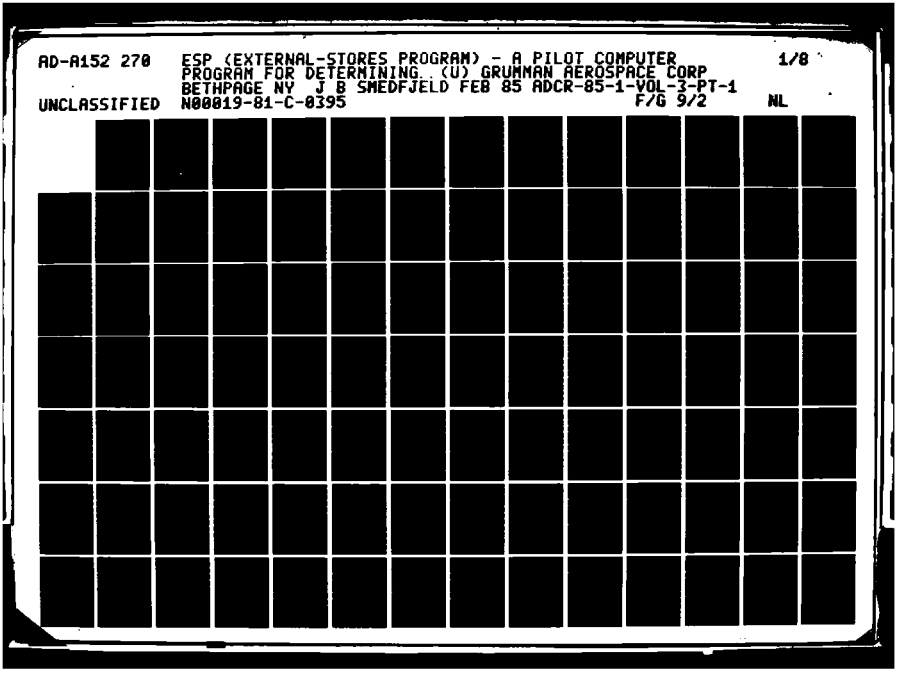
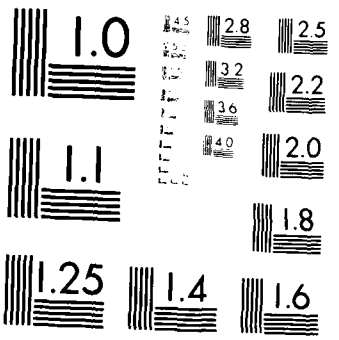

AD-A152 270 ESP (EXTERNAL-STORES PROGRAM) - A PILOT COMPUTER PROGRAM FOR DETERMINING (U) GRUMMAN AEROSPACE CORP BETHPAGE NY J B SMEDFJELD FEB 85 ADCR-85-1-VOL-3-PT-1
1/8
UNCLASSIFIED N00019-81-C-0395
F/G 9/2
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

AD-A152 270

REPORT NO. ADCR-85-1
Volume III, Part 1 of 2

ESP — A PILOT COMPUTER PROGRAM FOR DETERMINING FLUTTER-CRITICAL EXTERNAL-STORE CONFIGURATIONS

VOLUME III — PROGRAM COMPILATION
PART 1 OF 2

February 1985

Prepared Under Contracts N00019-81-C-0395
and N00019-84-C-0123

JOHN B. SMEDFJELD

GRUMMAN AEROSPACE CORPORATION
BETHPAGE, NEW YORK 11714



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Volume III, Part 1 of 2

ESP - A PILOT COMPUTER FOR DETERMINING FLUTTER-CRITICAL EXTERNAL-STORE CONFIGURATIONS

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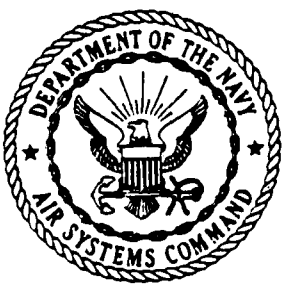
Prepared under Contracts N00019-81-C-0395
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by

GRUMMAN AEROSPACE CORPORATION
Bethpage, New York 11714

for

NAVAL AIR SYSTEMS COMMAND
Washington, D.C. 20361



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FOREWORD

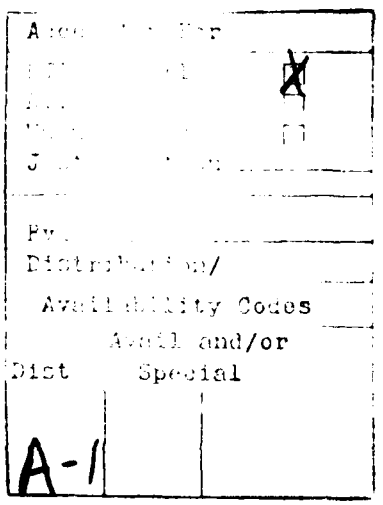
This report was prepared for the Naval Air Systems Command, Washington, D.C., under contracts N00019-81-C-0395 and N00019-84-C-0123, "Computer Code for Flutter-Critical External-Store Configurations". Funding was provided via Dr. Daniel Mulville, AIR-310B. The contract technical monitor was Mr. George Maggos, AIR-5302C.

The report consists of three volumes. Volume I, entitled "User's Manual", provides instructions for using the ESP program and presents descriptions of typical output. Volume II, "Final Report on Program Enhancement and Delivery", describes the work that was performed under the two contracts. A listing from a CDC compilation of the program is contained in Volume III, "Program Compilation".

The contributions of many individuals to the successful completion of the contracts are gratefully acknowledged. Ms. Ann Marie Novak performed much of the work required to convert the original IBM code to a CDC version. Highly valuable consulting support was provided by Mr. Richard Chipman, the primary developer of the original ESP version, and by Mr. Dino George and Dr. Joel Markowitz, key developers of FASTOP. Assistance on computing problems was provided by several persons at Grumman, including (in alphabetical order) Mr. Charles Bores, Mrs. Linda Ehlinger, Mr. Joel Halpert, Mr. Luke Kraner, Mr. Donald MacKenzie, Mr. Mario Mistretta, Mr. John Ortgiesen, Ms. Florence Wimpfheimer, and Mrs. Noreen Wolt. Key contributions to making the ESP program operational on the NADC Central Computing System were made by Messrs. Robert Richey and Howard Ireland of the Naval Air Development Center. Finally, Mr. Louis Mitchell of the Naval Air Systems Command provided valuable insight into program features which would be important to practicing flutter analysts, and also provided helpful suggestions during the preparation of this report.

CONTENTS

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1	SUMMARY	1-1
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1 - SUMMARY

A pilot computer program for determining flutter-critical external-store configurations has been developed and made operational on the Naval Air Development Center Central Computer System. The new program, designated ESP (External-Stores Program), is a derivative of the previously developed Flutter And STrength Optimization Program (FASTOP).

A compilation of the 264 subroutines in ESP is contained herein. The program consists of three major modules: (1) a vibration-analysis module, which begins with subroutine AVAM; (2) a flutter-analysis module, which begins with subroutine AFAM; and (3) a search module (called the flutter-optimization module in FASTOP), which begins with subroutine AFOM. These modules are entered via subroutine FOP, which performs most of the functions of a main program in the FASTOP and ESP Flutter Optimization Package. The actual MAIN program, which calls the FOP subroutine, is designated FASTOP herein.

To facilitate locating the compile for a particular routine, two numbered lists of all subroutine names have been provided. The first list, which is in order of appearance in the compile, determines the subroutine numbers. The second list is alphabetical. Part 1 of this volume contains the first 119 subroutines, and Part 2 contains the remainder.

2 - INTRODUCTION

During the development of the initial version of the Flutter And STrength Optimization Program (FASTOP), Reference 1, under contract F33615-72-C-1101 from the Air Force Flight Dynamics Laboratory, Mr. Keith Wilkinson, the project engineer on that contract, recognized that much of the technology being used for minimum-weight structural resizing in FASTOP also had the potential for substantially reducing the time and cost required to determine which combinations of wing-mounted external stores would result in the lowest aircraft flutter speeds.

Subsequently, under contract N00019-76-C-0160 from the Naval Air Systems Command, as well as a complementary Grumman Independent Research and Development project, a search algorithm for wing/store flutter was developed, refined, and tested by modifying and expanding the FASTOP code (see References 2 and 3). When this development effort led to a pilot program that exhibited both good reliability (absence of search failure) and good convergence characteristics, work was continued under a second NASC contract, N00019-79-C-0062, to add features desirable for practical applications and to demonstrate the new External-Stores Program (ESP) on a representative attack aircraft and its associated store inventory (see Reference 4). The project engineer on these studies was Mr. Richard Chipman.

With the performance and the advantages of the store search procedure having been confirmed, early utilization of the procedure on current aircraft projects became desirable. Toward this end, the program was further enhanced as described in Volume II of this report, and a user's manual, Volume I, was written. Also, the program was made operational on the Central Computer System at the Naval Air Development Center. A compilation of this latest version of the program is contained in this volume, Volume III.

3 - LIST OF SUBROUTINES NAMES IN ORDER OF APPEARANCE IN COMPILE

1 - FASTOF	2 - TFASTO	3 - FOP	4 - TFOP
5 - LDB	6 - ENDP	7 - DTABLE	8 - SETUP
9 - LTABLE	10 - LLABEL	11 - FSIOFO	12 - DSIOFO
13 - PTABLE	14 - PLABEL	15 - GEDLAB	16 - PUDLAB
17 - FSIO	18 - DSIO	19 - TSIO	20 - FCLOSE
21 - MESAGE	22 - TIMEB	23 - PROGNA	24 - PRMAT1
25 - PRMAT2	26 - SCAPRO	27 - DSQRTF	28 - DCMPLF
29 - CDABSF	30 - RDM	31 - AVAM	32 - TAVAM
33 - READY	34 - DYNMAS	35 - MASTOR	36 - FFMASS
37 - IV33	38 - BSOLVE	39 - MSG02	40 - QFACT
41 - QCHOL	42 - HOTDOT	43 - TRAN	44 - QFSOL
45 - QFOR	46 - QPASS	47 - REVERS	48 - QBSOL
49 - QBAC	50 - UNFIL	51 - MULT	52 - ENMMPY
53 - VIBIFO	54 - COMPAK	55 - EIGEN	56 - READMA
57 - RITVEC	58 - SYMEIG	59 - TFORM	60 - STURM
61 - PREP	62 - QSVEC	63 - SWAP	64 - DOTPRO
65 - ANDOR	66 - TRIEQ	67 - FUTILE	68 - DAGGER
69 - VIBRAP	70 - MMULT	71 - MCMULT	72 - ARAYMX
73 - ARAYMN	74 - MAX	75 - CLCORD	76 - FERGCV
77 - AFAM	78 - TAFAM	79 - RNRW	80 - CNRW
81 - DSCAPR	82 - COMSCA	83 - POOL	84 - FLINFO
85 - MOVIS	86 - HELGX	87 - FORM	88 - HELGA
89 - PICTUR	90 - AORDER	91 - SCLMAX	92 - ROUND
93 - SCLINC	94 - FATAN	95 - RODDEN	96 - PART1
97 - ATAN3	98 - MIDI	99 - MODAL	100 - HELP
101 - BIDI	102 - BEIN	103 - SPLIT3	104 - TRIDI
105 - MERGE	106 - GLOBAL	107 - GENQ	108 - AUGW
109 - TKER	110 - PRT2	111 - INCRO	112 - KERNEL
113 - IDF1	114 - IDF2	115 - SNPDF	116 - QUAS
117 - FUTSOL	118 - GENF	119 - MACH	120 - EVOVLE
121 - TANL	122 - TANT	123 - NOXN	124 - PLAN
125 - HELZ	126 - MODAZ	127 - ORDS	128 - DSPMD
129 - COFFIN	130 - NORDER	131 - RIP	132 - TRIP
133 - DSPDDW	134 - IMAGE	135 - KERN	136 - GEOM

137 - WHSA	138 - XTEXLE	139 - INTP	140 - FORK
141 - INVK	142 - CONB	143 - QUADX	144 - QUAXA
145 - QUAYB	146 - CONA	147 - SPCLA	148 - PARAM1
149 - GRS	150 - CLSQ	151 - UNIFAC	152 - DUPER
153 - SUPERF	154 - UNISLV	155 - PRESS	156 - SOLFLT
157 - QFLIN	158 - FLOP	159 - ZANLYN	160 - F
161 - CDET	162 - UERTST	163 - RTIN	164 - ASSESS
165 - FRORD	166 - VECP	167 - GENEIG	168 - JORCOM
169 - ORIENT	170 - ADIV	171 - CDAT	172 - CLUSAL
173 - GCVEC	174 - GRVEC	175 - CLUTSL	176 - EIGM
177 - CONV	178 - SREVNC	179 - FLSL	180 - BUCK
181 - FLASH	182 - VALCOM	183 - CQR	184 - VALROM
185 - CLR	186 - COMVEC	187 - GGCHK	188 - CLINEQ
189 - TRFR	190 - PRPLT	191 - FLUTAP	192 - VGPT
193 - AXFL	194 - AXIS	195 - TIPL	196 - AFOM
197 - TAFOM	198 - DRVTV	199 - DRVSTR	200 - FLTDES
201 - PACK	202 - UNPACK	203 - PUTROW	204 - GETROW
205 - CLUES	206 - PLB	207 - WORDS	208 - ERROR
209 - DVALUE	210 - IVALUE	211 - EOF01	212 - RWBT
213 - TITLES	214 - TIMEA	215 - PROGN	216 - HEAD
217 - DOPEN	218 - FETS	219 - DWRITE	220 - DREAD
221 - DFIND	222 - DCLOSE	223 - UCHECK	224 - MYIO
225 - MMOVE	226 - DVOLNO	227 - ABDUMP	228 - STRDES
229 - RILL	230 - VSCALE	231 - MURT	232 - USTEP
233 - CONSTR	234 - LINESR	235 - SOSCAP	236 - INCONS
237 - SERS	238 - MERS	239 - RECONS	240 - SETJGL
241 - LMKP1	242 - ADDCON	243 - LAGMUL	244 - HYPER
245 - LDFIX	246 - DELCON	247 - GRAPRO	248 - INSECT
249 - INV	250 - SOQUAS	251 - SOFUT	252 - TRPOSE
253 - DYNSTF	254 - TRIXY	255 - UPDATE	256 - CHANGE
257 - MOVE	258 - WDCHAR	259 - REDMOD	260 - REDVEC
261 - NRM2	262 - SREVNI	263 - QINTP	264 - NASTRD

4 - ALPHABETICAL LIST OF SUBROUTINE NAMES

ABDUMP - 227
ADDCON - 242
ADIV - 170
AFAM - 77
AFOM - 196
ANDOR - 65
AORDER - 90
ARAYMN - 73
ARAYMX - 72
ASSESS - 164
ATAN3 - 97
AUGW - 108
AVAM - 31
AXIS - 194
AXPL - 193
BEIN - 102
BIDI - 101
BSOLVE - 38
BUCK - 180
CDABSF - 29
CDAT - 171
CDET - 161
CHANGE - 256
CLCORD - 75
CLINEQ - 188
CLR - 185
CLSQ - 150
CLUES - 205
CLUSAL - 172
CLUTSL - 175
CNRW - 80
COFFIN - 129
COMPAK - 54
COMSCA - 82
COMVEC - 186
CONA - 146
CONB - 142
CONSTR - 233
CONV - 177
CQR - 183
DAGGER - 68
DCLOSE - 222
DCMPLF - 28
DELCON - 246
DFIND - 221
DOPEN - 217
DOTPRO - 64
DREAD - 220
DRVSTR - 199
DRVTV - 198
DSCAPR - 81
DSIO - 18
DSIOFO - 12
DSPDDW - 133
DSPMD - 128
DSQRTF - 27
DTABLE - 7
DUPER - 152
DVALUE - 209
DVOLNO - 226
DWRITE - 219
DYNMAS - 34
DYNSTF - 253
EIGEN - 85
EIGM - 176
ENDP - 6
ENMMPY - 52
EOF01 - 211
ERROR - 208
EVOVLE - 120
F - 160
FASTOP - 1
FATAN - 94
FCLOSE - 20
FERGCV - 76
FETS - 218
FFMASS - 36
FLASH - 181
FLINFO - 84
FLOP - 138
FLSL - 179
FLTDES - 200
FLUTAP - 191
FOP - 3
FORK - 140
FORM - 87
FRORD - 165
FSIO - 17
FSIOFO - 11
FUTILE - 67
FUTSOL - 117
GCVEC - 173
GEDLAB - 15
GENEIG - 167
GENF - 118
GENQ - 107
GEOM - 136
GETROW - 204
GGCHK - 187
GLOBAL - 106
GRAPRO - 247
GRS - 149
GRVEC - 174
HEAD - 216
HELGA - 88
HELGX - 86
HELP - 100
HELZ - 125
HOTDOT - 42
HYPER - 244
IDF1 - 113
IDF2 - 114
IMAGE - 134
INCONS - 236
INCRO - 111
INSECT - 248
INTP - 139
INV - 249
INVK - 141
IV33 - 37
IVALUE - 210
JORCOM - 168
KERN - 135
KERNEL - 112
LAGMUL - 243
LDB - 5
LDFIX - 245
LINESR - 234
LLABEL - 10
LMKP1 - 241
LTABLE - 9
MACH - 119
MASTOR - 35
MAX - 74
MCMULT - 71
MERGE - 105

MERS - 238 MESAGE - 21 MIDI - 98 MMOVE - 225
MMULT - 70 MODAL - 99 MODAZ - 126 MOVE - 257
MOVIS - 85 MSG02 - 39 MULT - 51 MURT - 231
MYIO - 224 NASTRD - 264 NORDER - 130 NOXN - 123
NRM2 - 261 ORDS - 127 ORIENT - 169 PACK - 201
PARAM1 - 148 PART1 - 96 PICTUR - 89 PLABEL - 14
PLAN - 124 PLB - 206 POOL - 83 PREP - 61
PRESS - 155 PRMAT1 - 24 PRMAT2 - 25 PROGN - 215
PROGNA - 23 PRPLT - 190 PRT2 - 110 PTABLE - 13
PUDLAB - 16 PUTROW - 203 QBAC - 49 QBSOL - 48
QCHOL - 41 QFACT - 40 QFLIN - 157 QFOR - 45
QFSOL - 44 QINTP - 263 QPASS - 46 QSVEC - 62
QUADX - 143 QUAS - 116 QUAXA - 144 QUAYB - 145
RDM - 30 READMA - 56 READY - 33 RECONS - 239
REDMOD - 259 REDVEC - 260 REVERS - 47 RILL - 229
RIP - 131 RITVEC - 57 RNRW - 79 RODDEN - 95
ROUND - 92 RTIN - 163 RWBT - 212 SCAPRO - 26
SCLINC - 93 SCLMAX - 91 SERS - 237 SETJGL - 240
SETUP - 8 SNPDF - 115 SOFUT - 251 SOLFLT - 156
SOQUAS - 250 SOSCAP - 235 SPCLA - 147 SPLIT3 - 103
SREVNC - 178 SREVNI - 262 STRDES - 228 STURM - 60
SUPERF - 153 SWAP - 63 SYMEIG - 58 TAFAM - 78
TAFOM - 197 TANL - 121 TANT - 122 TAVAM - 32
TFASTO - 2 TFOP - 4 TFORM - 59 TIMEA - 214
TIMEB - 22 TIPL - 195 TITLES - 213 TKER - 109
TRAN - 43 TRFR - 189 TRIDI - 104 TRIEQ - 66
TRIP - 132 TRIXY - 254 TRPOSE - 252 TSIO - 19
UCHECK - 223 UERTST - 162 UNFIL - 50 UNIFAC - 151
UNISLV - 154 UNPACK - 202 UPDATE - 255 USTEP - 232
VALCOM - 182 VALROM - 184 VECP - 166 VGPT - 192
VIBIFO - 53 VIBRAP - 69 VSCALE - 230 WDCHAR - 258
WHSA - 137 WORDS - 207 XTEXLE - 138 ZANLYN - 159

5 - COMPILE LISTING

A listing from a compile of all ESP subroutines on the Central Computer System at the Naval Air Development Center begins on the following page.

```
      C                                                                       FASTOP     2
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH [illegible]               FASTOP     3
            PROGRAM MAIN(INPUT,OUTPUT,TAPE16,TAPE6=OUTPUT,TAPE[illegible]     FASTOP     4
           1              TAPE17=512,TAPE18=512,TAPE19=512,TAPE[illegible]    FASTOP     5
           2              TAPE21=512,TAPE22=512,TAPE23=512,TAPE24=512         FASTOP     6
           3              TAPE25=512,TAPE26=512,TAPE27=512,TAPE28=512         FASTOP     7
           4              TAPE29=512,TAPE30=512,TAPE31=512,TAPE32=512         FASTOP     8
           5              TAPE33=512,TAPE34=512,TAPE35=512,TAPE36=512         FASTOP     9
           6              TAPE37=512,TAPE39=512,TAPE40=512,TAPE41=512,        FASTOP    10
           7              TAPE42=512,TAPE43=512,TAPE44=512,TAPE45=512,        FASTOP    11
           8              TAPE47=512,TAPE48=512,TAPE49=512,TAPE50=512         FASTOP    12
           9              TAPE57=512,TAPE58=512,TAPE59=512,TAPE60=512)        FASTOP    13
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS        FASTOP    14
      C                                                                       FASTOP    15
      C45700. PROG  FASTOP (FLUTTER AND STRUCTURAL OPTIMIZATION PROGRAM)      FASTOP    16
      C                                                                       FASTOP    17
      C     PROGRAM FASTOP                                                    FASTOP    18
      C                                                                       FASTOP    19
      C*************************************************************************FASTOP    20
      C*************************************************************************FASTOP    21
      C*************************************************************************FASTOP    22
      C*************************************************************************FASTOP    23
      C*************************************************************************FASTOP    24
      C*****                                                          ******** FASTOP    25
      C*****        FFFFF    AAA     SSSS   TTTTT    000    PPPP     ******** FASTOP    26
      C*****        F       A   A   S         T     0   0   P   P    ******** FASTOP    27
      C*****        FFFF  - AAAAA -  SSS  -   T   - 0   0 - PPPP     ******** FASTOP    28
      C*****        F       A   A      S      T     0   0   P        ******** FASTOP    29
      C*****        F       A   A   SSSS      T      000    P        ******** FASTOP    30
      C*****                                                          ******** FASTOP    31
      C*************************************************************************FASTOP    32
      C*************************************************************************FASTOP    33
      C*************************************************************************FASTOP    34
      C*************************************************************************FASTOP    35
      C************************************ ************************************FASTOP    36
      C                                                                       *  FASTOP    37
            INTEGER YES                                                       FASTOP    38
            DIMENSION AFFDL(4)                                                FASTOP    39
            DIMENSION DATE(4)                                                 FASTOP    40
            DIMENSION FMTAO(3)                                                FASTOP    41
            DIMENSION TMH(18,2)          ,TMAIN(2)                            FASTOP    42
            DIMENSION TFH(18)                                                 FASTOP    43
      C                                                                       FASTOP    44
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              FASTOP    45
            COMMON /CTMH  / KTMH  ,LTMH  ,TMH                                 FASTOP    46
            COMMON /MESAG / KMESAG,KTITLE,KTIME ,KTIMEL                       FASTOP    47
            COMMON /CTFH  / KTFH  ,LTFH  ,TFH                                 FASTOP    48
            COMMON /CONSTS/ NO    ,YES                                        FASTOP    49
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE   FASTOP    50
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                       FASTOP    51
            COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA  FASTOP    52
           1               ,ITAPET                                            FASTOP    53
            COMMON /REPORT/ KREPOR                                            FASTOP    54
            COMMON /CFMTAO/ FMTAO                                             FASTOP    55
            COMMON /COMPUT/ KOMPUT,NCHARW                                     FASTOP    56
            COMMON /LABELS/ KFLABO,KDLABO,KFLABI,KDLABI,ITAPEL,KLABEI         FASTOP    57
            COMMON /CAFFDL/ AFFDL                                             FASTOP    58
```

```
400               * 37X                                                    TFASTO   401
                  P 13H PPP                                                TFASTO   402
                  * 3X, 1H*                                                TFASTO   403
                  *,/, 5X, 1H* 2X                                          TFASTO   404
                  *,5X, 15H                    ,4X                         TFASTO   405
405               *,          40H  GGGGGG                      ,1X         TFASTO   406
                  *,37X                                                    TFASTO   407
                  P,13H PPP                                                TFASTO   408
                  *,3X, 1H*)                                               TFASTO   409
                210 FORMAT (                                               TFASTO   410
410               *    5X,1H*,2X                                           TFASTO   411
                  *,24X,       40H  GGGG                       ,1X         TFASTO   412
                  * 37X                                                    TFASTO   413
                  P 13H PPP                                                TFASTO   414
                  *,3X, 1H*                                                TFASTO   415
415               *,/, 5X,1H*,2X                                           TFASTO   416
                  *,24X,       40H  GG                         ,1X         TFASTO   417
                  *,37X                                                    TFASTO   418
                  P,13HPPPP                                                TFASTO   419
                  *,3X, 1H*                                                TFASTO   420
420               *,/, 5X,1H*,2X                                           TFASTO   421
                  *,24X,       40H  G                          ,1X         TFASTO   422
                  *,37X                                                    TFASTO   423
                  P,13HPPPP                                                TFASTO   424
                  *,3X, 1H*)                                               TFASTO   425
425             215 FORMAT (5X,1H*,120X,1H*,/, 5X,122(1H*))                TFASTO   426
                C                                                          TFASTO   427
                      RETURN                                               TFASTO   428
                     END                                                   TFASTO   429
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES

1	TFASTO	14	427

VARIABLES SN TYPE RELOCATION

0	AFFDL	REAL	ARRAY	CAFFDL	REFS	16	23	57				
2	ITAPEP	INTEGER		COMRWP	REFS	18						
0	ITAPER	INTEGER		COMRWP	REFS	18						
7	ITAPET	INTEGER		CTABLE	REFS	21						
1	ITAPEW	INTEGER		COMRWP	REFS	18	I/O REFS	53	54	55	56	57
						58	59	60	61	62	63	64	65
						66	67	68	69	70	71	72	73
						74	75	76				
7	KBPAGE	INTEGER		CLIST	REFS	19						
4	KLABEL	INTEGER		CLIST	REFS	19						
0	KOUNT	INTEGER		CLIST	REFS	19	DEFINED	28	48			
11	KOUNTH	INTEGER		CLIST	REFS	19						
1	KPAGE	INTEGER		CLIST	REFS	19						
0	KTABLE	INTEGER		CTABLE	REFS	21	DEFINED	32	36	39	42	45
5	KTABLO	INTEGER		CTABLE	REFS	21						
5	KTPAGE	INTEGER		CLIST	REFS	19						
2	LINES	INTEGER		CLIST	REFS	19	28	48				

```
                *,24X,      40H  GGGGGGGGGGGGGGGGGGGGGGGGGGG          ,1X          TFASTO   344
                *,17X                                                              TFASTO   345
345             0,13H000       000                                                 TFASTO   346
                *,7X                                                               TFASTO   347
                P,13H PPP     PPP                                                  TFASTO   348
                *,3X, 1H*                                                          TFASTO   349
                *,/, 5X,1H*,2X                                                     TFASTO   350
350             *,24X,      40H   GGGGGGGGGGGGGGGGGGGGG          ,1X              TFASTO   351
                *,17X                                                              TFASTO   352
                0,13H000       000                                                 TFASTO   353
                *,7X                                                               TFASTO   354
                P,13H PPPPPPPPP                                                    TFASTO   355
355             *,3X, 1H*)                                                         TFASTO   356
              195 FORMAT (                                                         TFASTO   357
                *    5X,1H*,2X                                                     TFASTO   358
                *,5X,  15H. . . . . . . . . . . . ,4X                              TFASTO   359
                *,          40H    GGGGGGGGGGGGGGGG          ,1X                  TFASTO   360
360             *,17X                                                              TFASTO   361
                0,13H000       000                                                 TFASTO   362
                *,7X                                                               TFASTO   363
                P,13H PPPPPPPP                                                     TFASTO   364
                *,3X, 1H*                                                          TFASTO   365
365             *,/, 5X,1H*,2X                                                     TFASTO   366
                *,5X,  15H.                ,4X                                     TFASTO   367
                *,          40H   GGGGGGGGGGGGGGG          ,1X                   TFASTO   368
                *,17X                                                              TFASTO   369
                0,13H 0000   0000                                                  TFASTO   370
370             *,7X                                                               TFASTO   371
                P,13H PPP                                                          TFASTO   372
                *,3X, 1H*)                                                         TFASTO   373
              200 FORMAT (                                                         TFASTO   374
                *    5X,1H*,2X                                                     TFASTO   375
375             *,5X,  15H.   GRUMMAN    .,4X                                     TFASTO   376
                *,          40H  GGGGGGGGGGGGGG          ,1X                      TFASTO   377
                *,17X                                                              TFASTO   378
                0,13H  000000000                                                   TFASTO   379
                *,7X                                                               TFASTO   380
380             P,13H PPP                                                          TFASTO   381
                *,3X, 1H*                                                          TFASTO   382
                *,/, 5X,1H*,2X                                                     TFASTO   383
                *,5X,  15H.  AEROSPACE   .,4X                                      TFASTO   384
                *,          40H  GGGGGGGGGGG          ,1X                         TFASTO   385
385             *,17X                                                              TFASTO   386
                0,13H   0000000                                                    TFASTO   387
                *,7X                                                               TFASTO   388
                P,13H PPP                                                          TFASTO   389
                *,3X, 1H*)                                                         TFASTO   390
390           205 FORMAT (                                                         TFASTO   391
                *    5X,1H*,2X                                                     TFASTO   392
                *,5X,  15H. CORPORATION  ,4X                                       TFASTO   393
                *,          40H  GGGGGGGGG          ,1X                          TFASTO   394
                *,37X                                                              TFASTO   395
395             P,13H PPP                                                          TFASTO   396
                *,3X, 1H*                                                          TFASTO   397
                *,/, 5X,1H*,2X                                                     TFASTO   398
                *,5X,  15H.              .,4X                                      TFASTO   399
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                S,13H   SSSSSSS                                                                  TFASTO   287
                *,7X                                                                             TFASTO   288
                T,13H     TTT                                                                    TFASTO   289
                *,7X                                                                             TFASTO   290
290             O,13HOOO        OOO                                                              TFASTO   291
                *,7X                                                                             TFASTO   292
                P,13HPPPPPPPPPPP                                                                 TFASTO   293
                *,3X, 1H*)                                                                       TFASTO   294
              175 FORMAT (                                                                       TFASTO   295
295             *    5X,1H*,64X                                                                  TFASTO   296
                T,13H     TTT                                                                    TFASTO   297
                *,7X                                                                             TFASTO   298
                O,13HOOO        OOO                                                              TFASTO   299
                *,7X                                                                             TFASTO   300
300             P,13H PPP    PPPP                                                                TFASTO   301
                *,3X, 1H*                                                                        TFASTO   302
                *,/, 5X,1H*,64X                                                                  TFASTO   303
                T,13H     TTT                                                                    TFASTO   304
                *,7X                                                                             TFASTO   305
305             O,13HOOO        OOO                                                              TFASTO   306
                *,7X                                                                             TFASTO   307
                P,13H PPP       PPP                                                              TFASTO   308
                *, 3X,  1H*)                                                                     TFASTO   309
              180 FORMAT (                                                                       TFASTO   310
310             *    5X,1H*,64X                                                                  TFASTO   311
                T,13H     TTT                                                                    TFASTO   312
                *,7X                                                                             TFASTO   313
                O,13HOOO        OOO                                                              TFASTO   314
                *,7X                                                                             TFASTO   315
315             P,13H PPP       PPP                                                              TFASTO   316
                *,3X, 1H*                                                                        TFASTO   317
                *,/, 5X,1H*,64X                                                                  TFASTO   318
                T,13H     TTT                                                                    TFASTO   319
                *,7X                                                                             TFASTO   320
320             O,13HOOO        OOO                                                              TFASTO   321
                *,7X                                                                             TFASTO   322
                P,13H PPP       PPP                                                              TFASTO   323
                *,3X, 1H*)                                                                       TFASTO   324
              185 FORMAT (                                                                       TFASTO   325
325             *    5X,1H*,2X                                                                   TFASTO   326
                *,8(3HGGG), 38HGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG                            TFASTO   327
                T,13HGG   TTT                                                                    TFASTO   328
                *,7X                                                                             TFASTO   329
                O,13HOOO        OOO                                                              TFASTO   330
330             *,7X                                                                             TFASTO   331
                P,13H PPP       PPP                                                              TFASTO   332
                *,3X, 1H*                                                                        TFASTO   333
                *,/, 5X,1H*,2X                                                                   TFASTO   334
                *,8(3HGGG), 38HGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG                            TFASTO   335
335             T,13H     TTT                                                                    TFASTO   336
                *,7X                                                                             TFASTO   337
                O,13HOOO        OOO                                                              TFASTO   338
                *,7X                                                                             TFASTO   339
                P,13H PPP     PPP                                                                TFASTO   340
340             *,3X, 1H*)                                                                       TFASTO   341
              190 FORMAT (                                                                       TFASTO   342
                *    5X,1H*,2X                                                                   TFASTO   343
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                *,7X                                                    TFASTO    230
230             S,13H           SSS                                     TFASTO    231
                *,7X                                                    TFASTO    232
                T,13H     TTT                                           TFASTO    233
                *,7X                                                    TFASTO    234
                O,13H   0000000                                         TFASTO    235
235             *,23X,  1H*                                             TFASTO    236
                *,/, 5X,1H*,24X                                         TFASTO    237
                A,13HAAA        AAA                                     TFASTO    238
                *,7X                                                    TFASTO    239
                S,13H  S        SSS                                     TFASTO    240
240             *,7X                                                    TFASTO    241
                T,13H     TTT                                           TFASTO    242
                *,7X                                                    TFASTO    243
                O,13H  000000000                                        TFASTO    244
                *,23X,  1H*)                                            TFASTO    245
245           160 FORMAT (                                              TFASTO    246
                *    5X,1H*,44X                                         TFASTO    247
                S,13H SS        SSS                                     TFASTO    248
                *,7X                                                    TFASTO    249
                T,13H     TTT                                           TFASTO    250
250             *,7X                                                    TFASTO    251
                O,13H 0000   0000                                       TFASTO    252
                *,23X,  1H*                                             TFASTO    253
                *,/, 5X,1H*,44X                                         TFASTO    254
                S,13HSSS        SSS                                     TFASTO    255
255             *,7X                                                    TFASTO    256
                T,13H     TTT                                           TFASTO    257
                *,7X                                                    TFASTO    258
                O,13HOOO        OOO                                     TFASTO    259
                *,23X,  1H*)                                            TFASTO    260
260           165 FORMAT (                                              TFASTO    261
                *    5X,1H*,44X                                         TFASTO    262
                S,13HSSSS     SSSS                                      TFASTO    263
                *,7X                                                    TFASTO    264
                T,13H     TTT                                           TFASTO    265
265             *,7X                                                    TFASTO    266
                O,13HOOO        OOO                                     TFASTO    267
                *,23X,  1H*                                             TFASTO    268
                *,/, 5X,1H*,44X                                         TFASTO    269
                S,13H SSSS   SSSS                                       TFASTO    270
270             *,7X                                                    TFASTO    271
                T,13H     TTT                                           TFASTO    272
                *,7X                                                    TFASTO    273
                O,13HOOO        OOO                                     TFASTO    274
                *,23X,  1H*)                                            TFASTO    275
275           170 FORMAT (                                              TFASTO    276
                *    5X,1H*,44X                                         TFASTO    277
                S,13H  SSSSSSSSS                                        TFASTO    278
                *,7X                                                    TFASTO    279
                T,13H     TTT                                           TFASTO    280
280             *,7X                                                    TFASTO    281
                O,13HOOO        OOO                                     TFASTO    282
                *,7X                                                    TFASTO    283
                P 13HPPPPPPPPPP                                         TFASTO    284
                *,3X, 1H*                                               TFASTO    285
285             *,/, 5X,1H*,44X                                         TFASTO    286
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                     *,7X                                                TFASTO    173
                     A,13H  AAAA AAAA                                    TFASTO    174
                     *,7X                                                TFASTO    175
175                  S,13HSSS       SS                                   TFASTO    176
                     *,63X,  1H*)                                        TFASTO    177
                   140 FORMAT (                                          TFASTO    178
                     *    5X,1H*,4X                                      TFASTO    179
                     F,13HFFFF                                           TFASTO    180
180                  *,7X                                                TFASTO    181
                     A,13H  AAA   AAA                                    TFASTO    182
                     *,7X                                                TFASTO    183
                     S,13HSSS       S                                    TFASTO    184
                     *,7X                                                TFASTO    185
185                  T,13HTTTTTTTTTTTTT                                  TFASTO    186
                     *,43X,  1H*                                         TFASTO    187
                     *,/, 5X,1H*,4X                                      TFASTO    188
                     F,13HFFFF                                           TFASTO    189
                     *,7X                                                TFASTO    190
190                  A,13H  AAA   AAA                                    TFASTO    191
                     *,7X                                                TFASTO    192
                     S,13HSSS                                            TFASTO    193
                     *,7X                                                TFASTO    194
                     T,13HTTTTTTTTTTTTT                                  TFASTO    195
195                  *,43X,  1H*)                                        TFASTO    196
                   145 FORMAT (                                          TFASTO    197
                     *    5X,1H*,24X                                     TFASTO    198
                     A,13H AAA     AAA                                   TFASTO    199
                     *,7X                                                TFASTO    200
200                  S,13HSSSS                                           TFASTO    201
                     *,7X                                                TFASTO    202
                     T,13HTTT  TTT  TTT                                  TFASTO    203
                     *,43X,  1H*                                         TFASTO    204
                     *,/, 5X,1H*,24X                                     TFASTO    205
205                  A,13H AAA     AAA                                   TFASTO    206
                     *,7X                                                TFASTO    207
                     S,13H SSSSSSSSSS                                    TFASTO    208
                     *,7X                                                TFASTO    209
                     T,13H     TTT                                       TFASTO    210
210                  *,43X,  1H*)                                        TFASTO    211
                   150 FORMAT (                                          TFASTO    212
                     *    5X,1H*,24X                                     TFASTO    213
                     A,13H AAA     AAA                                   TFASTO    214
                     *,7X                                                TFASTO    215
215                  S,13H  SSSSSSSSSS                                   TFASTO    216
                     *,7X                                                TFASTO    217
                     T,13H     TTT                                       TFASTO    218
                     *,43X,  1H*                                         TFASTO    219
                     *,/, 5X,1H*,24X                                     TFASTO    220
220                  A,13HAAA       AAA                                  TFASTO    221
                     *,7X                                                TFASTO    222
                     S,13H          SSSS                                 TFASTO    223
                     *,7X                                                TFASTO    224
                     T,13H     TTT                                       TFASTO    225
225                  *,43X,  1H*)                                        TFASTO    226
                   155 FORMAT (                                          TFASTO    227
                     *    5X,1H*,24X                                     TFASTO    228
                     A,13HAAA       AAA                                  TFASTO    229
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115               *,43X, 36H.            AIR FORCE              .,4X,1H*          TFASTO   116
                  *,/, 5X,1H*,4X                                                  TFASTO   117
                  F,13H FFFFFFFFF                                                 TFASTO   118
                  *,7X                                                            TFASTO   119
                  A,13H    AAAAA                                                  TFASTO   120
120               *,43X, 36H.    FLIGHT DYNAMICS LABORATORY     .,4X,1H*)         TFASTO   121
                 120 FORMAT (                                                     TFASTO   122
                  *    5X,1H*,4X                                                  TFASTO   123
                  F,13H FFFFFFFFF                                                 TFASTO   124
                  *,7X                                                            TFASTO   125
125               A,13H   AAA AAA                                                 TFASTO   126
                  *,43X, 36H.                                   .,4X,1H*          TFASTO   127
                  *,/, 5X,1H*,4X                                                  TFASTO   128
                  F,13H FFF                                                       TFASTO   129
                  *,7X                                                            TFASTO   130
130               A,13H   AAA AAA                                                 TFASTO   131
                  *,43X, 10H.          ,4A4, 10H          .4X,1H*)                TFASTO   132
                 125 FORMAT (                                                     TFASTO   133
                  *    5X,1H*,4X                                                  TFASTO   134
                  F,13H FFF                                                       TFASTO   135
135               *,7X                                                            TFASTO   136
                  A,13H   AAA AAA                                                 TFASTO   137
                  *,7X                                                            TFASTO   138
                  S,13H   SSSSSSS                                                 TFASTO   139
                  *,23X, 36H.                                   .,4X,1H*          TFASTO   140
140               *,/, 5X,1H*,4X                                                  TFASTO   141
                  F,13H FFF                                                       TFASTO   142
                  *,7X                                                            TFASTO   143
                  A,13H   AAA AAA                                                 TFASTO   144
                  *,7X                                                            TFASTO   145
145               S,13H  SSSSSSSSS                                                TFASTO   146
                  *,23X, 36H.....  .....,4X,1H*)                                  TFASTO   147
                 130 FORMAT (                                                     TFASTO   148
                  *    5X.1H*,4X                                                  TFASTO   149
                  F,13H FFF                                                       TFASTO   150
150               *,7X                                                            TFASTO   151
                  A,13H   AAA AAA                                                 TFASTO   152
                  *,7X                                                            TFASTO   153
                  S,13H SSSS   SSSS                                               TFASTO   154
                  *,63X,  1H*                                                     TFASTO   155
155               *,/, 5X,1H*,4X                                                  TFASTO   156
                  F,13H FFF                                                       TFASTO   157
                  *,7X                                                            TFASTO   158
                  A,13H  AAAAAAAAA                                                TFASTO   159
                  *,7X                                                            TFASTO   160
160               S,13HSSSS     SSSS                                              TFASTO   161
                  *,63X,  1H*)                                                    TFASTO   162
                 135 FORMAT (                                                     TFASTO   163
                  *    5X,1H*,4X                                                  TFASTO   164
                  F,13H FFF                                                       TFASTO   165
165               *,7X                                                            TFASTO   166
                  A,13H  AAAAAAAAA                                                TFASTO   167
                  *,7X                                                            TFASTO   168
                  S,13HSSS       SSS                                              TFASTO   169
                  *,63X,  1H*                                                     TFASTO   170
170               *,/, 5X,1H*,4X                                                  TFASTO   171
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                WRITE (ITAPEW,125)                                          TFASTO     59
                WRITE (ITAPEW,130)                                          TFASTO     60
60              WRITE (ITAPEW,135)                                          TFASTO     61
                WRITE (ITAPEW,140)                                          TFASTO     62
                WRITE (ITAPEW,145)                                          TFASTO     63
                WRITE (ITAPEW,150)                                          TFASTO     64
                WRITE (ITAPEW,155)                                          TFASTO     65
65              WRITE (ITAPEW,160)                                          TFASTO     66
                WRITE (ITAPEW,165)                                          TFASTO     67
                WRITE (ITAPEW,170)                                          TFASTO     68
                WRITE (ITAPEW,175)                                          TFASTO     69
                WRITE  (ITAPEW,180)                                         TFASTO     70
70              WRITE  (ITAPEW,185)                                         TFASTO     71
                WRITE  (ITAPEW,190)                                         TFASTO     72
                WRITE  (ITAPEW,195)                                         TFASTO     73
                WRITE  (ITAPEW,200)                                         TFASTO     74
                WRITE  (ITAPEW,205)                                         TFASTO     75
75              WRITE  (ITAPEW,210)                                         TFASTO     76
                WRITE  (ITAPEW,215;                                         TFASTO     77
             100 FORMAT (                                                   TFASTO     78
                *    5X,122(1H*)                                           TFASTO     79
                *,/, 5X,1H*,120X,1H*                                       TFASTO     80
80              *,/, 5X,1H*,4X                                             TFASTO     81
                F,13HFFFFFFFFFFFFF                                         TFASTO     82
                *,63X, 36H.....,4X,1H*                                     TFASTO     83
                *,/, 5X,1H*,4X                                             TFASTO     84
                F,13HFFFFFFFFFFFFF                                         TFASTO     85
85              *,63X, 36H.                                  .,4X,1H*      TFASTO     86
                *,/, 5X,1H*,4X                                             TFASTO     87
                F,13H FFF     FFF                                          TFASTO     88
                *,63X, 36H.          **** FASTOP ****        .,4X,1H*)     TFASTO     89
             105 FORMAT (                                                   TFASTO     90
90              *    5X,1H*,4X                                             TFASTO     91
                F,13H FFF     FFF                                          TFASTO     92
                *,63X, 36H.       FLUTTER AND STRUCTURAL     .,4X,1H*      TFASTO     93
                *,/, 5X,1H*,4X                                             TFASTO     94
                F,13H FFF                                                  TFASTO     95
95              *,63X, 36H.        OPTIMIZATION PROGRAM      .,4X,1H*      TFASTO     96
                *,/, 5X,1H*,4X                                             TFASTO     97
                F,13H FFF                                                  TFASTO     98
                *,63X, 36H.                                  .,4X,1H*)     TFASTO     99
             110 FORMAT (                                                   TFASTO    100
100             *    5X,1H*,4X                                             TFASTO    101
                F,13H FFF                                                  TFASTO    102
                *,7X                                                       TFASTO    103
                A,13H      A                                               TFASTO    104
                *,43X, 36H.....,4X,1H*                                     TFASTO    105
105             *,/, 5X,1H*,4X                                             TFASTO    106
                F,13H FFF                                                  TFASTO    107
                *,7X                                                       TFASTO    108
                A,13H     AAA                                              TFASTO    109
                *,43X, 36H.                                  .,4X,1H*)     TFASTO    110
110          115 FORMAT (                                                  TFASTO    111
                *    5X,1H*,4X                                             TFASTO    112
                F,13H FFF                                                  TFASTO    113
                *,7X                                                       TFASTO    114
                A,13H    AAAAA                                             TFASTO    115
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      C                                                                       TFASTO     2
      C45700, SUB  TFASTO (TITLE FOR FLUTTER AND STR. OPTIMIZATION PROGRAM)   TFASTO     3
      C                                                                       TFASTO     4
      C*************************************************************************TFASTO     5
      C                                                                       TFASTO     6
      C***  SUBROUTINE TFASTO ***************************************************TFASTO     7
      C                                                                       TFASTO     8
      C***  OBJECTIVE  **********************************************************TFASTO     9
      C     ---------                                                       *  TFASTO    10
      C     PRINTS THE TITLE PAGE FOR FASTOP SYSTEM                         *  TFASTO    11
      C                                                                     *  TFASTO    12
      C*************************************************************************TFASTO    13
      C                                                                       TFASTO    14
            SUBROUTINE TFASTO                                                 TFASTO    15
      C                                                                       TFASTO    16
            DIMENSION AFFDL(4)                                                TFASTO    17
      C                                                                       TFASTO    18
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              TFASTO    19
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE   TFASTO    20
           1               ,KBPAGE,LINESG,KOUNTH                              TFASTO    21
            COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA  TFASTO    22
           1               ,ITAPET                                            TFASTO    23
            COMMON /CAFFDL/ AFFDL                                             TFASTO    24
      C                                                                       TFASTO    25
      C                                                                       TFASTO    26
      C PREPARE TABLE OF CONTENTS                                             TFASTO    27
      C                                                                       TFASTO    28
            KOUNT  =  LINES                                                   TFASTO    29
            CALL TITLES (-1)                                                  TFASTO    30
            NCOLS  =  0                                                       TFASTO    31
            NROWS  =  2                                                       TFASTO    32
            KTABLE =  2                                                       TFASTO    33
            CALL PTABLE (1,60,60                                              TFASTO    34
           1   H*****    ***     ****   *****    ***    ****     FLUTTER    ) TFASTO    35
            NROWS  =  0                                                       TFASTO    36
            KTABLE =  2                                                       TFASTO    37
            CALL PTABLE (1,60,60                                              TFASTO    38
           1   H*       *   *   *         *     *   *   *   *      AND      ) TFASTO    39
            KTABLE =  2                                                       TFASTO    40
            CALL PTABLE (1,60,60                                              TFASTO    41
           1   H****  - ***** -  ***  -   *   - *   * - ****   STRUCTURAL  ) TFASTO    42
            KTABLE =  2                                                       TFASTO    43
            CALL PTABLE (1,60,60                                              TFASTO    44
           1  'H*       *   *       *     *     *   *   *     OPTIMIZATION ) TFASTO    45
            KTABLE =  2                                                       TFASTO    46
            CALL PTABLE (2,60,60                                              TFASTO    47
           1   H*       *   *   ****      *      ***    *       PROGRAM    ) TFASTO    48
            KOUNT  =  LINES                                                   TFASTO    49
      C                                                                       TFASTO    50
      C                                                                       TFASTO    51
      C LIST TITLE PAGE                                                       TFASTO    52
      C                                                                       TFASTO    53
            WRITE (ITAPEW,100)                                                TFASTO    54
            WRITE (ITAPEW,105)                                                TFASTO    55
            WRITE (ITAPEW,110)                                                TFASTO    56
            WRITE (ITAPEW,115)                                                TFASTO    57
            WRITE (ITAPEW,120) AFFDL                                          TFASTO    58
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EXTERNALS	TYPE	ARGS	REFERENCES	
DVALUE		3	112	
FOP		0	196	
TFASTO		0	141	
TIMEB		2	147	
WORDS		3	98	99

STATEMENT LABELS		DEF LINE	REFERENCES
0	132	114	113
0	140	126	125

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
56443	132	L	113 114	3B	INSTACK
56463	140	I	125 126	3B	INSTACK

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)			
CTMH	38	0 KTMH (1)	1 LTMH (1)	2 TMH (36)			
MESAG	4	0 KMESAG (1)	1 KTITLE (1)	2 KTIME (1)			
		3 KTIMEL (1)					
CTFH	20	0 KTFH (1)	1 LTFH (1)	2 TFH (18)			
CONSTS	2	0 NO (1)	1 YES (1)				
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)			
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)			
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)			
		9 KOUNTH (1)	10 KOUNTI (1)				
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)			
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)			
		6 NPAGEA (1)	7 ITAPET (1)				
REPORT	1	0 KREPOR (1)					
CFMTAO	3	0 FMTAO (3)					
COMPUT	2	0 KOMPUT (1)	1 NCHARW (1)				
LABELS	6	0 KFLABO (1)	1 KDLABO (1)	2 KFLABI (1)			
		3 KDLABI (1)	4 ITAPEL (1)	5 KLABEI (1)			
CAFFDL	4	0 AFFDL (4)					
GENCOM	1578	0 DUMMY (1578)					
FLPCOM	14400 ECS	0 GKECS (3200)	3200 SOLECS (8000)	11200 AECS (3200)			
BCOM	6400 ECS	0 BECS (3200)	3200 BBECS (3200)				
INCCOM	1802 ECS	0 GECS (1750)	1750 BCOECS (50)	1800 NPMECS (1)			
		1801 MSTRECS(1)					
STRCOM	5436 ECS	0 JSETECS(50)	50 JDIMECS(1)	51 LMKECS (2500)			
		2551 NOTJECS(50)	2601 NTDMECS(1)	2602 LNDECS (50)			
		2652 LDMECS (1)	2653 NOTTECS(50)	2703 ICNECS (1)			
		2704 NDIMECS(1)	2705 XOECS (35)	2740 XNECS (35)			
		2775 DELXECS(35)	2810 GROECS (35)	2845 GRNECS (35)			
		2880 DELGECS(35)	2915 ZECS (35)	2950 HOECS (1225)			
		4175 HNECS (1225)	5400 HGRECS (35)	5435 ICNVECS(1)			

STATISTICS

PROGRAM LENGTH	3432B	1818
BUFFER LENGTH	53120B	22096
CM LABELED COMMON LENGTH	3220B	1680
ECS LABELED COMMON LENGTH	66606B	28038

520000B CM USED

VARIABLES	SN	TYPE		RELOCATION								
6	NPAGEA	INTEGER		CTABLE	REFS	51	DEFINED	123				
1	NPASS	INTEGER		CTABLE	REFS	51	DEFINED	124				
3410	NPMECS	INTEGER		INCCOM	REFS	67	74					
2	NROWS	INTEGER		CTABLE	REFS	51						
5051	NTDMECS	INTEGER		STRCOM	REFS	68	74					
56530	SHIFT	* REAL			REFS	98						
6200	SOLECS	COMPLEX	ARRAY	FLPCOM	REFS	62	65	74				
2	TFH	REAL	ARRAY	CTFH	REFS	42	47					
56537	TMAIN	REAL	ARRAY		REFS	41	115	116	DEFINED	96		
2	TMH	REAL	ARRAY	CTMH	REFS	41	45	112	DEFINED	114	115	116
5264	XNECS	REAL	ARRAY	STRCOM	REFS	68	74					
5221	XOECS	REAL	ARRAY	STRCOM	REFS	68	74					
1	YES	INTEGER		CONSTS	REFS	37	48	146	DEFINED	103		
5543	ZECS	REAL	ARRAY	STRCOM	REFS	68	74					

FILE NAMES	MODE
0	INPUT
2054	OUTPUT
4130	TAPE16
7260	TAPE17
10334	TAPE18
11410	TAPE19
12464	TAPE20
13540	TAPE21
14614	TAPE22
15670	TAPE23
16744	TAPE24
20020	TAPE25
21074	TAPE26
22150	TAPE27
23224	TAPE28
24300	TAPE29
25354	TAPE30
26430	TAPE31
27504	TAPE32
30560	TAPE33
31634	TAPE34
32710	TAPE35
33764	TAPE36
35040	TAPE37
36114	TAPE39
37170	TAPE40
40244	TAPE41
41320	TAPE42
42374	TAPE43
43450	TAPE44
44524	TAPE45
45600	TAPE47
46654	TAPE48
47730	TAPE49
6204	TAPE5
51004	TAPE50
52060	TAPE57
53134	TAPE58
54210	TAPE59
2054	TAPE6

VARIABLES	SN	TYPE		RELOCATION						
0	GECS	REAL	ARRAY	INCCOM	REFS	67	74			
0	GKECS	COMPLEX	ARRAY	FLPCOM	REFS	62	65	74		
5435	GRNECS	REAL	ARRAY	STRCOM	REFS	68	74			
5372	GROECS	REAL	ARRAY	STRCOM	REFS	68	74			
12430	HGRECS	REAL	ARRAY	STRCOM	REFS	68	74			
10117	HNECS	REAL	ARRAY	STRCOM	REFS	68	74			
5606	HOECS	REAL	ARRAY	STRCOM	REFS	68	74			
56532	I	INTEGER			REFS	2*126	DEFINED	125		
5217	ICNECS	INTEGER		STRCOM	REFS	68	74			
12473	ICNVECS	INTEGER		STRCOM	REFS	68	74			
4	ITAPEL	INTEGER		LABELS	REFS	56				
2	ITAPEP	INTEGER		COMRWP	REFS	44				
0	ITAPER	INTEGER		COMRWP	REFS	44				
7	ITAPET	INTEGER		CTABLE	REFS	51	DEFINED	118		
1	ITAPEW	INTEGER		COMRWP	REFS	44	DEFINED	117		
62	JDIMECS	INTEGER		STRCOM	REFS	68	74			
0	JSETECS	INTEGER	ARRAY	STRCOM	REFS	68	74			
7	KBPAGE	INTEGER		CLIST	REFS	49	DEFINED	111		
3	KDLABI	INTEGER		LABELS	REFS	56				
1	KDLABO	INTEGER		LABELS	REFS	56				
2	KFLABI	INTEGER		LABELS	REFS	56				
0	KFLABO	INTEGER		LABELS	REFS	56				
5	KLABEI	INTEGER		LABELS	REFS	56				
4	KLABEL	INTEGER		CLIST	REFS	49				
0	KMESAG	INTEGER		MESAG	REFS	46				
0	KOMPUT	INTEGER		COMPUT	REFS	55				
0	KOUNT	INTEGER		CLIST	REFS	49	DEFINED	107		
11	KOUNTH	INTEGER		CLIST	REFS	49				
12	KOUNTI	INTEGER		CLIST	REFS	49				
1	KPAGE	INTEGER		CLIST	REFS	49	DEFINED	108		
0	KREPOR	INTEGER		REPORT	REFS	53	DEFINED	119		
0	KTABLE	INTEGER		CTABLE	REFS	51	DEFINED	120		
5	KTABLO	INTEGER		CTABLE	REFS	51	DEFINED	121		
0	KTFH	INTEGER		CTFH	REFS	47	DEFINED	104		
2	KTIME	INTEGER		MESAG	REFS	46	DEFINED	144	149	
3	KTIMEL	INTEGER		MESAG	REFS	46	DEFINED	146		
1	KTITLE	INTEGER		MESAG	REFS	46	DEFINED	145	150	
0	KTMH	INTEGER		CTMH	REFS	45				
5	KTPAGE	INTEGER		CLIST	REFS	49	DEFINED	110		
56531	L	INTEGER			REFS	114	DEFINED	113		
5134	LDMECS	INTEGER		STRCOM	REFS	68	74			
2	LINES	INTEGER		CLIST	REFS	49	107	DEFINED	101	
10	LINESG	INTEGER		CLIST	REFS	49				
3	LINEST	INTEGER		CLIST	REFS	49	DEFINED	106		
63	LMKECS	INTEGER	ARRAY	STRCOM	REFS	68	74			
5052	LNDECS	INTEGER	ARRAY	STRCOM	REFS	68	74			
1	LTFH	INTEGER		CTFH	REFS	47	DEFINED	105		
1	LTMH	INTEGER		CTMH	REFS	45	112	113	DEFINED	100
3411	MSTRECS	INTEGER		INCCOM	REFS	67	74			
1	NCHARW	INTEGER		COMPUT	REFS	55	DEFINED	134		
3	NCOLS	INTEGER		CTABLE	REFS	51				
4	NCOLST	INTEGER		CTABLE	REFS	51	DEFINED	122		
5220	NDIMECS	INTEGER		STRCOM	REFS	68	74			
0	NO	INTEGER		CONSTS	REFS	48	104	DEFINED	102	
4767	NOTJECS	INTEGER	ARRAY	STRCOM	REFS	68	74			
5135	NOTTECS	INTEGER	ARRAY	STRCOM	REFS	68	74			
6	NPAGE	INTEGER		CLIST	REFS	49	DEFINED	109		

```
                C                                                                       FASTOP    173
                C     CALL SOP                                                          FASTOP    174
                C                                                                       FASTOP    175
    175         C*************************************************************************FASTOP    176
                C*************************************************************************FASTOP    177
                C*************************************************************************FASTOP    178
                C*************************************************************************FASTOP    179
                C*************************************************************************FASTOP    180
    180         C*****                                                           ******FASTOP    181
                C*****                    FFFFF    000    PPPP                  ******FASTOP    182
                C*****                    F       0   0   P   P                 ******FASTOP    183
                C*****                    FFFF  - 0   0 - PPPP                  ******FASTOP    184
                C*****                    F       0   0   P                     ******FASTOP    185
    185         C*****                    F        000    P                     ******FASTOP    186
                C*****                                                           ******FASTOP    187
                C*************************************************************************FASTOP    188
                C*************************************************************************FASTOP    189
                C*************************************************************************FASTOP    190
    190         C*************************************************************************FASTOP    191
                C*************************************************************************FASTOP    192
                C                                                                       FASTOP    193
                C                                                                       FASTOP    194
                C FLUTTER OPTIMIZATION PACKAGE                                          FASTOP    195
    195         C                                                                       FASTOP    196
                      CALL FOP                                                          FASTOP    197
                C                                                                       FASTOP    198
                C*************************************************************************FASTOP    199
                C*************************************************************************FASTOP    200
    200         C*************************************************************************FASTOP    201
                C*************************************************************************FASTOP    202
                C*************************************************************************FASTOP    203
                C                                                                       FASTOP    204
                      STOP                                                              FASTOP    205
    205               END                                                               FASTOP    206
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES					
56417	MAIN	3						

VARIABLES	SN	TYPE		RELOCATION					
25700	AECS	COMPLEX	ARRAY	FLPCOM	REFS	62	65	74	
0	AFFDL	REAL	ARRAY	CAFFDL	REFS	38	57	DEFINED	126
6200	BBECS	COMPLEX	ARRAY	BCOM	REFS	63	66	74	
3326	BCOECS	REAL	ARRAY	INCCOM	REFS	67	74		
0	BECS	COMPLEX	ARRAY	BCOM	REFS	63	66	74	
56522	BLANK	REAL			REFS	112	DEFINED	94	
56533	DATE	REAL	ARRAY		REFS	39	126	DEFINED	97
5500	DELGECS	REAL	ARRAY	STRCOM	REFS	68	74		
5327	DELXECS	REAL	ARRAY	STRCOM	REFS	68	74		
56523	DOTS	REAL			REFS	114	DEFINED	95	
0	DUMMY	REAL	ARRAY	GENCOM	REFS	60			
0	FMTAO	REAL	ARRAY	CFMTAO	REFS	40	54	99	

```
      TMH( 9,1) =  TMAIN(1)                                                FASTOP   116
      TMH(10,1) =  TMAIN(2)                                                FASTOP   117
      ITAPEW =  6                                                          FASTOP   118
      ITAPET =  19                                                         FASTOP   119
      KREPOR =  1                                                          FASTOP   120
      KTABLE =  2                                                          FASTOP   121
      KTABLO =  2                                                          FASTOP   122
      NCOLST =  60                                                         FASTOP   123
      NPAGEA  =  0                                                         FASTOP   124
      NPASS  =  1                                                          FASTOP   125
      DO 140 I=1,4                                                         FASTOP   126
  140 AFFDL(I) = DATE(I)                                                   FASTOP   127
C                                                                          FASTOP   128
CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS        FASTOP   129
C     NCHARW =  4                                                          FASTOP   130
CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS           FASTOP   131
C                                                                          FASTOP   132
C                                                                          FASTOP   133
CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS        FASTOP   134
      NCHARW =  10                                                         FASTOP   135
CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS           FASTOP   136
C                                                                          FASTOP   137
C                                                                          FASTOP   138
C                                                                          FASTOP   139
C PRINT FASTOP TITLE                                                       FASTOP   140
C                                                                          FASTOP   141
      CALL TFASTO                                                          FASTOP   142
C                                                                          FASTOP   143
C                                                                          FASTOP   144
      KTIME  =  1                                                          FASTOP   145
      KTITLE =  1                                                          FASTOP   146
      KTIMEL =  YES                                                        FASTOP   147
      CALL TIMEB (25,25                                                    FASTOP   148
     1   HFROM FASTOP, INITIAL TIME)                                       FASTOP   149
      KTIME  =  0                                                          FASTOP   150
      KTITLE =  2                                                          FASTOP   151
C                                                                          FASTOP   152
C*************************************************************************FASTOP   153
C*************************************************************************FASTOP   154
C*************************************************************************FASTOP   155
C*************************************************************************FASTOP   156
C*************************************************************************FASTOP   157
C*****                                                            ******  FASTOP   158
C*****                    SSSS    000    PPPP                    ******  FASTOP   159
C*****                   S       0   0   P   P                   ******  FASTOP   160
C*****                    SSS  - 0   0 - PPPP                    ******  FASTOP   161
C*****                       S   0   0   P                       ******  FASTOP   162
C*****                   SSSS     000    P                       ******  FASTOP   163
C*****                                                            ******  FASTOP   164
C*************************************************************************FASTOP   165
C*************************************************************************FASTOP   166
C*************************************************************************FASTOP   167
C*************************************************************************FASTOP   168
C*************************************************************************FASTOP   169
C                                                                          FASTOP   170
C                                                                          FASTOP   171
```

```
      C                                                                 FASTOP     59
      CCDC                                                              FASTOP     60
60          COMMON /GENCOM/ DUMMY(1578)                                 FASTOP     61
                                                                        FASTOP     62
            COMPLEX GKECS(40,40),AECS(40,40),SOLECS(40,100)             FASTOP     63
            COMPLEX BECS(40,40),BBECS(40,40)                            FASTOP     64
                                                                        FASTOP     65
65          COMMON /FLPCOM/ GKECS,SOLECS,AECS                           FASTOP     66
            COMMON /BCOM/   BECS,BBECS                                  FASTOP     67
            COMMON /INCCOM/ GECS(35,50),BCOECS(50),NPMECS,MSTRECS       FASTOP     68
            COMMON /STRCOM/ JSETECS(50),JDIMECS,LMKECS(50,50),NOTJECS(50),  FASTOP 69
           1        NTDMECS,LNDECS(50),LDMECS,NOTTECS(50),ICNECS,NDIMECS,   FASTOP 70
70         2        XOECS(35),XNECS(35),DELXECS(35),GROECS(35),GRNECS(35),  FASTOP 71
           3        DELGECS(35),ZECS(35),HOECS(35,35),HNECS(35,35),HGRECS(35), FASTOP 72
           4        ICNVECS                                             FASTOP     73
                                                                        FASTOP     74
            LEVEL 3, GKECS,SOLECS,AECS,BECS,BBECS,GECS,BCOECS,NPMECS,MSTRECS,  FASTOP 75
75         1         JSETECS,JDIMECS,LMKECS,NOTJECS,NTDMECS,LNDECS,LDMECS,   FASTOP 76
           2         NOTTECS,ICNECS,NDIMECS,XOECS,XNECS,DELXECS,GROECS,GRNECS, FASTOP 77
           3         DELGECS,ZECS,HOECS,HNECS,HGRECS,ICNVECS             FASTOP     78
      CCDC                                                              FASTOP     79
      C                                                                 FASTOP     80
80    CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS FASTOP     81
      C                                                                 FASTOP     82
      C EXTENDED ERROR HANDLING PACKAGE                                 FASTOP     83
      C 100 CONTINUE                                                    FASTOP     84
      C     CALL ERRSET (207,0,0,2,ERROR,301)                           FASTOP     85
85    C     CALL ERRSET (208,0,0,2,1     ,0)                            FASTOP     86
      C     CALL ERRSET (210,0,0,2,1     ,0)                            FASTOP     87
      C     CALL ERRSET (215,0,0,2,1     ,0)                            FASTOP     88
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   FASTOP     89
      C                                                                 FASTOP     90
90    C                                                                 FASTOP     91
      C                                                                 FASTOP     92
      C INITIAL CONDITIONS                                              FASTOP     93
      C                                                                 FASTOP     94
            DATA BLANK  /4H    /                                        FASTOP     95
95          DATA DOTS   /4H..../                                        FASTOP     96
            DATA TMAIN /4H FAS,4HTOP /                                  FASTOP     97
            DATA DATE /4H    ,4HJULY,4H 197,4H5   /                     FASTOP     98
            CALL WORDS (SHIFT,1,4H(10X)                                 FASTOP     99
            CALL WORDS (FMTAO,3,12H(10X,18A4)  )                        FASTOP    100
100         LTMH   =  18                                                FASTOP    101
            LINES  =  54                                                FASTOP    102
            NO     =  1                                                 FASTOP    103
            YES    =  2                                                 FASTOP    104
            KTFH   =  NO                                                FASTOP    105
105         LTFH   =  18                                                FASTOP    106
            LINEST =  4                                                 FASTOP    107
            KOUNT  =  LINES                                             FASTOP    108
            KPAGE  =  2                                                 FASTOP    109
            NPAGE  =  0                                                 FASTOP    110
110         KTPAGE = 2                                                  FASTOP    111
            KBPAGE =  2                                                 FASTOP    112
            CALL DVALUE (TMH,BLANK,2*LTMH)                              FASTOP    113
            DO 132 L=1,LTMH                                             FASTOP    114
          132 TMH(L,1) = DOTS                                           FASTOP    115
```

```
VARIABLES      SN  TYPE            RELOCATION
    10  LINESG     INTEGER             CLIST        REFS        19
     3  LINEST     INTEGER             CLIST        REFS        19
     3  NCOLS      INTEGER             CTABLE       REFS        21    DEFINED       30
     4  NCOLST     INTEGER             CTABLE       REFS        21
     6  NPAGE      INTEGER             CLIST        REFS        19
     6  NPAGEA     INTEGER             CTABLE       REFS        21
     1  NPASS      INTEGER             CTABLE       REFS        21
     2  NROWS      INTEGER             CTABLE       REFS        21    DEFINED       31        35
        VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS           TYPE   ARGS       REFERENCES
        PTABLE                3            33        37        40        43        46
        TITLES                1            29

STATEMENT LABELS                 DEF LINE   REFERENCES
  251  100      FMT                  77         53
  302  105      FMT                  89         54
  331  110      FMT                  99         55
  354  115      FMT                 110         56
  377  120      FMT                 121         57
  421  125      FMT                 132         58
  450  130      FMT                 147         59
  467  135      FMT                 162         60
  506  140      FMT                 177         61
  530  145      FMT                 196         62
  547  150      FMT                 211         63
  566  155      FMT                 226         64
  611  160      FMT                 245         65
  630  165      FMT                 260         66
  647  170      FMT                 275         67
  671  175      FMT                 294         68
  710  180      FMT                 309         69
  727  185      FMT                 324         70
  757  190      FMT                 341         71
 1004  195      FMT                 356         72
 1035  200      FMT                 373         73
 1066  205      FMT                 390         74
 1125  210      FMT                 409         75
 1157  215      FMT                 425         76

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
        COMRWP        3              0 ITAPER (1)          1 ITAPEW (1)          2 ITAPEP (1)
        CLIST        10              0 KOUNT  (1)          1 KPAGE  (1)          2 LINES  (1)
                                     3 LINEST (1)          4 KLABEL (1)          5 KTPAGE (1)
                                     6 NPAGE  (1)          7 KBPAGE (1)          8 LINESG (1)
                                     9 KOUNTH (1)
        CTABLE        8              0 KTABLE (1)          1 NPASS  (1)          2 NROWS  (1)
                                     3 NCOLS  (1)          4 NCOLST (1)          5 KTABLO (1)
                                     6 NPAGEA (1)          7 ITAPET (1)
        CAFFDL        4              0 AFFDL  (4)

STATISTICS
  PROGRAM LENGTH                 1231B      665
  CM LABELED COMMON LENGTH         31B       25
          52000B CM USED
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      C                                                                      FOP       2
      C45700, SUB. FOP (FLUTTER OPTIMIZATION PACKAGE                         FOP       3
      C                                                                      FOP       4
      C*********************************************************************** FOP       5
      C*********************************************************************** FOP       6
      C*********************************************************************** FOP       7
      C*********************************************************************** FOP       8
      C*********************************************************************** FOP       9
      C*****                                                          ****** FOP      10
      C*****                  FFFFF    000    PPPP                    ****** FOP      11
      C*****                  F       0   0   P   P                   ****** FOP      12
      C*****                  FFFF  - 0   0 - PPPP                    ****** FOP      13
      C*****                  F       0   0   P                       ****** FOP      14
      C*****                  F        000    P                       ****** FOP      15
      C*****                                                          ****** FOP      16
      C*********************************************************** ********** FOP      17
      C*********************************************************************** FOP      18
      C*********************************************************************** FOP      19
      C*********************************************************************** FOP      20
      C*********************************************************************** FOP      21
      C                                                                     * FOP      22
      C*********************************************************************** FOP      23
      C                                                                     * FOP      24
      C***  COMPUTER VERSION  ************************************************ FOP      25
      C     ----------------                                                * FOP      26
      C     IBM COMPUTER PROGRAM VERSION                                    * FOP      27
      C                                                                     * FOP      28
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED    * FOP      29
      C     BY CIBM IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE IBM      * FOP      30
      C     COMPUTER AND SHOULD BE LEFT BLANK.                              * FOP      31
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED    * FOP      32
      C     BY CCDC IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE CDC      * FOP      33
      C     COMPUTER AND SHOULD HAVE A C IN COLUMN ONE.                     * FOP      34
      C                                                                     * FOP      35
      C     CDC COMPUTER PROGRAM VERSION                                    * FOP      36
      C                                                                     * FOP      37
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED    * FOP      38
      C     BY CCDC IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE CDC      * FOP      39
      C     COMPUTER AND SHOULD BE LEFT BLANK.                              * FOP      40
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED    * FOP      41
      C     BY CIBM IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE IBM      * FOP      42
      C     COMPUTER AND SHOULD HAVE A C IN COLUMN ONE.                     * FOP      43
      C                                                                     * FOP      44
      C***  OBJECTIVE  ******************************************************* FOP      45
      C     ---------                                                       * FOP      46
      C     FLUTTER ANALYSIS AND/OR OPTIMIZATION PACKAGE                      FOP      47
      C                                                                     * FOP      48
      C     PERFORM FLUTTER ANALYSIS AND/OR OPTIMIZATION BY EXECUTING         FOP      49
      C     THE DESIRED COMBINATION OF THE FOLLOWING MODULES.                 FOP      50
      C         1.  VIBRATION ANALYSIS                                      * FOP      51
      C         2.  FLUTTER ANALYSIS                                        * FOP      52
      C                                                                     * FOP      53
      C                                                                     * FOP      54
      C***  SUMMARY OF SYMBOLS  ********************************************** FOP      55
      C     ------------------                                              * FOP      56
      C                                                                     * FOP      57
      C     KLUE(I)         INPUT (I = 1,     LKLUE)                      * FOP      58
```

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      C     INPUT DATA CONTROL WORD OPTIONS FOR PERFORMING CERTAIN ANALYSES  * FOP        59
      C     AND/OR OPTIMIZATIONS.                                           * FOP        60
   60 C                                                                     * FOP        61
      C     VALUES ENTERED AS DATA HAVE THE FOLLOWING GENERAL FUNCTION ...  * FOP        62
      C     KLUE( I) = 0, DO NOT PERFORM THE I'TH ANALYSIS AND/OR           * FOP        63
      C                    OPTIMIZATION.                                    * FOP        64
      C              = I, PERFORM THE I'TH ANALYSIS AND/OR OPTIMZATION      * FOP        65
   65 C                                                                     * FOP        66
      C     WHERE THE SPECIFIC FUNCTION OF EACH VARIABLE IS ...             * FOP        67
      C     KLUE( 1) = 0, DUMMY OPTION                                      * FOP        68
      C     KLUE( 2) = 0, DUMMY OPTION                                      * FOP        69
      C     KLUE( 3) = 0, DO NOT PERFORM VIBRATION ANALYSS                  * FOP        70
   70 C              = 3, PERFORM VIBRATION ANALYSIS                       * FOP        71
      C     KLUE( 4) = 0, DO NOT PERFORM FLUTTER ANALYSIS                   * FOP        72
      C              = 4, PERFORM FLUTTER ANALYSIS                         * FOP        73
      C     KLUE( 5) = 0, DUMMY OPTION                                      * FOP        74
      C     KLUE( 6) = 0, DUMMY OPTION                                      * FOP        75
   75 C     KLUE( 7) = 0, DO NOT PERFORM FLUTTER OPTIMIZATION               * FOP        76
      C              = 7, PERFORM FLUTTER OPTIMIZATION                     * FOP        77
      C     KLUE( 8) = 0, RESULTS ARE NOT TO BE INCLUDED IN A REPORT        * FOP        78
      C              = 8, RESULTS ARE TO BE INCLUDED IN A REPORT (THEREFORE, * FOP        79
      C                   WHERE APPROPRIATE, RESULTS WILL BE LISTED ON EIGHT * FOP        80
   80 C                   AND ONE HALF BY ELEVEN PAPER.)                    * FOP        81
      C     KLUE( 9) = 0, DO NOT LIST LABELS OF FILES GENERATED BY DSIO     * FOP        82
      C                   (DISK SEQUENTIAL INPUT/OUTPUT).                   * FOP        83
      C              = 9, LIST LABELS OF FILES GENERATED BY DSIO            * FOP        84
      C                   (DISK SEQUENTIAL INPUT/OUTPUT).                   * FOP        85
   85 C     KLUE(10) = 0, DO NOT LIST MESSAGES UPON ENTERING AND LEAVING    * FOP        86
      C                   SUBROUTINES                                       * FOP        87
      C              =10, LIST MESSAGES UPON ENTERING AND LEAVING           * FOP        88
      C                   SUBROUTINES                                       * FOP        89
      C     KLUE(11) = 0, DO NOT LIST MAIN HEADING                          * FOP        90
   90 C              =11, LIST MAIN HEADING ENTERED AS CARD DATA            * FOP        91
      C     KLUE(12) = 0, DO NOT LIST SUBHEADING                            * FOP        92
      C              =12, LIST SUBHEADING ENTERED AS CARD DATA              * FOP        93
      C     KLUE(13) = 0, DO NOT LIST INTERMEDIATE LABELS                   * FOP        94
      C              =13, LIST INTERMEDIATE LABELS                         * FOP        95
   95 C     KLUE(14) = 0, DO NOT LIST COMPUTER TIMES                        * FOP        96
      C               14, LIST COMPUTER TIMES                              * FOP        97
      C     KLUE(15) = 0, DUMMY OPTION                                        FOP        98
      C     KLUE(16) = 0, DUMMY OPTION                                        FOP        99
      C     KLUE(17) = 0, DUMMY OPTION                                        FOP       100
  100 C     KLUE(18) = 0, DUMMY OPTION                                        FOP       101
      C     KLUE(19) = 0, DUMMY OPTION                                        FOP       102
      C     KLUE(20) = 0, DUMMY OPTION                                        FOP       103
      C     KLUE(21) = 0, DUMMY OPTION                                        FOP       104
      C     KLUE(22) = 0, DUMMY OPTION                                        FOP       105
  105 C     KLUE(23) = 0, DUMMY OPTION                                        FOP       106
      C     KLUE(24) = 0, DUMMY OPTION                                        FOP       107
      C     KLUE(25) = 0, DUMMY OPTION                                        FOP       108
      C     KLUE(26) = 0, THIS IS INITIAL PASS THROGH FOP                     FOP       109
      C              =26, THIS IS NOT THE FIRST PASS THROUGH FOP               FOP       110
  110 C     KLUE(27) = 0, VIBRATION ANALYSIS WILL USE STIFFNESS MATRIX        FOP       111
      C              =27, VIBRATION ANALYSIS WILL USE FLEXIBILITY MATRIX      FOP       112
      C     KLUE(28) = 0, INITIAL DYNAMIC MASS MATRIX IS (WAS) SUPPLIED BY    FOP       113
      C                   USER IN FIRST FOP PASS                            FOP       114
      C              =28, USE FULLY AUTOMATED MASS OPTION TO COMPUTE DYNAMIC FOP       115
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C                    MASS MATRIX                                          FOP      116
C       KLUE(29) = 0, THERE ARE NO (USER-SUPPLIED) FIXED MASS ITEMS TO BE FOP      117
C                    CONSIDERED IN FULLY AUTOMATED MASS OPTION            FOP      118
C              =29,  FIXED MASS ITEMS ARE TO BE CONSIDERED IN THE FULLY   FOP      119
C                    AUTOMATED MASS OPTION                                FOP      120
C       KLUE(30) = 0, THE FIXED MASS ITEMS IN THE FULLY AUTOMATED MASS     FOP      121
C                    OPTION DO NOT CONTRIBUTE TO THE OFF-DIAGONAL TERMS   FOP      122
C                    OF THE STRUCTURAL MASS MATRIX                        FOP      123
C              =30,  FIXED MASS ITEMS IN THE FULLY AUTOMATED MASS OPTION  FOP      124
C                    DO CONTRIBUTE TO THE OFF-DIAGONAL TERMS OF THE       FOP      125
C                    STRUCTURAL MASS MATRIX                               FOP      126
C       KLUE(31) = 0, THERE ARE NO MASS BALANCE VARIABLES PRESENT          FOP      127
C              =31,  MASS BALANCE VARIABLES ARE PRESENT IN THE PROBLEM     FOP      128
C       KLUE(32) = 0, DO NOT SUPERSEDE EXISTING MASS BALANCE DATA WITH     FOP      129
C                    NEW DATA                                             FOP      130
C              =32,  NEW MASS BALANCE DATA ARE BEING SUPPLIED TO           FOP      131
C                    OVERRIDE EXISTING DATA                               FOP      132
C       KLUE(33) = 0, IN THE MOST RECENT SOP STEP, THAT PROGRAM WAS SIMPLY FOP      133
C                    USED TO COMPUTE THE DYNAMIC FLEXIBILITY MATRIX OR    FOP      134
C                    THE STRUCTURAL STIFFNESS MATRIX. THAT IS, SOP WAS    FOP      135
C                    NOT USED TO ANALYZE OR REDESIGN.                     FOP      136
C              =33,  IN THE LAST PASS THROUGH SOP, THAT PROGRAM DID       FOP      137
C                    ANALYZE OR REDESIGN THE STRUCTURE                    FOP      138
C       KLUE(34) = 0, COMPUTE FLUTTER VELOCITY DERIVATIVES FOR ALL         FOP      139
C                    STRUCTURAL MEMBERS AND MASS BALANCE VARIABLES, BUT   FOP      140
C                    DO NOT REDESIGN THE STRUCTURE FOR FLUTTER            FOP      141
C              =34,  COMPUTE FLUTTER VELOCITY DERIVATIVES ONLY FOR        FOP      142
C                    FLUTTER REDESIGN VARIABLES (SEE KLUE(36)), PERFORM   FOP      143
C                    FLUTTER REDESIGN(S), AND PREPARE OUTPUT TAPES        FOP      144
C                    REQUIRED FOR SUBSEQUENT USE BY SOP AND FOP           FOP      145
C       KLUE(35) = 0, THERE ARE NO NON-OPTIMUM WEIGHT FACTORS IN THE       FOP      146
C                    PROBLEM                                              FOP      147
C              =35,  NON-OPTIMUM WEIGHT FACTORS ARE PRESENT IN THE        FOP      148
C                    PROBLEM                                              FOP      149
C       KLUE(36) = 0, DO NOT EXCLUDE ANY STRUCTURAL MEMBERS FROM THE       FOP      150
C                    FLUTTER REDESIGN PROCESS                             FOP      151
C              =36,  EXCLUDE SPECIFIED STRUCTURAL MEMBERS FROM THE        FOP      152
C                    FLUTTER REDESIGN PROCESS                             FOP      153
C       KLUE(37) = 0, PERFORM A CANTILEVER VIBRATION ANALYSIS              FOP      154
C              =37,  PERFORM A FREE-FREE VIBRATION ANALYSIS                FOP      155
C                                                                       *  FOP      156
C       THE VALUES OF THE CARD INPUT DATA CONTROL WORD OPTIONS (KLUE (J))*  FOP      157
C       GIVEN ABOVE ARE ENTERED INTO THE PROGRAM BY THE SUBROUTINE CLUES *  FOP      158
C       AND THEN CHANGED, WITHIN THE SUBROUTINE CLUES, TO A NEW SET OF   *  FOP      159
C       NUMERICAL VALUES                                                 *  FOP      160
C       A VALUE OF ONE (CORRESPONDING TO THE ORIGINAL ZERO VALUE)        *  FOP      161
C       INDICATES THAT THE OPTION IS TO BE DELETED WHEREAS A VALUE OF TWO*  FOP      162
C       (CORRESPONDING TO THE ORIGINAL I'TH VALUE) INDICATES THAT THE    *  FOP      163
C       OPTION IS TO BE EXERCISED.                                       *  FOP      164
C       FINALLY, FOR PROGRAMMING CONVENIENCE, A NEW SET OF OPTIONS       *  FOP      165
C       REFERRED TO AS PROGRAM CONTROL WORD OPTIONS (KXXXXX) ARE DEFINED *  FOP      166
C       TO BE EQUIVALENT TO THE CARD INPUT CONTROL WORD OPTIONS.         *  FOP      167
C                                                                        *  FOP      168
C       KLUE (I) = 0, IS CHANGED TO 1, AND CORRESPONDS TO  KXXXXX = 1    *  FOP      169
C       KLUE (I) = 1, IS CHANGED TO 2, AND CORRESPONDS TO  KXXXXX = 2    *  FOP      170
C                                                                        *  FOP      171
C       THE SPECIFIC RELATIONSHIP OF THE CARD INPUT DATA AND PROGRAM     *  FOP      172
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      C     CONTROL WORD OPTIONS IS GIVEN BELOW                                * FOP      173
      C                                                                        * FOP      174
      C     KLUE ( 3)  =  KANAV                                                * FOP      175
175   C     KLUE ( 4)  =  KANAF                                                * FOP      176
      C     KLUE ( 7)  =  KOPTF                                                * FOP      177
      C     KLUE ( 8)  =  KREPOR                                               * FOP      178
      C     KLUE ( 9)  =  KLABEL                                               * FOP      179
      C     KLUE (10)  =  KMESAG                                               * FOP      180
180   C     KLUE (11)  =  KTMH                                                 * FOP      181
      C     KLUE (12)  =  KTSH                                                 * FOP      182
      C     KLUE(13)   =  KLABEI                                               * FOP      183
      C     KLUE(14)   =  KTIMEL                                               * FOP      184
      C     KLUE (26)  =  KPASS                                                  FOP      185
185   C     KLUE (27)  =  KRED                                                   FOP      186
      C     KLUE (28)  =  KMASSA                                                 FOP      187
      C     KLUE (29)  =  KMASSD                                                 FOP      188
      C     KLUE (30)  =  KMASSO                                                 FOP      189
      C     KLUE (31)  =  KMASSB                                                 FOP      190
190   C     KLUE (32)  =  KBALUP                                                 FOP      191
      C     KLUE (33)  =  KSTRER                                                 FOP      192
      C     KLUE (34)  =  KRESIZ                                                 FOP      193
      C     KLUE (35)  =  KNOPT                                                  FOP      194
      C     KLUE (36)  =  KIDFIX                                                 FOP      195
195   C     KLUE (37)  =  KFREE                                                  FOP      196
      C                                                                        * FOP      197
      C.... KLUE(I) ..... INTERMEDIATE, (I = LKLUE+1,...,2*LKLUE)            * FOP      198
      C     PROGRAM CONTROL WORD OPTION FOR INDICATING WHICH OF THE ANALYSES   * FOP      199
      C     AND/OR OPTIMIZATIONS HAVE BEEN PERFORMED.                          * FOP      200
200   C                                                                        * FOP      201
      C     VALUES DEFINED WITHIN THE PROGRAM HAVE THE FOLLOWING GENERAL       * FOP      202
      C     FUNCTION ..                                                        * FOP      203
      C     KLUE(I) = 0, THE I'TH ANALYSIS AND/OR OPTIMIZATION HAS NOT BEEN    * FOP      204
      C                  PERFORMED IN THE CURRENT RUN.                         * FOP      205
205   C             = I, THE I'TH ANALYSIS AND/OR OPTIMIZATION HAS BEEN        * FOP      206
      C                  PERFORMED IN THE CURRENT RUN.                         * FOP      207
      C                                                                        * FOP      208
      C     WHERE THE SPECIFIC FUNCTION OF EACH VARIABLE IS ASSOCIATED WITH    * FOP      209
      C     THE SPECIFIC FUNCTION OF THE VARIABLE KLUE(I) FOR                  * FOP      210
210   C     I = 1,...,LKLUE.                                                   * FOP      211
      C                                                                        * FOP      212
      C.... KLUEF(I) .... INPUT (SEE SUBROUTINE FLUTA)                       * FOP      213
      C     INPUT DATA CONTROL WORD OPTION FOR PERFORMING FLUTTER ANALYSIS.    * FOP      214
      C                                                                        * FOP      215
215   C.... KLUEV(I) ..... INPUT (SEE SUBROUTINE VIBRA)                      * FOP      216
      C     INPUT DATA CONTROL WORD OPTION FOR PERFORMING VIBRATION ANALYSIS.  * FOP      217
      C                                                                        * FOP      218
      C. .. TMH(I) ....... INTERMEDIATE                                      * FOP      219
      C     TITLE CONSISTING OF TWO CARDS FOR LISTING AT THE TOP OF EACH       * FOP      220
220   C     PAGE OF THE LISTED RESULTS.                                        * FOP      221
      C                                                                        * FOP      222
      C                                                                        * FOP      223
      C************************************************************************ FOP      224
      C                                                                          FOP      225
225         SUBROUTINE FOP                                                       FOP      226
      C                                                                          FOP      227
            INTEGER YES                                                          FOP      228
      C                                                                          FOP      229
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C                    MASS MATRIX                                          FOP
C     KLUE(29) = 0,  THERE ARE NO (USER-SUPPLIED) FIXED MASS ITEMS TO BE  FOP
C                    CONSIDERED IN FULLY AUTOMATED MASS OPTION            FOP
C              =29,  FIXED MASS ITEMS ARE TO BE CONSIDERED IN THE FULLY   FOP
C                    AUTOMATED MASS OPTION                                FOP
C     KLUE(30) = 0,  THE FIXED MASS ITEMS IN THE FULLY AUTOMATED MASS     FOP
C                    OPTION DO NOT CONTRIBUTE TO THE OFF-DIAGONAL TERMS   FOP
C                    OF THE STRUCTURAL MASS MATRIX                        FOP
C              =30,  FIXED MASS ITEMS IN THE FULLY AUTOMATED MASS OPTION  FOP
C                    DO CONTRIBUTE TO THE OFF-DIAGONAL TERMS OF THE       FOP
C                    STRUCTURAL MASS MATRIX                               FOP
C     KLUE(31) = 0,  THERE ARE NO MASS BALANCE VARIABLES PRESENT          FOP
C              =31,  MASS BALANCE VARIABLES ARE PRESENT IN THE PROBLEM     FOP
C     KLUE(32) = 0,  DO NOT SUPERSEDE EXISTING MASS BALANCE DATA WITH      FOP
C                    NEW DATA                                             FOP
C              =32,  NEW MASS BALANCE DATA ARE BEING SUPPLIED TO           FOP
C                    OVERRIDE EXISTING DATA                               FOP
C     KLUE(33) = 0,  IN THE MOST RECENT SOP STEP, THAT PROGRAM WAS SIMPLY  FOP
C                    USED TO COMPUTE THE DYNAMIC FLEXIBILITY MATRIX OR    FOP
C                    THE STRUCTURAL STIFFNESS MATRIX. THAT IS, SOP WAS    FOP
C                    NOT USED TO ANALYZE OR REDESIGN.                     FOP
C              =33,  IN THE LAST PASS THROUGH SOP, THAT PROGRAM DID       FOP
C                    ANALYZE OR REDESIGN THE STRUCTURE                    FOP
C     KLUE(34) = 0,  COMPUTE FLUTTER VELOCITY DERIVATIVES FOR ALL          FOP
C                    STRUCTURAL MEMBERS AND MASS BALANCE VARIABLES, BUT   FOP
C                    DO NOT REDESIGN THE STRUCTURE FOR FLUTTER            FOP
C              =34,  COMPUTE FLUTTER VELOCITY DERIVATIVES ONLY FOR        FOP
C                    FLUTTER REDESIGN VARIABLES (SEE KLUE(36)), PERFORM   FOP
C                    FLUTTER REDESIGN(S), AND PREPARE OUTPUT TAPES        FOP
C                    REQUIRED FOR SUBSEQUENT USE BY SOP AND FOP           FOP
C     KLUE(35) = 0,  THERE ARE NO NON-OPTIMUM WEIGHT FACTORS IN THE       FOP
C                    PROBLEM                                              FOP
C              =35,  NON-OPTIMUM WEIGHT FACTORS ARE PRESENT IN THE        FOP
C                    PROBLEM                                              FOP
C     KLUE(36) = 0,  DO NOT EXCLUDE ANY STRUCTURAL MEMBERS FROM THE        FOP
C                    FLUTTER REDESIGN PROCESS                             FOP
C              =36,  EXCLUDE SPECIFIED STRUCTURAL MEMBERS FROM THE        FOP
C                    FLUTTER REDESIGN PROCESS                             FOP
C     KLUE(37) = 0,  PERFORM A CANTILEVER VIBRATION ANALYSIS               FOP
C              =37,  PERFORM A FREE-FREE VIBRATION ANALYSIS                FOP
C                                                                       *   FOP
C     THE VALUES OF THE CARD INPUT DATA CONTROL WORD OPTIONS (KLUE (J))*   FOP
C     GIVEN ABOVE ARE ENTERED INTO THE PROGRAM BY THE SUBROUTINE CLUES *   FOP
C     AND THEN CHANGED, WITHIN THE SUBROUTINE CLUES, TO A NEW SET OF   *   FOP
C     NUMERICAL VALUES                                                 *   FOP
C     A VALUE OF ONE (CORRESPONDING TO THE ORIGINAL ZERO VALUE)        *   FOP
C     INDICATES THAT THE OPTION IS TO BE DELETED WHEREAS A VALUE OF TWO*   FOP
C     (CORRESPONDING TO THE ORIGINAL I'TH VALUE) INDICATES THAT THE    *   FOP
C     OPTION IS TO BE EXERCISED.                                       *   FOP
C     FINALLY, FOR PROGRAMMING CONVENIENCE, A NEW SET OF OPTIONS       *   FOP
C     REFERRED TO AS PROGRAM CONTROL WORD OPTIONS (KXXXXX) ARE DEFINED *   FOP
C     TO BE EQUIVALENT TO THE CARD INPUT CONTROL WORD OPTIONS.          *   FOP
C                                                                       *   FOP
C     KLUE (I) = 0, IS CHANGED TO 1, AND CORRESPONDS TO  KXXXXX = 1    *   FOP
C     KLUE (I) = I, IS CHANGED TO 2, AND CORRESPONDS TO  KXXXXX = 2    *   FOP
C                                                                       *   FOP
C     THE SPECIFIC DIMENSION OF THE CARD INPUT DATA PROGRAM...
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      C     CONTROL WORD OPTIONS IS GIVEN BELOW.                                * FOP      173
      C                                                                         * FOP      174
      C     KLUE ( 3)  =  KANAV                                                 * FOP      175
  175 C     KLUE ( 4)  =  KANAF                                                 * FOP      176
      C     KLUE ( 7)  =  KOPTF                                                 * FOP      177
      C     KLUE ( 8)  =  KREPOR                                                * FOP      178
      C     KLUE ( 9)  =  KLABEL                                                * FOP      179
      C     KLUE (10)  =  KMESAG                                                * FOP      180
  180 C     KLUE (11)  =  KTMH                                                  * FOP      181
      C     KLUE (12)  =  KTSH                                                  * FOP      182
      C     KLUE(13)   =  KLABEI                                                * FOP      183
      C     KLUE(14)   =  KTIMEL                                                * FOP      184
      C     KLUE (26)  =  KPASS                                                   FOP      185
  185 C     KLUE (27)  =  KRED                                                    FOP      186
      C     KLUE (28)  =  KMASSA                                                  FOP      187
      C     KLUE (29)  =  KMASSD                                                  FOP      188
      C     KLUE (30)  =  KMASSO                                                  FOP      189
      C     KLUE (31)  =  KMASSB                                                  FOP      190
  190 C     KLUE (32)  =  KBALUP                                                  FOP      191
      C     KLUE (33)  =  KSTRER                                                  FOP      192
      C     KLUE (34)  =  KRESIZ                                                  FOP      193
      C     KLUE (35)  =  KNOPT                                                   FOP      194
      C     KLUE (36)  =  KIDFIX                                                  FOP      195
  195 C     KLUE (37)  =  KFREE                                                   FOP      196
      C                                                                         * FOP      197
      C     KLUE(I)  . . . INTERMEDIATE, (I = LKLUE+1,  ,2*LKLUE)               * FOP      198
      C     PROGRAM CONTROL WORD OPTION FOR INDICATING WHICH OF THE ANALYSES    * FOP      199
      C     AND/OR OPTIMIZATIONS HAVE BEEN PERFORMED.                           * FOP      200
  200 C                                                                         * FOP      201
      C     VALUES DEFINED WITHIN THE PROGRAM HAVE THE FOLLOWING GENERAL        * FOP      202
      C     FUNCTION  .                                                         * FOP      203
      C     KLUE(I) = 0, THE I'TH ANALYSIS AND/OR OPTIMIZATION HAS NOT BEEN     * FOP      204
      C                  PERFORMED IN THE CURRENT RUN.                          * FOP      205
  205 C             = 1, THE I'TH ANALYSIS AND/OR OPTIMIZATION HAS BEEN         * FOP      206
      C                  PERFORMED IN THE CURRENT RUN.                          * FOP      207
      C                                                                         * FOP      208
      C     WHERE THE SPECIFIC FUNCTION OF EACH VARIABLE IS ASSOCIATED WITH     * FOP      209
      C     THE SPECIFIC FUNCTION OF THE VARIABLE KLUE(I) FOR                   * FOP      210
  210 C     I = 1,...,LKLUE.                                                    * FOP      211
      C                                                                         * FOP      212
      C.... KLUEF(I)  . . . INPUT (SEE SUBROUTINE FLUTA)                        * FOP      213
      C     INPUT DATA CONTROL WORD OPTION FOR PERFORMING FLUTTER ANALYSIS      * FOP      214
      C                                                                         * FOP      215
  215 C.... KLUEV(I)  . . . INPUT (SEE SUBROUTINE VIBRA)                        * FOP      216
      C     INPUT DATA CONTROL WORD OPTION FOR PERFORMING VIBRATION ANALYSIS.   * FOP      217
      C                                                                         * FOP      218
      C.... TMH(I)  . . . INTERMEDIATE                                         * FOP      219
      C     TITLE CONSISTING OF TWO CARDS FOR LISTING AT THE TOP OF EACH        * FOP      220
  220 C     PAGE OF THE LISTED RESULTS                                          * FOP      221
      C                                                                         * FOP      222
      C                                                                         * FOP      223
      C*************************************************************************** FOP      224
      C                                                                           FOP      225
  225       SUBROUTINE FOP                                                        FOP      226
      C                                                                           FOP      227
            INTEGER YES                                                           FOP      228
      C                                                                           FOP      229
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      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
230   C     EXTERNAL ERROR
      C     DOUBLE PRECISION   ELSTF
      C     DOUBLE PRECISION DATER ,REELO2
      C     DOUBLE PRECISION FSIONS,DSIONS
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
235   C
            COMPLEX UMOD,VMOD
      C
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS
            INTEGER FET,BUFFER,BUFSZ,OLDU,OLDOP,BUFSZD
240         DIMENSION BUFFER(513,12)    ,BUFSZ(12)
            DIMENSION FET(54,12)
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS
      C
      C
245         DIMENSION DRVMB(20),DRVMBO(20)
            DIMENSION EMP(3,3)
            DIMENSION FMTA(2)           ,FMTBO(3)
           1         ,FMTB(3)           ,FMTCO(8)
           2         ,FSIONS(20)
250         DIMENSION DSIONS(20)
            DIMENSION IDBAL(20)
            DIMENSION ITAPES(50)        ,IFILES(50)         ,IPOS(20)
           1         ,ISETUP(45)
            DIMENSION JSETUP(25)
255         DIMENSION KLUE(80)          ,KLUEV(20)          ,KLUEF(20)
            DIMENSION KLUFO(20)
            DIMENSION MBDOF(20,3)
            DIMENSION NFUF(20,3)        ,NDUF(20,3)
      C
260   C  ******************************************************
      C  *       THE FOLLOWING LINE OF FASTOP CODE HAS        *
      C  *       BEEN COMMENTED OUT BECAUSE IT IS NOT         *
      C  *       USED IN THE CURRENT VERSION OF ESP.          *
      C  ******************************************************
265   C     DIMENSION ELSTF(24,24),PATTY(6),NSTART(8),NGO(8)
      C
            DIMENSION PHP(3,40)
            DIMENSION S1MB(20),S2MB(20),S3MB(20)
            DIMENSION TSHFO(18)         ,TSH(18)            ,TMH(18,2)
270        1         ,TSHV(18)          ,TSHF(18)           ,TITLEI(18)
           2         ,TITLE(18,2)
            DIMENSION TFH(18)
            DIMENSION UMOD(40), VMOD(40), IDMODE(40)
            DIMENSION VMBIN(20),VMBNEW(20),VMBOLD(20)
275   C
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS
            COMMON /DCOM1 / MAXUNTS,MAXFILS,OLDU,OLDOP,BUFSZ
            COMMON /DCOM2 / FET
            COMMON /DCOM3 / BUFFER
280   CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS
      C
      C
            COMMON /CTAPES/ ITAPES
            COMMON /CLUEM / LKLUE ,KLUE
285         COMMON /CLUEV / LKLUEV,KLUEV
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      COMMON /CLUEF / LKLUEF,KLUEF                                      FOP       287
      COMMON /CTITLE/ LTITLE,TITLE                                      FOP       288
      COMMON /CTMH  / KTMH  ,LTMH  ,TMH                                 FOP       289
      COMMON /CTSH  / KTSH  ,LTSH  ,TSH                                 FOP       290
290   COMMON /MESAG / KMESAG,KTITLE,KTIME ,KTIMEL                       FOP       291
      COMMON /CTFH  / KTFH  ,LTFH  ,TFH                                 FOP       292
      COMMON /CTSHV / LTSHV ,TSHV                                       FOP       293
      COMMON /CTSHF / LTSHF ,TSHF                                       FOP       294
      COMMON /CTSHFO/ LTSHFO, TSHFO                                     FOP       295
295   COMMON /CFMTA / FMTA                                              FOP       296
      COMMON /CFMTB / FMTB                                              FOP       297
      COMMON /CFMTBO/ FMTBO                                             FOP       298
      COMMON /CFMTCO/ FMTCO                                             FOP       299
      COMMON /CDATER/ DATER                                             FOP       300
300   COMMON /CEELO2/ REELO2                                            FOP       301
      COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE   FOP       302
     1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                       FOP       303
      COMMON /CTABLE/ KTABLE,NPASS ,NROWS, NCOLS , NCOLST,KTABLO,NPAGEA FOP       304
     1              ,ITAPET                                            FOP       305
305   COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              FOP       306
      COMMON /LABELS/ KFLABO,KDLABO,KFLABI,KDLABI,ITAPEL,KLABEI         FOP       307
      COMMON /CSHIFT/ SHIFT                                             FOP       308
      COMMON /REPORT/ KREPOR                                            FOP       309
      COMMON /CBYTES/ NBYTES                                            FOP       310
310   COMMON /CFILES/ KFILES,IFILES                                     FOP       311
      COMMON /MATRIX/ ISETUP                                            FOP       312
      COMMON /FILE  / IPOS  ,NOBUF                                      FOP       313
      COMMON /DSRN  / JSETUP                                            FOP       314
      COMMON /CSETUP/ IOINC                                             FOP       315
315   COMMON /CVIBRA/ TOL   ,TOL1  ,TOL2  ,MINUS2                       FOP       316
      COMMON /FSIO1 /LFUF  ,LFUFD ,NFUF                                 FOP       317
      COMMON /FSIO2 / FSIONS                                            FOP       318
      COMMON /DSIO1 /LDUF  ,LDUFD ,NDUF                                 FOP       319
      COMMON /DSIO2 / DSIONS                                            FOP       320
320   COMMON /CONSTS/ NO    ,YES                                        FOP       321
      COMMON /BAL   / NMBAL,IDBAL,VMBIN,VMBOLD,VMBNEW,                  FOP       322
     1                MBDOF,DRVMB,DRVMBO,S1MB,S2MB,S3MB                 FOP       323
      COMMON /FLUT  / UMOD,VMOD,VF,WW,CSCL,NMODE,IDMODE                 FOP       324
      COMMON/PLACES/ IUIN1,IUIN2,IUOUT1,IUOUT2,IUGO1,IUGO2,IUGO3,IUGO4, FOP       325
325  1               IUSCR,IFSCR,IFS1,IFS2,IFS3,IFS4,IUCD,IUPR,         FOP       326
     2               IUA,IFA,IUY,IFY,IUMEMN,IFMEMN,IUSTFN,IFSTFN,       FOP       327
     3               IUKS,IFKS,IUB,IFB,IUDESO,IFDESO,                   FOP       328
     4               IUMDBI,IFMDBI,IUADDI,IFADDI,IUBALI,IFBALI,         FOP       329
     5               IUDESI,IFDESI,IUWTI,IFWTI,                         FOP       330
330  6               IUMEMO,IFMEMO,IUBT,IFBT,                           FOP       331
     7               IUDESN,IFDESN,IUMD,IFMD,                           FOP       332
     8               IUMEMF,IFMEMF,                                     FOP       333
     9               IUSTFO,IFSTFO,IUMDB,IFMDB,IUADD,IFADD,IUBAL,IFBAL, FOP       334
     A               IUDESF,IFDESF,IUWT,IFWT,                           FOP       335
335  B               IUDUM1,IFDUM1,IUDUM2,IFDUM2,IUDUM3,IFDUM3,         FOP       336
     C               IUL,IFL,IUYT,IFYT,IUZ,IFZ,IUZR,IFZR,IULR,IFLR,     FOP       337
     D               IUBR,IFBR,                                         FOP       338
     E               IUPHTF,IFPHTF,IUMODM,IFMODM,                       FOP       339
     F               IUMODK,IFMODK,IUPHT,IFPHT,IUQT,IFQT,IUQ,IFQ,       FOP       340
340  G               IUPH,IFPH,IUINCM,IFINCM,IUINCK,IFINCK              FOP       341
      COMMON /PLAYFF/ IUMDFF,IFMDFF,IUDLTI,IFDLTI,IUSLTI,IFSLTI         FOP       342
     1                IUMPLT,IFMPLT,IUTPGT,IFTPGT,IUPATF,IFPATF         FOP       343
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      2               ,IUMPL,IFMPL,IUSLT,IFSLT,IUDLT,IFDLT                  FOP       344
      3               ,IUQA,IFQA,IUQAT,IFQAT,IUPHA,IFPHA,IUPHAT,IFPHAT      FOP       345
345    COMMON/KLUES/ KLUSE,KLUNAL,IRED,KLUMD,KLUBAL,MSADD,NPAS, IDNOPT,      FOP       346
      1              VDES,EPS1,DWMAX,NBAR,NFIX,D,DEL,EPS2,NCYC,NNN,IBAND,   FOP       347
      2              IFIN,KLUB,KLUQ,MORBAL,DBAL                             FOP       348
       COMMON /KLUFF/ KFREE                                                 FOP       349
       COMMON/COLS/ IT,IMINT,IMAXT,IDENS,IOLDT,IOLDW,ISRAT,IMINTO,          FOP       350
350   A             IINITT,IWPUT,                                          FOP       351
      1             NVAR,JWPUT,JINITT,JMINT,JMAXT,JOLDT,JNEWT,JDRV,        FOP       352
      2             JDRVO,JSPR1,JSPR2,JSPR3                                FOP       353
       COMMON/SIZES/ NSTMEM,NSTDOF,NDYDOF,NNOPT,NDESNO,NDESYS               FOP       354
      C                                                                     FOP       355
355   C  ******************************************************            FOP       356
      C  *       THE FOLLOWING LINE OF FASTOP CODE HAS        *           FOP       357
      C  *       BEEN COMMENTED OUT BECAUSE IT IS NOT         *           FOP       358
      C  *       USED IN THE CURRENT VERSION OF ESP           *           FOP       359
      C  ******************************************************            FOP       360
360   C     COMMON /ELMNT/ ELSTF,PATTY,NSTART,NGO                           FOP       361
      C                                                                     FOP       362
       COMMON/BANDW/ IBANDW                                                 FOP       363
       COMMON/WAYTS/ WINITT,WST,WMB,WBOTH,WPRES,DW                          FOP       364
       COMMON /CIDIV / IDIV                                                 FOP       365
365    COMMON /CORE  / KORE  ,KOREDP                                       FOP       366
       COMMON /CLUFO/ LKLUFO,KLUFO                                          FOP       367
       COMMON /PLUG/ EMP,PHP                                                FOP       368
       COMMON /CPLOTS/ KPLOTS                                               FOP       369
       COMMON /CPLOTF/ KPLOTF                                               FOP       370
370    COMMON /STORES/ NUMSTR,KCONST,ISTDOF(5,6),IDYDOF(5,6),IDSTR(5)       FOP       371
      A               ,STRWI(5),STRWO(5),STRWN(5),STRII(5,3),STRIO(5,3)     FOP       372
      B               ,STRIN(5,3),STRRI(5,3),STRRO(5,3),STRRN(5,3)          FOP       373
      C               ,STRWDO(5),STRWDN(5),STRIDO(5,3),STRIDN(5,3)          FOP       374
      D               ,STRRDO(5,3),STRRDN(5,3),SCALE(5,7)                   FOP       375
375    COMMON /STRCLU/ ICYCLE,ISTEP,M1,M2,M3,M4,VS,VOLD,VNEW,STPOLD         FOP       376
       COMMON /LOCSTR/ IUSTRI,IFSTRI,IUMREF,IFMREF                          FOP       377
      1               ,IUMOD,IFMOD                                          FOP       378
       COMMON/RESIZE/ ISIZE,SCLNEW(5,4),SCLOLD(5,4),ITESTO,SAVSTP,IDUB      FOP       379
       COMMON/ACCEL/ ISTOP,IPAR,DWNEW(5),DINEW(5,3),DWOLD(5),DIOLD(5,3)     FOP       380
380    1            ,RILSTP                                                 FOP       381
       ICYCLE = 0                                                           FOP       382
       IIII = 0                                                             FOP       383
       M3 = 0                                                               FOP       384
       M4 = 3                                                               FOP       385
385    JJJJ = 0                                                            FOP       386
       M5 = 0                                                               FOP       387
       M6 = 0                                                               FOP       388
       M7 = 0                                                               FOP       389
       S1OLD = 0.0                                                          FOP       390
390    KCONST = 0                                                          FOP       391
      C                                                                     FOP       392
      C                                                                     FOP       393
      C PRINT TITLE FOR FLUTTER OPTIMIZATION PACKAGE                        FOP       394
      C                                                                     FOP       395
395    CALL TFOP                                                           FOP       396
      C                                                                     FOP       397
      C                                                                     FOP       398
      C INITIALIZE THE VARIABLES                                            FOP       399
        120 CONTINUE                                                        FOP       400
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      C                                                                 FOP     401
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS FOP     402
      C     LTITLE =  18                                                FOP     403
      C     CALL WORDS (FMTB ,3,12H(18A4)       )                       FOP     404
      C     CALL WORDS (FMTBO,4,16H(10X,18A4)       )                   FOP     405
      C     CALL WORDS (FMTCO,8,32H(10X, 2HJ=,I2,1H,1X,18A4)        )   FOP     406
      C     KOMPUT =  1                                                 FOP     407
      C     TOL    =  1.0E-08                                           FOP     408
      C     TOL1   =  1.0E-03                                           FOP     409
      C     TOL2   =  3.0E-07                                           FOP     410
      C     MINUS2 = -2                                                 FOP     411
      C     IOINC  =  0                                                 FOP     412
      C     NBYTES =  8                                                 FOP     413
      C     KBLAB  =  2                                                 FOP     414
      C     IDIV   =   1                                                FOP     415
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS  FOP     416
      C                                                                 FOP     417
      C                                                                 FOP     418
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS FOP     419
            LTITLE =  8                                                 FOP     420
            CALL WORDS (FMTB,3,12H(7A10,1A2)  )                         FOP     421
            CALL WORDS (FMTBO,4,16H(10X,7A10,1A2)  )                    FOP     422
            CALL WORDS (FMTCO,8,32H(10X, 2HJ=,I2,1H,1X,7A10,1A2)   )    FOP     423
            KOMPUT  = 2                                                 FOP     424
            TOL    =  1.0E-13                                           FOP     425
            TOL1   =  1.0E-03                                           FOP     426
            TOL2   =  1.0E-13                                           FOP     427
            DATA MINUS /7777777777777777776B/                           FOP     428
            MINUS2 =  MINUS                                             FOP     429
            IOINC  =  3                                                 FOP     430
            NBYTES =  4                                                 FOP     431
            KBLAB  =  2                                                 FOP     432
            IDIV   =   1                                                FOP     433
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS  FOP     434
      C                                                                 FOP     435
            NO     =  1                                                 FOP     436
            YES    =  2                                                 FOP     437
            KPLOTS =  YES                                               FOP     438
            KPLOTV =  NO                                                FOP     439
            KPLOTF =  NO                                                FOP     440
            KLUED  =  80                                                FOP     441
            LKLUE  =  KLUED/2                                           FOP     442
            NKLUE=LKLUE                                                 FOP     443
            KLUEVD =  20                                                FOP     444
            LKLUEV = KLUEVD/2                                           FOP     445
            KLUEFD =  20                                                FOP     446
            LKLUEF = KLUEFD/2                                           FOP     447
            KLESED=30                                                   FOP     448
            LKLESE=KLESED/2                                             FOP     449
            NKLESE=LKLESE                                               FOP     450
            KLUFOD=20                                                   FOP     451
            LKLUFO=KLUFOD/2                                             FOP     452
            IONE   =  1                                                 FOP     453
            NCC    =  10                                                FOP     454
            LTSH   =  18                                                FOP     455
            LTSHV  =  LTSH                                              FOP     456
            LTSHF  =  LTSH                                              FOP     457
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                LTSHFO =  LTSH                                          FOP       458
                KTFH   =  NO                                            FOP       459
                LTFH   =  LTSH                                          FOP       460
460             NROWS  =  2                                             FOP       461
                NCOLS  =  0                                             FOP       462
                LINESG =  LINES + 1                                     FOP       463
                KFLABO =  2                                             FOP       464
                KDLABO =  2                                             FOP       465
465             KFLABI =  1                                             FOP       466
                KDLABI =  1                                             FOP       467
                KROUP  = -1                                             FOP       468
                LTITLI =  18                                            FOP       469
                CALL DATE(DATER)                                        FOP       470
470             CALL WORDS (FMTA,2,8H(18A4)  )                          FOP       471
                KASE   =  0                                             FOP       472
                MTAPES =  50                                            FOP       473
                ITAPES(1) =  MTAPES                                     FOP       474
                MPOS   =  20                                            FOP       475
475             IPOS(1)   = MPOS                                        FOP       476
                CALL SETUP (2)                                          FOP       477
                ITAPER =  ITAPES(5)                                     FOP       478
                ITAPEW =  ITAPES(6)                                     FOP       479
                ITAPEP =  ITAPES(7)                                     FOP       480
480             IUCD=ITAPER                                             FOP       481
                IUPR=ITAPEW                                             FOP       482
                ITAPET  =  ITAPES(19)                                   FOP       483
                ITAPEL = ITAPES(19)                                     FOP       484
          C                                                             FOP       485
485       C                                                             FOP       486
          C INITIALIZE THE VARIABLES AND LIST DATA                      FOP       487
                NCOL   =  80                                            FOP       488
                KHEAD  =  2                                             FOP       489
                NTAPEI = 16                                             FOP       490
490             CALL WORDS (SKIP,1,4H20X,)                              FOP       491
                KOUNT  =  LINES                                         FOP       492
                KTABLE =  2                                             FOP       493
                CALL LDB (NCOL,KHEAD,NTAPEI,ITAPER,ITAPEW,SKIP)         FOP       494
          C                                                             FOP       495
495       C                                                             FOP       496
          C READ INPUT DATA                                             FOP       497
            135 KASE   =  KASE + 1                                      FOP       498
                CALL IVALUE (KLUE ,IONE,KLUED)                          FOP       499
                CALL IVALUE (KLUEV,IONE,KLUEVD)                         FOP       500
500             CALL IVALUE (KLUEF,IONE,KLUEFD)                         FOP       501
                READ (ITAPER,5025) PACAGE, LINESI                       FOP       502
                DO 140 I=1,2                                            FOP       503
                CALL EOFO1 (ITAPER,TMH(1,I),LTMH,KEOF)                  FOP       504
                IF (KEOF .EQ. 2) GO TO 1000                             FOP       505
505           140 CONTINUE                                              FOP       506
                KOUNT  =  LINES                                         FOP       507
                KTITLE = 1                                              FOP       508
                CALL TIMEB (38,38                                       FOP       509
               1HFROM FOP , AFTER LDB - LIST INPUT DATA)                 FOP       510
510             KTITLE = 2                                              FOP       511
                READ (ITAPER,5010) MTITLE                               FOP       512
                IF (MTITLE .EQ. 0) GO TO 160                            FOP       513
                DO 150 K=1,MTITLE                                       FOP       514
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                READ (ITAPER,FMTA) (TITLEI(L), L=1,LTITLI)                    FOP       515
515          150 CONTINUE                                                     FOP       516
             160 CONTINUE                                                     FOP       517
                CALL CLUES (ITAPER,NCC,NKLUE ,KLUE )                          FOP       518
             170 CONTINUE                                                     FOP       519
                CALL FSIOFO                                                   FOP       520
520             CALL DSIOFO                                                   FOP       521
                KANAV  =  KLUE( 3)                                            FOP       522
                KANAF  =  KLUE( 4)                                            FOP       523
                KOPTF  =  KLUE( 7)                                            FOP       524
                KREPOR =  KLUE( 8)                                            FOP       525
525             KLABEL =  KLUE(9)                                             FOP       526
                KMESAG =  KLUE(10)                                            FOP       527
                KTMH   =  KLUE(11)                                            FOP       528
                KTSH   =  KLUE(12)                                            FOP       529
                KLABEI =  KLUE(13)                                            FOP       530
530             KTIMEL =  KLUE(14)                                            FOP       531
                KPASS =KLUE(26)                                               FOP       532
                KRED  =KLUE(27)                                               FOP       533
                KMASSA=KLUE(28)                                               FOP       534
                KMASSD=KLUE(29)                                               FOP       535
535             KMASSO=KLUE(30)                                               FOP       536
                KMASSB=KLUE(31)                                               FOP       537
                KBALUP=KLUE(32)                                               FOP       538
                KSTRER=KLUE(33)                                               FOP       539
                KRESIZ=KLUE(34)                                               FOP       540
540             KNOPT =KLUE(35)                                               FOP       541
                KIDFIX=KLUE(36)                                               FOP       542
                KFREE =KLUE(37)                                               FOP       543
                LANAV  =  KLUE( 3+LKLUE)                                      FOP       544
                LANAF  =  KLUE( 4+LKLUE)                                      FOP       545
545          C                                                                FOP       546
             C                                                                FOP       547
             C     CHECK TO SEE THAT VIBRATION & FLUTTER MODULES ARE CALLED    FOP       548
             C     IF FLUTTER OPTIMIZATION PACKAGE IS ENTERED.                 FOP       549
             C                                                                FOP       550
550             IF (KOPTF.EQ.2.AND.(KANAV.NE.2.OR.KANAF.NE.2)) GOTO 960       FOP       551
             C                                                                FOP       552
             C                                                                FOP       553
                NCYC   = 0                                                    FOP       554
                VNEW = 10000.0                                                FOP       555
555             DDD = -1.0                                                    FOP       556
                KLUSE  =  -2                                                  FOP       557
                IF (KANAV .EQ. 2)  KLUSE =-1                                  FOP       558
                IF (KANAV .EQ. 2  .AND. KANAF .EQ. 2) KLUSE  =0               FOP       559
                IF(KANAV.EQ 2.AND.KANAF.EQ.2.AND.KOPTF.EQ.2) KLUSE=1          FOP       560
560             IF(KANAV.EQ.2.AND.KANAF.EQ.2.AND.KOPTF.EQ.2.AND.              FOP       561
               1   KRESIZ.EQ.2) KLUSE=2                                       FOP       562
                KLUNAL=0                                                      FOP       563
                IF(KSTRER.EQ.2) KLUNAL=1                                      FOP       564
                IRED   =  KRED - 1                                            FOP       565
565             IF (KMASSA .EQ  1)  KLUMD  = 1                                FOP       566
                IF (KMASSA .EQ. 2)  KLUMD  = 0                                FOP       567
                KLUBAL =  KMASSB - 1                                          FOP       568
                MORBAL=KBALUP-1                                               FOP       569
                IF (KMASSD .EQ. 1) MSADD  =  0                                FOP       570
570             IF (KMASSD .EQ. 2 .AND. KMASSO .EQ. 1) MSADD = 1              FOP       571
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                IF (KMASSD .EQ. 2 .AND. KMASSO .EQ. 2) MSADD = 2                    FOP      572
                NPAS = KPASS - 1                                                    FOP      573
                IDNOPT=0                                                            FOP      574
                IF(KNOPT.EQ.2.OR.KIDFIX.EQ.2) IDNOPT=1                              FOP      575
575           200 CONTINUE                                                          FOP      576
              C                                                                     FOP      577
              C                                                                     FOP      578
              C  INITIALIZE THE TAPES FOR DSIO                                      FOP      579
              C                                                                     FOP      580
580           C                                                                     FOP      581
              CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   FOP      582
              C     IF (KANAV.EQ.1) GO TO 215                                       FOP      583
              C     CALL DINIT ( 1,8HFT01F001)                                      FOP      584
              C     CALL DINIT ( 2,8HFT02F001)                                      FOP      585
585           C     CALL DINIT ( 3,8HFT03F001)                                      FOP      586
              C     CALL DINIT ( 4,8HFT04F001)                                      FOP      587
              C     CALL DINIT ( 8,8HFT08F001)                                      FOP      588
              C     CALL DINIT (11,8HFT11F001)                                      FOP      589
              C     CALL DINIT (12,8HFT12F001)                                      FOP      590
590           C     CALL DINIT ( 9,8HFT09F001)                                      FOP      591
              C     CALL DINIT (10,8HFT10F001)                                      FOP      592
              C 210 CONTINUE                                                        FOP      593
              C                                                                     FOP      594
              C 215 CONTINUE                                                        FOP      595
595           C                                                                     FOP      596
              CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAM       FOP      597
              C                                                                     FOP      598
              C                                                                     FOP      599
              CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS   FOP      600
600           MAXUNTS = 12                                                          FOP      601
              MAXFILS = 40                                                          FOP      602
              MAXLOCS = MAXFILS + 14                                                FOP      603
              BUFSZD = 513                                                          FOP      604
              CALL FETS (FET,MAXLOCS,MAXUNTS)                                       FOP      605
605           DO 133 I=1,MAXUNTS                                                    FOP      606
              BUFSZ(I) = BUFSZD                                                     FOP      607
              CALL DOPEN (I,1)                                                      FOP      608
            133 CONTINUE                                                          FOP      609
              CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS      FOP      610
610           C                                                                     FOP      611
              C                                                                     FOP      612
              C                                                                     FOP      613
              C                                                                     FOP      614
              C DEFINE INPUT/OUTPUT UNIT NUMBERS                                    FOP      615
615           C                                                                     FOP      616
                CALL SETUP (1)                                                      FOP      617
                ITAPO2 = ITAPES(2)                                                  FOP      618
              C                                                                     FOP      619
              C*********************************************************************FOP      620
620           C*********************************************************************FOP      621
              C*********************************************************************FOP      622
              C*********************************************************************FOP      623
              C*********************************************************************FOP      624
              C*****                                                         ******FOP      625
625           C*****                  AAA    V   V    AAA    M   M          ******FOP      626
              C*****                 A   A   V   V   A   A   MM MM          ******FOP      627
              C*****                 .....   .. ..   .....   .. ..          ******FOP      628
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COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
		93 IFPH (1)	94 IUINCM (1)	95 IFINCM (1)
		96 IUINCK (1)	97 IFINCK (1)	
PLAYFF	26	0 IUMDFF (1)	1 IFMDFF (1)	2 IUDLTI (1)
		3 IFDLTI (1)	4 IUSLTI (1)	5 IFSLTI (1)
		6 IUMPLI (1)	7 IFMPLI (1)	8 IUTPGT (1)
		9 IFTPGT (1)	10 IUPATF (1)	11 IFPATF (1)
		12 IUMPL (1)	13 IFMPL (1)	14 IUSLT (1)
		15 IFSLT (1)	16 IUDLT (1)	17 IFDLT (1)
		18 IUQA (1)	19 IFQA (1)	20 IUQAT (1)
		21 IFQAT (1)	22 IUPHA (1)	23 IFPHA (1)
		24 IUPHAT (1)	25 IFPHAT (1)	
KLUES	24	0 KLUSE (1)	1 KLUNAL (1)	2 IRED (1)
		3 KLUMD (1)	4 KLUBAL (1)	5 MSADD (1)
		6 NPAS (1)	7 IDNOPT (1)	8 VDES (1)
		9 EPS1 (1)	10 DWMAX (1)	11 NBAR (1)
		12 NFIX (1)	13 D (1)	14 DEL (1)
		15 EPS2 (1)	16 NCYC (1)	17 NNN (1)
		18 IBAND (1)	19 IFIN (1)	20 KLUB (1)
		21 KLUQ (1)	22 MORBAL (1)	23 DBAL (1)
KLUFF	1	0 KFREE (1)		
COLS	22	0 IT (1)	1 IMINT (1)	2 IMAXT (1)
		3 IDENS (1)	4 IOLDT (1)	5 IOLDW (1)
		6 ISRAT (1)	7 IMINTO (1)	8 IINITT (1)
		9 IWPUT (1)	10 NVAR (1)	11 JWPUT (1)
		12 JINITT (1)	13 JMINT (1)	14 JMAXT (1)
		15 JOLDT (1)	16 JNEWT (1)	17 JDRV (1)
		18 JDRVO (1)	19 JSPR1 (1)	20 JSPR2 (1)
		21 JSPR3 (1)		
SIZES	6	0 NSTMEM (1)	1 NSTDOF (1)	2 NDYDOF (1)
		3 NNOPT (1)	4 NDESNO (1)	5 NDESYS (1)
BANDW	1	0 IBANDW (1)		
WAYTS	6	0 WINITT (1)	1 WST (1)	2 WMB (1)
		3 WBOTH (1)	4 WPRES (1)	5 DW (1)
CIDIV	1	0 IDIV (1)		
CORE	2	0 KORE (1)	1 KOREDP (1)	
CLUFO	21	0 LKLUFO (1)	1 KLUFO (20)	
PLUG	129	0 EMP (9)	9 PHP (120)	
CPLOTS	1	0 KPLOTS (1)		
CPLOTF	1	0 KPLOTF (1)		
STORES	277	0 NUMSTR (1)	1 KCONST (1)	2 ISTDOF (30)
		32 IDYDOF (30)	62 IDSTR (5)	67 STRWI (5)
		72 STRWO (5)	77 STRWN (5)	82 STRII (15)
		97 STRIO (15)	112 STRIN (15)	127 STRRI (15)
		142 STRRO (15)	157 STRRN (15)	172 STRWDO (5)
		177 STRWDN (5)	182 STRIDO (15)	197 STRIDN (15)
		212 STRRDO (15)	227 STRRDN (15)	242 SCALE (35)
STRCLU	10	0 ICYCLE (1)	1 ISTEP (1)	2 M1 (1)
		3 M2 (1)	4 M3 (1)	5 M4 (1)
		6 VS (1)	7 VOLD (1)	8 VNEW (1)
		9 STPOLD (1)		
LOCSTR	6	0 IUSTRI (1)	1 IFSTRI (1)	2 IUMREF (1)
		3 IFMREF (1)	4 IUMOD (1)	5 IFMOD (1)
RESIZE	44	0 ISIZE (1)	1 SCLNEW (20)	21 SCLOLD (20)
		41 ITESTO (1)	42 SAVSTP (1)	43 IDUB (1)
ACCEL	43	0 ISTOP (1)	1 IPAR (1)	2 DWNEW (5)
		7 DINEW (15)	22 DWOLD (5)	27 DIOLD (15)

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
		6 NPAGEA (1)	7 ITAPET (1)	
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
LABELS	6	0 KFLABO (1)	1 KDLABO (1)	2 KFLABI (1)
		3 KDLABI (1)	4 ITAPEL (1)	5 KLABEI (1)
CSHIFT	1	0 SHIFT (1)		
REPORT	1	0 KREPOR (1)		
CBYTES	1	0 NBYTES (1)		
CFILES	51	0 KFILES (1)	1 IFILES (50)	
MATRIX	45	0 ISETUP (45)		
FILE	21	0 IPOS (20)	20 NOBUF (1)	
DSRN	25	0 JSETUP (25)		
CSETUP	1	0 IOINC (1)		
CVIBRA	4	0 TOL (1)	1 TOL1 (1)	2 TOL2 (1)
		3 MINUS2 (1)		
FSIO1	62	0 LFUF (1)	1 LFUFD (1)	2 NFUF (60)
FSIO2	20	0 FSIONS (20)		
DSIO1	62	0 LDUF (1)	1 LDUFD (1)	2 NDUF (60)
DSIO2	20	0 DSIONS (20)		
CONSTS	2	0 NO (1)	1 YES (1)	
BAL	241	0 NMBAL (1)	1 IDBAL (20)	21 VMBIN (20)
		41 VMBOLD (20)	61 VMBNEW (20)	81 MBDOF (60)
		141 DRVMB (20)	161 DRVMBO (20)	181 S1MB (20)
		201 S2MB (20)	221 S3MB (20)	
FLUT	204	0 UMOD (80)	80 VMOD (80)	160 VF (1)
		161 WW (1)	162 CSCL (1)	163 NMODE (1)
		164 IDMODE (40)		
PLACES	98	0 IUIN1 (1)	1 IUIN2 (1)	2 IUOUT1 (1)
		3 IUOUT2 (1)	4 IUGO1 (1)	5 IUGO2 (1)
		6 IUGO3 (1)	7 IUGO4 (1)	8 IUSCR (1)
		9 IFSCR (1)	10 IFS1 (1)	11 IFS2 (1)
		12 IFS3 (1)	13 IFS4 (1)	14 IUCD (1)
		15 IUPR (1)	16 IUA (1)	17 IFA (1)
		18 IUY (1)	19 IFY (1)	20 IUMEMN (1)
		21 IFMEMN (1)	22 IUSTFN (1)	23 IFSTFN (1)
		24 IUKS (1)	25 IFKS (1)	26 IUB (1)
		27 IFB (1)	28 IUDESO (1)	29 IFDESO (1)
		30 IUMDBI (1)	31 IFMDBI (1)	32 IUADDI (1)
		33 IFADDI (1)	34 IUBALI (1)	35 IFBALI (1)
		36 IUDESI (1)	37 IFDESI (1)	38 IUWTI (1)
		39 IFWTI (1)	40 IUMEMO (1)	41 IFMEMO (1)
		42 IUBT (1)	43 IFBT (1)	44 IUDESN (1)
		45 IFDESN (1)	46 IUMD (1)	47 IFMD (1)
		48 IUMEMF (1)	49 IFMEMF (1)	50 IUSTFO (1)
		51 IFSTFO (1)	52 IUMDB (1)	53 IFMDB (1)
		54 IUADD (1)	55 IFADD (1)	56 IUBAL (1)
		57 IFBAL (1)	58 IUDESF (1)	59 IFDESF (1)
		60 IUWT (1)	61 IFWT (1)	62 IUDUM1 (1)
		63 IFDUM1 (1)	64 IUDUM2 (1)	65 IFDUM2 (1)
		66 IUDUM3 (1)	67 IFDUM3 (1)	68 IUL (1)
		69 IFL (1)	70 IUYT (1)	71 IFYT (1)
		72 IUZ (1)	73 IFZ (1)	74 IUZR (1)
		75 IFZR (1)	76 IULR (1)	77 IFLR (1)
		78 IUBR (1)	79 IFBR (1)	80 IUPHTF (1)
		81 IFPHTF (1)	82 IUMODM (1)	83 IFMODM (1)
		84 IUMODK (1)	85 IFMODK (1)	86 IUPHT (1)
		87 IFPHT (1)	88 IUQT (1)	89 IFQT (1)
		90 IUQ (1)	91 IFQ (1)	92 IUPH (1)

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STATEMENT LABELS                DEF LINE   REFERENCES
    0  120          INACTIVE      399
    0  133                        608       605
    0  135          INACTIVE      497
    0  140                        505       502
    0  150                        515       513
  156  160                        516       512
    0  170          INACTIVE      518
    0  200          INACTIVE      575
  347  600                        658       752
  360  700                        695       657       755
  376  725                        710       708
  404  750                        711       709
  405  800                        741       696
  415  850                        763       742
  415  900                        764       665       714       747
  423  960                        779       550
  425  1000                       780       504       778
  602  5010     FMT               784       511
  604  5020     FMT               785       779
  623  5025     FMT               788       501

LOOPS  LABEL    INDEX     FROM-TO    LENGTH    PROPERTIES
  124  140      I          502 505      11B              EXT REFS    EXITS
  146  150      K          513 515      10B              EXT REFS
  334  133      I          605 608       7B              EXT REFS

COMMON BLOCKS   LENGTH    MEMBERS - BIAS NAME(LENGTH)
       DCOM1        16              0 MAXUNTS(1)          1 MAXFILS(1)          2 OLDU   (1)
                                    3 OLDOP  (1)          4 BUFSZ  (12)
       DCOM2       648              0 FET    (648)
       DCOM3      6156              0 BUFFER (6156)
       CTAPES       50              0 ITAPES (50)
       CLUEM        81              0 LKLUE  (1)          1 KLUE   (80)
       CLUEV        21              0 LKLUEV (1)          1 KLUEV  (20)
       CLUEF        21              0 LKLUEF (1)          1 KLUEF  (20)
       CTITLE       37              0 LTITLE (1)          1 TITLE  (36)
       CTMH         38              0 KTMH   (1)          1 LTMH   (1)          2 TMH    (36)
       CTSH         20              0 KTSH   (1)          1 LTSH   (1)          2 TSH    (18)
       MESAG         4              0 KMESAG (1)          1 KTITLE (1)          2 KTIME  (1)
                                    3 KTIMEL (1)
       CTFH         20              0 KTFH   (1)          1 LTFH   (1)          2 TFH    (18)
       CTSHV        19              0 LTSHV  (1)          1 TSHV   (18)
       CTSHF        19              0 LTSHF  (1)          1 TSHF   (18)
       CTSHFO       19              0 LTSHFO (1)          1 TSHFO  (18)
       CFMTA         2              0 FMTA   (2)
       CFMTB         3              0 FMTB   (3)
       CFMTBO        3              0 FMTBO  (3)
       CFMTCO        8              0 FMTCO  (8)
       CDATER        1              0 DATER  (1)
       CEELO2        1              0 REELO2 (1)
       CLIST        11              0 KOUNT  (1)          1 KPAGE  (1)          2 LINES  (1)
                                    3 LINEST (1)          4 KLABEL (1)          5 KTPAGE (1)
                                    6 NPAGE  (1)          7 KBPAGE (1)          8 LINESG (1)
                                    9 KOUNTH (1)         10 KOUNTI (1)
       CTABLE        8              0 KTABLE (1)          1 NPASS  (1)          2 NROWS  (1)
                                    3 NCOLS  (1)          4 NCOLST (1)          5 KTABLO (1)
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VARIABLES	SN	TYPE		RELOCATION							
335	S3MB	REAL	ARRAY	BAL	REFS	268	321				
2	TFH	REAL	ARRAY	CTFH	REFS	272	291				
1	TITLE	REAL	ARRAY	CTITLE	REFS	269	287				
734	TITLEI	REAL	ARRAY		REFS	269	DEFINED	514			
2	TMH	REAL	ARRAY	CTMH	REFS	269	288	503			
0	TOL	REAL		CVIBRA	REFS	315	DEFINED	424			
1	TOL1	REAL		CVIBRA	REFS	315	DEFINED	425			
2	TOL2	REAL		CVIBRA	REFS	315	DEFINED	426			
2	TSH	REAL	ARRAY	CTSH	REFS	269	289				
1	TSHF	REAL	ARRAY	CTSHF	REFS	269	293				
1	TSHFO	REAL	ARRAY	CTSHFO	REFS	269	294				
1	TSHV	REAL	ARRAY	CTSHV	REFS	269	292				
0	UMOD	COMPLEX	ARRAY	FLUT	REFS	236	273	323			
10	VDES	REAL		KLUES	REFS	345					
240	VF	REAL		FLUT	REFS	323					
25	VMBIN	REAL	ARRAY	BAL	REFS	274	321				
75	VMBNEW	REAL	ARRAY	BAL	REFS	274	321				
51	VMBOLD	REAL	ARRAY	BAL	REFS	274	321				
120	VMOD	COMPLEX	ARRAY	FLUT	REFS	236	273	323			
10	VNEW	REAL		STRCLU	REFS	375	DEFINED	554			
7	VOLD	REAL		STRCLU	REFS	375					
6	VS	REAL		STRCLU	REFS	375					
3	WBOTH	REAL		WAYTS	REFS	363					
0	WINITT	REAL		WAYTS	REFS	363					
2	WMB	REAL		WAYTS	REFS	363					
4	WPRES	REAL		WAYTS	REFS	363					
1	WST	REAL		WAYTS	REFS	363					
241	WW	REAL		FLUT	REFS	323					
1	YES	INTEGER		CONSTS	REFS	227	320	437	662	701	2*710
					DEFINED	436					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES				
AFAM		1	699				
AFOM		1	744				
AVAM		1	660				
CLUES		4	517				
DATE		1	469				
DOPEN		2	607				
DSIOFO		0	520				
EOFO1		4	503				
FETS		3	604				
FLUTAP		3	701				
FSIOFO		0	519				
IVALUE		3	498	499	500		
LDB		6	493				
LLABEL		3	770				
LTABLE		2	775				
PLOT		3	710				
SETUP		1	476	616			
TFOP		0	395				
TIMEB		2	508				
VIBRAP		3	662				
WORDS		3	420	421	422	470	490

VARIABLES	SN		TYPE		RELOCATION							
4	NDESNO		INTEGER		SIZES	REFS	353					
5	NDESYS		INTEGER		SIZES	REFS	353	752				
2	NDUF		INTEGER	ARRAY	DSIO1	REFS	258	318				
2	NDYDOF		INTEGER		SIZES	REFS	353					
14	NFIX		INTEGER		KLUES	REFS	345	709				
2	NFUF		INTEGER	ARRAY	FSIO1	REFS	258	316				
662	NKLESE	*	INTEGER			DEFINED	449					
655	NKLUE		INTEGER			REFS	517	DEFINED	442			
0	NMBAL		INTEGER		BAL	REFS	321					
243	NMODE		INTEGER		FLUT	REFS	323					
21	NNN		INTEGER		KLUES	REFS	345					
3	NNOPT		INTEGER		SIZES	REFS	353					
0	NO		INTEGER		CONSTS	REFS	320	438	439	458	DEFINED	435
24	NOBUF		INTEGER		FILE	REFS	312					
0	NPAGE		INTEGER		CLIST	REFS	301					
0	NPAGEA		INTEGER		CTABLE	REFS	303					
0	NPAS		INTEGER		KLUES	REFS	345	DEFINED	572			
1	NPASS		INTEGER		CTABLE	REFS	303	664	698	DEFINED	664	698
732	NPLOTF	*	INTEGER			REFS	701					
731	NPLOTV	*	INTEGER			REFS	662					
2	NROWS		INTEGER		CTABLE	REFS	303	DEFINED	460			
1	NSTDOF		INTEGER		SIZES	REFS	353					
0	NSTMEM		INTEGER		SIZES	REFS	353					
675	NTAPEI		INTEGER			REFS	493	DEFINED	489			
0	NUMSTR		INTEGER		STORES	REFS	370					
12	NVAR		INTEGER		COLS	REFS	349					
3	OLDOP		INTEGER		DCOM1	REFS	239	277				
2	OLDU		INTEGER		DCOM1	REFS	239	277				
677	PACAGE	*	REAL			DEFINED	501					
11	PHP		REAL	ARRAY	PLUG	REFS	267	367				
0	REELO2		REAL		CEELO2	REFS	300					
52	RILSTP		REAL		ACCEL	REFS	379					
52	SAVSTP		REAL		RESIZE	REFS	378					
362	SCALE		REAL	ARRAY	STORES	REFS	370					
1	SCLNEW		REAL	ARRAY	RESIZE	REFS	378					
25	SCLOLD		REAL	ARRAY	RESIZE	REFS	378					
0	SHIFT		REAL		CSHIFT	REFS	307					
676	SKIP		REAL			REFS	490	493				
11	STPOLD		REAL		STRCLU	REFS	375					
305	STRIDN		REAL	ARRAY	STORES	REFS	370					
266	STRIDO		REAL	ARRAY	STORES	REFS	370					
122	STRII		REAL	ARRAY	STORES	REFS	370					
160	STRIN		REAL	ARRAY	STORES	REFS	370					
141	STRIO		REAL	ARRAY	STORES	REFS	370					
343	STRRDN		REAL	ARRAY	STORES	REFS	370					
324	STRRDO		REAL	ARRAY	STORES	REFS	370					
177	STRRI		REAL	ARRAY	STORES	REFS	370					
235	STRRN		REAL	ARRAY	STORES	REFS	370					
216	STRRO		REAL	ARRAY	STORES	REFS	370					
261	STRWDN		REAL	ARRAY	STORES	REFS	370					
254	STRWDO		REAL	ARRAY	STORES	REFS	370					
103	STRWI		REAL	ARRAY	STORES	REFS	370					
115	STRWN		REAL	ARRAY	STORES	REFS	370					
110	STRWO		REAL	ARRAY	STORES	REFS	370					
265	S1MB		REAL	ARRAY	BAL	REFS	268	321				
650	S1OLD	*	REAL			DEFINED	389					
211	S2MB		REAL	ARRAY	BAL	REFS	268	324				

VARIABLES	SN	TYPE	RELOCATION							
2	KTIME	INTEGER	MESAG	REFS	290					
3	KTIMEL	INTEGER	MESAG	REFS	290	DEFINED	530			
1	KTITLE	INTEGER	MESAG	REFS	290	DEFINED	507	510		
0	KTMH	INTEGER	CTMH	REFS	288	DEFINED	527			
5	KTPAGE	INTEGER	CLIST	REFS	301					
0	KTSH	INTEGER	CTSH	REFS	289	DEFINED	528			
733	KWIT	INTEGER		REFS	744	747				
705	L	INTEGER		REFS	514	DEFINED	514			
725	LANAF *	INTEGER		DEFINED	544					
724	LANAV *	INTEGER		DEFINED	543					
0	LDUF	INTEGER	DSIO1	REFS	318					
1	LDUFD	INTEGER	DSIO1	REFS	318					
0	LFUF	INTEGER	FSIO1	REFS	316					
1	LFUFD	INTEGER	FSIO1	REFS	316					
2	LINES	INTEGER	CLIST	REFS	301	462	491	506		
10	LINESG	INTEGER	CLIST	REFS	301	DEFINED	462			
700	LINESI *	INTEGER		DEFINED	501					
3	LINEST	INTEGER	CLIST	REFS	301					
661	LKLESE	INTEGER		REFS	449	DEFINED	448			
0	LKLUE	INTEGER	CLUEM	REFS	284	442	543	544	DEFINED	441
0	LKLUEF	INTEGER	CLUEF	REFS	286	DEFINED	446			
0	LKLUEV	INTEGER	CLUEV	REFS	285	DEFINED	444			
0	LKLUFO	INTEGER	CLUFO	REFS	366	DEFINED	451			
1	LTFH	INTEGER	CTFH	REFS	291	DEFINED	459			
0	LTITLE	INTEGER	CTITLE	REFS	287	DEFINED	419			
667	LTITLI	INTEGER		REFS	514	DEFINED	468			
1	LTMH	INTEGER	CTMH	REFS	288	503				
1	LTSH	INTEGER	CTSH	REFS	289	455	456	457	459	
				DEFINED	454					
0	LTSHF	INTEGER	CTSHF	REFS	293	DEFINED	456			
0	LTSHFO	INTEGER	CTSHFO	REFS	294	DEFINED	457			
0	LTSHV	INTEGER	CTSHV	REFS	292	DEFINED	455			
1	MAXFILS	INTEGER	DCOM1	REFS	277	602	DEFINED	601		
727	MAXLOCS	INTEGER		REFS	604	DEFINED	602			
0	MAXUNTS	INTEGER	DCOM1	REFS	277	604	605	DEFINED	600	
121	MBDOF	INTEGER ARRAY	BAL	REFS	257	321				
556	MINUS	INTEGER		REFS	428	DEFINED	427			
3	MINUS2	INTEGER	CVIBRA	REFS	315	DEFINED	428			
26	MORBAL	INTEGER	KLUES	REFS	345	DEFINED	568			
672	MPOS	INTEGER		REFS	475	DEFINED	474			
5	MSADD	INTEGER	KLUES	REFS	345	DEFINED	569	570	571	
671	MTAPES	INTEGER		REFS	473	DEFINED	472			
703	MTITLE	INTEGER		REFS	512	513	DEFINED	511		
2	M1	INTEGER	STRCLU	REFS	375					
3	M2	INTEGER	STRCLU	REFS	375					
4	M3	INTEGER	STRCLU	REFS	375	DEFINED	383			
5	M4	INTEGER	STRCLU	REFS	375	DEFINED	384			
645	M5 *	INTEGER		DEFINED	386					
646	M6 *	INTEGER		DEFINED	387					
647	M7 *	INTEGER		DEFINED	388					
13	NBAR	INTEGER	KLUES	REFS	345					
0	NBYTES	INTEGER	CBYTES	REFS	309	DEFINED	430			
665	NCC	INTEGER		REFS	517	DEFINED	453			
673	NCOL	INTEGER		REFS	493	DEFINED	487			
3	NCOLS	INTEGER	CTABLE	REFS	303	DEFINED	461			
4	NCOLST	INTEGER	CTABLE	REFS	303					
20	NCYC	INTEGER	KLUES	REFS	345	2*709	DEFINED	553		

VARIABLES		SN	TYPE		RELOCATION								
1	KCONST		INTEGER		STORES	REFS	370	DEFINED	390				
3	KDLABI		INTEGER		LABELS	REFS	306	DEFINED	466				
1	KDLABO		INTEGER		LABELS	REFS	306	DEFINED	464				
702	KEOF		INTEGER			REFS	503	504					
0	KFILES		INTEGER		CFILES	REFS	310						
2	KFLABI		INTEGER		LABELS	REFS	306	DEFINED	465				
0	KFLABO		INTEGER		LABELS	REFS	306	DEFINED	463				
0	KFREE		INTEGER		KLUFF	REFS	348	DEFINED	542				
674	KHEAD		INTEGER			REFS	493	DEFINED	488				
723	KIDFIX		INTEGER			REFS	574	DEFINED	541				
5	KLABEI		INTEGER		LABELS	REFS	306	DEFINED	529				
4	KLABEL		INTEGER		CLIST	REFS	301	DEFINED	525				
660	KLESED		INTEGER			REFS	448	DEFINED	447				
24	KLUB		INTEGER		KLUES	REFS	345						
4	KLUBAL		INTEGER		KLUES	REFS	345	DEFINED	567				
1	KLUE		INTEGER	ARRAY	CLUEM	REFS	255	284	498	517	521	522	523
						524	525	526	527	528	529	530	531
						532	533	534	535	536	537	538	539
						540	541	542	543	544	708		
654	KLUED		INTEGER			REFS	441	498	DEFINED	440			
1	KLUEF		INTEGER	ARRAY	CLUEF	REFS	255	286	500				
657	KLUEFD		INTEGER			REFS	446	500	DEFINED	445			
1	KLUEV		INTEGER	ARRAY	CLUEV	REFS	255	285	499				
656	KLUEVD		INTEGER			REFS	444	499	DEFINED	443			
1	KLUFO		INTEGER	ARRAY	CLUFO	REFS	256	366					
663	KLUFOD		INTEGER			REFS	451	DEFINED	450				
3	KLUMD		INTEGER		KLUES	REFS	345	DEFINED	565	566			
1	KLUNAL		INTEGER		KLUES	REFS	345	*DEFINED*	562	563			
25	KLUQ		INTEGER		KLUES	REFS	345						
0	KLUSE		INTEGER		KLUES	REFS	345	DEFINED	556	557	558	559	560
713	KMASSA		INTEGER			REFS	565	566	DEFINED	533			
716	KMASSB		INTEGER			REFS	567	DEFINED	536				
714	KMASSD		INTEGER			REFS	569	570	571	DEFINED	534		
715	KMASSO		INTEGER			REFS	570	571	DEFINED	535			
0	KMESAG		INTEGER		MESAG	REFS	290	DEFINED	526				
722	KNOPT		INTEGER			REFS	574	DEFINED	540				
651	KOMPUT	*	INTEGER			DEFINED	423						
710	KOPTF		INTEGER			REFS	550	559	560	742	DEFINED	523	
0	KORE		INTEGER		CORE	REFS	365						
1	KOREDP		INTEGER		CORE	REFS	365						
0	KOUNT		INTEGER		CLIST	REFS	301	DEFINED	491	506			
11	KOUNTH		INTEGER		CLIST	REFS	301						
12	KOUNTI		INTEGER		CLIST	REFS	301						
1	KPAGE		INTEGER		CLIST	REFS	301						
711	KPASS		INTEGER			REFS	572	DEFINED	531				
0	KPLOTF		INTEGER		CPLOTF	REFS	369	662	699	2*701	710		
						DEFINED	439						
0	KPLOTS		INTEGER		CPLOTS	REFS	368	DEFINED	437				
653	KPLOTV		INTEGER			REFS	660	2*662	701	710	DEFINED	438	
712	KRED		INTEGER			REFS	564	DEFINED	532				
0	KREPOR		INTEGER		REPORT	REFS	308	DEFINED	524	765			
721	KRESIZ		INTEGER			REFS	560	DEFINED	539				
666	KROUP		INTEGER			REFS	770	775	DEFINED	467			
720	KSTRER		INTEGER			REFS	563	DEFINED	538				
0	KTABLE		INTEGER		CTABLE	REFS	303	DEFINED	492				
5	KTABLO		INTEGER		CTABLE	REFS	303						
0	KTFH		INTEGER		CTFH	REFS	291	DEFINED	458				

VARIABLES	SN	TYPE	RELOCATION							
24	IUMEMN	INTEGER	PLACES	REFS	324					
50	IUMEMO	INTEGER	PLACES	REFS	324					
4	IUMOD	INTEGER	LOCSTR	REFS	376					
124	IUMODK	INTEGER	PLACES	REFS	324					
122	IUMODM	INTEGER	PLACES	REFS	324					
14	IUMPL	INTEGER	PLAYFF	REFS	341					
6	IUMPLI	INTEGER	PLAYFF	REFS	341					
2	IUMREF	INTEGER	LOCSTR	REFS	376					
2	IUOUT1	INTEGER	PLACES	REFS	324					
3	IUOUT2	INTEGER	PLACES	REFS	324					
12	IUPATF	INTEGER	PLAYFF	REFS	341					
134	IUPH	INTEGER	PLACES	REFS	324					
26	IUPHA	INTEGER	PLAYFF	REFS	341					
30	IUPHAT	INTEGER	PLAYFF	REFS	341					
126	IUPHT	INTEGER	PLACES	REFS	324					
120	IUPHTF	INTEGER	PLACES	REFS	324					
17	IUPR	INTEGER	PLACES	REFS	324	DEFINED	481			
132	IUQ	INTEGER	PLACES	REFS	324					
22	IUQA	INTEGER	PLAYFF	REFS	341					
24	IUQAT	INTEGER	PLAYFF	REFS	341					
130	IUQT	INTEGFR	PLACES	REFS	324					
10	IUSCR	INTEGER	PLACES	REFS	324					
16	IUSLT	INTEGER	PLAYFF	REFS	341					
4	IUSLTI	INTEGER	PLAYFF	REFS	341					
26	IUSTFN	INTEGER	PLACES	REFS	324					
62	IUSTFO	INTEGER	PLACES	REFS	324					
0	IUSTRI	INTEGER	LOCSTR	REFS	376					
10	IUTPGT	INTEGER	PLAYFF	REFS	341					
74	IUWT	INTEGER	PLACES	REFS	324					
46	IUWTI	INTEGER	PLACES	REFS	324					
22	IUY	INTEGER	PLACES	REFS	324					
106	IUYT	INTEGER	PLACES	REFS	324					
110	IUZ	INTEGER	PLACES	REFS	324					
112	IUZR	INTEGER	PLACES	REFS	324					
11	IWPUT	INTEGER	COLS	REFS	349					
21	JDRV	INTEGER	COLS	REFS	349					
22	JDRVO	INTEGER	COLS	REFS	349					
14	JINITT	INTEGER	COLS	REFS	349					
644	JJJJ	* INTEGER		DEFINED	385					
16	JMAXT	INTEGER	COLS	REFS	349					
15	JMINT	INTEGER	COLS	REFS	349					
20	JNEWT	INTEGER	COLS	REFS	349					
17	JOLDT	INTEGER	COLS	REFS	349					
0	JSETUP	INTEGER ARRAY	DSRN	REFS	254	313				
23	JSPR1	INTEGER	COLS	REFS	349					
24	JSPR2	INTEGER	COLS	REFS	349					
25	JSPR3	INTEGER	COLS	REFS	349					
13	JWPUT	INTEGER	COLS	REFS	349					
704	K	* INTEGER		DEFINED	513					
707	KANAF	INTEGER		REFS	550	558	559	560	696	
				DEFINED	522					
706	KANAV	INTEGER		REFS	550	557	558	559	560	657
				DEFINED	521					
670	KASE	INTEGER		REFS	497	DEFINED	471	497		
717	KBALUP	INTEGER		REFS	568	DEFINED	537			
652	KBLAB	INTEGER		REFS	770	DEFINED	431			
7	KBRACE	INTEGER	CLIST	REFS	201					

VARIABLES		SN	TYPE		RELOCATION							
5	IOLDW		INTEGER		COLS	REFS	349					
664	IONE		INTEGER			REFS	498	09	500	DEFINED	452	
1	IPAR		INTEGER		ACCEL	REFS	379					
0	IPOS		INTEGER	ARRAY	FILE	REFS	252	312	DEFINED	475		
2	IRED		INTEGER		KLUES	REFS	345	DEFINED	564			
0	ISETUP		INTEGER	ARRAY	MATRIX	REFS	252	311				
0	ISIZE		INTEGER		RESIZE	REFS	378					
6	ISRAT		INTEGER		COLS	REFS	349					
2	ISTDOF		INTEGER	ARRAY	STORES	REFS	370					
1	ISTEP		INTEGER		STRCLU	REFS	375					
0	ISTOP		INTEGER		ACCEL	REFS	379					
0	IT		INTEGER		COLS	REFS	349					
4	ITAPEL		INTEGER		LABELS	REFS	306	DEFINED	483			
2	ITAPEP		INTEGER		COMRWP	REFS	305	DEFINED	479			
0	ITAPER		INTEGER		COMRWP	REFS	305	480	493	503	517	
						DEFINED	477	I/O REFS	501	511	514	
0	ITAPES		INTEGER	ARRAY	CTAPES	REFS	252	283	477	478	479	482
						617	DEFINED	473				483
7	ITAPET		INTEGER		CTABLE	REFS	303	DEFINED	482			
1	ITAPEW		INTEGER		COMRWP	REFS	305	481	493	770	775	
						DEFINED	478	I/O REFS	779			
730	ITAPO2	*	INTEGER			DEFINED	617					
51	ITESTO		INTEGER		RESIZE	REFS	378					
20	IUA		INTEGER		PLACES	REFS	324					
66	IUADD		INTEGER		PLACES	REFS	324					
40	IUADDI		INTEGER		PLACES	REFS	324					
32	IUB		INTEGER		PLACES	REFS	324					
70	IUBAL		INTEGER		PLACES	REFS	324					
42	IUBALI		INTEGER		PLACES	REFS	324					
116	IUBR		INTEGER		PLACES	REFS	324					
52	IUBT		INTEGER		PLACES	REFS	324					
16	IUCD		INTEGER		PLACES	REFS	324	DEFINED	480			
72	IUDESF		INTEGER		PLACES	REFS	324					
44	IUDESI		INTEGER		PLACES	REFS	324					
54	IUDESN		INTEGER		PLACES	REFS	324					
34	IUDESO		INTEGER		PLACES	REFS	324					
20	IUDLT		INTEGER		PLAYFF	REFS	341					
2	IUDLTI		INTEGER		PLAYFF	REFS	341					
76	IUDUM1		INTEGER		PLACES	REFS	324					
100	IUDUM2		INTEGER		PLACES	REFS	324					
102	IUDUM3		INTEGER		PLACES	REFS	324					
4	IUGO1		INTEGER		PLACES	REFS	324					
5	IUGO2		INTEGER		PLACES	REFS	324					
6	IUGO3		INTEGER		PLACES	REFS	324					
7	IUGO4		INTEGER		PLACES	REFS	324					
140	IUINCK		INTEGER		PLACES	REFS	324					
136	IUINCM		INTEGER		PLACES	REFS	324					
0	IUIN1		INTEGER		PLACES	REFS	324					
1	IUIN2		INTEGER		PLACES	REFS	324					
30	IUKS		INTEGER		PLACES	REFS	324					
104	IUL		INTEGER		PLACES	REFS	324					
114	IULR		INTEGER		PLACES	REFS	324					
56	IUMD		INTEGER		PLACES	REFS	324					
64	IUMDB		INTEGER		PLACES	REFS	324					
36	IUMDBI		INTEGER		PLACES	REFS	324					
0	IUMDFF		INTEGER		PLAYFF	REFS	341					
60	IUMEMF		INTEGER		PLACES	REFS	324					

VARIABLES	SN	TYPE		RELOCATION				
77	IFDUM1	INTEGER		PLACES	REFS	324		
101	IFDUM2	INTEGER		PLACES	REFS	324		
103	IFDUM3	INTEGER		PLACES	REFS	324		
1	IFILES	INTEGER	ARRAY	CFILES	REFS	252	310	
23	IFIN	INTEGER		KLUES	REFS	345	665	714
141	IFINCK	INTEGER		PLACES	REFS	324		
137	IFINCM	INTEGER		PLACES	REFS	324		
31	IFKS	INTEGER		PLACES	REFS	324		
105	IFL	INTEGER		PLACES	REFS	324		
115	IFLR	INTEGER		PLACES	REFS	324		
57	IFMD	INTEGER		PLACES	REFS	324		
65	IFMDB	INTEGER		PLACES	REFS	324		
37	IFMDBI	INTEGER		PLACES	REFS	324		
1	IFMDFF	INTEGER		PLAYFF	REFS	341		
61	IFMEMF	INTEGER		PLACES	REFS	324		
25	IFMEMN	INTEGER		PLACES	REFS	324		
51	IFMEMO	INTEGER		PLACES	REFS	324		
5	IFMOD	INTEGER		LOCSTR	REFS	376		
125	IFMODK	INTEGER		PLACES	REFS	324		
123	IFMODM	INTEGER		PLACES	REFS	324		
15	IFMPL	INTEGER		PLAYFF	REFS	341		
7	IFMPLI	INTEGER		PLAYFF	REFS	341		
3	IFMREF	INTEGER		LOCSTR	REFS	376		
13	IFPATF	INTEGER		PLAYFF	REFS	341		
135	IFPH	INTEGER		PLACES	REFS	324		
27	IFPHA	INTEGER		PLAYFF	REFS	341		
31	IFPHAT	INTEGER		PLAYFF	REFS	341		
127	IFPHT	INTEGER		PLACES	REFS	324		
121	IFPHTF	INTEGER		PLACES	REFS	324		
133	IFQ	INTEGER		PLACES	REFS	324		
23	IFQA	INTEGER		PLAYFF	REFS	341		
25	IFQAT	INTEGER		PLAYFF	REFS	341		
131	IFQT	INTEGER		PLACES	REFS	324		
11	IFSCR	INTEGER		PLACES	REFS	324		
17	IFSLT	INTEGER		PLAYFF	REFS	341		
5	IFSLTI	INTEGER		PLAYFF	REFS	341		
27	IFSTFN	INTEGER		PLACES	REFS	324		
63	IFSTFO	INTEGER		PLACES	REFS	324		
1	IFSTRI	INTEGER		LOCSTR	REFS	376		
12	IFS1	INTEGER		PLACES	REFS	324		
13	IFS2	INTEGER		PLACES	REFS	324		
14	IFS3	INTEGER		PLACES	REFS	324		
15	IFS4	INTEGER		PLACES	REFS	324		
11	IFTPGT	INTEGER		PLAYFF	REFS	341		
75	IFWT	INTEGER		PLACES	REFS	324		
47	IFWTI	INTEGER		PLACES	REFS	324		
23	IFY	INTEGER		PLACES	REFS	324		
107	IFYT	INTEGER		PLACES	REFS	324		
111	IFZ	INTEGER		PLACES	REFS	324		
113	IFZR	INTEGER		PLACES	REFS	324		
643	IIII	* INTEGER			DEFINED	382		
10	IINITT	INTEGER		COLS	REFS	349		
2	IMAXT	INTEGER		COLS	REFS	349		
1	IMINT	INTEGER		COLS	REFS	349		
7	IMINTO	INTEGER		COLS	REFS	349		
0	IOINC	INTEGER		CSETUP	REFS	314	DEFINED	429
4	IOLDT	INTEGER		COLS	REFS	349		

ENTRY POINTS		DEF LINE	REFERENCES
1	FOP	225	790

VARIABLES	SN	TYPE		RELOCATION								
0	BUFFER	INTEGER	ARRAY	DCOM3	REFS	239	240	279				
4	BUFSZ	INTEGER	ARRAY	DCOM1	REFS	239	240	277	DEFINED	606		
642	BUFSZD	INTEGER			REFS	239	606	DEFINED	603			
242	CSCL	REAL		FLUT	REFS	323						
15	D	REAL		KLUES	REFS	345						
0	DATER	REAL		CDATER	REFS	299	469					
27	DBAL	REAL		KLUES	REFS	345						
726	DDD	* REAL			DEFINED	555						
16	DEL	REAL		KLUES	REFS	345						
7	DINEW	REAL	ARRAY	ACCEL	REFS	379						
33	DIOLD	REAL	ARRAY	ACCEL	REFS	379						
215	DRVMB	REAL	ARRAY	BAL	REFS	245	321					
241	DRVMBO	REAL	ARRAY	BAL	REFS	245	321					
0	DSIONS	REAL	ARRAY	DSIO2	REFS	250	319					
5	DW	REAL		WAYTS	REFS	363						
12	DWMAX	REAL		KLUES	REFS	345						
2	DWNEW	REAL	ARRAY	ACCEL	REFS	379						
26	DWOLD	REAL	ARRAY	ACCEL	REFS	379						
0	EMP	REAL	ARRAY	PLUG	REFS	246	367					
11	EPS1	REAL		KLUES	REFS	345						
17	EPS2	REAL		KLUES	REFS	345						
0	FET	INTEGER	ARRAY	DCOM2	REFS	239	241	278	604			
0	FMTA	REAL	ARRAY	CFMTA	REFS	247	295	470	514			
0	FMTB	REAL	ARRAY	CFMTB	REFS	247	296	420				
0	FMTBO	REAL	ARRAY	CFMTBO	REFS	247	297	421				
0	FMTCO	REAL	ARRAY	CFMTCO	REFS	247	298	422				
0	FSIONS	REAL	ARRAY	FSIO2	REFS	247	317					
701	I	INTEGER			REFS	503	606	607	DEFINED	502	605	
22	IBAND	INTEGER		KLUES	REFS	345						
0	IBANDW	INTEGER		BANDW	REFS	362						
0	ICYCLE	INTEGER		STRCLU	REFS	375	DEFINED	381				
1	IDBAL	INTEGER	ARRAY	BAL	REFS	251	321					
3	IDENS	INTEGER		COLS	REFS	349						
0	IDIV	INTEGER		CIDIV	REFS	364	DEFINED	432				
244	IDMODE	INTEGER	ARRAY	FLUT	REFS	273	323					
7	IDNOPT	INTEGER		KLUES	REFS	345	DEFINED	573	574			
76	IDSTR	INTEGER	ARRAY	STORES	REFS	370						
53	IDUB	INTEGER		RESIZE	REFS	378						
40	IDYDOF	INTEGER	ARRAY	STORES	REFS	370						
21	IFA	INTEGER		PLACES	REFS	324						
67	IFADD	INTEGER		PLACES	REFS	324						
41	IFADDI	INTEGER		PLACES	REFS	324						
33	IFB	INTEGER		PLACES	REFS	324						
71	IFBAL	INTEGER		PLACES	REFS	324						
43	IFBALI	INTEGER		PLACES	REFS	324						
117	IFBR	INTEGER		PLACES	REFS	324						
53	IFBT	INTEGER		PLACES	REFS	324						
73	IFDESF	INTEGER		PLACES	REFS	324						
45	IFDESI	INTEGER		PLACES	REFS	324						
55	IFDESN	INTEGER		PLACES	REFS	324						
35	IFDESO	INTEGER		PLACES	REFS	324						
21	IFDLT	INTEGER		PLAYFF	REFS	341						
3	IFDLTI	INTEGER		PLAYFF	REFS	341						

```
                IF (KOPTF .EQ. 1) GO TO 850                                     FOP       743
              C                                                                 FOP       744
                CALL AFOM (KWIT)                                                FOP       745
  745         C                                                                 FOP       746
              C                                                                 FOP       747
                IF(KWIT.EQ.1) GO TO 900                                         FOP       748
              C                                                                 FOP       749
              C THE MODAL MASS(MODM) AND THE MODAL STIFFNESS(MODK) HAVE BEEN UPDATED  FOP       750
  750         C FOR THE NEW DESIGN. CALL FLUTTER PACKAGE FOR NEW FLUTTER ANALYSIS.    FOP       751
              C                                                                 FOP       752
                IF(NDESYS.EQ.0) GO TO 600                                       FOP       753
              C                                                                 FOP       754
              C                                                                 FOP       755
  755           GO TO 700                                                       FOP       756
              C                                                                 FOP       757
              C*********************************************************************** FOP       758
              C*********************************************************************** FOP       759
              C*********************************************************************** FOP       760
  760         C*********************************************************************** FOP       761
              C*********************************************************************** FOP       762
              C                                                                 FOP       763
                850 CONTINUE                                                    FOP       764
                900 CONTINUE                                                    FOP       765
  765           KREPOR =  2                                                     FOP       766
              C                                                                 FOP       767
              C                                                                 FOP       768
              C LIST INPUT-OUTPUT LABELS                                        FOP       769
              C                                                                 FOP       770
  770           CALL LLABEL (ITAPEW,KROUP,KBLAB)                                FOP       771
              C                                                                 FOP       772
              C                                                                 FOP       773
              C LIST TABLE OF CONTENTS                                          FOP       774
              C                                                                 FOP       775
  775           CA   LTABLE (ITAPEW,KROUP)                                      FOP       776
              C                                                                 FOP       777
              C     GO TO 135                                                   FOP       778
                    GOTO 1000                                                   FOP       779
                960 WRITE (ITAPEW,5020)                                         FOP       780
  780          1000 CONTINUE                                                    FOP       781
              C                                                                 FOP       782
              C                                                                 FOP       783
              C FORMATS                                                         FOP       784
               5010 FORMAT (10I4 )                                              FOP       785
  785          5020 FORMAT (20X,27H********** ERROR **********, //,            FOP       786
                   1        20X65HVIBRATION & FLUTTER PACKAGES MUST BE CALLED PRIOR TO FOP       787
                  2 OPTIMIZATION, //, 20X20HEXECUTION TERMINATED)               FOP       788
               5025 FORMAT (1A4, 10I4)                                          FOP       789
              C                                                                 FOP       790
  790           RETURN                                                          FOP       791
                END                                                             FOP       792
```

SYMBOLIC REFERENCE MAP (R=3)

```
      C                                                                       FOP       686
      C AUTOMATED FLUTTER ANALYSIS MODULE                                     FOP       687
      C                                                                       FOP       688
      C                                                                       FOP       689
      C CALL FLUTTER PACKAGE.                                                 FOP       690
      C   1. COMPUTE FLUTTER SPEED,VF, AND FLUTTER FREQ.(SQ),WW.              FOP       691
      C   2. IF KLUSE=1 OR 2 ALSO COMPUTE MODAL VECTORS, UMOD AND VMOD,       FOP       692
      C      AND THE AERO DERIVATIVE SCALAR, CSCL.                            FOP       693
      C                                                                       FOP       694
      C                                                                       FOP       695
        700 CONTINUE                                                          FOP       696
            IF (KANAF .EQ. 1) GOTO 800                                        FOP       697
      C                                                                       FOP       698
            NPASS  =  NPASS + 1                                               FOP       699
            CALL AFAM (KPLOTF)                                                FOP       700
      C                                                                       FOP       701
            IF (KPLOTF .EQ. YES)  CALL FLUTAP (KPLOTV,KPLOTF,NPLOTF)          FOP       702
      C                                                                       FOP       703
      CIBM                                                                    FOP       704
      C     IF (KPLOTF.EQ.YES.OR.KPLOTV.EQ.YES)  CALL PLOT(0.,0.,999)         FOP       705
      CIBM                                                                    FOP       706
      C                                                                       FOP       707
      CCDC                                                                    FOP       708
            IF (KLUE(7).EQ.1)  GO TO 725                                      FOP       709
            IF (NCYC.EQ.0.OR.NCYC.LT.NFIX)  GO TO 750                         FOP       710
        725 IF (KPLOTF.EQ.YES.OR.KPLOTV.EQ.YES)  CALL PLOT(0.,0.,999)         FOP       711
        750 CONTINUE                                                          FOP       712
      CCDC                                                                    FOP       713
      C                                                                       FOP       714
            IF(IFIN.EQ.0) GO TO 900                                           FOP       715
      C                                                                       FOP       716
      C*************************************************************************FOP       717
      C*************************************************************************FOP       718
      C*************************************************************************FOP       719
      C*************************************************************************FOP       720
      C*************************************************************************FOP       721
      C*****                                                           ******FOP       722
      C*****                  AAA    FFFFF    000    M   M            ******FOP       723
      C*****                 A   A   F       0   0   MM MM            ******FOP       724
      C*****                 AAAAA - FFFF  - 0   0 - M M M            ******FOP       725
      C*****                 A   A   F       0   0   M M M            ******FOP       726
      C*****                 A   A   F        000    M M M            ******FOP       727
      C*****                                                           ******FOP       728
      C*************************************************************************FOP       729
      C*************************************************************************FOP       730
      C*************************************************************************FOP       731
      C*************************************************************************FOP       732
      C*************************************************************************FOP       733
      C                                                                       FOP       734
      C                                                                       FOP       735
      C AUTOMATED FLUTTER OPTIMIZATION MODULE                                 FOP       736
      C                                                                       FOP       737
      C                                                                       FOP       738
      C CALL SUBROUTINE AFOM  TO COMPUTE FLUTTER DERIVATIVES, REDESIGN THE    FOP       739
      C STRUCTURE, ETC.                                                       FOP       740
      C                                                                       FOP       741
        800 CONTINUE                                                          FOP       742
```

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      C*****                A   A    V V    A   A   M M M                ****** FOP      629
      C*****                A   A     V     A   A   M M M                ****** FOP      630
630   C*****                                                               ****** FOP      631
      C*************************************************************************** FOP      632
      C*************************************************************************** FOP      633
      C*************************************************************************** FOP      634
      C*************************************************************************** FOP      635
635   C*************************************************************************** FOP      636
      C                                                                           FOP      637
      C                                                                           FOP      638
      C AUTOMATED VIBRATION ANALYSIS MODULE                                       FOP      639
      C                                                                           FOP      640
640   C CALL THE VIBRATION PACKAGE.  FIVE UNITS ARE AVAILABLE.                    FOP      641
      C                                                                           FOP      642
      C  A. UNIT IUIN1(TAPE) CONTAINS A (OR KS,IF IRED=0) AS FIRST FILE.          FOP      643
      C     IF NEEDED, SCRATCH FILE IFSCR IS AVAILABLE.                           FOP      644
      C  B. UNIT IUGO2 CONTAINS MD AS FILE IFS2. WHEN MD IS NO LONGER NEEDED,     FOP      645
645   C     THIS FILE CAN BE USED AS SCRATCH SPACE.                               FOP      646
      C  C. UNITS IUGO1,IUGO3 AND IUGO4 HAVE SCRATCH SPACE ON FILES IFS1, IFS3    FOP      647
      C     AND IFS4, RESPECTIVELY.                                               FOP      648
      C                                                                           FOP      649
      C OUTPUT- MODAL MATRIX PHTF OCCUPIES FILE IFS4 ON UNIT IUGO4.               FOP      650
650   C         MODAL MASS,MODM, IS PUT ON FILE IFS1 OF UNIT IUGO1. THIS IS       FOP      651
      C         FOLLOWED BY FILE FOR MODAL STIFFNESS, MODK.                       FOP      652
      C         IN ADDITION, ONE FORTRAN FILE IS PROVIDED FOR THE FLUTTER         FOP      653
      C         PROGRAM. THIS FILE CONTAINS FREQUENCIES, MODAL MASS AND THE       FOP      654
      C         REDUCED MODAL MATRIX.                                             FOP      655
655   C                                                                           FOP      656
      C                                                                           FOP      657
            IF (KANAV .EQ. 1) GOTO 700                                            FOP      658
        600 CONTINUE                                                              F P      659
      C                                                                           FOP      660
660         CALL AVAM (KPLOTV)                                                    FOP      661
      C                                                                           FOP      662
            IF(KPLOTV.EQ.YES) CALL VIBRAP(KPLOTV,KPLOTF,NPLOTV)                   FOP      663
      C                                                                           FOP      664
            NPASS  =  NPASS - 1                                                   FOP      665
665         IF(IFIN.EQ.-1) GO TO 900                                              FOP      666
      C                                                                           FOP      667
      C*************************************************************************** FOP      668
      C*************************************************************************** FOP      669
      C*************************************************************************** FOP      670
670   C*************************************************************************** FOP      671
      C*************************************************************************** FOP      672
      C*****                                                               ****** FOP      673
      C*****                 AAA    FFFFF    AAA    M   M                ****** FOP      674
      C*****                A   A   F       A   A   MM MM                ****** FOP      675
675   C*****                AAAAA - FFFF  - AAAAA   M M M                ****** FOP      676
      C*****                A   A   F       A   A   M M M                ****** FOP      677
      C*****                A   A   F       A   A   M M M                ****** FOP      678
      C*****                                                               ****** FOP      679
      C*************************************************************************** FOP      680
680   C*************************************************************************** FOP      681
      C*************************************************************************** FOP      682
      C*************************************************************************** FOP      683
      C*************************************************************************** FOP      684
      C                                                                           FOP      685
```

STATISTICS

PROGRAM LENGTH	1002B	514
CM LABELED COMMON LENGTH	20767B	8695

520000B CM USED

```
      C                                                                      TFOP        2
      C45700, SUB. TFOP(TITLE FOR FLUTTER OPTIMIZATION PACKAGE)              TFOP        3
      C                                                                      TFOP        4
      C*************************************************************************** TFOP  5
      C                                                                     * TFOP        6
      C***  SUBROUTINE TFOP   ***************************************************** TFOP  7
      C                                                                     * TFOP        8
      C***  OBJECTIVE  ************************************************************ TFOP  9
      C     ---------                                                       * TFOP       10
      C     PRINTS THE TITLE PAGE FOR THE FLUTTER    OPTIMIZATION PACKAGE   * TFOP       11
      C                                                                     * TFOP       12
      C*************************************************************************** TFOP  13
      C                                                                      TFOP       14
            SUBROUTINE TFOP                                                  TFOP       15
      C                                                                      TFOP       16
            DIMENSION AFFDL(4)                                               TFOP       17
      C                                                                      TFOP       18
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                             TFOP       19
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE  TFOP       20
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                      TFOP       21
            COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA TFOP       22
           1               ,ITAPET                                           TFOP       23
            COMMON /CAFFDL/ AFFDL                                            TFOP       24
      C                                                                      TFOP       25
      C                                                                      TFOP       26
      C PREPARE TABLE OF CONTENTS                                            TFOP       27
      C                                                                      TFOP       28
            KOUNT  =  LINES                                                  TFOP       29
            CALL TITLES (-1)                                                 TFOP       30
            NCOLS  =  0                                                      TFOP       31
            NROWS  =  2                                                      TFOP       32
            KTABLE =  2                                                      TFOP       33
            CALL PTABLE (1,60,60                                             TFOP       34
           *   H*****    ***    ****                                      )  TFOP       35
            NROWS  =  0                                                      TFOP       36
            KTABLE =  2                                                      TFOP       37
            CALL PTABLE (1,60,60                                             TFOP       38
           *   H*       *   *   *   *                                     )  TFOP       39
            KTABLE =  2                                                      TFOP       40
            CALL PTABLE (1,60,60                                             TFOP       41
           *   H****  - *   * - ****              FLUTTER                 )  TFOP       42
            KTABLE =  2                                                      TFOP       43
            CALL PTABLE (1,60,60                                             TFOP       44
           *   H*       *   *   *                OPTIMIZATION            )  TFOP       45
            KTABLE =  2                                                      TFOP       46
            CALL PTABLE (2,60,60                                             TFOP       47
           *   H*        ***    *                 PACKAGE                 )  TFOP       48
            KOUNT  =  LINES                                                  TFOP       49
      C                                                                      TFOP       50
      C                                                                      TFOP       51
      C LIST TITLE PAGE                                                      TFOP       52
      C                                                                      TFOP       53
            WRITE (ITAPEW,100)                                               TFOP       54
            WRITE (ITAPEW,105)                                               TFOP       55
            WRITE (ITAPEW,110)                                               TFOP       56
            WRITE (ITAPEW,115) AFFDL                                         TFOP       57
            WRITE (ITAPEW,120)                                               TFOP       58
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                WRITE (ITAPEW,125)                                              TFOP      59
                WRITE (ITAPEW,130)                                              TFOP      60
60              WRITE (ITAPEW,135)                                              TFOP      61
                WRITE (ITAPEW,140)                                              TFOP      62
                WRITE (ITAPEW,145)                                              TFOP      63
                WRITE (ITAPEW,150)                                              TFOP      64
                WRITE (ITAPEW,155)                                              TFOP      65
65              WRITE (ITAPEW,160)                                              TFOP      66
                WRITE (ITAPEW,165)                                              TFOP      67
                WRITE (ITAPEW,170)                                              TFOP      68
                WRITE (ITAPEW,175)                                              TFOP      69
              100 FORMAT (                                                      TFOP      70
70               *    5X,122(1H*)                                               TFOP      71
                 *,/, 5X,1H*,120X,1H*                                           TFOP      72
                 *,/, 5X,1H*,15X                                                TFOP      73
                 F,13HFFFFFFFFFFFFF                                             TFOP      74
                 *,52X, 36H.....,4X,1H*                                         TFOP      75
75               *,/, 5X,1H*,15X                                                TFOP      76
                 F,13HFFFFFFFFFFFFF                                             TFOP      77
                 *,52X, 36H.                                  .,4X,1H*          TFOP      78
                 *,/, 5X,1H*,15X                                                TFOP      79
                 F,13H FFF     FFF                                              TFOP      80
80               *,52X, 36H.          **** FASTOP ****        .,4X,1H*          TFOP      81
                 *,/, 5X,1H*,15X                                                TFOP      82
                 F,13H FFF     FFF                                              TFOP      83
                 *,52X, 36H.      FLUTTER AND STRUCTURAL      .,4X,1H*          TFOP      84
                 *,/, 5X,1H*,15X                                                TFOP      85
85               F,13H FFF                                                      TFOP      86
                 *,52X, 36H.       OPTIMIZATION PROGRAM       .,4X,1H*)         TFOP      87
              105 FORMAT (                                                      TFOP      88
                 *    5X,1H*,15X                                                TFOP      89
                 F,13H FFF                                                      TFOP      90
90               *,52X, 36H.                                  .,4X,1H*          TFOP      91
                 *,/, 5X,1H*,15X                                                TFOP      92
                 F,13H FFF                                                      TFOP      93
                 *,52X, 36H.           **** FOP ****          .,4X,1H*          TFOP      94
                 *,/, 5X,1H*,15X                                                TFOP      95
95               F,13H FFF                                                      TFOP      96
                 *,52X, 36H.   FLUTTER OPTIMIZATION PACKAGE   .,4X,1H*          TFOP      97
                 *,/, 5X,1H*,15X                                                TFOP      98
                 F,13H FFF                                                      TFOP      99
                 *,52X, 36H.                                  .,4X,1H*          TFOP     100
100              *,/, 5X,1H*,15X                                                TFOP     101
                 F,13H FFFFFFFFF                                                TFOP     102
                 *,52X, 36H.....,4X,1H*)                                        TFOP     103
              110 FORMAT (                                                      TFOP     104
                 *    5X,1H*,15X                                                TFOP     105
105              F,13H FFFFFFFFF                                                TFOP     106
                 *,26X                                                          TFOP     107
                 *,26X, 36H.                                  .,4X,1H*          TFOP     108
                 *,/, 5X,1H*,15X                                                TFOP     109
                 F,13H FFF                                                      TFOP     110
110              *,26X                                                          TFOP     111
                 *,26X, 36H.            AIR FORCE             .,4X,1H*          TFOP     112
                 *,/, 5X,1H*,15X                                                TFOP     113
                 F,13H FFF                                                      TFOP     114
                 *,26X                                                          TFOP     115
```

```
115               *,26X, 36H     FLIGHT DYNAMICS LABORATORY     .,4X,1H*)          TFOP      116
                 115 FORMAT (                                                       TFOP      117
                    *     5X,1H*,15X                                              TFOP      118
                    F,13H FFF                                                     TFOP      119
                    *,52X, 36H.                                    .,4X,1H*       TFOP      120
120                 *,/, 5X,1H*,15X                                               TFOP      121
                    F,13H FFF                                                     TFOP      122
                    *,52X, 10H.          ,4A4, 10H          .,4X,1H*              TFOP      123
                    *,/, 5X,1H*,15X                                               TFOP      124
                    F,13H FFF                                                     TFOP      125
125                 *,26X                                                         TFOP      126
                    0,13H   0000000                                               TFOP      127
                    *,13X, 36H.                                    .,4X,1H*)      TFOP      128
                 120 FORMAT (                                                       TFOP      129
                    *     5X,1H*,15X                                              TFOP      130
130                 F,13H FFF                                                     TFOP      131
                    *,26X                                                         TFOP      132
                    0,13H  000000000                                              TFOP      133
                    *,13X, 36H.....................................,4X,1H*       TFOP      134
                    *,/, 5X.1H*,15X                                               TFOP      135
135                 F,13H FFF                                                     TFOP      136
                    *.26X                                                         TFOP      137
                    0,13H 0000   0000                                             TFOP      138
                    *,53X,1H*                                                     TFOP      139
                    *,/, 5X,1H*,15X                                               TFOP      140
140                 F,13HFFFF                                                     TFOP      141
                    *,26X                                                         TFOP      142
                    0.13H000       000                                            TFOP      143
                    *,53X,1H*)                                                    TFOP      144
                 125 FORMAT (                                                       TFOP      145
145                 *     5X,1H*,15X                                              TFOP      146
                    F,13HFFFF                                                     TFOP      147
                    *,26X                                                         TFOP      148
                    0,13H000       000                                            TFOP      149
                    *,53X,1H*                                                     TFOP      150
150                 *,/, 5X,1H*,54X                                               TFOP      151
                    0,13H000       000                                            TFOP      152
                    *,53X,1H*                                                     TFOP      153
                    *,/, 5X,1H*,54X                                               TFOP      154
                    0,13H000       000                                            TFOP      155
155                 *,53X,1H*)                                                    TFOP      156
                 130 FORMAT (                                                       TFOP      157
                    *     5X,1H*,54X                                              TFOP      158
                    0,13H000       000                                            TFOP      159
                    *,53X,1H*                                                     TFOP      160
160                 *,/, 5X,1H*,54X                                               TFOP      161
                    0,13H000       000                                            TFOP      162
                    *,53X,1H*                                                     TFOP      163
                    *,/, 5X,1H*,54X                                               TFOP      164
                    0,13H000       000                                            TFOP      165
165                 *,53X,1H*)                                                    TFOP      166
                 135 FORMAT (                                                       TFOP      167
                    *     5X,1H*,54X                                              TFOP      168
                    0,13H000       000                                            TFOP      169
                    *,53X,1H*                                                     TFOP      170
170                 *,/, 5X,1H*,54X                                               TFOP      171
```

```
                     *,53X,1H*                                                                  TFOP    173
                     *,/, 5X,1H*,54X                                                            TFOP    174
                     0,13H000        000                                                        TFOP    175
175                  *,53X,1H*)                                                                 TFOP    176
                    140 FORMAT (                                                                TFOP    177
                     *    5X,1H*,54X                                                           TFOP    178
                     0,13H000        000                                                        TFOP    179
                     *,53X,1H*                                                                  TFOP    180
180                  *,/, 5X,1H*,54X                                                            TFOP    181
                     0,13H000        000                                                        TFOP    182
                     *,53X,1H*                                                                  TFOP    183
                     *,/, 5X,1H*,54X                                                            TFOP    184
                     0,13H000        000                                                        TFOP    185
185                  *,26X                                                                      TFOP    186
                     P,13HPPPPPPPPPPP                                                           TFOP    187
                     *,14X,1H*)                                                                 TFOP    188
                    145 FORMAT (                                                                TFOP    189
                     *    5X,1H*,54X                                                           TFOP    190
190                  0,13H000        000                                                        TFOP    191
                     *,26X                                                                      TFOP    192
                     P,13HPPPPPPPPPPP                                                           TFOP    193
                     *,14X,1H*                                                                  TFOP    194
                     *,/, 5X,1H*,54X                                                            TFOP    195
195                  0,13H 0000   0000                                                          TFOP    196
                     *,26X                                                                      TFOP    197
                     P,13H PPP    PPPP                                                          TFOP    198
                     *,14X,1H*                                                                  TFOP    199
                     *,/, 5X,1H*,54X                                                            TFOP    200
200                  0,13H  000000000                                                           TFOP    201
                     *,26X                                                                      TFOP    202
                     P,13H PPP      PPP                                                         TFOP    203
                     *,14X,1H*)                                                                 TFOP    204
                    150 FORMAT (                                                                TFOP    205
205                  *    5X,1H*,54X                                                           TFOP    206
                     0,13H   0000000                                                            TFOP    207
                     *,26X                                                                      TFOP    208
                     P,13H PPP      PPP                                                         TFOP    209
                     *,14X,1H*                                                                  TFOP    210
210                  *,/, 5X,1H*,93X                                                            TFOP    211
                     P,13H PPP      PPP                                                         TFOP    212
                     *,14X,1H*                                                                  TFOP    213
                     *,/, 5X,1H*,2X                                                             TFOP    214
                     *,8(3HGGG), 4OHGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG,1X              TFOP    215
215                  *,26X                                                                      TFOP    216
                     P,13H PPP      PPP                                                         TFOP    217
                     *,14X,1H*)                                                                 TFOP    218
                    155 FORMAT (                                                                TFOP    219
                     *    5X,1H*,2X                                                            TFOP    220
220                  *,8(3HGGG), 4OHGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG      ,1X              TFOP    221
                     *,26X                                                                      TFOP    222
                     P,13H PPP     PPP                                                          TFOP    223
                     *,14X,1H*                                                                  TFOP    224
                     *,/, 5X,1H*,2X                                                             TFOP    225
225                  *,24X,       4OH  GGGGGGGGGGGGGGGGGGGGGGGGGGGG          ,1X              TFOP    226
                     *,26X                                                                      TFOP    227
                     P,13H PPP    PPP                                                           TFOP    228
                     *,14X,1H*                                                                  TFOP    229
```

```
                *,/, 5X,1H*,2X                                                  TFOP    230
230             *,24X,      40H   GGGGGGGGGGGGGGGGGGGGG              ,1X      TFOP    231
                *,26X                                                           TFOP    232
                P,13H PPPPPPPPP                                                 TFOP    233
                *,14X,1H*)                                                      TFOP    234
              160 FORMAT (                                                      TFOP    235
235             *    5X,1H*,2X                                                  TFOP    236
                *,5X,  15H. . . . . . . . . . . . ,4X                           TFOP    237
                *,          40H    GGGGGGGGGGGGGGGG              ,1X          TFOP    238
                *,26X                                                           TFOP    239
                P,13H PPPPPPPP                                                  TFOP    240
240             *,14X,1H*                                                       TFOP    241
                *,/, 5X,1H*,2X                                                  TFOP    242
                *,5X,  15H.               .,4X                                  TFOP    243
                *,          40H   GGGGGGGGGGGGGGG              ,1X           TFOP    244
                *,26X                                                           TFOP    245
245             P,13H PPP                                                       TFOP    246
                *,14X,1H*                                                       TFOP    247
                *,/, 5X,1H*,2X                                                  TFOP    248
                *,5X,  15H.   GRUMMAN    .,4X                                  TFOP    249
                *,          40H  GGGGGGGGGGGGGG              ,1X               TFOP    250
250             *,26X                                                           TFOP    251
                P,13H PPP                                                       TFOP    252
                *,14X,1H*)                                                      TFOP    253
              165 FORMAT (                                                      TFOP    254
                *    5X,1H*,2X                                                  TFOP    255
255             *,5X,  15H.  AEROSPACE   .,4X                                   TFOP    256
                *,          40H  GGGGGGGGGGGG              ,1X                 TFOP    257
                *,26X                                                           TFOP    258
                P,13H PPP                                                       TFOP    259
                *,14X,1H*                                                       TFOP    260
260             *,/, 5X,1H*,2X                                                  TFOP    261
                *,5X,  15H. CORPORATION .,4X                                    TFOP    262
                *,          40H  GGGGGGGGGG              ,1X                   TFOP    263
                *,26X                                                           TFOP    264
                P,13H PPP                                                       TFOP    265
265             *,14X,1H*                                                       TFOP    266
                *,/, 5X,1H*,2X                                                  TFOP    267
                *,5X,  15H.               .,4X                                  TFOP    268
                *,          40H  GGGGGGGG              ,1X                    TFOP    269
                *,26X                                                           TFOP    270
270             P,13H PPP                                                       TFOP    271
                *,14X,1H*)                                                      TFOP    272
              170 FORMAT (  5X, 1H*, 2X                                         TFOP    273
                *,5X,  15H. . . . . . . . . . . . . . ,4X                       TFOP    274
                *,          40H  GGGGGG              ,1X                      TFOP    275
275             *,26X                                                           TFOP    276
                P,13H PPP                                                       TFOP    277
                *,14X,1H*                                                       TFOP    278
                *,/, 5X,1H*,2X                                                  TFOP    279
                *,24X,      40H  GGGG              ,1X                        TFOP    280
280             *,26X                                                           TFOP    281
                P,13H PPP                                                       TFOP    282
                *,14X,1H*                                                       TFOP    283
                *,/, 5X,1H*,2X                                                  TFOP    284
                *,24X,      40H  GG              ,1X                          TFOP    285
285             *,26X                                                           TFOP    286
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```
                     P,13HPPPP                                                  TFOP     287
                     *,14X,1H*                                                  TFOP     288
                     *,/, 5X,1H*,2X                                             TFOP     289
                     *,24X,      40H  G                              ,1X        TFOP     290
290                  *,26X                                                      TFOP     291
                     P,13HPPPP                14X,1H*)                          TFOP     292
                  175 FORMAT ( 5X,1H*,120X,1H*,/,5X,122(1H*))                   TFOP     293
                C                                                               TFOP     294
                      RETURN                                                    TFOP     295
295                   END                                                       TFOP     296
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
1 TFOP 14 294

VARIABLES	SN	TYPE		RELOCATION								
AFFDL	0	REAL	ARRAY	CAFFDL	REFS	16	23	56				
ITAPEP	2	INTEGER		COMRWP	REFS	18						
ITAPER	0	INTEGER		COMRWP	REFS	18						
ITAPET	7	INTEGER		CTABLE	REFS	21						
ITAPEW	1	INTEGER		COMRWP	REFS	18	I/O REFS	53	54	55	56	57
					58	59	60	61	62	63	64	65
					66	67	68					
KBPAGE	7	INTEGER		CLIST	REFS	19						
KLABEL	4	INTEGER		CLIST	REFS	19						
KOUNT	0	INTEGER		CLIST	REFS	19	DEFINED	28	48			
KOUNTH	11	INTEGER		CLIST	REFS	19						
KOUNTI	12	INTEGER		CLIST	REFS	19						
KPAGE	1	INTEGER		CLIST	REFS	19						
KTABLE	0	INTEGER		CTABLE	REFS	21	DEFINED	32	36	39	42	45
KTABLO	5	INTEGER		CTABLE	REFS	21						
KTPAGE	5	INTEGER		CLIST	REFS	19						
LINES	2	INTEGER		CLIST	REFS	19	28	48				
LINESG	10	INTEGER		CLIST	REFS	19						
LINEST	3	INTEGER		CLIST	REFS	19						
NCOLS	3	INTEGER		CTABLE	REFS	21	DEFINED	30				
NCOLST	4	INTEGER		CTABLE	REFS	21						
NPAGE	6	INTEGER		CLIST	REFS	19						
NPAGEA	6	INTEGER		CTABLE	REFS	21						
NPASS	1	INTEGER		CTABLE	REFS	21						
NROWS	2	INTEGER		CTABLE	REFS	21	DEFINED	31	35			

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES					
PTABLE		3	33	37	40	43	46	
TITLES		1	29					

STATEMENT LABELS			DEF LINE	REFERENCES
201	100	FMT	69	53
251	105	FMT	87	54
317	110	FMT	103	55

STATEMENT LABELS			DEF LINE	REFERENCES
377	120	FMT	128	57
424	125	FMT	144	58
441	130	FMT	156	59
454	135	FMT	166	60
467	140	FMT	176	61
504	145	FMT	188	62
525	150	FMT	204	63
547	155	FMT	218	64
601	160	FMT	234	65
641	165	FMT	253	66
701	170	FMT	272	67
745	175	FMT	292	68

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)
		6 NPAGEA (1)	7 ITAPET (1)	
CAFFDL	4	0 AFFDL (4)		

STATISTICS

PROGRAM LENGTH	1017B	527
CM LABELED COMMON LENGTH	32B	26

52000B CM USED

```
      C45730, SUB. LDB (LIST DATA - VERSION B)                                  LDB      2
      C                                                                         LDB      3
      C***  SUBROUTINE LDB (NCOL,KHEAD,NTAPEI,ITAPEI,ITAPEO,SKIP)       ******* LDB      4
      C***  OBJECTIVE  ************************************************** LDB      5
      C     ---------                                                     * LDB      6
      C     TO READ AND LIST INPUT DATA FROM THE INPUT STREAM AND TO PREPARE * LDB      7
      C     THE FORMATTED INPUT TAPE FOR THE USER'S PROGRAM.              * LDB      8
      C                                                                   * LDB      9
      C                                                                   * LDB     10
      C***  SUMMARY OF FORTRAN SYMBOLS  ********************************** LDB     11
      C     --------------------------                                    * LDB     12
      C                                                                   * LDB     13
      C.... ITAPEI ....... INPUT                                         * LDB     14
      C     FORMATTED INPUT TAPE IN USER'S ORIGINAL PROGRAM.              * LDB     15
      C                                                                   * LDB     16
      C.... ITAPEO ....... INPUT                                         * LDB     17
      C     TAPE FOR LISTING CARD DATA.                                   * LDB     18
      C                                                                   * LDB     19
      C.... KHEAD ........ INPUT                                         * LDB     20
      C     CONTROL WORD FOR LISTING TITLE AT TOP OF PAGE AND COLUMN NUMBERS * LDB     21
      C     AT TOP AND BOTTOM OF PAGE.                                    * LDB     22
      C     KHEAD = 1, LIST TITLE AND COLUMN NUMBERS AT TOP OF PAGE ONLY. * LDB     23
      C     KHEAD = 2, LIST TITLE AT TOP OF PAGE AND COLUMN NUMBERS AT TOP * LDB     24
      C                AND BOTTOM OF PAGE.                                * LDB     25
      C     KHEAD = 3, DO NOT LIST TITLE AT TOP OF PAGE NOR COLUMN NUMBERS * LDB     26
      C                AT TOP AND BOTTOM OF PAGE.                         * LDB     27
      C                                                                   * LDB     28
      C.... LINES ........ INPUT                                         * LDB     29
      C     NUMBER OF LINES TO BE LISTED.                                 * LDB     30
      C                                                                   * LDB     31
      C.... NCOL ......... INPUT                                         * LDB     32
      C     NUMBER OF CARD COLUMNS LISTED BY PROGRAM (MUST BE A MULTIPLE OF * LDB     33
      C     FOUR).                                                        * LDB     34
      C                                                                   * LDB     35
      C.... NTAPEI ....... INPUT                                         * LDB     36
      C     INPUT TAPE FOR READING CARD DATA IN THE INPUT STREAM (MUST BE * LDB     37
      C     DIFFERENT FROM INPUT TAPE IN USER'S ORIGINAL PROGRAM - THAT IS * LDB     38
      C     NTAPEI SHOULD NOT EQUAL ITAPEI)                               * LDB     39
      C                                                                   * LDB     40
      C.... SKIP ......... INPUT                                         * LDB     41
      C     CONTAINS THE NUMBER OF COLUMNS TO BE SKIPPED BEFORE THE INPUT * LDB     42
      C     DATA IS LISTED   THIS DATA MUST BE STORED IN THE VARIABLE SKIP * LDB     43
      C     USING THE DATA STATEMENT AS FOLLOWS.                          * LDB     44
      C                                                                   * LDB     45
      C     DATA SKIP /'NNX,'/                                            * LDB     46
      C                                                                   * LDB     47
      C     WHERE THE NUMBER  NN  REPRESENTS THE NUMBER OF COLUMNS WHICH ARE * LDB     48
      C     TO BE SKIPPED AND SHOULD VARY FROM ONE TO A MAXIMUM OF ONE    * LDB     49
      C     HUNDRED AND THIRTY TWO MINUS THE NUMBER OF CARD COLUMNS LISTED * LDB     50
      C     BY THE PROGRAM (NCOL).                                        * LDB     51
      C                                                                   * LDB     52
      C                                                                   * LDB     53
      C     ERROR MESSAGES  ********************************************** LDB     54
      C     --------------                                                * LDB     55
      C                                                                   * LDB     56
      C     IF NO CARD DATA IS PROVIDED, AN ERROR MESSAGE IS PRINTED.     * LDB     57
      C                                                                   * LDB     58
```

```
      C                                                                      * LDB        59
      C                                                                      * LDB        60
60    C*********************************************************************** LDB        61
      C                                                                        LDB        62
      C                                                                        LDB        63
            SUBROUTINE LDB (NCOL,KHEAD,NTAPEI,ITAPEI,ITAPEO,SKIP)              LDB        64
      C                                                                        LDB        65
65          INTEGER YES                                                        LDB        66
      C                                                                        LDB        67
            DIMENSION T1( 8), T2(20), T3(20), CARD(20)                         LDB        68
            DIMENSION FMT1(4)           ,FMT2(6)            ,FMT3(6)         LDB        69
           1         ,FMT4(4)           ,FMT5(5)            ,FMT6(5)         LDB        70
70         2         ,FMT7(5)                                                  LDB        71
      C                                                                        LDB        72
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE  LDB        73
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                      LDB        74
            COMMON /CONSTS/ NO    ,YES                                         LDB        75
75    C                                                                        LDB        76
      C                                                                        LDB        77
      C INITIALIZE VARIABLES                                                   LDB        78
      C.... PSN(20) TO PSN(80) ....                                            LDB        79
         20 IF (NCOL  .LE. 0 .OR. NCOL  .GT. 80) NCOL  = 80                    LDB        80
80          IF (KHEAD .LE. 0 .OR. KHEAD .GT. 3 ) KHEAD = 2                   LDB        81
            KEND   =  NO                                                       LDB        82
            LSKIP  =  1                                                        LDB        83
            LTITLE =  2                                                        LDB        84
            LREC   =  (NCOL-1)/4 + 1                                           LDB        85
85          KFIRST =  YES                                                      LDB        86
            LCARD  =  20                                                       LDB        87
            KARD   =  0                                                        LDB        88
            DATA T1    /4H  PR,4HOGRA,4HM LI,4HSTIN,4HG OF,4H CAR,4HD DA       LDB        89
           1           ,4HTA  /                                                LDB        90
90          DATA T2    /4H....,4H....,4H.1..,4H....,4H ..2,4H....,4H....      LDB        91
           1           ,4H.3..,4H....,4H...4,4H....,4H....,4H.5...4H....      LDB        92
           2           ,4H...6,4H....,4H....,4H.7..,4H....,4H...8/            LDB        93
            DATA T3    /4H1234,4H5678,4H9012,4H3456,4H7890,4H1234,4H5678       LDB        94
           1           ,4H9012,4H3456,4H7890,4H1234,4H5678,4H9012,4H3456       LDB        95
95         2           ,4H7890,4H1234,4H5678,4H9012,4H3456,4H7890/             LDB        96
            DATA FMT1   /4H(    , 4H    , 4H6X,2, 4HOA4)/                      LDB        97
            DATA FMT2   /4H(    , 4H    , 4H1A4,, 4H    , 4H4X,2, 4HOA4)/      LDB        98
            DATA FMT3   /4H(    , 4H    , 4H1A4,, 4H    , 4H4X,2, 4HOA4)/      LDB        99
            DATA FMT4   /4H(    , 4H    , 4H8X,2, 4HOA4)/                      LDB       100
100         DATA FMT5   /4H(    , 4H    , 4H28X,, 4H2OA4, 4H)   /              LDB       101
            DATA FMT6   /4H(    , 4H    , 4H32X,, 4H2OA4, 4H)   /              LDB       102
            DATA FMT7   /4H(    , 4H    , 4HI4.4, 4HX, 2, 4HOA4)/              LDB       103
            DATA CARDH  /4HCARD/                                               LDB       104
            DATA NUMBH  /4H NO./                                               LDB       105
105         DATA SIXI   /4H   6/                                               LDB       106
            DATA EIGHTI /4H   8/                                               LDB       107
            INCHES = 9                                                         LDB       108
            LINESI = 6                                                         LDB       109
            FMT1(2) =  SKIP                                                    LDB       110
110         FMT2(2) =  SKIP                                                    LDB       111
            FMT3(2) =  SKIP                                                    LDB       112
         80 FMT4(2) =  SKIP                                                    LDB       113
            FMT5(2)=  SKIP                                                     LDB       114
            FMT6(2)=  SKIP                                                     LDB       115
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115                FMT7(2)=  SKIP                                          LDB     116
                   CALL DTABLE (1,CARD)                                    LDB     117
             C                                                             LDB     118
             C                                                             LDB     119
             C LIST INPUT DATA CARDS AND PREPARE TAPE ITAPEO               LDB     120
120          C   . PSN(90) TO PSN(1500) ....                               LDB     121
              90 REWIND ITAPEI                                             LDB     122
                   WRITE (ITAPEI,2000) SKIP                                LDB     123
                   REWIND ITAPEI                                           LDB     124
                   CALL EOFO1 (NTAPEI,CARD,LCARD,KEOF)                     LDB     125
125                KARD   =  KARD + 1                                      LDB     126
                   IF (KEOF .EQ. YES) GO TO 1000                           LDB     127
                   IF (CARD(2) .EQ. SIXI  ) LINESI = 6                     LDB     128
                   IF (CARD(2) .EQ. EIGHTI) LINESI = 8                     LDB     129
                   LINEST =  LINESI - 2                                    LDB     130
130                LINES  =  LINESI*INCHES                                 LDB     131
                   KOUNT  =  LINES                                         LDB     132
              100 CONTINUE                                                 LDB     133
                   IF (KOUNT .LT. LINES) GO TO 300                         LDB     134
                   CALL TITLES (-1)                                        LDB     135
135                CALL PTABLE (2,28,28HPROGRAM LISTING OF CARD DATA)      LDB     136
                   IF (LTITLE .GT. 0) CALL DTABLE (2,CARD)                 LDB     137
                   KOUNT  =  0                                             LDB     138
                   IF (KHEAD .EQ. 3) GO TO 200                             LDB     139
                   IF (LREC .EQ. 18 .OR. LREC .EQ. 20) GO TO 150           LDB     140
140                WRITE (ITAPEO,FMT1) (T1(L),L=1,8)                       LDB     141
              150 CONTINUE                                                 LDB     142
                   KOUNT  =  KOUNT + LSKIP + LTITLE + 2                    LDB     143
                   IF (LTITLE .EQ. 0) GO TO 160                            LDB     144
                   IF (LREC .EQ. 18) WRITE (ITAPEO,FMT5) (T1(L), L=1,8)    LDB     145
145                IF (LREC .EQ. 20) WRITE (ITAPEO,FMT6) (T1(L), L=1,8)    LDB     146
                   CALL PLB (1,1,ITAPEO)                                   LDB     147
                   LTITLE =  0                                             LDB     148
              160 CONTINUE                                                 LDB     149
                   WRITE (ITAPEO,FMT2) CARDH, (T2(L), L=1,LREC)            LDB     150
150                WRITE (ITAPEO,FMT3) NUMBH, (T3(L), L=1,LREC)            LDB     151
                   CALL PLB (1,LSKIP,ITAPEO)                               LDB     152
              200 CONTINUE                                                 LDB     153
              300 CONTINUE                                                 LDB     154
                   CALL DTABLE (3,CARD)                                    LDB     155
155                IF (KFIRST .EQ. YES) GO TO 310                          LDB     156
                   CALL EOFO1 (NTAPEI,CARD,LCARD,KEOF)                     LDB     157
                   CALL ENDP (CARD)                                        LDB     158
                   KARD   =  KARD + 1                                      LDB     159
                   IF (KEOF .EQ. YES) GO TO 900                            LDB     160
160           310 CONTINUE                                                 LDB     161
                   KFIRST =  NO                                            LDB     162
                   IF (NTAPEI .EQ. ITAPEI) GO TO 350                       LDB     163
                   WRITE (ITAPEI,2000) CARD                                LDB     164
              350 CONTINUE                                                 LDB     165
165                WRITE (ITAPEO,FMT7) KARD, CARD                          LDB     166
                   KOUNT  =  KOUNT + 1                                     LDB     167
                   IF (KOUNT .LT. (LINES-(LSKIP+2))) GO TO 300             LDB     168
                   IF (KHEAD .EQ. 1 .OR. KHEAD .EQ. 3) GO TO 600           LDB     169
              400 CONTINUE                                                 LDB     170
170                CALL PLB (1,LSKIP,ITAPEO)                               LDB     171
                   WRITE (ITAPEO,FMT1) (T2(L), L=1,LREC)                   LDB     172
```

```
                      WRITE (ITAPEO,FMT4) (T3(L), L=1,LREC)                              LDB       173
                      KOUNT  =  KOUNT + LSKIP + 2                                        LDB       174
                    600 CONTINUE                                                         LDB       175
    175               IF (KEND  EQ.  YES) GO TO 950                                      LDB       176
                      GO TO 100                                                          LDB       177
                    900 CONTINUE                                                         LDB       178
                      IF (KHEAD  EQ.  1  OR  KHEAD  .EQ.  3) GO TO 950                   LDB       179
                      KEND   =  YES                                                      LDB       180
    180               LSKIP  =  LINES - KOUNT - 2                                        LDB       181
                      GO TO 400                                                          LDB       182
                    950 CONTINUE                                                         LDB       183
                      REWIND ITAPEI                                                      LDB       184
                      GO TO 1500                                                         LDB       185
    185             1000 CONTINUE                                                        LDB       186
                      WRITE (ITAPEO,3000)                                                LDB       187
                      CALL EXIT                                                          LDB       188
                    1500 CONTINUE                                                        LDB       189
                   C                                                                     LDB       190
    190            C                                                                     LDB       191
                   C FORMATS                                                             LDB       192
                    2000 FORMAT ( 20A4)                                                  LDB       193
                    3000 FORMAT (1H1,///,10X,41H*** ERROR MESSAGE FROM SUBROUTINE LDB ***  LDB     194
                       1           ,  /,10X,72HEXECUTION TERMINATED - CARD INPUT DATA HAS  LDB     195
    195                2NOT BEEN PROVIDED IN THIS RUN )                                  LDB       196
                   C                                                                     LDB       197
                      RETURN                                                             LDB       198
                      END                                                                LDB       199
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

3	LDB	63

REFERENCES: 197

VARIABLES

		SN	TYPE		RELOCATION							
504	CARD		REAL	ARRAY		REFS	67	116	124	127	128	136	154
							156	157	163	165			
277	CARDH		REAL			REFS	149	DEFINED	103				
302	EIGHTI		REAL			REFS	128	DEFINED	106				
530	FMT1		REAL	ARRAY		REFS	68	140	DEFINED	96	109		
534	FMT2		REAL	ARRAY		REFS	68	149	DEFINED	97	110		
542	FMT3		REAL	ARRAY		REFS	68	150	DEFINED	98	111		
550	FMT4		REAL	ARRAY		REFS	68	171	172	DEFINED	99	112	
554	FMT5		REAL	ARRAY		REFS	68	144	DEFINED	100	113		
561	FMT6		REAL	ARRAY		REFS	68	145	DEFINED	101	114		
566	FMT7		REAL	ARRAY		REFS	68	165	DEFINED	102	115		
420	INCHES		INTEGER			REFS	130	DEFINED	107				
0	ITAPEI		INTEGER		F.P.	REFS	162	DEFINED	63	I/O REFS	121	122	123
							163	183					
0	ITAPEO		INTEGER		F.P.	REFS	146	151	170	DEFINED	63		
						I/O REFS	140	144	145	149	150	165	171
							172	186					
417	KARD		INTEGER			REFS	125	158	165	DEFINED	87	125	158
7	KRPAGE		INTEGER		CLIST	REFS	72						

VARIABLES	SN	TYPE	RELOCATION								
411	KEND	INTEGER		REFS	175	DEFINED	81	179			
422	KEOF	INTEGER		REFS	124	126	156	159			
415	KFIRST	INTEGER		REFS	155	DEFINED	85	161			
0	KHEAD	INTEGER	F.P.	REFS	2*80	138	2*168	2*178	DEFINED	63	80
4	KLABEL	INTEGER	CLIST	REFS	72						
0	KOUNT	INTEGER	CLIST	REFS	72	133	142	166	167	173	180
				DEFINED	131	137	142	166	173		
11	KOUNTH	INTEGER	CLIST	REFS	72						
12	KOUNTI	INTEGER	CLIST	REFS	72						
1	KPAGE	INTEGER	CLIST	REFS	72						
5	KTPAGE	INTEGER	CLIST	REFS	72						
423	L	INTEGER		REFS	140	144	145	149	150	171	172
				DEFINED	140	144	145	149	150	171	172
416	LCARD	INTEGER		REFS	124	156	DEFINED	86			
2	LINES	INTEGER	CLIST	REFS	72	131	133	167	180		
				DEFINED	130						
10	LINESG	INTEGER	CLIST	REFS	72						
421	LINESI	INTEGER		REFS	129	130	DEFINED	108	127	128	
3	LINEST	INTEGER	CLIST	REFS	72	DEFINED	129				
414	LREC	INTEGER		REFS	2*139	144	145	149	150	171	172
				DEFINED	84						
412	LSKIP	INTEGER		REFS	142	151	167	170	173		
				DEFINED	82	180					
413	LTITLE	INTEGER		REFS	136	142	143	DEFINED	83	147	
0	NCOL	INTEGER	F.P.	REFS	2*79	84	DEFINED	63	79		
0	NO	INTEGER	CONSTS	REFS	74	81	161				
6	NPAGE	INTEGER	CLIST	REFS	72						
0	NTAPEI	INTEGER	F.P.	REFS	124	156	162	DEFINED	63		
300	NUMBH	INTEGER		REFS	150	DEFINED	104				
301	SIXI	REAL		REFS	127	DEFINED	105				
0	SKIP	REAL	F.P.	REFS	109	110	111	112	113	114	115
				122	DEFINED	63					
424	T1	REAL	ARRAY	REFS	67	140	144	145	DEFINED	88	
434	T2	REAL	ARRAY	REFS	67	149	171	DEFINED	90		
460	T3	REAL	ARRAY	REFS	67	150	172	DEFINED	93		
1	YES	INTEGER	CONSTS	REFS	65	74	85	126	155	159	175
				179							

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES		
DTABLE		2	116	136	154
ENDP		1	157		
EOFO1		4	124	156	
EXIT		0	187		
PLB		3	146	151	170
PTABLE		3	135		
TITLES		1	134		

STATEMENT LABELS		DEF LINE	REFERENCES	
0 20	INACTIVE	79		
0 80	INACTIVE	112		
0 90	INACTIVE	121		
64 100		132	176	
107 150		141	139	
126 160		148	143	
143 200		152	138	
143 300		153	133	167

STATEMENT LABELS			DEF LINE	REFERENCES	
160	310		160	155	
165	350		164	162	
177	400		169	181	
217	600		174	168	
222	900		177	159	
233	950		182	175	178
236	1000		185	126	
241	1500		188	184	
364	2000	FMT	192	122	163
366	3000	FMT	193	186	

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CONSTS	2	0 NO (1)	1 YES (1)	

STATISTICS

PROGRAM LENGTH	577B	383
CM LABELED COMMON LENGTH	15B	13

52000B CM USED

```
      C45700, SUB. SETUP (ASSIGN TAPE AND DISK UNITS FOR VARIOUS DATA BLOCKS)  SETUP     2
      C                                                                        SETUP     3
      C************************************************************************ SETUP     4
      C                                                                      * SETUP     5
      C***  SUBROUTINE SETUP  ************************************************ SETUP     6
      C                                                                      * SETUP     7
      C***  COMPUTER VERSION  ************************************************ SETUP     8
      C     ----------------                                                 * SETUP     9
      C     IBM .... AS IS.                                                  * SETUP    10
      C                                                                      * SETUP    11
      C     CDC .... AS IS.                                                  * SETUP    12
      C                                                                      * SETUP    13
      C***  OBJECTIVE  ******************************************************* SETUP    14
      C     ---------                                                        * SETUP    15
      C     COLLECTS TOGETHER ALL THE TAPE AND DISK UNIT ASSIGNMENTS.        * SETUP    16
      C                                                                      * SETUP    17
      C***  INPUT/OUTPUT  ***************************************************** SETUP    18
      C     ------------                                                     * SETUP    19
      C     NO INPUT TO THIS PROGRAM.  OUTPUT CONSISTS OF UNIT NUMBERS THAT  * SETUP    20
      C     WILL STORE THE DIFFERENT SETS OF DATA NEEDED IN THE PROGRAM.     * SETUP    21
      C                                                                      * SETUP    22
      C***  SUMMARY OF SYMBOLS  *********************************************** SETUP    23
      C     ------------------                                               * SETUP    24
      C                                                                      * SETUP    25
      C***  ERROR MESSAGES  *************************************************** SETUP    26
      C     --------------                                                   * SETUP    27
      C     NONE.                                                              SETUP    28
      C                                                                      * SETUP    29
      C************************************************************************ SETUP    30
      C                                                                        SETUP    31
            SUBROUTINE SETUP(KINIT)                                            SETUP    32
      C                                                                        SETUP    33
      C                                                                        SETUP    34
            DIMENSION ISETUP(45),IPOS(20),IFILES(50),ITAPES(50),JSETUP(25)     SETUP    35
      C                                                                        SETUP    36
            COMMON /DSRN  / JSETUP                                             SETUP    37
            COMMON /FILE  / IPOS                                               SETUP    38
            COMMON /MATRIX/ ISETUP                                             SETUP    39
            COMMON /SUM   / LST   ,LSF   ,LDT   ,LDF   ,LMT   ,LMF             SETUP    40
            COMMON /CSETUP/ IOINC                                              SETUP    41
            COMMON /CFILES/ KFILES,IFILES                                      SETUP    42
            COMMON /CTAPES/ ITAPES                                             SETUP    43
      C                                                                        SETUP    44
      C                                                                        SETUP    45
      C                                                                        SETUP    46
      C DEFINE BASIC I/O UNITS AND FILES                                       SETUP    47
      C                                                                        SETUP    48
            IF (KINIT .EQ. 1) GO TO 100                                        SETUP    49
            MTAPES = ITAPES(1)                                                 SETUP    50
            MPOS   = IPOS(1)                                                   SETUP    51
        100 CONTINUE                                                           SETUP    52
            DO 130 I=1,MTAPES                                                  SETUP    53
            IFILES(I) = 1                                                      SETUP    54
        130 ITAPES(I) = I                                                      SETUP    55
            ITAPES( 2) =  17                                                   SETUP    56
            ITAPES( 8) =  18                                                   SETUP    57
            ITAPES(13) =  13 - IOINC                                           SETUP    58
```

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES		
115	600	MOD	105 110	158		EXITS	NOT INNER
120	600	NPA	107 110	78	INSTACK	EXITS	

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CONSTS	2	0 NO (1)	1 YES (1)	
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)
		6 NPAGEA (1)	7 ITAPET (1)	

STATISTICS

PROGRAM LENGTH	1317B	719
CM LABELED COMMON LENGTH	12B	10

52000B CM USED

STATEMENT LABELS		DEF LINE	REFERENCES								
342	3080	247	215								
343	3090	249	215								
344	4000	255	117								
363	4001	259	257								
370	4010	265	257								
371	4020	267	257								
372	4030	269	257								
373	4040	271	257								
374	4050	273	257								
375	4060	275	257								
376	4070	277	257								
377	4080	279	257								
400	4090	281	257								
401	5000	287	117								
420	5001	291	289								
425	5010	297	289								
426	5020	299	289								
427	5030	301	289								
430	5040	303	289								
430	5050	304	289								
431	5060	306	289								
432	5070	308	289								
433	5080	310	289								
434	5090	312	289								
435	6000	318	117								
454	6001	322	320								
461	6010	328	320								
462	6020	330	320								
463	6030	332	320								
464	6040	334	320								
465	6050	336	320								
466	6060	338	320								
467	6070	340	320								
470	6080	342	320								
471	6090	344	320								
472	7000	350	117								
511	7001	354	352								
516	7010	360	352								
517	7020	362	352								
520	7030	364	352								
521	7040	366	352								
522	7050	368	352								
523	7060	370	352								
524	7070	372	352								
525	7080	374	352								
526	7090	376	352								
526	10000	378	111	132	136	140	142	146	148	150	154
			156	158	172	176	180	184	188	192	196
			200	204	208	222	226	230	234	238	242
			244	246	248	250	264	266	268	270	272
			274	276	278	280	282	296	298	300	302
			305	307	309	311	313	327	329	331	333
			335	337	339	341	343	345	359	361	363
			365	367	369	371	373	375			
530	20000	380	89	101							

VARIABLES	SN	TYPE	RELOCATION								
730	SAO7	REAL		REFS	69	DEFINED	36				
731	SAO8	REAL		REFS	70	DEFINED	37				
732	SAO9	REAL		REFS	71	DEFINED	38				
711	SOP	REAL		REFS	96	DEFINED	14				
741	SOOO	REAL		REFS	81	DEFINED	45				
735	TAC1	REAL		REFS	75	DEFINED	41				
736	TAC2	REAL		REFS	76	DEFINED	42				
737	TAC3	REAL		REFS	77	DEFINED	43				
740	TADG	REAL		REFS	78	DEFINED	44				
733	TAOO	REAL		REFS	79	DEFINED	39				
734	TAO1	REAL		REFS	74	DEFINED	40				
742	VAOO	REAL		REFS	83	DEFINED	46				
1	YES	INTEGER	CONSTS	REFS	6	11	113				

EXTERNALS	TYPE	ARGS	REFERENCES								
DVALUE		3	53								
PTABLE		3	96	98	130	134	138	144	152	170	174
			178	182	186	190	194	198	202	206	220
			224	228	232	236	240	262	294	325	357

STATEMENT LABELS		DEF LINE	REFERENCES	
16	100	18	17	
100	400	90	17	
114	500	102	17	
0	600	110	105	107
132	610	112	109	
151	1000	123	117	
170	1001	127	125	
175	1010	133	125	
200	1020	137	125	
203	1030	141	125	
204	1040	143	125	
207	1050	147	125	
210	1060	149	125	
211	1070	151	125	
214	1080	155	125	
215	1090	157	125	
216	2000	163	117	
235	2001	167	165	
242	2010	173	165	
245	2020	177	165	
250	2030	181	165	
253	2040	185	165	
256	2050	189	165	
261	2060	193	165	
264	2070	197	165	
267	2080	201	165	
272	2090	205	165	
275	3000	213	117	
314	3001	217	215	
321	3010	223	215	
324	3020	227	215	
327	3030	231	215	
332	3040	235	215	
335	3050	239	215	
340	3060	243	215	
211	2070	215	215	

ENTRY POINTS DEF LINE REFERENCES
3 DTABLE 4 382

VARIABLES	SN	TYPE	RELOCATION								
713	BLANK	REAL		REFS	53	DEFINED	23				
0	CARD	REAL	F.P.	REFS	96	98	109	DEFINED	4		
1013	CARD1	REAL	ARRAY	REFS	9	53	109	DEFINED	57	58	59
					60	61	63	64	65	66	67	68
					69	70	71	72	74	75	76	77
					78	79	81	83	85	87		
743	FAOO	REAL		REFS	85	DEFINED	47				
712	FOP	REAL		REFS	98	DEFINED	15				
744	FOOO	REAL		REFS	87	DEFINED	48				
7	ITAPET	INTEGER	CTABLE	REFS	12						
0	KINIT	INTEGER	F.P.	REFS	17	DEFINED	4				
0	KTABLE	INTEGER	CTABLE	REFS	12	DEFINED	95	113	379		
5	KTABLO	INTEGER	CTABLE	REFS	12						
777	LAST	INTEGER		REFS	61	72	79	81	83	85	87
				DEFINED	54						
714	LAOO	REAL		REFS	7	61	DEFINED	24			
715	LAO1	REAL		REFS	7	57	DEFINED	25			
716	LAO2	REAL		REFS	7	58	DEFINED	26			
717	LAO4	REAL		REFS	7	59	DEFINED	27			
720	LAO7	REAL		REFS	7	60	DEFINED	28			
776	MAX	INTEGER		REFS	53	DEFINED	52				
774	MAXMOD	INTEGER		REFS	52	105	DEFINED	50			
775	MAXPAR	INTEGER		REFS	52	54	107	DEFINED	51		
1007	MOD	INTEGER		REFS	106	DEFINED	105				
1005	MODFA	INTEGER		REFS	85	DEFINED	84				
1006	MODFO	INTEGER		REFS	87	DEFINED	86				
1000	MODLA	INTEGER		REFS	57	58	59	60	61		
				DEFINED	56						
1001	MODSA	INTEGER		REFS	63	64	65	66	67	68	69
					70	71	72	DEFINED	62		
1003	MODSO	INTEGER		REFS	81	DEFINED	80				
1002	MODTA	INTEGER		REFS	74	75	76	77	78	79	
				DEFINED	73						
1010	MODULE	INTEGER		REFS	109	117	DEFINED	106			
1004	MODVA	INTEGER		REFS	83	DEFINED	82				
3	NCOLS	INTEGER	CTABLE	REFS	12	DEFINED	94	115	129	169	219
					261	293	324	356			
4	NCOLST	INTEGER	CTABLE	REFS	12						
0	NO	INTEGER	CONSTS	REFS	11	379					
1011	NPA	INTEGER		REFS	108	DEFINED	107				
6	NPAGEA	INTEGER	CTABLE	REFS	12						
1012	NPART	INTEGER		REFS	109	125	165	215	257	289	320
					352	DEFINED	108				
1	NPASS	INTEGER	CTABLE	REFS	12						
2	NROWS	INTEGER	CTABLE	REFS	12	DEFINED	93	114	128	168	218
					260	292	323	355			
721	SAOO	REAL		REFS	72	DEFINED	29				
722	SAO1	REAL		REFS	63	DEFINED	30				
723	SAO2	REAL		REFS	64	DEFINED	31				
724	SAO3	REAL		REFS	65	DEFINED	32				
725	SAO4	REAL		REFS	66	DEFINED	33				
726	SAO5	REAL		REFS	67	DEFINED	34				
727	SAO6	REAL		REFS	68	DEFINED	35				

```
                    GO TO 10000                                                    DTABLE   344
                6090 CONTINUE                                                      DTABLE   345
345                 GO TO 10000                                                    DTABLE   346
                C                                                                  DTABLE   347
                C                                                                  DTABLE   348
                C AUTOMATED FLUTTER OPTIMIZATION MODULE                            DTABLE   349
                C                                                                  DTABLE   350
350             7000 CONTINUE                                                      DTABLE   351
                C                                                                  DTABLE   352
                    GO TO (7010,7020,7030,7040,7050,7060,7070,7080,7090,7001), NPART DTABLE  353
                C                                                                  DTABLE   354
                7001 CONTINUE                                                      DTABLE   355
355                 NROWS  =  1                                                    DTABLE   356
                    NCOLS  =  3                                                    DTABLE   357
                    CALL PTABLE (2,37,37                                           DTABLE   358
                   1   HAUTOMATED FLUTTER OPTIMIZATION MODULE)                    DTABLE   359
                    GO TO 10000                                                    DTABLE   360
360             7010 CONTINUE                                                      DTABLE   361
                    GO TO 10000                                                    DTABLE   362
                7020 CONTINUE                                                      DTABLE   363
                    GO TO 10000                                                    DTABLE   364
                7030 CONTINUE                                                      DTABLE   365
365                 GO TO 10000                                                    DTABLE   366
                7040 CONTINUE                                                      DTABLE   367
                    GO TO 10000                                                    DTABLE   368
                7050 CONTINUE                                                      DTABLE   369
                    GO TO 10000                                                    DTABLE   370
370             7060 CONTINUE                                                      DTABLE   371
                    GO TO 10000                                                    DTABLE   372
                7070 CONTINUE                                                      DTABLE   373
                    GO TO 10000                                                    DTABLE   374
                7080 CONTINUE                                                      DTABLE   375
375                 GO TO 10000                                                    DTABLE   376
                7090 CONTINUE                                                      DTABLE   377
                C                                                                  DTABLE   378
                10000 CONTINUE                                                     DTABLE   379
                    KTABLE =  NO                                                   DTABLE   380
380             20000 CONTINUE                                                     DTABLE   381
                C                                                                  DTABLE   382
                    RETURN                                                         DTABLE   383
                    END                                                            DTABLE   384


CARD NR  SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

      17    I               AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.


  SYMBOLIC REFERENCE MAP (R=3)
```

```
      C                                                                 DTABLE   287
       5000 CONTINUE                                                    DTABLE   288
      C                                                                 DTABLE   289
            GO TO (5010,5020,5030,5040,5050,5060,5070,5080,5090,5001), NPART  DTABLE   290
290   C                                                                 DTABLE   291
       5001 CONTINUE                                                    DTABLE   292
            NROWS  =  1                                                 DTABLE   293
            NCOLS  =  3                                                 DTABLE   294
            CALL PTABLE (2,35,35                                        DTABLE   295
295        1   HAUTOMATED VIBRATION ANALYSIS MODULE)                    DTABLE   296
            GO TO 10000                                                 DTABLE   297
       5010 CONTINUE                                                    DTABLE   298
            GO TO 10000                                                 DTABLE   299
       5020 CONTINUE                                                    DTABLE   300
300         GO TO 10000                                                 DTABLE   301
       5030 CONTINUE                                                    DTABLE   302
            GO TO 10000                                                 DTABLE   303
       5040 CONTINUE                                                    DTABLE   304
       5050 CONTINUE                                                    DTABLE   305
305         GO TO 10000                                                 DTABLE   306
       5060 CONTINUE                                                    DTABLE   307
            GO TO 10000                                                 DTABLE   308
       5070 CONTINUE                                                    DTABLE   309
            GO TO 10000                                                 DTABLE   310
310    5080 CONTINUE                                                    DTABLE   311
            GO TO 10000                                                 DTABLE   312
       5090 CONTINUE                                                    DTABLE   313
            GO TO 10000                                                 DTABLE   314
      C                                                                 DTABLE   315
315   C                                                                 DTABLE   316
      C AUTOMATED FLUTTER ANALYSIS MODULE                               DTABLE   317
      C                                                                 DTABLE   318
       6000 CONTINUE                                                    DTABLE   319
      C                                                                 DTABLE   320
320         GO TO (6010,6020,6030,6040,6050,6060,6070,6080,6090,6001), NPART  DTABLE   321
      C                                                                 DTABLE   322
       6001 CONTINUE                                                    DTABLE   323
            NROWS  =  1                                                 DTABLE   324
            NCOLS  =  3                                                 DTABLE   325
325         CALL PTABLE (2,33,33                                        DTABLE   326
           1   HAUTOMATED FLUTTER ANALYSIS MODULE)                      DTABLE   327
            GO TO 10000                                                 DTABLE   328
       6010 CONTINUE                                                    DTABLE   329
            GO TO 10000                                                 DTABLE   330
330    6020 CONTINUE                                                    DTABLE   331
            GO TO 10000                                                 DTABLE   332
       6030 CONTINUE                                                    DTABLE   333
            GO TO 10000                                                 DTABLE   334
       6040 CONTINUE                                                    DTABLE   335
335         GO TO 10000                                                 DTABLE   336
       6050 CONTINUE                                                    DTABLE   337
            GO TO 10000                                                 DTABLE   338
       6060 CONTINUE                                                    DTABLE   339
            GO TO 10000                                                 DTABLE   340
340    6070 CONTINUE                                                    DTABLE   341
            GO TO 10000                                                 DTABLE   342
```

```
                1   HCORRESPONDENCE TABLE FOR AERODYNAMICS GRID)                    DTABLE   230
230              GO TO 10000                                                        DTABLE   231
              3030 CONTINUE                                                         DTABLE   232
                   CALL PTABLE (2,37,37                                             DTABLE   233
                  1   HCORRESPONDENCE TABLE FOR WEIGHT  GRID)                       DTABLE   234
                   GO TO 10000                                                      DTABLE   235
235           3040 CONTINUE                                                        DTABLE   236
                   CALL PTABLE (2,38,38                                             DTABLE   237
                  1   HCORRESPONDENCE TABLE FOR DYNAMICS GRID)                      DTABLE   238
                   GO TO 10000                                                      DTABLE   239
              3050 CONTINUE                                                         DTABLE   240
240                CALL PTABLE (2,37,37                                             DTABLE   241
                  1   HDYNAMICS GRID TO GENERATE FLEXIBILITY)                       DTABLE   242
                   GO TO 10000                                                      DTABLE   243
              3060 CONTINUE                                                         DTABLE   244
                   GO TO 10000                                                      DTABLE   245
245           3070 CONTINUE                                                        DTABLE   246
                   GO TO 10000                                                      DTABLE   247
              3080 CONTINUE                                                         DTABLE   248
                   GO TO 10000                                                      DTABLE   249
              3090 CONTINUE                                                         DTABLE   250
250                GO TO 10000                                                      DTABLE   251
            C                                                                       DTABLE   252
            C                                                                       DTABLE   253
            C AUTOMATED STRUCTURAL OPTIMIZATION MODULE                              DTABLE   254
            C                                                                       DTABLE   255
255          4000 CONTINUE                                                        DTABLE   256
            C                                                                       DTABLE   257
                   GO TO (4010,4020,4030,4040,4050,4060,4070,4080,4090,4001), NPART DTABLE   258
            C                                                                       DTABLE   259
             4001 CONTINUE                                                        DTABLE   260
260                NROWS  =  1                                                      DTABLE   261
                   NCOLS  =  3                                                      DTABLE   262
                   CALL PTABLE (2,40,40                                             DTABLE   263
                  1   HAUTOMATED STRUCTURAL OPTIMIZATION MODULE)                  DTABLE   264
                   GO TO 10000                                                      DTABLE   265
265          4010 CONTINUE                                                        DTABLE   266
                   GO TO 10000                                                      DTABLE   267
             4020 CONTINUE                                                        DTABLE   268
                   GO TO 10000                                                      DTABLE   269
             4030 CONTINUE                                                        DTABLE   270
270                GO TO 10000                                                      DTABLE   271
             4040 CONTINUE                                                        DTABLE   272
                   GO TO 10000                                                      DTABLE   273
             4050 CONTINUE                                                        DTABLE   274
                   GO TO 10000                                                      DTABLE   275
275          4060 CONTINUE                                                        DTABLE   276
                   GO TO 10000                                                      DTABLE   277
             4070 CONTINUE                                                        DTABLE   278
                   GO TO 10000                                                      DTABLE   279
             4080 CONTINUE                                                        DTABLE   280
280                GO TO 10000                                                      DTABLE   281
             4090 CONTINUE                                                        DTABLE   282
                   GO TO 10000                                                      DTABLE   283
            C                                                                       DTABLE   284
            C                                                                       DTABLE   285
285         C AUTOMATED VIBRATION ANALYSIS MODULE                                   DTABLE   286
```

```
                GO TO 10000                                                     DTABLE   173
              2010 CONTINUE                                                     DTABLE   174
                CALL PTABLE (2,44,44                                            DTABLE   175
     175       1   HGEOMETRY COORDINATES AND BOUNDARY CONDITIONS)               DTABLE   176
                GO TO 10000                                                     DTABLE   177
              2020 CONTINUE                                                     DTABLE   178
                CALL PTABLE (2,25,25                                            DTABLE   179
               1   HGEOMETRY COORDINATES ONLY)                                  DTABLE   180
     180        GO TO 10000                                                     DTABLE   181
              2030 CONTINUE                                                     DTABLE   182
                CALL PTABLE (2,24,24                                            DTABLE   183
               1   HBOUNDARY CONDITIONS ONLY)                                   DTABLE   184
                GO TO 10000                                                     DTABLE   185
     185      2040 CONTINUE                                                     DTABLE   186
                CALL PTABLE (2,27,27                                            DTABLE   187
               1   HMATERIAL PROPERTIES UPDATES)                                DTABLE   188
                GO TO 10000                                                     DTABLE   189
              2050 CONTINUE                                                     DTABLE   190
     190        CALL PTABLE (2,17,17                                            DTABLE   191
               1   HMEMBER PROPERTIES)                                          DTABLE   192
                GO TO 10000                                                     DTABLE   193
              2060 CONTINUE                                                     DTABLE   194
                CALL PTABLE (2,15,15                                            DTABLE   195
     195       1   HLOAD CONDITIONS)                                            DTABLE   196
                GO TO 10000                                                     DTABLE   197
              2070 CONTINUE                                                     DTABLE   198
                CALL PTABLE (2,29,29                                            DTABLE   199
               1   HCONDENSED BOUNDARY CONDITIONS)                              DTABLE   200
     200        GO TO 10000                                                     DTABLE   201
              2080 CONTINUE                                                     DTABLE   202
                CALL PTABLE (2,32,32                                            DTABLE   203
               1   HDEFLECTION CONSTRAINT CONDITIONS)                           DTABLE   204
                GO TO 10000                                                     DTABLE   205
     205      2090 CONTINUE                                                     DTABLE   206
                CALL PTABLE (2,20,20                                            DTABLE   207
               1   HSTABILITY CONDITIONS)                                       DTABLE   208
                GO TO 10000                                                     DTABLE   209
            C                                                                   DTABLE   210
     210    C                                                                   DTABLE   211
            C AUTOMATED TRANSFORMATION ANALYSIS MODULE                          DTABLE   212
            C                                                                   DTABLE   213
             3000 CONTINUE                                                      DTABLE   214
            C                                                                   DTABLE   215
     215        GO TO (3010,3020,3030,3040,3050,3060,3070,3080,3090,3001), NPART DTABLE   216
            C                                                                   DTABLE   217
             3001 CONTINUE                                                      DTABLE   218
                NROWS  =  1                                                     DTABLE   219
                NCOLS  =  3                                                     DTABLE   220
     220        CALL PTABLE (2,40,40                                            DTABLE   221
               1   HAUTOMATED TRANSFORMATION ANALYSIS MODULE)                  DTABLE   222
                GO TO 10000                                                     DTABLE   223
             3010 CONTINUE                                                      DTABLE   224
                CALL PTABLE (2,24,24                                            DTABLE   225
     225       1   HSTRUCTURES GEOMETRY GRID)                                   DTABLE   226
                GO TO 10000                                                     DTABLE   227
              3020 CONTINUE                                                     DTABLE   228
                CALL PTABLE (2,42,42                                            DTABLE   229
```

```
115                NCOLS  =  6                                                DTABLE   116
                C                                                             DTABLE   117
                      GO TO (1000, 2000, 3000, 4000, 5000, 6000, 7000), MODULE DTABLE   118
                C                                                             DTABLE   119
                C                                                             DTABLE   120
120             C                                                             DTABLE   121
                C AUTOMATED LOAD ANALYSIS MODULE                              DTABLE   122
                C                                                             DTABLE   123
                 1000 CONTINUE                                                DTABLE   124
                C                                                             DTABLE   125
125                   GO TO (1010,1020,1030,1040,1050,1060,1070,1080,1090,1001), NPART DTABLE   126
                C                                                             DTABLE   127
                 1001 CONTINUE                                                DTABLE   128
                      NROWS  =  1                                             DTABLE   129
                      NCOLS  =  3                                             DTABLE   130
130                   CALL PTABLE (2,30,30                                    DTABLE   131
                     1   HAUTOMATED LOAD ANALYSIS MODULE)                     DTABLE   132
                      GO TO 10000                                             DTABLE   133
                 1010 CONTINUE                                                DTABLE   134
                      CALL PTABLE (2,52,52                                    DTABLE   135
135                  1   HAERODYNAMIC INFLUENCE COEFFICIENTS FOR SUBSONIC FLOW) DTABLE   136
                      GO TO 10000                                             DTABLE   137
                 1020 CONTINUE                                                DTABLE   138
                      CALL PTABLE (2,54,54                                    DTABLE   139
                     1   HAERODYNAMIC INFLUENCE COEFFICIENTS FOR SUPERSONIC FLOW) DTABLE   140
140                   GO TO 10000                                             DTABLE   141
                 1030 CONTINUE                                                DTABLE   142
                      GO TO 10000                                             DTABLE   143
                 1040 CONTINUE                                                DTABLE   144
                      CALL PTABLE (2,17,17                                    DTABLE   145
145                  1   HAERODYNAMIC LOADS)                                  DTABLE   146
                      GO TO 10000                                             DTABLE   147
                 1050 CONTINUE                                                DTABLE   148
                      GO TO 10000                                             DTABLE   149
                 1060 CONTINUE                                                DTABLE   150
150                   GO TO 10000                                             DTABLE   151
                 1070 CONTINUE                                                DTABLE   152
                      CALL PTABLE (2,14,14                                    DTABLE   153
                     1   HINERTIAL LOADS)                                     DTABLE   154
                      GO TO 10000                                             DTABLE   155
155              1080 CONTINUE                                                DTABLE   156
                      GO TO 10000                                             DTABLE   157
                 1090 CONTINUE                                                DTABLE   158
                      GO TO 10000                                             DTABLE   159
                C                                                             DTABLE   160
160             C                                                             DTABLE   161
                C AUTOMATED STRUCTURAL ANALYSIS MODULE                        DTABLE   162
                C                                                             DTABLE   163
                 2000 CONTINUE                                                DTABLE   164
                C                                                             DTABLE   165
165                   GO TO (2010,2020,2030,2040,2050,2060,2070,2080,2090,2001), NPART DTABLE   166
                C                                                             DTABLE   167
                 2001 CONTINUE                                                DTABLE   168
                      NROWS  =  1                                             DTABLE   169
                      NCOLS  =  3                                             DTABLE   170
170                   CALL PTABLE (2,36,36                                    DTABLE   171
                     1   HAUTOMATED STRUCTURAL ANALYSIS MODULE)               DTABLE   172
```

```
                CARD1(   2,MODLA) =  LAO2                                DTABLE     59
                CARD1(   4,MODLA) =  LAO4                                DTABLE     60
60              CARD1(   7,MODLA) =  LAO7                                DTABLE     61
                CARD1(LAST,MODLA) =  LAOO                                DTABLE     62
                MODSA  =  2                                              DTABLE     63
                CARD1(   1,MODSA) =  SAO1                                DTABLE     64
                CARD1(   2,MODSA) =  SAO2                                DTABLE     65
65              CARD1(   3,MODSA) =  SAO3                                DTABLE     66
                CARD1(   4,MODSA) =  SAO4                                DTABLE     67
                CARD1(   5,MODSA) =  SAO5                                DTABLE     68
                CARD1(   6,MODSA) =  SAO6                                DTABLE     69
                CARD1(   7,MODSA) =  SAO7                                DTABLE     70
70              CARD1(   8,MODSA) =  SAO8                                DTABLE     71
                CARD1(   9,MODSA) =  SAO9                                DTABLE     72
                CARD1(LAST,MODSA) =  SAOO                                DTABLE     73
                MODTA  =  3                                              DTABLE     74
                CARD1(   1,MODTA) =  TAO1                                DTABLE     75
75              CARD1(   2,MODTA) =  TAC1                                DTABLE     76
                CARD1(   3,MODTA) =  TAC2                                DTABLE     77
                CARD1(   4,MODTA) =  TAC3                                DTABLE     78
                CARD1(   5,MODTA) =  TADG                                DTABLE     79
                CARD1(LAST,MODTA) =  TAOO                                DTABLE     80
80              MODSO  =  4                                              DTABLE     81
                CARD1(LAST,MODSO) =  SOOO                                DTABLE     82
                MODVA  =  5                                              DTABLE     83
                CARD1(LAST,MODVA) =  VAOO                                DTABLE     84
                MODFA  =  6                                              DTABLE     85
85              CARD1(LAST,MODFA) =  FAOO                                DTABLE     86
                MODFO  =  7                                              DTABLE     87
                CARD1(LAST,MODFO) =  FOOO                                DTABLE     88
            C                                                            DTABLE     89
                GO TO 20000                                              DTABLE     90
90            400 CONTINUE                                               DTABLE     91
            C                                                            DTABLE     92
            C                                                            DTABLE     93
                NROWS  =  1                                              DTABLE     94
                NCOLS  =  3                                              DTABLE     95
95              KTABLE =  2                                              DTABLE     96
                IF (CARD    .EQ. SOP) CALL PTABLE (2,31,31               DTABLE     97
               1   HSTRUCTURAL OPTIMIZATION PACKAGE)                     DTABLE     98
                IF (CARD    .EQ. FOP) CALL PTABLE (2,28,28               DTABLE     99
               1   HFLUTTER OPTIMIZATION PACKAGE)                        DTABLE    100
100         C                                                            DTABLE    101
                GO TO 20000                                              DTABLE    102
            500 CONTINUE                                                 DTABLE    103
            C                                                            DTABLE    104
            C                                                            DTABLE    105
105             DO 600 MOD=1,MAXMOD                                      DTABLE    106
                MODULE =  MOD                                            DTABLE    107
                DO 600 NPA=1,MAXPAR                                      DTABLE    108
                NPART  =  NPA                                            DTABLE    109
                IF (CARD1(NPART,MODULE) .EQ. CARD) GO TO 610             DTABLE    110
110           600 CONTINUE                                               DTABLE    111
                GO TO 10000                                              DTABLE    112
              610 CONTINUE                                               DTABLE    113
                KTABLE =  YES                                            DTABLE    114
                NROWS  =  0                                              DTABLE    115
```

```
      C                                                                 DTABLE      2
      C45700, SUB. DTABLE (DATA TABLE OF CONTENTS)                      DTABLE      3
      C                                                                 DTABLE      4
            SUBROUTINE DTABLE (KINIT,CARD)                              DTABLE      5
      C                                                                 DTABLE      6
            INTEGER YES                                                 DTABLE      7
            REAL LAOO, LAO1, LAO2, LAO4, LAO7                           DTABLE      8
      C                                                                 DTABLE      9
            DIMENSION CARD1(10,7)                                       DTABLE     10
      C                                                                 DTABLE     11
            COMMON /CONSTS/ NO    ,YES                                  DTABLE     12
            COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA  DTABLE  13
           1               ,ITAPET                                      DTABLE     14
            DATA SOP    /4HSOP /                                        DTABLE     15
            DATA FOP    /4HFOP /                                        DTABLE     16
      C                                                                 DTABLE     17
            GO TO (100, 400, 500), KINIT                                DTABLE     18
        100 CONTINUE                                                    DTABLE     19
      C                                                                 DTABLE     20
      C                                                                 DTABLE     21
      C INITIAL CONDITIONS                                              DTABLE     22
      C                                                                 DTABLE     23
            DATA BLANK  /4H    /                                        DTABLE     24
            DATA LAOO   /4HLAOO/                                        DTABLE     25
            DATA LAO1   /4HLAO1/                                        DTABLE     26
            DATA LAO2   /4HLAO2/                                        DTABLE     27
            DATA LAO4   /4HLAO4/                                        DTABLE     28
            DATA LAO7   /4HLAO7/                                        DTABLE     29
            DATA SAOO   /4HSAOO/                                        DTABLE     30
            DATA SAO1   /4HSAO1/                                        DTABLE     31
            DATA SAO2   /4HSAO2/                                        DTABLE     32
            DATA SAO3   /4HSAO3/                                        DTABLE     33
            DATA SAO4   /4HSAO4/                                        DTABLE     34
            DATA SAO5   /4HSAO5/                                        DTABLE     35
            DATA SAO6   /4HSAO6/                                        DTABLE     36
            DATA SAO7   /4HSAO7/                                        DTABLE     37
            DATA SAO8   /4HSAO8/                                        DTABLE     38
            DATA SAO9   /4HSAO9/                                        DTABLE     39
            DATA TAOO   /4HTAOO/                                        DTABLE     40
            DATA TAO1   /4HTAO1/                                        DTABLE     41
            DATA TAC1   /4HTAC1/                                        DTABLE     42
            DATA TAC2   /4HTAC2/                                        DTABLE     43
            DATA TAC3   /4HTAC3/                                        DTABLE     44
            DATA TADG   /4HTADG/                                        DTABLE     45
            DATA SOOO   /4HSOOO/                                        DTABLE     46
            DATA VAOO   /4HVAOO/                                        DTABLE     47
            DATA FAOO   /4HFAOO/                                        DTABLE     48
            DATA FOOO   /4HFOOO/                                        DTABLE     49
      C                                                                 DTABLE     50
            MAXMOD =  7                                                 DTABLE     51
            MAXPAR =  10                                                DTABLE     52
            MAX    =  MAXMOD*MAXPAR                                     DTABLE     53
            CALL DVALUE (CARD1,BLANK,MAX)                               DTABLE     54
            LAST   =  MAXPAR                                            DTABLE     55
      C                                                                 DTABLE     56
            MODLA  =  1                                                 DTABLE     57
            CARD1(    1,MODLA) =  LAO1                                  DTABLE     58
```

```
STATEMENT LABELS                DEF LINE    REFERENCES
   26  200                         27          19          21          23

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       CPLOTF         1                 0 KPLOTF (1)

STATISTICS
  PROGRAM LENGTH                    338         27
  CM LABELED COMMON LENGTH           1B          1
          520000B CM USED
```

```
      SUBROUTINE ENDP       74/74   OPT=1                    FTN 4.8+577       85/01/23. 08.10.44       PAGE      1

      1           C45700. SUB. ENDP (DEFINE KPLOTF FOR ENDING PLOTS IN AFAM)                ENDP        2
                  C                                                                         ENDP        3
                  C     THIS ROUTINE SEARCHES THE CARD INPUT DATA TO LOCATE THE VALUE OF    ENDP        4
                  C     LC(14).  THEN                                                       ENDP        5
      5           C     IF LC(14) = 0, KPLOTF = 1                                           ENDP        6
                  C     IF LC(14) = 1, KPLOTF = 2                                           ENDP        7
                  C                                                                         ENDP        8
                        SUBROUTINE ENDP (CARD)                                              ENDP        9
                  C                                                                         ENDP       10
     10                 DIMENSION CARD(1)                                                   ENDP       11
                  C                                                                         ENDP       12
                        COMMON /CPLOTF/ KPLOTF                                              ENDP       13
                  C                                                                         ENDP       14
                        DATA FAOO   /4HFAOO/                                                ENDP       15
     15                 DATA KSTART /2/                                                     ENDP       16
                        DATA ONE    /4H   1/                                                ENDP       17
                        DATA KOUNTL /-1/                                                    ENDP       18
                  C                                                                         ENDP       19
                        IF (KSTART .EQ. 1) GO TO 200                                        ENDP       20
     20                 IF (CARD(1) .EQ. FAOO) KOUNTL = 0                                   ENDP       21
                        IF (KOUNTL .EQ.-1) GO TO 200                                        ENDP       22
                        KOUNTL =  KOUNTL + 1                                                ENDP       23
                        IF (KOUNTL .LT. 5) GO TO 200                                        ENDP       24
                        IF (CARD(5) .NE. ONE ) KPLOTF = 1                                   ENDP       25
     25                 IF (CARD(5) .EQ. ONE ) KPLOTF = 2                                   ENDP       26
                        KSTART =  1                                                         ENDP       27
                    200 CONTINUE                                                            ENDP       28
                  C                                                                         ENDP       29
                        RETURN                                                              ENDP       30
     30                 END                                                                 ENDP       31


CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

      24    I      CARD       ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
      25    I      CARD       ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.



        SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
     3  ENDP            8         29

 VARIABLES     SN  TYPE            RELOCATION
     0  CARD       REAL        ARRAY     F.P.          REFS        10        20        24        25    DEFINED         8
    27  FAOO       REAL                                 REFS        20  DEFINED         14
    32  KOUNTL     INTEGER                              REFS        21        22        23  DEFINED        17        20        22
     0  KPLOTF     INTEGER               CPLOTF         REFS        12  DEFINED        24        25
    30  KSTART     INTEGER                              REFS        19  DEFINED        15        26
    31  ONE        REAL                                 REFS        24        25  DEFINED        16
```

```
      ITAPES(31) =  11 - IOINC                                          SETUP      59
      KFILES =  1                                                       SETUP      60
C                                                                       SETUP      61
      MATXC1 =  0                                                       SETUP      62
      MATXC2 =  0                                                       SETUP      63
      MATXM1 =  0                                                       SETUP      64
      MATXM2 =  0                                                       SETUP      65
      MATXS1 =  0                                                       SETUP      66
      MATXS2 =  0                                                       SETUP      67
      MEMOUT =  0                                                       SETUP      68
      NTAPLT =  0                                                       SETUP      69
      DO 30 J=1,MPOS                                                    SETUP      70
      IPOS(J) = 1                                                       SETUP      71
   30 CONTINUE                                                          SETUP      72
      JDSRN = 1                                                         SETUP      73
      ISCR = 2                                                          SETUP      74
      JSCR = 3                                                          SETUP      75
      MDSRN = 4                                                         SETUP      76
      NDSRN  =  8  - IOINC                                              SETUP      77
      LDSRN  =  9  - IOINC                                              SETUP      78
      IDSRN  =  10 - IOINC                                              SETUP      79
      KSCR   =  11 - IOINC                                              SETUP      80
      LSCR   =  12 - IOINC                                              SETUP      81
      MSCR   =  13 - IOINC                                              SETUP      82
      NSCR   =  14 - IOINC                                              SETUP      83
      NTAPC = JDSRN                                                     SETUP      84
      IFILC = 1                                                         SETUP      85
      NTAPBC = JDSRN                                                    SETUP      86
      IFILBC = 2                                                        SETUP      87
      NTAPL = JDSRN                                                     SETUP      88
      IFILL = 3                                                         SETUP      89
      NTAPM = JDSRN                                                     SETUP      90
      IFILM = 4                                                         SETUP      91
      NTAPK = MDSRN                                                     SETUP      92
      IFILK = 1                                                         SETUP      93
      NTAPDD = MDSRN                                                    SETUP      94
      IFILDD = 1                                                        SETUP      95
      NTAPIS = IDSRN                                                    SETUP      96
      IFILIS = 3                                                        SETUP      97
      NTAPST = NDSRN                                                    SETUP      98
      IFILST = 1                                                        SETUP      99
      NTAPES = LDSRN                                                    SETUP     100
      NTAPD = IDSRN                                                     SETUP     101
      IFILD = 2                                                         SETUP     102
      IFILLT = 1                                                        SETUP     103
      NTAPDC = LDSRN                                                    SETUP     104
      IFILDC = 0                                                        SETUP     105
      NTAPS = LDSRN                                                     SETUP     106
      NTAPT = NDSRN                                                     SETUP     107
      IFILT = 2                                                         SETUP     108
      LMT = JDSRN+NDSRN                                                 SETUP     109
      LMF = IFILM+2                                                     SETUP     110
      NTTSDL=KSCR                                                       SETUP     111
      IFTSDL =  1                                                       SETUP     112
      NTAKDI=LSCR                                                       SETUP     113
      IFIKDI =  1                                                       SETUP     114
      NTTRAN=MSCR                                                       SETUP     115
```

```
      IFTRAN = 0                                                        SETUP  116
      IF (JATRAN .GT. 0) IFTRAN = IFTRAN + 1                            SETUP  117
      IF (JWTRAN .GT. 0) IFTRAN = IFTRAN + 1                            SETUP  118
      IF (JDTRAN .GT. 0) IFTRAN = IFTRAN + 1                            SETUP  119
      NTAERO=14                                                         SETUP  120
      IFAERO=15                                                         SETUP  121
C                                                                       SETUP  122
C                                                                       SETUP  123
C TRANSFER BASIC INFORMATION TO THE GENERAL VARIABLES                   SETUP  124
C                                                                       SETUP  125
      ISETUP( 1) = MATXC1                                               SETUP  126
      ISETUP( 2) = MATXC2                                               SETUP  127
      ISETUP( 3) = NTAPC                                                SETUP  128
      ISETUP( 4) = IFILC                                                SETUP  129
      ISETUP( 5) = NTAPBC                                               SETUP  130
      ISETUP( 6) = IFILBC                                               SETUP  131
      ISETUP( 7) = NTAPL                                                SETUP  132
      ISETUP( 8) = IFILL                                                SETUP  133
      ISETUP( 9) = MATXM1                                               SETUP  134
      ISETUP(10) = MATXM2                                               SETUP  135
      ISETUP(11) = NTAPM                                                SETUP  136
      ISETUP(12) = IFILM                                                SETUP  137
      ISETUP(13) = NTAPK                                                SETUP  138
      ISETUP(14) = IFILK                                                SETUP  139
      ISETUP(15) = NTAPDD                                               SETUP  140
      ISETUP(16) = IFILDD                                               SETUP  141
      ISETUP(17) = NTAPST                                               SETUP  142
      ISETUP(18) = IFILST                                               SETUP  143
      ISETUP(19) = NTAPES                                               SETUP  144
      ISETUP(20) = IFILFS                                               SETUP  145
      ISETUP(21) = NTAPD                                                SETUP  146
      ISETUP(22) = IFILD                                                SETUP  147
      ISETUP(23) = NTAPDC                                               SETUP  148
      ISETUP(24) = IFILDC                                               SETUP  149
      ISETUP(25) = MATXS1                                               SETUP  150
      ISETUP(26) = MATXS2                                               SETUP  151
      ISETUP(27) = NTAPS                                                SETUP  152
      ISETUP(28) = IFILS                                                SETUP  153
      ISETUP(29) = MEMOUT                                               SETUP  154
      ISETUP(30) = NTAPT                                                SETUP  155
      ISETUP(31) = IFILT                                                SETUP  156
      ISETUP(32) = NTAPLT                                               SETUP  157
      ISETUP(33) = IFILLT                                               SETUP  158
      ISETUP(34) = IS12                                                 SETUP  159
      ISETUP(35) = KOR                                                  SETUP  160
      ISETUP(36) = NTAPIS                                               SETUP  161
      ISETUP(37) = IFILIS                                               SETUP  162
      ISETUP(38) = NTTSDL                                               SETUP  163
      ISETUP(39) = IFTSDL                                               SETUP  164
      ISETUP(40) = NTAKDI                                               SETUP  165
      ISETUP(41) = IFIKDI                                               SETUP  166
      ISETUP(42) = NTTRAN                                               SETUP  167
      ISETUP(43) = IFTRAN                                               SETUP  168
      ISETUP(44) = NTAERO                                               SETUP  169
      ISETUP(45) = IFAERO                                               SETUP  170
      JSETUP( 1) = JDSRN                                                SETUP  171
      JSETUP( 2) = KDSRN                                                SETUP  172
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                    JSETUP( 3) = LDSRN                                  SETUP    173
                    JSETUP( 4) = MDSRN                                  SETUP    174
                    JSETUP( 5) = NDSRN                                  SETUP    175
175                 JSETUP( 6) = IDSRN                                  SETUP    176
                    JSETUP( 7) = ISCR                                   SETUP    177
                    JSETUP( 8) = JSCR                                   SETUP    178
                    JSETUP( 9) = KSCR                                   SETUP    179
                    JSETUP(10) = LSCR                                   SETUP    180
180                 JSETUP(11) = MSCR                                   SETUP    181
                    JSETUP(12) = NSCR                                   SETUP    182
                    JSETUP(13) = ISC                                    SETUP    183
                    RETURN                                              SETUP    184
                    END                                                 SETUP    185
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	SETUP	31	183

VARIABLES	SN	TYPE		RELOCATION								
244	I	INTEGER			REFS	53	2*54	DEFINED	52			
264	IDSRN	INTEGER			REFS	95	100	175	DEFINED	78		
334	IFAERO	INTEGER			REFS	169	DEFINED	120				
325	IFIKDI	INTEGER			REFS	165	DEFINED	113				
274	IFILBC	INTEGER			REFS	130	DEFINED	86				
272	IFILC	INTEGER			REFS	128	DEFINED	84				
313	IFILD	INTEGER			REFS	146	DEFINED	101				
316	IFILDC	INTEGER			REFS	148	DEFINED	104				
304	IFILDD	INTEGER			REFS	140	DEFINED	94				
1	IFILES	INTEGER	ARRAY	CFILES	REFS	34	41	DEFINED	53			
335	IFILFS	* INTEGER	*UNDEF		REFS	144						
306	IFILIS	INTEGER			REFS	161	DEFINED	96				
302	IFILK	INTEGER			REFS	138	DEFINED	92				
276	IFILL	INTEGER			REFS	132	DEFINED	88				
314	IFILLT	INTEGER			REFS	157	DEFINED	102				
300	IFILM	INTEGER			REFS	109	136	DEFINED	90			
336	IFILS	* INTEGER	*UNDEF		REFS	152						
310	IFILST	INTEGER			REFS	142	DEFINED	98				
321	IFILT	INTEGER			REFS	155	DEFINED	107				
327	IFTRAN	INTEGER			REFS	116	117	118	167	DEFINED	115	116
						117	118					
323	IFTSDL	INTEGER			REFS	163	DEFINED	111				
0	IOINC	INTEGER		CSETUP	REFS	40	57	58	76	77	78	79
						80	81	82				
0	IPOS	INTEGER	ARRAY	FILE	REFS	34	37	50	DEFINED	70		
342	ISC	* INTEGER	*UNDEF		REFS	182						
257	ISCR	INTEGER			REFS	176	DEFINED	73				
0	ISETUP	INTEGER	ARRAY	MATRIX	REFS	34	38	DEFINED	125	126	127	128
						129	130	131	132	133	134	135	136
						137	138	139	140	141	142	143	144
						145	146	147	148	149	150	151	152
						153	154	155	156	157	158	159	160
						161	162	163	164	165	166	167	168

VARIABLES	SN	TYPE	RELOCATION									
					169							
337	IS12	* INTEGER	*UNDEF		REFS	158						
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	34	42	49	DEFINED	54	55	56
					57	58						
255	J	INTEGER			REFS	70	DEFINED	69				
330	JATRAN	* INTEGER	*UNDE		REFS	116						
256	JDSRN	INTEGER			RE S	83	85	87	89	108	170	
					DEFINED	72						
332	JDTRAN	* INTEGER	*UNDEF		REFS	118						
260	JSCR	INTEGER			REFS	177	DEFINED	74				
0	JSETUP	INTEGER	ARRAY	DSRN	REFS	34	36	DEFINED	170	171	172	173
					174	175	176	177	178	179	180	181
					182							
331	JWTRAN	* INTEGER	*UNDEF		REFS	117						
341	KDSRN	* INTEGER	*UNDEF		REFS	171						
0	KFILES	INTEGER		CFILES	REFS	41	DEFINED	59				
0	KINIT	INTEGER		F.P.	REFS	48	DEFINED	31				
340	KOR	* INTEGER	*UNDEF		REFS	159						
265	KSCR	INTEGER			REFS	110	178	DEFINED	79			
3	LDF	INTEGER		SUM	REFS	39						
263	LDSRN	INTEGER			REFS	99	103	105	172	DEFINED	77	
2	LDT	INTEGER		SUM	REFS	39						
5	LMF	INTEGER		SUM	REFS	39	DEFINED	109				
4	LMT	INTEGER		SUM	REFS	39	DEFINED	108				
266	LSCR	INTEGER			REFS	112	179	DEFINED	80			
1	LSF	INTEGER		SUM	REFS	39						
0	LST	INTEGER		SUM	REFS	39						
245	MATXC1	INTEGER			REFS	125	DEFINED	61				
246	MATXC2	INTEGER			REFS	126	DEFINED	62				
247	MATXM1	INTEGER			REFS	133	DEFINED	63				
250	MATXM2	INTEGER			REFS	134	DEFINED	64				
251	MATXS1	INTEGER			REFS	149	DEFINED	65				
252	MATXS2	INTEGER			REFS	150	DEFINED	66				
261	MDSRN	INTEGER			REFS	91	93	173	DEFINED	75		
253	MEMOUT	INTEGER			REFS	153	DEFINED	67				
243	MPOS	INTEGER			REFS	69	DEFINED	50				
267	MSCR	INTEGER			REFS	114	180	DEFINED	81			
242	MTAPES	INTEGER			REFS	52	DEFINED	49				
262	NDSRN	INTEGER			REFS	97	106	108	174	DEFINED	76	
270	NSCR	INTEGER			REFS	181	DEFINED	82				
333	NTAERO	INTEGER			REFS	168	DEFINED	119				
324	NTAKDI	INTEGER			REFS	164	DEFINED	112				
273	NTAPBC	INTEGER			REFS	129	DEFINED	85				
271	NTAPC	INTEGER			REFS	127	DEFINED	83				
312	NTAPD	INTEGER			REFS	145	DEFINED	100				
315	NTAPDC	INTEGER			REFS	147	DEFINED	103				
303	NTAPDD	INTEGER			REFS	139	DEFINED	93				
311	NTAPES	INTEGER			REFS	143	DEFINED	99				
305	NTAPIS	INTEGER			REFS	160	DEFINED	95				
301	NTAPK	INTEGER			REFS	137	DEFINED	91				
275	NTAPL	INTEGER			REFS	131	DEFINED	87				
254	NTAPLT	INTEGER			REFS	156	DEFINED	68				
277	NTAPM	INTEGER			REFS	135	DEFINED	89				
317	NTAPS	INTEGER			REFS	151	DEFINED	105				
307	NTAPST	INTEGER			REFS	141	DEFINED	97				
320	NTAPT	INTEGER			REFS	154	DEFINED	106				
326	NTTRAN	INTEGER			REFS	166	DEFINED	114				

VARIABLES SN TYPE RELOCATION
322 NTTSDL INTEGER REFS 162 DEFINED 110

STATEMENT LABELS		DEF LINE	REFERENCES
0	30	71	69
12	100	51	48
0	130	54	52

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
15	130	I	52 54	3B	INSTACK
36	30	J	69 71	2B	INSTACK

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
DSRN	25	0 JSETUP	(25)				
FILE	20	0 IPOS	(20)				
MATRIX	45	0 ISETUP	(45)				
SUM	6	0 LST	(1)	1 LSF	(1)	2 LDT	(1)
		3 LDF	(1)	4 LMT	(1)	5 LMF	(1)
CSETUP	1	0 IOINC	(1)				
CFILES	51	0 KFILES	(1)	1 IFILES	(50)		
CTAPES	50	0 ITAPES	(50)				

STATISTICS
PROGRAM LENGTH 343B 227
CM LABELED COMMON LENGTH 306B 198
52000B CM USED

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      C45700, SUB. LTABLE (LIST TABLE OF CONTENTS)                                LTABLE     2
      C                                                                           LTABLE     3
            SUBROUTINE LTABLE (ITAPEW,KROUPD)                                     LTABLE     4
      C                                                                           LTABLE     5
            INTEGER WIDTHA                                                        LTABLE     6
      C                                                                           LTABLE     7
      C                                                                           LTABLE     8
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS         LTABLE     9
      C     DOUBLE PRECISION DUMMY1,DUMMY2,DUMMY3                                 LTABLE    10
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS            LTABLE    11
      C                                                                           LTABLE    12
            DIMENSION CPAR(2)            ,CHAR(15)                              LTABLE    13
            DIMENSION EQU(100)                                                  LTABLE    14
            DIMENSION FMT(10)            ,FNUM(15)                              LTABLE    15
            DIMENSION  TEXT(18)          ,TMH(18,2)                             LTABLE    16
            DIMENSION XN(2)                                                     LTABLE    17
      C                                                                           LTABLE    18
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE     LTABLE    19
           1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                          LTABLE    20
            COMMON /CTITLE/ LDUMMY,TEXT                                         LTABLE    21
            COMMON /COMPUT/ KOMPUT,NCHARW                                       LTABLE    22
            COMMON /CTABLE/ KTABLE,NPASSD,NROWSD,NCOLSD, NCOLST,KTABLO,NPAGEA   LTABLE    23
           1               ,ITAPET                                              LTABLE    24
            COMMON /CTMH  / KTMH  ,LTMH  ,TMH                                   LTABLE    25
            COMMON /CONSTS/ NO    ,YES                                          LTABLE    26
      C                                                                           LTABLE    27
            EQUIVALENCE (EQU(1),KROUP ), (EQU(2),KLAST ), (EQU(3),NCHAR )       LTABLE    28
           1           ,(EQU(4),NPASS), (EQU(5),NROWS ), (EQU(6),NCOLS )       LTABLE    29
           2           ,(EQU(7),NPAGET),(EQU(8),NWORDS), (EQU(9),CHAR(1))      LTABLE    30
      C                                                                           LTABLE    31
            IF (KTABLO .EQ. 1) GO TO 900                                        LTABLE    32
      C                                                                           LTABLE    33
      C                                                                           LTABLE    34
      C INITIAL CONDITIONS                                                        LTABLE    35
      C                                                                           LTABLE    36
            DATA BLANK /1H /                                                    LTABLE    37
      C                                                                           LTABLE    38
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS         LTABLE    39
      C     DATA DOTS   /4H..../                                                  LTABLE    40
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS            LTABLE    41
      C                                                                           LTABLE    42
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS         LTABLE    43
            DATA DOTS   /10H...../                                              LTABLE    44
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS            LTABLE    45
      C                                                                           LTABLE    46
            DATA OPAR   /4H(9X,/                                                LTABLE    47
            DATA X      /4HX,  /                                                LTABLE    48
            DATA A      /4HA   /                                                LTABLE    49
            DATA C1A    /4H,1A /                                                LTABLE    50
            DATA XN     /4H,12X,4H,2X,/                                         LTABLE    51
            DATA CPAR   /4H   ),4H2I5)/                                         LTABLE    52
            DATA FNUM   /2H 1,2H 2,2H 3,2H 4,2H 5,2H 6,2H 7,2H 8,2H 9,2H10     LTABLE    53
           1            ,2H11,2H12,2H13,2H14,2H15/                             LTABLE    54
            KROUP  =  KROUPD                                                    LTABLE    55
            IF (KROUP.EQ.0)   GOTO 50                                           LTABLE    56
            KROUP  =  0                                                         LTABLE    57
            NWORDS =  15                                                        LTABLE    58
```

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                MAXV   =  NWORDS + 8                                              LTABLE     59
                WRITE (ITAPET) MAXV, KROUP, KLAST, NCHAR, NPASS, NROWS, NCOLS     LTABLE     60
60              1             ,NPAGE, NWORDS, (CHAR(N), N=1,NWORDS)               LTABLE     61
                2             ,DUMMY1,DUMMY2,DUMMY3                               LTABLE     62
             50 CONTINUE                                                          LTABLE     63
                REWIND ITAPET                                                     LTABLE     64
                KOUNT  =  LINES                                                   LTABLE     65
65           C                                                                    LTABLE     66
             C                                                                    LTABLE     67
             C LIST TABELE OF CONTENTS                                            LTABLE     68
             C                                                                    LTABLE     69
            100 CONTINUE                                                          LTABLE     70
70              READ (ITAPET) MAXV, (EQU(IE), IE=1,MAXV),DUMMY1,DUMMY2,DUMMY3     LTABLE     71
                IF (KROUP .EQ. 0) GO TO 900                                       LTABLE     72
                IF (KROUP .NE. 1) GO TO 100                                       LTABLE     73
                LTEXT  =  18                                                      LTABLE     74
                DO 150 L=1,LTEXT                                                  LTABLE     75
75              IF (KLAST .EQ. 1) TEXT(L) =  BLANK                                LTABLE     76
                IF (KLAST .EQ. 2) TEXT(L) =  DOTS                                 LTABLE     77
            150 CONTINUE                                                          LTABLE     78
                DO 170 L=1,NWORDS                                                 LTABLE     79
            170 TEXT(L)=  CHAR(L)                                                 LTABLE     80
80              KOEFA  =  (NCOLST - NCOLS)/NCHARW                                 LTABLE     81
                WIDTHA =  (NCOLST - NCOLS) - KOEFA*NCHARW                         LTABLE     82
                KOEFX  =  1 + NCOLS                                               LTABLE     83
                LTEXT  =  KOEFA                                                   LTABLE     84
                FMT( 1)=  OPAR                                                    LTABLE     85
85              FMT( 2)=  FNUM(KOEFX)                                             LTABLE     86
                FMT( 3)=  X                                                       LTABLE     87
                FMT( 4)=  FNUM(KOEFA)                                             LTABLE     88
                FMT( 5)=  A                                                       LTABLE     89
                FMT( 6)=  FNUM(NCHARW)                                            LTABLE     90
90              FMT( 7)=  BLANK                                                   LTABLE     91
                FMT( 8)=  BLANK                                                   LTABLE     92
                IF (WIDTHA .EQ. 0) GO TO 175                                      LTABLE     93
                LTEXT  =  LTEXT + 1                                               LTABLE     94
                FMT( 7)= C1A                                                      LTABLE     95
95              FMT( 8)=  FNUM(WIDTHA)                                            LTABLE     96
            175 CONTINUE                                                          LTABLE     97
                FMT( 9)=  XN(KLAST)                                               LTABLE     98
                FMT(10)=  CPAR(KLAST)                                             LTABLE     99
                KOUNT  =  KOUNT + NROWS                                           LTABLE    100
100             CALL TITLES (1)                                                   LTABLE    101
                IF (KOUNT .GT. 3*(KTMH-NO)) GO TO 180                             LTABLE    102
                WRITE (ITAPEW,1000)                                               LTABLE    103
                NROWS  =  2                                                       LTABLE    104
                KOUNT  =  KOUNT + NROWS + 1                                       LTABLE    105
105         180 KOUNT  =  KOUNT + 1                                               LTABLE    106
                CALL PLB (1,NROWS,ITAPEW)                                         LTABLE    107
                GO TO (200, 300), KLAST                                           LTABLE    108
            200 WRITE (ITAPEW,FMT ) (TEXT(L), L=1,LTEXT)                          LTABLE    109
                GO TO 400                                                         LTABLE    110
110         300 WRITE (ITAPEW,FMT ) (TEXT(L), L=1,LTEXT),NPASS,NPAGET             LTABLE    111
            400 CONTINUE                                                          LTABLE    112
                GO TO 100                                                         LTABLE    113
            900 CONTINUE                                                          LTABLE    114
                KROUPD =  KROUP                                                   LTABLE    115
```

```
                C                                                       LTABLE    116
                C                                                       LTABLE    117
                C FORMATS                                               LTABLE    118
                C                                                       LTABLE    119
                 1000 FORMAT (10X, 20(1H*),19H TABLE OF CONTENTS ,21(1H*), 2X,  LTABLE    120
      120            1       ,10H PASS PAGE)                           LTABLE    121
                C                                                       LTABLE    122
                      RETURN                                            LTABLE    123
                      END                                               LTABLE    124
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

107 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 LTABLE 3 122

VARIABLES	SN	TYPE	RELOCATION									
174	A	REAL		REFS	88	DEFINED	48					
170	BLANK	REAL		REFS	75	90	91	DEFINED	36			
277	CHAR	REAL	ARRAY	REFS	12	27	59	79				
433	CPAR	REAL	ARRAY	REFS	12	98	DEFINED	51				
175	C1A	REAL		REFS	94	DEFINED	49					
171	DOTS	REAL		REFS	76	DEFINED	43					
257	DUMMY1	REAL		REFS	59	DEFINED	70					
260	DUMMY2	REAL		REFS	59	DEFINED	70					
261	DUMMY3	REAL		REFS	59	DEFINED	70					
267	EQU	REAL	ARRAY	REFS	13	9*27	DEFINED	70				
435	FMT	REAL	ARRAY	REFS	14	108	110	DEFINED	84	85	86	
				87	88	89	90	91	94	95	97	
				98								
447	FNUM	REAL	ARRAY	REFS	14	85	87	89	95			
				DEFINED	52							
262	IE	INTEGER		REFS	70	DEFINED	70					
7	ITAPET	INTEGER	CTABLE	REFS	22	I/O REFS	59	63	70			
0	ITAPEW	INTEGER	F.P.	REFS	106	DEFINED	3	I/O REFS	102	108	110	
7	KBPAGE	INTEGER	CLIST	REFS	18							
4	KLABEL	INTEGER	CLIST	REFS	18							
270	KLAST	INTEGER		REFS	27	59	75	76	97	98	107	
265	KOEFA	INTEGER		REFS	81	83	87	DEFINED	80			
266	KOEFX	INTEGER		REFS	85	DEFINED	82					
0	KOMPUT	INTEGER	COMPUT	REFS	21							
0	KOUNT	INTEGER	CLIST	REFS	18	99	101	104	105			
				DEFINED	64	99	104	105				
11	KOUNTH	INTEGER	CLIST	REFS	18							
12	KOUNTI	INTEGER	CLIST	REFS	18							
1	KPAGE	INTEGER	CLIST	REFS	18							
267	KPOUR	INTEGER		REFS	27	55	59	71	72	114		

VARIABLES	SN	TYPE		RELOCATION								
					DEFINED	54	56					
0	KROUPD	INTEGER		F.P.	REFS	54	DEFINED	3	114			
0	KTABLE	INTEGER		CTABLE	REFS	22						
5	KTABLO	INTEGER		CTABLE	REFS	22	31					
0	KTMH	INTEGER		CTMH	REFS	24	101					
5	KTPAGE	INTEGER		CLIST	REFS	18						
264	L	INTEGER			REFS	75	76	2*79	108	110		
					DEFINED	74	78	108	110			
0	LDUMMY	INTEGER		CTITLE	REFS	20						
2	LINES	INTEGER		CLIST	REFS	18	64					
10	LINESG	INTEGER		CLIST	REFS	18						
3	LINEST	INTEGER		CLIST	REFS	18						
263	LTEXT	INTEGER			REFS	74	93	108	110	DEFINED	73	83
					93							
1	LTMH	INTEGER		CTMH	REFS	24						
255	MAXV	INTEGER			REFS	59	70	DEFINED	58	70		
256	N	INTEGER			REFS	59	DEFINED	59				
271	NCHAR	INTEGER			REFS	27	59					
1	NCHARW	INTEGER		COMPUT	REFS	21	80	81	89			
274	NCOLS	INTEGER			REFS	27	59	80	81	82		
3	NCOLSD	INTEGER		CTABLE	REFS	22						
4	NCOLST	INTEGER		CTABLE	REFS	22	80	81				
0	NO	INTEGER		CONSTS	REFS	25	101					
6	NPAGE	INTEGER		CLIST	REFS	18	59					
6	NPAGEA	INTEGER		CTABLE	REFS	22						
275	NPAGET	INTEGER			REFS	27	110					
272	NPASS	INTEGER			REFS	27	59	110				
1	NPASSD	INTEGER		CTABLE	REFS	22						
273	NROWS	INTEGER			REFS	27	59	99	104	106		
					DEFINED	103						
2	NROWSD	INTEGER		CTABLE	REFS	22						
276	NWORDS	INTEGER			REFS	27	58	2*59	78	DEFINED	57	
172	OPAR	REAL			REFS	84	DEFINED	46				
1	TEXT	REAL	ARRAY	CTITLE	REFS	15	20	108	110	DEFINED	75	76
					79							
2	TMH	REAL	ARRAY	CTMH	REFS	15	24					
254	WIDTHA	INTEGER			REFS	5	92	95	DEFINED	81		
173	X	REAL			REFS	86	DEFINED	47				
466	XN	REAL	ARRAY		REFS	16	97	DEFINED	50			
1	YES	REAL		CONSTS	REFS	25						

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES
PLB		3	106
TITLES		1	100

STATEMENT LABELS		DEF LINE	REFERENCES	
20	50	62	55	
24	100	69	72	112
0	150	77	74	
0	170	79	78	
110	175	96	92	
127	180	105	101	
142	200	108	107	
150	300	110	107	
155	400	111	109	
156	900	113	31	71

STATEMENT LABELS			DEF LINE	REFERENCES
244	1000	FMT	119	102

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
45	150	L	74 77	5B	INSTACK
56	170	L	78 79	3B	INSTACK

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CTITLE	19	0 LDUMMY (1)	1 TEXT (18)	
COMPUT	2	0 KOMPUT (1)	1 NCHARW (1)	
CTABLE	8	0 KTABLE (1)	1 NPASSD (1)	2 NROWSD (1)
		3 NCOLSD (1)	4 NCOLST (1)	5 KTABLO (1)
		6 NPAGEA (1)	7 ITAPET (1)	
CTMH	38	0 KTMH (1)	1 LTMH (1)	2 TMH (36)
CONSTS	2	0 NO (1)	1 YES (1)	

EQUIV CLASSES	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
EQU	100	0 KROUP (1)	1 KLAST (1)	2 NCHAR (1)
		3 NPASS (1)	4 NROWS (1)	5 NCOLS (1)
		6 NPAGET (1)	7 NWORDS (1)	8 CHAR (15)

STATISTICS

PROGRAM LENGTH	4708	312
CM LABELED COMMON LENGTH	1208	80

520000B CM USED

```
      C45700, SUB. LLABEL (LIST TABLE FOR INPUT-OUTPUT LABELS)                  LLABEL     2
      C                                                                         LLABEL     3
      C*************************************************************************LLABEL     4
      C                                                                       * LLABEL     5
      C***  SUBROUTINE LLABEL  ************************************************LLABEL     6
      C                                                                       * LLABEL     7
      C***  COMPUTER VERSION  *************************************************LLABEL     8
      C     ----------------                                                  * LLABEL     9
      C     IBM COMPUTER PROGRAM VERSION                                      * LLABEL    10
      C                                                                       * LLABEL    11
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED      * LLABEL    12
      C     BY CIBM IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE IBM        * LLABEL    13
      C     COMPUTER AND SHOULD BE LEFT BLANK.                                * LLABEL    14
      C                                                                       * LLABEL    15
      C     CDC COMPUTER PROGRAM VERSION                                      * LLABEL    16
      C                                                                       * LLABEL    17
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED      * LLABEL    18
      C     BY CIBM IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE IBM        * LLABEL    19
      C     CCMPUTER AND SHOULD HAVE A C IN COLUMN ONE.                       * LLABEL    20
      C                                                                       * LLABEL    21
      C*************************************************************************LLABEL    22
      C                                                                         LLABEL    23
            SUBROUTINE LLABEL (ITAPEW,KROUPD,KBLAB)                             LLABEL    24
      C                                                                         LLABEL    25
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS       LLABEL    26
      C     DOUBLE PRECISION PNAME ,CNAME ,UNITNA                               LLABEL    27
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS          LLABEL    28
      C                                                                         LLABEL    29
            DIMENSION IOS(100)          ,IOSUM(100)                           LLABEL    30
            DIMENSION EQU(100)                                                LLABEL    31
            DIMENSION FILENA(2)                                               LLABEL    32
            DIMENSION TMH(18,2)                                               LLABEL    33
      C                                                                         LLABEL    34
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE   LLABEL    35
           1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                        LLABEL    36
            COMMON /LABELS/ KFLABO,KDLABO,KFLABI,KDLABI,ITAPEL                LLABEL    37
            COMMON /CTMH  / KTMH  ,LTMH  ,TMH                                 LLABEL    38
            COMMON /CONSTS/ NO    ,YES                                        LLABEL    39
      C                                                                         LLABEL    40
            EQUIVALENCE (EQU(1),KROUP ), (EQU(2),NTAPE ), (EQU(3), FILENA(1)) LLABEL    41
           1           ,(EQU(5),NFILE), (EQU(6),IROWS ), (EQU(7),JCOLS )      LLABEL    42
           2           ,(EQU(8),NPAGET), (EQU(9),TSIO)                        LLABEL    43
      C                                                                         LLABEL    44
            IF (KFLABO .EQ. 1 .AND. KDLABO .EQ. 1) GO TO 950                    LLABEL    45
      C                                                                         LLABEL    46
      C                                                                         LLABEL    47
      C INITIAL CONDITIONS                                                      LLABEL    48
      C                                                                         LLABEL    49
            DATA FSIO   /4HFSIO/                                              LLABEL    50
            DATA DSIO   /4HDSIO/                                              LLABEL    51
            KLABT  =  (KFLABI-1) + (KDLABI-1)                                 LLABEL    52
            KROUP  =  KROUPD                                                  LLABEL    53
            NIOS   =  100                                                     LLABEL    54
            DO 40 IO=1,NIOS                                                   LLABEL    55
            IOSUM(IO) = 0                                                     LLABEL    56
         40 IOS(IO)=  0                                                       LLABEL    57
            IF (KROUP.EQ.0)   GOTO 50                                         LLABEL    58
```

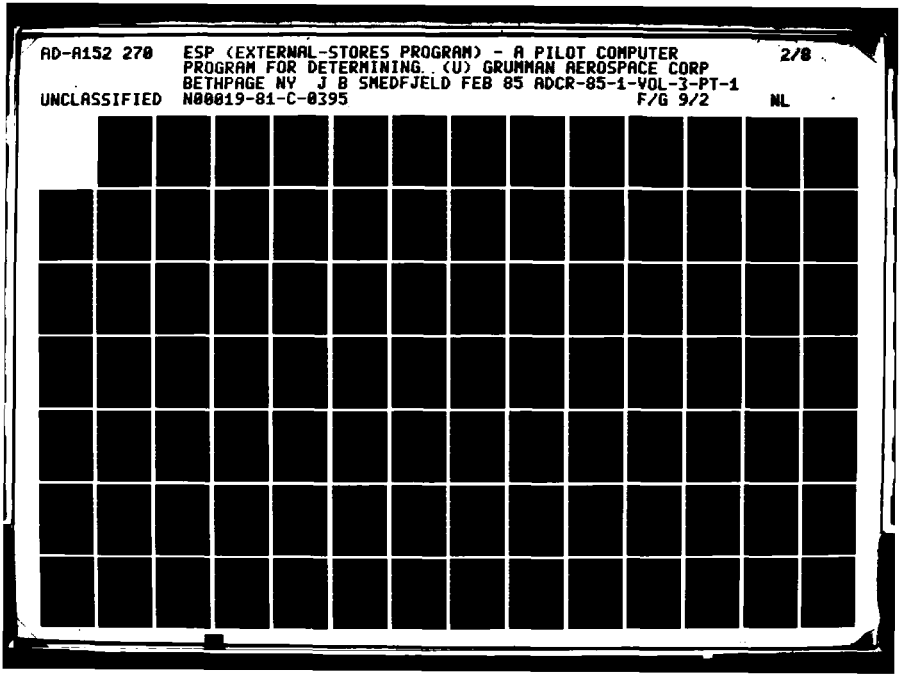
```
                KROUP  =  0                                                    LLABEL     59
                MAXV   =  9                                                    LLABEL     60
60              WRITE (ITAPEL) MAXV,KROUP,NTAPE,FILENA,NFILE,IROWS,JCOLS,NPAGE LLABEL     61
               1              ,TSIO,PNAME,CNAME,UNITNA                         LLABEL     62
             50 CONTINUE                                                       LLABEL     63
          C                                                                    LLABEL     64
          C                                                                    LLABEL     65
65        C LIST INPUT-OUTPUT MATRIX LABELS AS GENERATED WITHIN THE PROGRAM    LLABEL     66
          C                                                                    LLABEL     67
                KLAB   =  0                                                    LLABEL     68
             75 CONTINUE                                                       LLABEL     69
                KLAB   =  KLAB + 1                                             LLABEL     70
70              REWIND ITAPEL                                                  LLABEL     71
                KOUNT  =  LINES                                                LLABEL     72
            100 CONTINUE                                                       LLABEL     73
                READ (ITAPEL) MAXV, (EQU(IE), IE=1,MAXV),PNAME,CNAME,UNITNA    LLABEL     74
                IF (KROUP .EQ. 0) GO TO 200                                    LLABEL     75
75              IF (KROUP .NE. 2) GO TO 100                                    LLABEL     76
                IF (KBLAB  .EQ. 2) GO TO 150                                   LLABEL     77
                IF (KLAB  .GT. 1) GO TO 110                                    LLABEL     78
                IF (KFLABI .EQ. 1) GO TO 110                                   LLABEL     79
                IF (KLAB .EQ. 1     .AND. TSIO .EQ. FSIO) GO TO 150            LLABEL     80
80              GO TO 100                                                      LLABEL     81
            110 CONTINUE                                                       LLABEL     82
                IF (KDLABI .EQ. 1) GO TO 230                                   LLABEL     83
                IF (KLAB .EQ. KLABT .AND. TSIO .EQ. DSIO) GO TO 150            LLABEL     84
                GO TO 100                                                      LLABEL     85
85          150 CONTINUE                                                       LLABEL     86
                IOS(NTAPE) = NTAPE                                             LLABEL     87
                IOSUM(NTAPE) = IOSUM(NTAPE) + 1                                LLABEL     88
                CALL TITLES (1)                                                LLABEL     89
                IF (KOUNT .GT. 3*(KTMH-NO)) GO TO 180                          LLABEL     90
90              WRITE (ITAPEW,1000)                                            LLABEL     91
                CALL PLB (1,1,ITAPEW)                                          LLABEL     92
                WRITE (ITAPEW,1100)                                            LLABEL     93
                CALL PLB (1,1,ITAPEW)                                          LLABEL     94
                KOUNT  =  KOUNT + 5                                            LLABEL     95
95          180 KOUNT  =  KOUNT + 1                                            LLABEL     96
                WRITE (ITAPEW,1200) PNAME,CNAME,UNITNA,FILENA,NTAPE,NFILE      LLABEL     97
               1                    ,IROWS,JCOLS,NPAGET                        LLABEL     98
                GO TO 100                                                      LLABEL     99
            200 CONTINUE                                                       LLABEL    100
100       C                                                                    LLABEL    101
                IF (KBLAB  EQ. 2) GO TO 230                                    LLABEL    102
                IF (KLAB .LT. KLABT) GO TO 75                                  LLABEL    103
            230 CONTINUE                                                       LLABEL    104
          C                                                                    LLABEL    105
105       C                                                                    LLABEL    106
          C LIST INPUT-OUTPUT MATRIX LABELS IN NUMERICAL ORDER OF I/O UNITS    LLABEL    107
          C                                                                    LLABEL    108
                KOUNT  =  LINES                                                LLABEL    109
                DO 450 IO=1,NIOS                                               LLABEL    110
110             IF (IOSUM(IO) .EQ. 0) GO TO 450                                LLABEL    111
                KLAB   =  0                                                    LLABEL    112
            275 CONTINUE                                                       LLABEL    113
                KLAB   =  KLAB + 1                                             LLABEL    114
                REWIND ITAPEL                                                  LLABEL    115
```

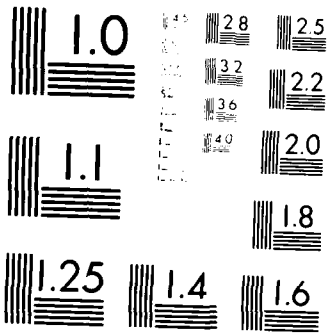
```
115           300 CONTINUE                                                      LLABEL   116
                  IF (IOSUM(IO)  EQ. 0) GO TO 450                               LLABEL   117
                  READ (ITAPEL) MAXV, (EQU(IE), IE=1,MAXV),PNAME,CNAME,UNITNA   LLABEL   118
                  IF '(KROUP .EQ  0) GO TO 400                                  LLABEL   119
                  IF (KROUP .NE. 2) GO TO 300                                   LLABEL   120
120               IF (KBLAB  .EQ. 2) GO TO 350                                  LLABEL   121
                  IF (KLAB  .GT. 1) GO TO 310                                   LLABEL   122
                  IF (KFLABI .EQ. 1) GO TO 310                                  LLABEL   123
                  IF (KLAB .EQ. 1      .AND. TSIO .EQ. FSIO) GO TO 350          LLABEL   124
                  GO TO 300                                                     LLABEL   125
125           310 CONTINUE                                                      LLABEL   126
                  IF (KDLABI .EQ. 1) GO TO 430                                  LLABEL   127
                  IF (KLAB .EQ. KLABT .AND. TSIO .EQ. DSIO) GO TO 350           LLABEL   128
                  GO TO 300                                                     LLABEL   129
              350 CONTINUE                                                      LLABEL   130
130               NTAPEA = IOS(IO)                                              LLABEL   131
                  IF (NTAPEA  .NE. NTAPE) GO TO 300                             LLABEL   132
                  IOSUM(IO)  =  IOSUM(IO) - 1                                   LLABEL   133
                  CALL TITLES (1)                                               LLABEL   134
                  IF (KOUNT .GT. 3*(KTMH-NO)) GO TO 380                         LLABEL   135
135               WRITE (ITAPEW,1010)                                           LLABEL   136
                  CALL PLB (1,1,ITAPEW)                                         LLABEL   137
                  WRITE (ITAPEW,1100)                                           LLABEL   138
                  CALL PLB (1,1,ITAPEW)                                         LLABEL   139
                  KOUNT  =  KOUNT + 5                                           LLABEL   140
140           380 KOUNT  =  KOUNT + 1                                           LLABEL   141
                  WRITE (ITAPEW,1200) PNAME,CNAME,UNITNA,FILENA,NTAPE,NFILE     LLABEL   142
                 1                   ,IROWS,JCOLS,NPAGET                        LLABEL   143
                  GO TO 300                                                     LLABEL   144
              400 CONTINUE                                                      LLABEL   145
145           C                                                                 LLABEL   146
                  IF (KBLAB .EQ. 2) GO TO 430                                   LLABEL   147
                  IF (KLAB .LT. KLABT) GO TO 275                                LLABEL   148
              430 CONTINUE                                                      LLABEL   149
              450 CONTINUE                                                      LLABEL   150
150               KROUPD =  0                                                   LLABEL   151
              950 CONTINUE                                                      LLABEL   152
            C                                                                   LLABEL   153
            C FORMATS                                                           LLABEL   154
             1000 FORMAT (10X,           40HINPUT-OUTPUT MATRIX LABELS AS GENERATED  LLABEL   155
155             1           18HWITHIN THE PROGRAM)                              LLABEL   156
             1100 FORMAT (10X,                                                  LLABEL   157
                 1 30HCALLING   CALLED   UNIT   FILE ,/, 10X,                   LLABEL   158
                 2 57HPROGRAM   PROGRAM  NAME   NAME      UNIT FILE  ROWS  COLS  LLABEL   159
                 3,11X, 4HPAGE)                                                 LLABEL   160
160          1010 FORMAT (10X,51HINPUT-OUTPUT MATRIX LABELS IN NUMERICAL ORDER OF I/ LLABEL   161
                 1           , 7HO UNITS)                                       LLABEL   162
             1200 FORMAT (10X,1A8,2X,1A6,3X,1A6,1X,2A4,2X,1I4,1X,1I4,    2I6    LLABEL   163
                 1       ,11X,1I4)                                              LLABEL   164
            C                                                                   LLABEL   165
165               RETURN                                                        LLABEL   166
                  END                                                           LLABEL   167
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 LLABEL 23 165

VARIABLES	SN	TYPE		RELOCATION								
430	CNAME	REAL			REFS	60	96	141	DEFINED	73	117	
250	DSIO	REAL			REFS	83	127	DEFINED	50			
435	EQU	REAL	ARRAY		REFS	30	8*40	DEFINED	73	117		
437	FILENA	REAL	ARRAY		REFS	31	40	60	96	141		
247	FSIO	REAL			REFS	79	123	DEFINED	49			
433	IE	INTEGER			REFS	73	117	DEFINED	73	117		
425	IO	INTEGER			REFS	55	56	110	116	130	2*132	
					DEFINED	54	109					
601	IOS	INTEGER	ARRAY		REFS	29	130	DEFINED	56	86		
745	IOSUM	INTEGER	ARRAY		REFS	29	87	110	116	132		
					DEFINED	55	87	132				
442	IROWS	INTEGER			REFS	40	60	96	141			
4	ITAPEL	INTEGER		LABELS	REFS	36	I/O REFS	60	70	73	114	117
0	ITAPEW	INTEGER		F.P.	REFS	91	93	136	138	DEFINED	23	
					I/O REFS	90	92	96	135	137	141	
443	JCOLS	INTEGER			REFS	40	60	96	141			
0	KBLAB	INTEGER		F.P.	REFS	76	101	120	146	DEFINED	23	
7	KBPAGE	INTEGER		CLIST	REFS	34						
3	KDLABI	INTEGER		LABELS	REFS	36	51	82	126			
1	KDLABO	INTEGER		LABELS	REFS	36	44					
2	KFLABI	INTEGER		LABELS	REFS	36	51	78	122			
0	KFLABO	INTEGER		LABELS	REFS	36	44					
432	KLAB	INTEGER			REFS	69	77	79	83	102	113	121
						123	127	147	DEFINED	67	69	111	113
4	KLABEL	INTEGER		CLIST	REFS	34						
423	KLABT	INTEGER			REFS	83	102	127	147	DEFINED	51	
0	KOUNT	INTEGER		CLIST	REFS	34	89	94	95	134	139	140
					DEFINED	71	94	95	108	139	140	
11	KOUNTH	INTEGER		CLIST	REFS	34						
12	KOUNTI	INTEGER		CLIST	REFS	34						
1	KPAGE	INTEGER		CLIST	REFS	34						
435	KROUP	INTEGER			REFS	40	57	60	74	75	118	119
					DEFINED	52	58					
0	KROUPD	INTEGER		F.P.	REFS	52	DEFINED	23	150			
0	KTMH	INTEGER		CTMH	REFS	37	89	134				
5	KTPAGE	INTEGER		CLIST	REFS	34						
2	LINES	INTEGER		CLIST	REFS	34	71	108				
10	LINESG	INTEGER		CLIST	REFS	34						
3	LINEST	INTEGER		CLIST	REFS	34						
1	LTMH	INTEGER		CTMH	REFS	37						
426	MAXV	INTEGER			REFS	60	73	117	DEFINED	59	73	117
441	NFILE	INTEGER			REFS	40	60	96	141			
424	NIOS	INTEGER			REFS	54	109	DEFINED	53			
0	NO	INTEGER		CONSTS	REFS	38	89	134				
6	NPAGE	INTEGER		CLIST	REFS	34	60					
444	NPAGET	INTEGER			REFS	40	96	141				
436	NTAPE	INTEGER			REFS	40	60	2*86	2*87	96	131	141
434	NTAPEA	INTEGER			REFS	131	DEFINED	130				
427	PNAME	REAL			REFS	60	96	141	DEFINED	73	117	
2	TMH	REAL	ARRAY	CTMH	REFS	32	37					


AD-A152 270
ESP (EXTERNAL-STORES PROGRAM) - A PILOT COMPUTER PROGRAM FOR DETERMINING.. (U) GRUMMAN AEROSPACE CORP BETHPAGE NY J B SMEDFJELD FEB 85 ADCR-85-1-VOL-3-PT-1
2/8
UNCLASSIFIED
N00019-81-C-0395
F/G 9/2
NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

```
VARIABLES      SN  TYPE          RELOCATION
  445  TSIO       REAL                          REFS      40      60      79      83     123     127
  431  UNITNA     REAL                          REFS      60      96     141  DEFINED      73     117
    1  YES        REAL                CONSTS    REFS      38
       VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS          TYPE   ARGS       REFERENCES
       PLB                   3            91      93     136     138
       TITLES                1            88     133

STATEMENT LABELS             DEF LINE   REFERENCES
    0  40                        56         54
   32  50                        62         57
   33  75                        68        102
   40  100                       72         75      80      84      98
   63  110                       81         77      78
   73  150                       85         76      79      83
  120  180                       95         89
  124  200                       99         74
  131  230                      103         82     101
  137  275                      112        147
  142  300                      115        119     124     128     131     143
  166  310                      125        121     122
  176  350                      129        120     123     127
  224  380                      140        134
  230  400                      144        118
  234  430                      148        126     146
  234  450                      149        109     110     116
  240  950                      151         44
  357  1000     FMT             154         90
  404  1010     FMT             160        135
  367  1100     FMT             156         92     137
  414  1200     FMT             162         96     141

LOOPS  LABEL    INDEX     FROM-TO    LENGTH    PROPERTIES
   22  40       IO          54 56       3B     INSTACK
  134  450      IO         109 149     103B              EXT REFS

COMMON BLOCKS   LENGTH    MEMBERS - BIAS NAME(LENGTH)
       CLIST        11              0 KOUNT  (1)     1 KPAGE  (1)     2 LINES  (1)
                                    3 LINEST (1)     4 KLABEL (1)     5 KTPAGE (1)
                                    6 NPAGE  (1)     7 KBPAGE (1)     8 LINESG (1)
                                    9 KOUNTH (1)    10 KOUNTI (1)
       LABELS        5              0 KFLABO (1)     1 KDLABO (1)     2 KFLABI (1)
                                    3 KDLABI (1)     4 ITAPEL (1)
       CTMH         38              0 KTMH   (1)     1 LTMH   (1)     2 TMH    (36)
       CONSTS        2              0 NO     (1)     1 YES    (1)

EQUIV CLASSES   LENGTH    MEMBERS - BIAS NAME(LENGTH)
       EQU          100             0 KROUP  (1)     1 NTAPE  (1)     2 FILENA (2)
                                    4 NFILE  (1)     5 IROWS  (1)     6 JCOLS  (1)
                                    7 NPAGET (1)     8 TSIO   (1)

STATISTICS
  PROGRAM LENGTH                1116B      590
  CM LABELED COMMON LENGTH       70B       56
        520000B CM USED
```

```
      C457000 SUB. FSIOFO (FORTRAN SEQUENTIAL I/O FOR FLUTTER OPTIMIZATION)
      C
            SUBROUTINE FSIOFO
      C
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
      C     DOUBLE PRECISION FSIONS
      C     DOUBLE PRECISION FDVIBA,FAICFA
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
      C
      C
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS
            DIMENSION IFILES(1)
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS
            DIMENSION KLUE(80),FSIONS(20),ITAPES(50)
            DIMENSION NFUF(20,3)
      C
      C
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS
            COMMON /CFILES/ KFILES,IFILES
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS
      C
            COMMON /FSIO1 / LFUF  ,LFUFD ,NFUF
            COMMON /FSIO2 / FSIONS
            COMMON /CTAPES/ ITAPES
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP
            COMMON /CLUEM / LKLUE ,KLUE
      C
      C
      C INITIAL CONDITIONS
      C
            DATA FDVIBA /8HIDVIBA  /
            DATA FAICFA/ 8HIAICFA  /
            DO 100 I=1,50
      C
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS
            IFILES(I) =  1
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS
      C
            ITAPES(I) =  I
        100 CONTINUE
            LFUF   =  2
            LFUFD  =  20
            KANAV  =  KLUE(3)
      C
      C
      C ENTER CARD DATA
      C
            KFSIO  =  NO
            IF (KFSIO .EQ. NO) GO TO 200
            READ (ITAPER,1000) IDVIBA,JDVIBA,KDVIBA,IAICFA,JAICFA,KAICFA
        200 CONTINUE
      C
      C
      C TRANSFER I/O DATA FROM NONSUBSCRIPTED TO SUBSCRIPTED VARIABLES
      C
            IDVIBA =  17
```

```
                    KDVIBA =  1                                          FSIOFO     59
                    IAICFA =  0                                          FSIOFO     60
   60               JAICFA =  0                                          FSIOFO     61
                    KAICFA =  0                                          FSIOFO     62
                    IF (KANAV .EQ. 2) JDVIBA = 0                         FSIOFO     63
                    FSIONS( 1) =  FDVIBA                                 FSIOFO     64
                    NFUF( 1,1) =  IDVIBA                                 FSIOFO     65
   65               NFUF( 1,2) =  JDVIBA                                 FSIOFO     66
                    NFUF( 1,3) =  KDVIBA                                 FSIOFO     67
                    FSIONS( 2) =  FAICFA                                 FSIOFO     68
                    NFUF( 2,1) =  IAICFA                                 FSIOFO     69
                    NFUF( 2,2) =  JAICFA                                 FSIOFO     70
   70               NFUF( 2,3) =  KAICFA                                 FSIOFO     71
               C                                                         FSIOFO     72
               C                                                         FSIOFO     73
               C FORMATS                                                 FSIOFO     74
               C                                                         FSIOFO     75
   75           1000 FORMAT ( 4(1I4,2I3))                                FSIOFO     76
               C                                                         FSIOFO     77
                    RETURN                                               FSIOFO     78
                    END                                                  FSIOFO     79
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
1	FSIOFO	3	77

VARIABLES

		SN	TYPE		RELOCATION								
44	FAICFA		REAL			REFS	67	DEFINED	32				
43	FDVIBA		REAL			REFS	63	DEFINED	31				
0	FSIONS		REAL	ARRAY	FSIO2	REFS	14	23	DEFINED	63	67		
62	I		INTEGER			REFS	36	2*39	DEFINED	33			
71	IAICFA		INTEGER			REFS	68	DEFINED	50	59			
66	IDVIBA		INTEGER			REFS	64	DEFINED	50	56			
1	IFILES		INTEGER	ARRAY	CFILES	REFS	12	19	DEFINED	36			
2	ITAPEP		INTEGER		COMRWP	REFS	25						
0	ITAPER		INTEGER		COMRWP	REFS	25	I/O REFS	50				
0	ITAPES		INTEGER	ARRAY	CTAPES	REFS	14	24	DEFINED	39			
1	ITAPEW		INTEGER		COMRWP	REFS	25						
72	JAICFA		INTEGER			REFS	69	DEFINED	50	60			
67	JDVIBA		INTEGER			REFS	65	DEFINED	50	57	62		
73	KAICFA		INTEGER			REFS	70	DEFINED	50	61			
63	KANAV		INTEGER			REFS	62	DEFINED	43				
70	KDVIBA		INTEGER			REFS	66	DEFINED	50	58			
0	KFILES		INTEGER		CFILES	REFS	19						
64	KFSIO		INTEGER			REFS	49	DEFINED	48				
1	KLUE		INTEGER	ARRAY	CLUEM	REFS	14	26	43				
0	LFUF		INTEGER		FSIO1	REFS	22	DEFINED	41				
1	LFUFD		INTEGER		FSIO1	REFS	22	DEFINED	42				
0	LKLUE		INTEGER		CLUEM	REFS	26						
2	NFUF		INTEGER	ARRAY	FSIO1	REFS	15	22	DEFINED	64	65	66	68
							69	70					
65	NO		INTEGER	*UNDEF		REFS	48	49					

VARIABLES SN TYPE RELOCATION
VARIABLES USED AS FILE NAMES, SEE ABOVE

STATEMENT LABELS			DEF LINE	REFERENCES
0	100		40	33
20	200		51	49
57	1000	FMT	75	50

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
5	100	I	33 40	38	INSTACK

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CFILES	2	0 KFILES (1)	1 IFILES (1)	
FSIO1	62	0 LFUF (1)	1 LFUFD (1)	2 NFUF (60)
FSIO2	20	0 FSIONS (20)		
CTAPES	50	0 ITAPES (50)		
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CLUEM	81	0 LKLUE (1)	1 KLUE (80)	

STATISTICS

PROGRAM LENGTH	74B	60
CM LABELED COMMON LENGTH	332B	218

520000B CM USED

```
      C45700 SUB. DSIOFO (DISK SEQUENTIAL I/O FOR FLUTTER  OPTIMIZATION)
      C
            SUBROUTINE DSIOFO
      C
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
      C     DOUBLE PRECISION DSIONS
      C     DOUBLE PRECISION DFLEX ,DSTIFF,DDEFLS,DMEMBS,DESTIF
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
      C
            DIMENSION DSIONS(20)
            DIMENSION NDUF(20,3)
      C
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP
            COMMON /DSIO1 / LDUF  ,LDUFD ,NDUF
            COMMON /DSIO2 / DSIONS
      C
      C
      C INITIAL CONDITIONS
      C
            DATA DFLEX  /8HLFLEX   /
            DATA DSTIFF /8HLSTIFF  /
            DATA DDEFLS /8HLDEFLS  /
            DATA DMEMBS /8HLMEMBS  /
            DATA DESTIF /8HLESTIF  /
            LDUF   =  5
            LDUFD  =  20
      C
      C
      C ENTER CARD DATA
      C
            KDSIO  =  NO
            IF (KDSIO .EQ. NO) GO TO 200
            READ (ITAPER,1000) LFLEX ,MFLEX ,NFLEX ,LSTIFF,MSTIFF,NSTIFF
           1                  ,LDEFLS,MDEFLS,NDEFLS,LMEMBS,MMEMBS,NMEMBS
           2                  ,LESTIF,MESTIF,NESTIF
        200 CONTINUE
      C
      C
      C TRANSFER I/O DATA FROM NONSUBSCRIPTED VARIABLES TO SUBSCRIPTED
      C VARIABLES
      C
            LFLEX  =  0
            MFLEX  =  0
            NFLEX  =  0
            LSTIFF =  0
            MSTIFF =  0
            NSTIFF =  0
            LDEFLS =  0
            MDEFLS =  0
            NDEFLS =  0
            LMEMBS =  0
            MMEMBS =  0
            NMEMBS =  0
            LESTIF =  0
            MESTIF =  0
            NESTIF =  0
            DSIONS( 1)  = DFLEX
```

```
                      NDUF( 1,1) = LFLEX                                DSIOFO     59
                      NDUF( 1,2) = MFLEX                                DSIOFO     60
      60              NDUF( 1,3) = NFLEX                                DSIOFO     61
                      DSIONS( 2) = DSTIFF                               DSIOFO     62
                      NDUF( 2,1) = LSTIFF                               DSIOFO     63
                      NDUF( 2,2) = MSTIFF                               DSIOFO     64
                      NDUF( 2,3) = NSTIFF                               DSIOFO     65
      65              DSIONS( 3) = DDEFLS                               DSIOFO     66
                      NDUF( 3,1) = LDEFLS                               DSIOFO     67
                      NDUF( 3,2) = MDEFLS                               DSIOFO     68
                      NDUF( 3,3) = NDEFLS                               DSIOFO     69
                      DSIONS( 4) = DMEMBS                               DSIOFO     70
      70              NDUF( 4,1) = LMEMBS                               DSIOFO     71
                      NDUF( 4,2) = MMEMBS                               DSIOFO     72
                      NDUF( 4,3) = NMEMBS                               DSIOFO     73
                      DSIONS( 5) = DESTIF                               DSIOFO     74
                      NDUF( 5,1) = LESTIF                               DSIOFO     75
      75              NDUF( 5,2) = MESTIF                               DSIOFO     76
                      NDUF( 5,3) = NESTIF                               DSIOFO     77
                C                                                       DSIOFO     78
                C                                                       DSIOFO     79
                C FORMATS                                               DSIOFO     80
      80         1000 FORMAT ( 4(1I4,2I3))                              DSIOFO     81
                C                                                       DSIOFO     82
                      RETURN                                            DSIOFO     83
                      END                                               DSIOFO     84
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
1	DSIOFO	3	82

VARIABLES

	SN	TYPE		RELOCATION								
41	DDEFLS	REAL			REFS	65	DEFINED	22				
43	DESTIF	REAL			REFS	73	DEFINED	24				
37	DFLEX	REAL			REFS	57	DEFINED	20				
42	DMEMBS	REAL			REFS	69	DEFINED	23				
0	DSIONS	REAL	ARRAY	DSIO2	REFS	10	15	DEFINED	57	61	65	69
					73							
40	DSTIFF	REAL			REFS	61	DEFINED	21				
2	ITAPEP	INTEGER		COMRWP	REFS	13						
0	ITAPER	INTEGER		COMRWP	REFS	13	I/O REFS	33				
1	ITAPEW	INTEGER		COMRWP	REFS	13						
72	KDSIO	INTEGER			REFS	32	DEFINED	31				
102	LDEFLS	INTEGER			REFS	66	DEFINED	33	48			
0	LDUF	INTEGER		DSIO1	REFS	14	DEFINED	25				
1	LDUFD	INTEGER		DSIO1	REFS	14	DEFINED	26				
110	LESTIF	INTEGER			REFS	74	DEFINED	33	54			
74	LFLEX	INTEGER			REFS	58	DEFINED	33	42			
105	LMEMBS	INTEGER			REFS	70	DEFINED	33	51			
77	LSTIFF	INTEGER			REFS	62	DEFINED	33	45			
103	MDEFLS	INTEGER			REFS	67	DEFINED	33	49			
111	MESTIF	INTEGER			REFS	75	DEFINED	33	55			

```
VARIABLES      SN  TYPE            RELOCATION
    75  MFLEX      INTEGER                          REFS      59    DEFINED       33        43
   106  MMEMBS     INTEGER                          REFS      71    DEFINED       33        52
   100  MSTIFF     INTEGER                          REFS      63    DEFINED       33        46
   104  NDEFLS     INTEGER                          REFS      68    DEFINED       33        50
     2  NDUF       INTEGER    ARRAY    DSIO1        REFS      11       14     DEFINED       58        59        60        62
                                                      63      64       66        67        68        70        71        72
                                                      74      75       76
   112  NESTIF     INTEGER                          REFS      76    DEFINED       33        56
    76  NFLEX      INTEGER                          REFS      60    DEFINED       33        44
   107  NMEMBS     INTEGER                          REFS      72    DEFINED       33        53
    73  NO         INTEGER,  *UNDEF                 REFS      31       32
   101  NSTIFF     INTEGER                          REFS      64    DEFINED       33        47
        VARIABLES USED AS FILE NAMES, SEE ABOVE

STATEMENT LABELS                 DEF LINE   REFERENCES
    10  200                         36         32
    67  1000     FMT                80         33

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
        COMRWP        3              0 ITAPER (1)          1 ITAPEW (1)          2 ITAPEP (1)
        DSIO1        62              0 LDUF   (1)          1 LDUFD  (1)          2 NDUF   (60)
        DSIO2        20              0 DSIONS (20)

STATISTICS
  PROGRAM LENGTH                 113B       75
  CM LABELED COMMON LENGTH       125B       85
          520000B CM USED
```

```
      C4570, SUB. PTABLE (PREPARE TABLE OF CONTENTS)                                PTABLE     2
      C                                                                             PTABLE     3
            SUBROUTINE PTABLE (KLAST, NCHAR, CHAR)                                  PTABLE     4
      C                                                                             PTABLE     5
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS           PTABLE     6
      C     DOUBLE PRECISION DUMMY1,DUMMY2,DUMMY3                                   PTABLE     7
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS              PTABLE     8
      C                                                                             PTABLE     9
            DIMENSION CHAR(15)                                                      PTABLE    10
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE         PTABLE    11
           1               ,KBPAGE,LINESG                                           PTABLE    12
            COMMON /CTABLE/ KTABLE,NPASS ,NROWS, NCOLS , NCOLST,KTABLO,NPAGEA       PTABLE    13
           1               ,ITAPET                                                  PTABLE    14
            COMMON /COMPUT/ KOMPUT,NCHARW                                           PTABLE    15
      C                                                                             PTABLE    16
            IF (KTABLO .EQ. 1) GO TO 300                                            PTABLE    17
            IF (KTABLE .EQ. 1) GO TO 300                                            PTABLE    18
            NPAGE  =  NPAGE + NPAGEA                                                PTABLE    19
          100 CONTINUE                                                              PTABLE    20
      C                                                                             PTABLE    21
      C                                                                             PTABLE    22
      C INITIAL CONDITIONS                                                          PTABLE    23
      C                                                                             PTABLE    24
            NCHARI =  NCHAR                                                         PTABLE    25
            IF (NCHAR .GT. NCOLST) NCHARI = NCOLST                                  PTABLE    26
            NWORDS =  (NCHARI-1)/NCHARW+ 1                                          PTABLE    27
            KROUP  =  1                                                             PTABLE    28
            MAXV   =  NWORDS + 8                                                    PTABLE    29
      C                                                                             PTABLE    30
      C                                                                             PTABLE    31
      C PREPARE TABLE OF CONTENTS                                                   PTABLE    32
      C                                                                             PTABLE    33
            WRITE (ITAPET) MAXV, KROUP, KLAST, NCHAR, NPASS, NROWS, NCOLS           PTABLE    34
           1               ,NPAGE, NWORDS, (CHAR(N), N=1,NWORDS),DUMMY1,DUMMY2      PTABLE    35
           2               ,DUMMY3                                                  PTABLE    36
      C                                                                             PTABLE    37
            NPAGE  =  NPAGE - NPAGEA                                                PTABLE    38
            KTABLE = 1                                                              PTABLE    39
            NPAGEA  =  0                                                            PTABLE    40
          300 CONTINUE                                                              PTABLE    41
      C                                                                             PTABLE    42
            RETURN                                                                  PTABLE    43
            END                                                                     PTABLE    44
```

SYMBOLIC REFERENCE MAP (R=3)

```
ENTRY POINTS      DEF LINE      REFERENCES
    3  PTABLE          3          42

VARIABLES      SN  TYPE           RELOCATION
    0  CHAR        REAL        ARRAY      F.P.        REFS          9          33    DEFINED        3
   62  DUMMY1   *  REAL       *UNDEF                  REFS         33
   63  DUMMY2   *  REAL       *UNDEF                  REFS         33
```

```
VARIABLES     SN  TYPE            RELOCATION
   64  DUMMY3   * REAL       *UNDEF                    REFS      33
    7  ITAPET     INTEGER                 CTABLE       REFS      12    I/O REFS      33
    7  KBPAGE     INTEGER                 CLIST        REFS      10
    4  KLABEL     INTEGER                 CLIST        REFS      10
    0  KLAST      INTEGER                  F.P.        REFS      33    DEFINED        3
    0  KOMPUT     INTEGER                 COMPUT       REFS      14
    0  KOUNT      INTEGER                 CLIST        REFS      10
    1  KPAGE      INTEGER                 CLIST        REFS      10
   57  KROUP      INTEGER                              REFS      33    DEFINED       27
    0  KTABLE     INTEGER                 CTABLE       REFS      12        17    DEFINED       38
    5  KTABLO     INTEGER                 CTABLE       REFS      12        16
    5  KTPAGE     INTEGER                 CLIST        REFS      10
    2  LINES      INTEGER                 CLIST        REFS      10
   10  LINESG     INTEGER                 CLIST        REFS      10
    3  LINEST     INTEGER                 CLIST        REFS      10
   60  MAXV       INTEGER                              REFS      33    DEFINED       28
   61  N          INTEGER                              REFS      33    DEFINED       33
    0  NCHAR      INTEGER                  F.P.        REFS      24        25        33    DEFINED        3
   55  NCHARI     INTEGER                              REFS      26    DEFINED       24        25
    1  NCHARW     INTEGER                 COMPUT       REFS      14        26
    3  NCOLS      INTEGER                 CTABLE       REFS      12        33
    4  NCOLST     INTEGER                 CTABLE       REFS      12      2*25
    6  NPAGE      INTEGER                 CLIST        REFS      10        18        33        37    DEFINED       18        37
    6  NPAGEA     INTEGER                 CTABLE       REFS      12        18        37    DEFINED       39
    1  NPASS      INTEGER                 CTABLE       REFS      12        33
    2  NROWS      INTEGER                 CTABLE       REFS      12        33
   56  NWORDS     INTEGER                              REFS      28      2*33    DEFINED       26
       VARIABLES USED AS FILE NAMES, SEE ABOVE

STATEMENT LABELS              DEF LINE   REFERENCES
    0  100          INACTIVE      19
   35  300                        40         16         17

COMMON BLOCKS    LENGTH     MEMBERS - BIAS NAME(LENGTH)
       CLIST          9              0 KOUNT  (1)          1 KPAGE  (1)          2 LINES  (1)
                                     3 LINEST (1)          4 KLABEL (1)          5 KTPAGE (1)
                                     6 NPAGE  (1)          7 KBPAGE (1)          8 LINESG (1)
       CTABLE         8              0 KTABLE (1)          1 NPASS  (1)          2 NROWS  (1)
                                     3 NCOLS  (1)          4 NCOLST (1)          5 KTABLO (1)
                                     6 NPAGEA (1)          7 ITAPET (1)
       COMPUT         2              0 KOMPUT (1)          1 NCHARW (1)

STATISTICS
  PROGRAM LENGTH                  658       53
  CM LABELED COMMON LENGTH        238       19
        52000B CM USED
```

```
      C45700, SUB  PLABEL (PREPARE TABLE FOR FSIO AND/OR DSIO LABELS)
      C
      C*****************************************************************
      C                                                               *
      C***  SUBROUTINE PLABEL  *******************************************
      C                                                               *
      C***  COMPUTER VERSION  ********************************************
      C     ----------------                                          *
      C     IBM COMPUTER PROGRAM VERSION                              *
      C                                                               *
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED *
      C     BY CIBM IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE IBM  *
      C     COMPUTER AND SHOULD BE LEFT BLANK.                        *
      C                                                               *
      C     CDC COMPUTER PROGRAM VERSION                              *
      C                                                               *
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED *
      C     BY CIBM IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE IBM  *
      C     COMPUTER AND SHOULD HAVE A C IN COLUMN ONE.               *
      C                                                               *
      C*****************************************************************
      C
            SUBROUTINE PLABEL (PNAME,CNAME,NTAPE,NAME,NFILE,IROWS,JCOLS,TSIO)
      C
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
      C     DOUBLE PRECISION PNAME ,CNAME ,UNITNA
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
      C
            DIMENSION NAME(2)
      C
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI
            COMMON /LABELS/ KFLABO,KDLABO,KFLABI,KDLABI,ITAPEL,KLABEI
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP
      C
      C
      C INITIAL CONDIONS
      C
            DATA FSIO   /4HFSIO/
            DATA DSIO   /4HDSIO/
            DATA UNITNA /8H        /
      C
      C
      C LIST LABELS IN THE CURRENT CALCULATION
      C
            IF (KLABEI .EQ. 1) GO TO 50
            LEFT=LINES-KOUNT
            IF(LEFT.LT.3) KOUNT=LINES
            CALL TITLES(2)
            KOUNT=KOUNT+3
            WRITE (ITAPEW,1000) CNAME,PNAME,NAME  ,NTAPE,NFILE,IROWS,JCOLS
         50 CONTINUE
      C
      C
      C PREPARE TABLE FOR INPUT-OUTPUT LABELS
      C
            IF (KLABEI .EQ. 1) GO TO 400
```

```
                      IF (TSIO  EQ  FSIO  AND  KFLABO  EQ  2) GO TO 100                 PLABEL     59
                      IF (TSIO  EQ  DSIO  AND  KDLABO  EQ  2) GO TO 110                 PLABEL     60
     60               GO TO 300                                                         PLABEL     61
                    100 CONTINUE                                                        PLABEL     62
                      KFLABI =  2                                                       PLABEL     63
                      GO TO 120                                                         PLABEL     64
                    110 CONTINUE                                                        PLABEL     65
     65               KDLABI =  2                                                       PLABEL     66
                    120 CONTINUE                                                        PLABEL     67
                      KROUP  =  2                                                       PLABEL     68
                      MAXV   =  9                                                       PLABEL     69
                      WRITE (ITAPEL) MAXV,KROUP,NTAPE,NAME,NFILE,IROWS,JCOLS,NPAGE,TSIO PLABEL     70
     70               1              ,PNAME,CNAME,UNITNA                                PLABEL     71
                C                                                                       PLABEL     72
                    300 CONTINUE                                                        PLABEL     73
                    400 CONTINUE                                                        PLABEL     74
                C                                                                       PLABEL     75
     75         C                                                                       PLABEL     76
                C FORMATS                                                               PLABEL     77
                 1000 FORMAT (1X,/,10X, 5HFROM ,1A6, 1X, 10HCALLED BY , 1A8             PLABEL     78
                      1             ,/,10X,3X, 7HNAME = ,2A4, 1H,,2X                    PLABEL     79
                      2             ,      7HUNIT = ,I2,1H,,2X                          PLABEL     80
     80               3             ,  7HFILE = , I2,1H,,2X                            PLABEL     81
                      4             ,  7HROWS = , I5,1H,,2X                            PLABEL     82
                      5             ,  7HCOLS = ,I5)                                   PLABEL     83
                C                                                                       PLABEL     84
                      RETURN                                                            PLABEL     85
     85               END                                                               PLABEL     86
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

SN	ENTRY POINTS	DEF LINE	REFERENCES
3	PLABEL	23	84

VARIABLES

SN	VARIABLES	TYPE	RELOCATION								
0	CNAME	REAL	F.P.	REFS	51	69	DEFINED	23			
46	DSIO	REAL		REFS	59	DEFINED	40				
45	FSIO	REAL		REFS	58	DEFINED	39				
0	IROWS	INTEGER	F.P.	REFS	51	69	DEFINED	23			
4	ITAPEL	INTEGER	LABELS	REFS	33	I/O REFS	69				
2	ITAPEP	INTEGER	COMRWP	REFS	34						
0	ITAPER	INTEGER	COMRWP	REFS	34						
1	ITAPEW	INTEGER	COMRWP	REFS	34	I/O REFS	51				
0	JCOLS	INTEGER	F.P.	REFS	51	69	DEFINED	23			
7	KBPAGE	INTEGER	CLIST	REFS	31						
3	KDLABI	INTEGER	LABELS	REFS	33	DEFINED	65				
1	KDLABO	INTEGER	LABELS	REFS	33	59					
2	KFLABI	INTEGER	LABELS	REFS	33	DEFINED	62				
0	KFLABO	INTEGER	LABELS	REFS	33						
5	KLABEI	INTEGER	LABELS	REFS	33						
4	KLABEL	INTEGER	CLIST	REFS	31						
0	KOUNT	INTEGER	CLIST	REFS	31	47	50	DEFINED	48	50	
11	KOUNTH	INTEGER	CLIST	REFS	31						

```
VARIABLES      SN  TYPE            RELOCATION
    12  KOUNTI      INTEGER             CLIST        REFS        31
     1  KPAGE       INTEGER             CLIST        REFS        31
   120  KROUP       INTEGER                          REFS        69    DEFINED       67
     5  KTPAGE      INTEGER             CLIST        REFS        31
   117  LEFT        INTEGER                          REFS        48    DEFINED       47
     2  LINES       INTEGER             CLIST        REFS        31       47         48
    10  LINESG      INTEGER             CLIST        REFS        31
     3  LINEST      INTEGER             CLIST        REFS        31
   121  MAXV        INTEGER                          REFS        69    DEFINED       68
     0  NAME        INTEGER   ARRAY      F.P         REFS        29       51         69    DEFINED       23
     0  NFILE       INTEGER              F.P         REFS        51       69    DEFINED       23
     6  NPAGE       INTEGER             CLIST        REFS        31       69
     0  NTAPE       INTEGER              F.P         REFS        51       69    DEFINED       23
     0  PNAME       REAL                 F.P         REFS        51       69    DEFINED       23
     0  TSIO        REAL                 F.P         REFS        58       59         69    DEFINED       23
    47  UNITNA      REAL                             REFS        69    DEFINED       41
        VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS           TYPE   ARGS      REFERENCES
        TITLES               1           49

STATEMENT LABELS              DEF LINE   REFERENCES
    20  50                       52         46
    33  100                      61         58
    35  110                      64         59
    36  120                      66         63
    42  300                      72         60
    42  400                      73         57
   100  1000     FMT             77         51

COMMON BLOCKS    LENGTH     MEMBERS - BIAS NAME(LENGTH)
        CLIST        11             0 KOUNT  (1)        1 KPAGE  (1)        2 LINES  (1)
                                    3 LINEST (1)        4 KLABEL (1)        5 KTPAGE (1)
                                    6 NPAGE  (1)        7 KBPAGE (1)        8 LINESG (1)
                                    9 KOUNTH (1)       10 KOUNTI (1)
        LABELS        6             0 KFLABO (1)        1 KDLABO (1)        2 KFLABI (1)
                                    3 KDLABI (1)        4 ITAPEL (1)        5 KLABEI (1)
        COMRWP        3             0 ITAPER (1)        1 ITAPEW (1)        2 ITAPEP (1)

STATISTICS
  PROGRAM LENGTH                 122B       82
  CM LABELED COMMON LENGTH        24B       20
          520008 CM USED
```

```
ENTRY POINTS      DEF LINE      REFERENCES
     3  MESAGE          4        49

VARIABLES      SN  TYPE            RELOCATION
     2  ITAPEP     INTEGER              COMRWP        REFS        10
     0  ITAPER     INTEGER              COMRWP        REFS        10
     1  ITAPEW     INTEGER              COMRWP        REFS        10        26     I/O REFS       27        28        29
     7  KBPAGE     INTEGER              CLIST         REFS        11
     4  KLABEL     INTEGER              CLIST         REFS        11
     0  KMESAG     INTEGER              MESAG         REFS        13        17
     0  KOMPUT     INTEGER              COMPUT        REFS        15
     0  KOUNT      INTEGER              CLIST         REFS        11        23        30    DEFINED       24        30
    11  KOUNTH     INTEGER              CLIST         REFS        11
    12  KOUNTI     INTEGER              CLIST         REFS        11        24        30    DEFINED       22
     1  KPAGE      INTEGER              CLIST         REFS        11
     2  KTIME      INTEGER              MESAG         REFS        13
     1  KTITLE     INTEGER              MESAG         REFS        13
     5  KTPAGE     INTEGER              CLIST         REFS        11
     0  KTYPE      INTEGER               F.P.         REFS        19        27        28        29    DEFINED        4
   132  L          INTEGER                            REFS        27        28        29    DEFINED       27        28        29
   131  LEFT       INTEGER                            REFS        24    DEFINED       23
     2  LINES      INTEGER              CLIST         REFS        11        23        24
    10  LINESG     INTEGER              CLIST         REFS        11
     3  LINEST     INTEGER              CLIST         REFS        11
     0  NCHAR      INTEGER               F.P.         REFS        20    DEFINED        4
     1  NCHARW     INTEGER              COMPUT        REFS        15        21
   127  NCHAR1     INTEGER                            REFS        21        22    DEFINED       20
   126  NDIV       INTEGER                            REFS        22    DEFINED       18        19
     0  NO         INTEGER              CONSTS        REFS        14        17
     6  NPAGE      INTEGER              CLIST         REFS        11
   130  NWORDS     INTEGER                            REFS        27        28        29    DEFINED       21
     0  TEXT       REAL       ARRAY      F.P          REFS         8        27        28        29    DEFINED        4
     1  YES        INTEGER              CONSTS        REFS         6        14
        VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS           TYPE    ARGS       REFERENCES
        PLB                    3            26
        TITLES                 1            25        33

STATEMENT LABELS              DEF LINE    REFERENCES
   62  500                        32         17
   64  600                        34         31
  107  1000      FMT              43         27
  114  2000      FMT              44         28
  121  3000      FMT              45         29

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
        COMRWP          3              0 ITAPER (1)          1 ITAPEW (1)          2 ITAPEP (1)
        CLIST          11              0 KOUNT  (1)          1 KPAGE  (1)          2 LINES  (1)
                                       3 LINEST (1)          4 KLABEL (1)          5 KTPAGE (1)
                                       6 NPAGE  (1)          7 KBPAGE (1)          8 LINESG (1)
                                       9 KOUNTH (1)         10 KOUNTI (1)
        MESAG           3              0 KMESAG (1)          1 KTITLE (1)          2 KTIME  (1)
        CONSTS          2              0 NO     (1)          1 YES    (1)
        COMPUT          2              0 KOMPUT (1)          1 NCHARW (1)
```

```
      C                                                                 MESAGE      2
      C45700, SUB  MESAGE (ENTER AND LEAVE MESSAGES FROM CALLING PROGRAMS)  MESAGE      3
      C                                                                 MESAGE      4
            SUBROUTINE MESAGE (KTYPE,NCHAR,TEXT)                        MESAGE      5
      C                                                                 MESAGE      6
            INTEGER YES                                                 MESAGE      7
      C                                                                 MESAGE      8
            DIMENSION TEXT(1)                                           MESAGE      9
      C                                                                 MESAGE     10
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                        MESAGE     11
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE  MESAGE     12
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                 MESAGE     13
            COMMON /MESAG / KMESAG,KTITLE,KTIME                         MESAGE     14
            COMMON /CONSTS/ NO    ,YES                                  MESAGE     15
            COMMON /COMPUT/ KOMPUT,NCHARW                               MESAGE     16
      C                                                                 MESAGE     17
            IF (KMESAG .EQ. NO) GO TO 500                               MESAGE     18
            NDIV   =  60                                                MESAGE     19
            IF (KTYPE .EQ. 3) NDIV = 72                                 MESAGE     20
            NCHAR1 =  NCHAR - 1                                         MESAGE     21
            NWORDS =  NCHAR1/NCHARW + 1                                 MESAGE     22
            KOUNTI =  NCHAR1/NDIV + 3                                   MESAGE     23
            LEFT=LINES-KOUNT                                            MESAGE     24
            IF(LEFT.LT.KOUNTI) KOUNT=LINES                              MESAGE     25
            CALL TITLES(2)                                              MESAGE     26
            CALL PLB (1,2,ITAPEW)                                       MESAGE     27
            IF (KTYPE .EQ. 1) WRITE (ITAPEW,1000) (TEXT(L), L=1,NWORDS)  MESAGE     28
            IF (KTYPE .EQ. 2) WRITE (ITAPEW,2000) (TEXT(L), L=1,NWORDS)  MESAGE     29
            IF (KTYPE .EQ. 3) WRITE (ITAPEW,3000) (TEXT(L), L=1,NWORDS)  MESAGE     30
            KOUNT=KOUNT+KOUNTI                                          MESAGE     31
            GO TO 600                                                   MESAGE     32
        500 CONTINUE                                                    MESAGE     33
            CALL TITLES(2)                                              MESAGE     34
        600 CONTINUE                                                    MESAGE     35
      C                                                                 MESAGE     36
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS  MESAGE     37
      C1000 FORMAT (10X, 12HENTER PROG. ,15A4 / (22X, 15A4))            MESAGE     38
      C2000 FORMAT (10X, 12HLEAVE PROG. ,15A4 / (22X, 15A4))            MESAGE     39
      C3000 FORMAT (10X, 18A4)                                          MESAGE     40
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS  MESAGE     41
      C                                                                 MESAGE     42
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS  MESAGE     43
       1000 FORMAT (10X, 12HENTER PROG. ,6A10 / (22X, 6A10))            MESAGE     44
       2000 FORMAT (10X, 12HLEAVE PROG. ,6A10 / (22X, 6A10))            MESAGE     45
       3000 FORMAT (10X, 7A10,1A2)                                      MESAGE     46
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS  MESAGE     47
      C                                                                 MESAGE     48
      C                                                                 MESAGE     49
            RETURN                                                      MESAGE     50
            END                                                         MESAGE     51
```

SYMBOLIC REFERENCE MAP (R=3)

```
ENTRY POINTS      DEF LINE      REFERENCES
    3  FCLOSE           3        40

VARIABLES     SN  TYPE           RELOCATION
    1  IFILES     INTEGER    ARRAY    CFILES        REFS        6         7    DEFINED       19        35
    0  KFILES     INTEGER             CFILES        REFS        7
    0  KGEN       INTEGER              F.P.         REFS       10    DEFINED        3
    0  NFILE      INTEGER              F.P.         REFS       19        35    DEFINED        3
    0  NTAPE      INTEGER              F.P.         REFS       19        35    DEFINED        3    I/O REFS      16
       VARIABLES USED AS FILE NAMES, SEE ABOVE

STATEMENT LABELS              DEF LINE   REFERENCES
   14  200                       15         10
   22  300                       27         10
   24  400                       38         22

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       CFILES        2              0 KFILES (1)              1 IFILES (1)

STATISTICS
  PROGRAM LENGTH                 26B       22
  CM LABELED COMMON LENGTH        2B        2
          52000B CM USED
```

```
      C45700 SUB  FCLOSE (FORTRAN CLOSING (END OF FILE) OR REWINDING OF I/O)   FCLOSE     2
      C                                                                        FCLOSE     3
            SUBROUTINE FCLOSE (NTAPE,NFILE,KGEN)                               FCLOSE     4
      C                                                                        FCLOSE     5
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS      FCLOSE     6
            DIMENSION IFILES(1)                                                FCLOSE     7
            COMMON /CFILES/ KFILES,IFILES                                      FCLOSE     8
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS         FCLOSE     9
      C                                                                        FCLOSE    10
            GO TO (200, 300), KGEN                                             FCLOSE    11
      C                                                                        FCLOSE    12
      C                                                                        FCLOSE    13
      C CLOSE FILE AT THE END OF A WRITE                                       FCLOSE    14
      C                                                                        FCLOSE    15
        200 CONTINUE                                                           FCLOSE    16
            END FILE NTAPE                                                     FCLOSE    17
      C                                                                        FCLOSE    18
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS      FCLOSE    19
            IFILES(NTAPE) =  NFILE + 1                                         FCLOSE    20
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS         FCLOSE    21
      C                                                                        FCLOSE    22
            GO TO 400                                                          FCLOSE    23
      C                                                                        FCLOSE    24
      C                                                                        FCLOSE    25
      C CLOSE FILE AT THE END OF A READ                                        FCLOSE    26
      C                                                                        FCLOSE    27
        300 CONTINUE                                                           FCLOSE    28
      C                                                                        FCLOSE    29
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS      FCLOSE    30
      C     REWIND NTAPE                                                       FCLOSE    31
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS         FCLOSE    32
      C                                                                        FCLOSE    33
      C                                                                        FCLOSE    34
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS      FCLOSE    35
            IFILES(NTAPE) =  NFILE                                             FCLOSE    36
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS         FCLOSE    37
      C                                                                        FCLOSE    38
        400 CONTINUE                                                           FCLOSE    39
      C                                                                        FCLOSE    40
            RETURN                                                             FCLOSE    41
            END                                                                FCLOSE    42
```

```
CARD NR.  SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

      10     I                AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
```

SYMBOLIC REFERENCE MAP (R=3)

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 TSIO 3 48

VARIABLES SN TYPE RELOCATION

73	IFILE	* INTEGER			DEFINED	46						
0	INCFIL	INTEGER	*UNUSED	F.P.	DEFINED	3						
66	IO	INTEGER			REFS	17	18	31	33	DEFINED	16	30
67	IOS	INTEGER			REFS	21	37	44	46	DEFINED	17	
0	KGEN	INTEGER		F.P.	REFS	23	DEFINED	3				
70	LASTF	INTEGER			REFS	34	36	DEFINED	29	34		
0	LOCFIL	INTEGER	*UNUSED	F.P.	DEFINED	3						
0	LTUF	INTEGER		F.P.	REFS	16	30	DEFINED	3			
0	LTUFD	INTEGER		F.P.	REFS	10	11	DEFINED	3			
72	NEXTF	INTEGER			REFS	34	DEFINED	33				
71	NEXTIO	INTEGER			REFS	32	DEFINED	31				
0	NFILE	INTEGER		F.P.	REFS	37	DEFINED	3	36	44		
0	NTAPE	INTEGER		F.P.	REFS	32	DEFINED	3	21			
0	NTUF	INTEGER	ARRAY	F.P.	REFS	11	21	31	33	44	46	
					DEFINED	3	37					
0	TSION	REAL		F.P.	REFS	18	DEFINED	3				
0	TSIONS	REAL	ARRAY	F.P.	REFS	10	18	DEFINED	3			

INLINE FUNCTIONS TYPE ARGS DEF LINE REFERENCES
MAXO INTEGER 0 INTRIN 34

STATEMENT LABELS DEF LINE REFERENCES

0	100	19	16
17	120	20	18
31	200	28	23
46	230	35	30 32
55	300	43	23
61	400	45	38

LOOPS LABEL INDEX FROM-TO LENGTH PROPERTIES

11	100	IO	16 19	6B	INSTACK	EXITS
40	230	IO	30 35	7B	INSTACK	

STATISTICS
PROGRAM LENGTH 101B 65
52000B CM USED

```
      C45700 SUB  TSIO (SEARCH FOR TYPICAL SEQUENTIAL I/O UNITS AND FILES)     TSIO      2
      C                                                                        TSIO      3
            SUBROUTINE TSIO (TSION,NTAPE,NFILE,INCFIL,LOCFIL,KGEN              TSIO      4
           1                ,TSIONS,NTUF,LTUF,LTUFD)                          TSIO      5
      C                                                                        TSIO      6
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS      TSIO      7
      C     DOUBLE PRECISION TSIONS,TSION                                      TSIO      8
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS         TSIO      9
      C                                                                        TSIO     10
            DIMENSION TSIONS(LTUFD)                                          TSIO     11
            DIMENSION NTUF(LTUFD,3)                                          TSIO     12
      C                                                                        TSIO     13
      C                                                                        TSIO     14
      C INITIAL CONDITIONS                                                     TSIO     15
      C                                                                        TSIO     16
            DO 100 IO=1,LTUF                                                 TSIO     17
            IOS    =  IO                                                     TSIO     18
            IF (TSION .EQ. TSIONS(IO)) GO TO 120                             TSIO     19
          100 CONTINUE                                                       TSIO     20
          120 CONTINUE                                                       TSIO     21
            NTAPE  =  NTUF(IOS,1)                                            TSIO     22
      C                                                                        TSIO     23
            GO TO (200, 300), KGEN                                           TSIO     24
      C                                                                        TSIO     25
      C                                                                        TSIO     26
      C DEFINE FILE NUMBER TO WRITE ON UNIT NTAPE                              TSIO     27
      C                                                                        TSIO     28
          200 CONTINUE                                                       TSIO     29
            LASTF  =  0                                                      TSIO     30
            DO 230 IO=1,LTUF                                                 TSIO     31
            NEXTIO =  NTUF(IO,1)                                             TSIO     32
            IF (NTAPE .NE. NEXTIO) GO TO 230                                 TSIO     33
            NEXTF  =  NTUF(IO,2)                                             TSIO     34
            LASTF  =  MAXO(LASTF,NEXTF)                                      TSIO     35
          230 CONTINUE                                                       TSIO     36
            NFILE  =  LASTF + 1                                              TSIO     37
            NTUF(IOS,2) =  NFILE                                             TSIO     38
            GO TO 400                                                        TSIO     39
      C                                                                        TSIO     40
      C                                                                        TSIO     41
      C DEFINE FILE NUMBER TO READ FROM UNIT NTAPE                             TSIO     42
      C                                                                        TSIO     43
          300 CONTINUE                                                       TSIO     44
            NFILE  =  NTUF(IOS,2)                                            TSIO     45
          400 CONTINUE                                                       TSIO     46
            IFILE  =  NTUF(IOS,3)                                            TSIO     47
      C                                                                        TSIO     48
            RETURN                                                           TSIO     49
            END                                                              TSIO     50
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

23 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

```
      1          C45700 SUB. DSIO (SEARCH FOR DISK SEQUENTIAL I/O UNITS AND FILES)        DSIO        2
                 C                                                                        DSIO        3
                       SUBROUTINE DSIO (DSION,NTAPE,NFILE,INCFIL,LOCFIL,KGEN)             DSIO        4
                 C                                                                        DSIO        5
      5          CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS      DSIO        6
                 C     DOUBLE PRECISION DSIONS,DSION                                      DSIO        7
                 CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS        DSIO        8
                 C                                                                        DSIO        9
                       COMMON /DSIO1 / LDUF   ,LDUFD ,NDUF                              DSIO       10
     10                COMMON /DSIO2 / DSIONS                                           DSIO       11
                 C                                                                        DSIO       12
                 C                                                                        DSIO       13
                 C SEARCH FOR FORTRAN (DSIO) UNIT AND FILE NUMBERS                        DSIO       14
                 C                                                                        DSIO       15
     15                CALL TSIO (DSION,NTAPE,NFILE,INCFIL,LOCFIL,KGEN                   DSIO       16
                    1           ,DSIONS,NDUF,LDUF,LDUFD)                                 DSIO       17
                 C                                                                        DSIO       18
                       RETURN                                                             DSIO       19
                       END                                                                DSIO       20
```

SYMBOLIC REFERENCE MAP (R=3)

```
ENTRY POINTS      DEF LINE     REFERENCES
    3  DSIO            3        18

VARIABLES     SN  TYPE           RELOCATION
    0  DSION      REAL               F.P.        REFS      15    DEFINED      3
    0  DSIONS     REAL              DSIO2        REFS      10       15
    0  INCFIL     INTEGER            F.P.        REFS      15    DEFINED      3
    0  KGEN       INTEGER            F.P.        REFS      15    DEFINED      3
    0  LDUF       INTEGER           DSIO1        REFS       9       15
    1  LDUFD      INTEGER           DSIO1        REFS       9       15
    0  LOCFIL     INTEGER            F.P.        REFS      15    DEFINED      3
    2  NDUF       INTEGER           DSIO1        REFS       9       15
    0  NFILE      INTEGER            F.P.        REFS      15    DEFINED      3
    0  NTAPE      INTEGER            F.P.        REFS      15    DEFINED      3

EXTERNALS          TYPE    ARGS      REFERENCES
       TSIO                 10           15

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       DSIO1         3              0 LDUF   (1)          1 LDUFD  (1)          2 NDUF   (1)
       DSIO2         1              0 DSIONS (1)

STATISTICS
  PROGRAM LENGTH                338       27
  CM LABELED COMMON LENGTH       48        4
        520000B CM USED
```

```
      C45700 SUB. FSIO (SEARCH FOR FORTRAN SEQUENTIAL I/O UNITS AND FILES)
      C
            SUBROUTINE FSIO (FSION,NTAPE,NFILE,INCFIL,LOCFIL,KGEN)
      C
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
      C     DOUBLE PRECISION FSIONS,FSION
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
      C
            COMMON /FSIO1 / LFUF   ,LFUFD ,NFUF
            COMMON /FSIO2 / FSIONS
      C
      C
      C SEARCH FOR FORTRAN (FSIO) UNIT AND FILE NUMBERS
      C
            CALL TSIO (FSION,NTAPE,NFILE,INCFIL,LOCFIL,KGEN
           1          ,FSIONS,NFUF,LFUF,LFUFD)
      C
            RETURN
            END
```

FSIO 2 FSIO 3 FSIO 4 FSIO 5 FSIO 6 FSIO 7 FSIO 8 FSIO 9 FSIO 10 FSIO 11 FSIO 12 FSIO 13 FSIO 14 FSIO 15 FSIO 16 FSIO 17 FSIO 18 FSIO 19 FSIO 20

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 FSIO 3 18

VARIABLES	SN	TYPE	RELOCATION				
FSION	0	REAL	F.P.	REFS	15	DEFINED	3
FSIONS	0	REAL	FSIO2	REFS	10	15	
INCFIL	0	INTEGER	F.P.	REFS	15	DEFINED	3
KGEN	0	INTEGER	F.P.	REFS	15	DEFINED	3
LFUF	0	INTEGER	FSIO1	REFS	9	15	
LFUFD	1	INTEGER	FSIO1	REFS	9	15	
LOCFIL	0	INTEGER	F.P.	REFS	15	DEFINED	3
NFILE	0	INTEGER	F.P.	REFS	15	DEFINED	3
NFUF	2	INTEGER	FSIO1	REFS	9	15	
NTAPE	0	INTEGER	F.P.	REFS	15	DEFINED	3

EXTERNALS	TYPE	ARGS	REFERENCES
TSIO		10	15

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
FSIO1	3	0 LFUF (1)	1 LFUFD (1)	2 NFUF (1)
FSIO2	1	0 FSIONS (1)		

STATISTICS

PROGRAM LENGTH	338	27
CM LABELED COMMON LENGTH	4B	4

52000B CM USED

```
VARIABLES      SN  TYPE            RELOCATION
                                                    74        76        77        79        82
    0  NAME        INTEGER     ARRAY      F.P.      REFS      58        73        74        88      DEFINED      51
    0  NFILE       INTEGER                F.P.      REFS      70        71        88      DEFINED        51
   10  NO2LAB      INTEGER     ARRAY      PUTGET    REFS      59        61
    0  NTAPE       INTEGER                F.P.      REFS      71        83        88      DEFINED        51
    0  PNAME       REAL                   F.P.      REFS      88    DEFINED       51

EXTERNALS           TYPE    ARGS        REFERENCES
       DATE                   1             81
       DFIND                  2             71
       DWRITE                 3             83
       PLABEL                 8             88

STATEMENT LABELS                DEF LINE    REFERENCES
    0  9             INACTIVE       71          70
   14  10                           73        2*70

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       PUTGET      10                 0 LABEL  (8)                 8 NO2LAB (2)

STATISTICS
  PROGRAM LENGTH                  75B       61
  CM LABELED COMMON LENGTH        12B       10
          52000B CM USED
```

```
                      DIMENSION NAME(1)                                                  PUDLAB     59
                      DIMENSION NO2LAB(2)                                                PUDLAB     60
   60           C                                                                        PUDLAB     61
                      COMMON /PUTGET/ LABEL, NO2LAB                                      PUDLAB     62
                C                                                                        PUDLAB     63
                C                                                                        PUDLAB     64
                C PUT LABEL INFORMATION ON INPUT UNIT                                    PUDLAB     65
   65           C                                                                        PUDLAB     66
                      DATA IBIN/3HBIN/                                                   PUDLAB     67
                      DATA IBLANK /1H /                                                  PUDLAB     68
                      LABEL(7) =  IBLANK                                                 PUDLAB     69
                C                                                                        PUDLAB     70
   70                 IF (NFILE) 10, 10, 9                                               PUDLAB     71
                    9 CALL DFIND (NTAPE,NFILE)                                           PUDLAB     72
                C  SET NAME                                                              PUDLAB     73
                   10 LABEL(1)=NAME(1)                                                   PUDLAB     74
                      LABEL(2)=NAME(2)                                                   PUDLAB     75
   75           C  SET ROW+COL COUNTS                                                    PUDLAB     76
                      LABEL(3)=IROWS                                                     PUDLAB     77
                      LABEL(4)=JCOLS                                                     PUDLAB     78
                C  DENOTE BINARY TAPE                                                    PUDLAB     79
                      LABEL(5)=IBIN                                                      PUDLAB     80
   80           C  SET DATE                                                              PUDLAB     81
                      CALL DATE(LABEL(6))                                                PUDLAB     82
                      LABEL(8)=0                                                         PUDLAB     83
                      CALL DWRITE (NTAPE,LABEL(1),32)                                    PUDLAB     84
                C                                                                        PUDLAB     85
   85           C                                                                        PUDLAB     86
                C PREPARE LABEL INFORMATION FOR LISTING                                  PUDLAB     87
                C                                                                        PUDLAB     88
                      CALL PLABEL (PNAME,6HPUDLAB,NTAPE,NAME,NFILE,IROWS,JCOLS,4HDSIO)   PUDLAB     89
                C                                                                        PUDLAB     90
   90                 RETURN                                                             PUDLAB     91
                      END                                                                PUDLAB     92
```

```
CARD NR.  SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

      74     I      NAME       ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	PUDLAB	51	90

VARIABLES	SN	TYPE	RELOCATION										
66	IBIN	INTEGER			REFS	79	DEFINED	66					
67	IBLANK	INTEGER			REFS	68	DEFINED	67					
0	IROWS	INTEGER		F.P.	REFS	76	88	DEFINED	51				
0	JCOLS	INTEGER		F.P.	REFS	77	88	DEFINED	51				
0	LABEL	INTEGER	ARRAY	PUTGET	REFS	57	61	81	83	DEFINED	68	73	

```
      C45700, SUB. PUDLAB (PUT OSIO LABEL ON TAPE)                          PUDLAB     2
      C                                                                     PUDLAB     3
      C*********************************************************************PUDLAB     4
      C                                                                    * PUDLAB     5
      C***  SUBROUTINE PUDLAB ***********************************************PUDLAB     6
      C                                                                    * PUDLAB     7
      C***  COMPUTER VERSION  ***********************************************PUDLAB     8
      C     ----------------                                               * PUDLAB     9
      C     IBM COMPUTER PROGRAM VERSION                                   * PUDLAB    10
      C                                                                    * PUDLAB    11
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED   * PUDLAB    12
      C     BY CIBM IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE IBM     * PUDLAB    13
      C     COMPUTER AND SHOULD BE LEFT BLANK.                             * PUDLAB    14
      C                                                                    * PUDLAB    15
      C     CDC COMPUTER PROGRAM VERSION                                   * PUDLAB    16
      C                                                                    * PUDLAB    17
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED   * PUDLAB    18
      C     BY CIBM IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE IBM     * PUDLAB    19
      C     COMPUTER AND SHOULD HAVE A C IN COLUMN ONE.                    * PUDLAB    20
      C                                                                    * PUDLAB    21
      C***  OBJECTIVE  ******************************************************PUDLAB    22
      C     ---------                                                      * PUDLAB    23
      C     PUTS A LABEL ON A PROGRAMMER CHOSEN DATA SET.                  * PUDLAB    24
      C                                                                    * PUDLAB    25
      C***  INPUT/OUTPUT  ***************************************************PUDLAB    26
      C     ------------                                                   * PUDLAB    27
      C     THE SUBROUTINE RECEIVES FROM THE CALLING ROUTINE THE MATRIX NAME,* PUDLAB    28
      C     SIZE, AND THE UNIT NUMBER.  IF DESIRED, THE                    * PUDLAB    29
      C     PROGRAM WILL PRINT OUT THIS SAME INFORMATION.                  * PUDLAB    30
      C                                                                    * PUDLAB    31
      C***  SUMMARY OF SYMBOLS  *********************************************PUDLAB    32
      C     ------------------                                             * PUDLAB    33
      C.... IROWS ........ INPUT                                           * PUDLAB    34
      C     NUMBER OF ROWS OF THE MATRIX.                                  * PUDLAB    35
      C                                                                    * PUDLAB    36
      C.... JCOLS ........ INPUT                                           * PUDLAB    37
      C     NUMBER OF COLUMNS OF THE MATRIX.                               * PUDLAB    38
      C                                                                    * PUDLAB    39
      C.... NAME(I) ...... INPUT                                           * PUDLAB    40
      C     NAME OF MATRIX MADE UP OF TWO ALPHAMERIC WORDS.                * PUDLAB    41
      C                                                                    * PUDLAB    42
      C.... NTAPE ........ INPUT                                           * PUDLAB    43
      C     DATA SET UNIT FOR STORING THE MATRIX.                          * PUDLAB    44
      C                                                                    * PUDLAB    45
      C***  ERROR MESSAGES  *************************************************PUDLAB    46
      C     --------------                                                 * PUDLAB    47
      C     NONE.                                                          * PUDLAB    48
      C                                                                    * PUDLAB    49
      C*********************************************************************PUDLAB    50
      C                                                                     PUDLAB    51
            SUBROUTINE PUDLAB (PNAME,NTAPE,NAME,NFILE,IROWS,JCOLS)          PUDLAB    52
      C                                                                     PUDLAB    53
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   PUDLAB    54
      C     DOUBLE PRECISION PNAME                                          PUDLAB    55
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS      PUDLAB    56
      C                                                                     PUDLAB    57
            DIMENSION LABEL(8)                                              PUDLAB    58
```

```
EXTERNALS            TYPE    ARGS       REFERENCES
      PLABEL                    8            80

STATEMENT LABELS                    DEF LINE    REFERENCES
    0  9              INACTIVE         69          68
   13  10                              70          2*68

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
      PUTGET        10                 0 LABEL  (8)              8 NO2LAB (2)

STATISTICS
  PROGRAM LENGTH                    76B       62
  CM LABELED COMMON LENGTH          12B       10
         520000B CM USED
```

```
                C                                                                  GEDLAB     59
                      DIMENSION LABEL(8)                                           GEDLAB     60
          60          DIMENSION NAME(1)                                            GEDLAB     61
                      DIMENSION NO2LAB(2)                                          GEDLAB     62
                C                                                                  GEDLAB     63
                      COMMON /PUTGET/ LABEL, NO2LAB                                GEDLAB     64
                C                                                                  GEDLAB     65
          65    C                                                                  GEDLAB     66
                C GET LABEL INFORMATION FROM OUTPUT UNIT                           GEDLAB     67
                C                                                                  GEDLAB     68
                      IF (NFILE) 10, 10, 9                                         GEDLAB     69
                    9 CALL DFIND (NTAPE,NFILE)                                     GEDLAB     70
          70       10 CALL DREAD (NTAPE,LABEL(1),32)                             GEDLAB     71
                      NAME(1)=  LABEL(1)                                           GEDLAB     72
                      NAME(2)=  LABEL(2)                                           GEDLAB     73
                      IROWS  =  LABEL(3)                                           GEDLAB     74
                      JCOLS  =  LABEL(4)                                           GEDLAB     75
          75          IF (LABEL(8).EQ.2) CALL DREAD (NTAPE,NO2LAB(1),8)            GEDLAB     76
                C                                                                  GEDLAB     77
                C                                                                  GEDLAB     78
                C PREPARE LABEL INFORMATION FOR LISTING                            GEDLAB     79
                C                                                                  GEDLAB     80
          80          CALL PLABEL (PNAME,6HGEDLAB,NTAPE,NAME,NFILE,IROWS,JCOLS,4HDSIO) GEDLAB  81
                C                                                                  GEDLAB     82
                      RETURN                                                       GEDLAB     83
                      END                                                          GEDLAB     84
```

```
CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

      72    I      NAME       ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
```

SYMBOLIC REFERENCE MAP (R=3)

```
 ENTRY POINTS      DEF LINE      REFERENCES
     3  GEDLAB          53          82

 VARIABLES      SN  TYPE              RELOCATION
     0  IROWS       INTEGER                F.P.        REFS        80     DEFINED        53         73
     0  JCOLS       INTEGER                F.P.        REFS        80     DEFINED        53         74
     0  LABEL       INTEGER     ARRAY      PUTGET      REFS        59          63         70         71          72          73          74
                                                                   75
     0  NAME        INTEGER     ARRAY       F.P.       REFS        60          80     DEFINED        53          71          72
     0  NFILE       INTEGER                 F.P.       REFS        68          69         80     DEFINED        53
    10  NO2LAB      INTEGER     ARRAY      PUTGET      REFS        61          63         75
     0  NTAPE       INTEGER                 F.P.       REFS        69          70         75          80     DEFINED        53
     0  PNAME       REAL                    F.P.       REFS        80     DEFINED        53

 EXTERNALS            TYPE    ARGS        REFERENCES
       DFIND                    2             69
       DREAD                    3             70          75
```

```
      C45700. SUB  GEDLAB (GET DSIO LABEL FROM TAPE)                        GEDLAB      2
      C                                                                     GEDLAB      3
      C*************************************************************************GEDLAB      4
      C                                                                    * GEDLAB      5
      C***  SUBROUTINE GEDLAB  ********************************************** GEDLAB      6
      C                                                                    * GEDLAB      7
      C***  COMPUTER VERSION  *********************************************** GEDLAB      8
      C     ----------------                                               * GEDLAB      9
      C     IBM COMPUTER PROGRAM VERSION                                   * GEDLAB     10
      C                                                                    * GEDLAB     11
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED   * GEDLAB     12
      C     BY CIBM IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE IBM     * GEDLAB     13
      C     COMPUTER AND SHOULD BE LEFT BLANK.                             * GEDLAB     14
      C                                                                    * GEDLAB     15
      C     CDC COMPUTER PROGRAM VERSION                                   * GEDLAB     16
      C                                                                    * GEDLAB     17
      C     FORTRAN STATEMENTS CONTAINED WITHIN THE TWO CARDS IDENTIFIED   * GEDLAB     18
      C     BY CIBM IN COLUMNS ONE TO FOUR ARE ASSOCIATED WITH THE IBM     * GEDLAB     19
      C     COMPUTER AND SHOULD HAVE A C IN COLUMN ONE.                    * GEDLAB     20
      C                                                                    * GEDLAB     21
      C***  OBJECTIVE  ****************************************************** GEDLAB     22
      C     ---------                                                      * GEDLAB     23
      C     GETS THE LABEL FROM A PROGRAMMER CHOSEN DATA SET.              * GEDLAB     24
      C                                                                    * GEDLAB     25
      C***  INPUT/OUTPUT  *************************************************** GEDLAB     26
      C     ------------                                                   * GEDLAB     27
      C     USING THE INFORMATION SUPPLIED BY THE CALLING ROUTINE THIS     * GEDLAB     28
      C     SUBROUTINE WILL POSITION THE TAPE AND READ THE MATRIX LABEL FROM * GEDLAB     29
      C     THE SPECIFIED DATA SET.                                        * GEDLAB     30
      C                                                                    * GEDLAB     31
      C***  SUMMARY OF SYMBOLS  ********************************************* GEDLAB     32
      C     ------------------                                             * GEDLAB     33
      C                                                                    * GEDLAB     34
      C.... IROWS ........ OUTPUT                                         * GEDLAB     35
      C     NUMBER OF ROWS IN THE MATRIX.                                  * GEDLAB     36
      C                                                                    * GEDLAB     37
      C.... JCOLS .... ... OUTPUT                                         * GEDLAB     38
      C     NUMBER OF COLUMNS IN THE MATRIX.                               * GEDLAB     39
      C                                                                    * GEDLAB     40
      C.... NAME(I) ..... OUTPUT                                          * GEDLAB     41
      C     NAME OF MATRIX MADE UP OF TWO ALPHAMERIC WORDS.                * GEDLAB     42
      C                                                                    * GEDLAB     43
      C.... NTAPE .. ..... INPUT                                          * GEDLAB     44
      C     DATA SET UNIT FROM WHICH THE LABEL AND THE SIZE OF THE MATRIX  * GEDLAB     45
      C     IS TO BE READ.                                                 * GEDLAB     46
      C                                                                    * GEDLAB     47
      C***  ERROR MESSAGES  ************************************************* GEDLAB     48
      C     --------------                                                 * GEDLAB     49
      C     NONE.                                                          * GEDLAB     50
      C                                                                    * GEDLAB     51
      C*************************************************************************GEDLAB     52
      C                                                                     GEDLAB     53
            SUBROUTINE GEDLAB (PNAME,NTAPE,NAME,NFILE,IROWS,JCOLS)          GEDLAB     54
      C                                                                     GEDLAB     55
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   GEDLAB     56
      C     DOUBLE PRECISION PNAME                                          GEDLAB     57
```

STATISTICS

PROGRAM LENGTH	133B	91
CM LABELED COMMON LENGTH	25B	21

520000B CM USED

```
      1          C                                                              TIMEB       2
                 C45700, SUB. TIMEB(COMPUTER TIME VERSION B)                    TIMEB       3
                 C                                                              TIMEB       4
                       SUBROUTINE TIMEB (NCHAR,TEXT)                            TIMEB       5
      5          C                                                              TIMEB       6
                       DIMENSION CHAR(1)                                        TIMEB       7
                       DIMENSION TEXT(1)                                        TIMEB       8
                 C                                                              TIMEB       9
                       COMMON /MESAG / KMESAG,KTITLE,KTIME ,KTIMEL              TIMEB      10
     10          C                                                              TIMEB      11
                       IF (KTIMEL .EQ. 1) GO TO 100                             TIMEB      12
                       CALL TIMEA (KTITLE,KTIME,1,TDUMMY,NCHAR,TEXT)            TIMEB      13
                   100 CONTINUE                                                 TIMEB      14
                 C                                                              TIMEB      15
     15                RETURN                                                   TIMEB      16
                       END                                                      TIMEB      17
```

SYMBOLIC REFERENCE MAP (R=3)

```
ENTRY POINTS      DEF LINE      REFERENCES
    3  TIMEB           4         15

VARIABLES     SN  TYPE           RELOCATION
   25  CHAR       REAL       *UNDEF                    REFS        6
    0  KMESAG     INTEGER             MESAG            REFS        9
    2  KTIME      INTEGER             MESAG            REFS        9        12
    3  KTIMEL     INTEGER             MESAG            REFS        9        11
    1  KTITLE     INTEGER             MESAG            REFS        9        12
    0  NCHAR      INTEGER              F.P.            REFS       12    DEFINED        4
   24  TDUMMY   * REAL                                 REFS       12
    0  TEXT       REAL         ARRAY     F.P.          REFS        7        12    DEFINED        4

EXTERNALS           TYPE    ARGS       REFERENCES
      TIMEA                    6             12

STATEMENT LABELS              DEF LINE   REFERENCES
   13  100                       13         11

COMMON BLOCKS    LENGTH     MEMBERS - BIAS NAME(LENGTH)
      MESAG         4              0 KMESAG (1)              1 KTITLE (1)              2 KTIME  (1)
                                   3 KTIMEL (1)

STATISTICS
  PROGRAM LENGTH                 268       22
  CM LABELED COMMON LENGTH        4B        4
         52000B CM USED
```

```
      1          C                                                                 PROGNA      2
                 C45700, SUB. PROGNA (PROGRAM NAME CONSISTING OF TWO WORDS - VERSION B) PROGNA  3
                 C                                                                 PROGNA      4
                       SUBROUTINE PROGNA (WORD1,WORD2)                             PROGNA      5
      5          C                                                                 PROGNA      6
                       DIMENSION TSH(1)                                            PROGNA      7
                 C                                                                 PROGNA      8
                       COMMON /CTSH  / KTSH  ,LTSH  ,TSH                           PROGNA      9
                 C                                                                 PROGNA     10
     10                L1     =  LTSH - 1                                        PROGNA     11
                       L2     =  LTSH                                            PROGNA     12
                       TSH(L1)=  WORD1                                           PROGNA     13
                       TSH(L2)=  WORD2                                           PROGNA     14
                 C                                                                 PROGNA     15
     15                RETURN                                                    PROGNA     16
                       END                                                       PROGNA     17
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	PROGNA	4	15

VARIABLES

		SN	TYPE		RELOCATION							
0	KTSH		INTEGER		CTSH	REFS	8					
1	LTSH		INTEGER		CTSH	REFS	8	10		11		
14	L1		INTEGER			REFS	12	DEFINED		10		
15	L2		INTEGER			REFS	13	DEFINED		11		
2	TSH		REAL	ARRAY	CTSH	REFS	6	8	DEFINED	12	13	
0	WORD1		REAL		F.P.	REFS	12	DEFINED		4		
0	WORD2		REAL		F.P.	REFS	13	DEFINED		4		

COMMON BLOCKS

	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CTSH	3	0 KTSH (1)	1 LTSH (1)	2 TSH (1)

STATISTICS

PROGRAM LENGTH	16B	14
CM LABELED COMMON LENGTH	3B	3

520000B CM USED

```
      C                                                                 PRMAT1      2
            SUBROUTINE PRMAT1(IUNIT,IFILE,WORK,LOWTRI,IUOUT,LWIDE,NCHAR,A)  PRMAT1      3
      C                                                                 PRMAT1      4
      C                                                                 PRMAT1      5
      C THIS ROUTINE WRITES OUT ALL THE ELEMENTS (INCLUDING ZEROES) OF A  PRMAT1      6
      C MATRIX STORED (IN ROW SORT) ON AN I/O UNIT.                     PRMAT1      7
      C                                                                 PRMAT1      8
      C     IUNIT - UNIT ON WHICH MATRIX RESIDES                        PRMAT1      9
      C     IFILE - FILE ON WHICH MATRIX RESIDES                        PRMAT1     10
      C     WORK  - STORAGE LOCATION IN CORE LARGE ENOUGH TO CONTAIN A ROW  PRMAT1     11
      C             OF THE MATRIX                                       PRMAT1     12
      C                                                                 PRMAT1     13
      C     LOWTRI=0 WRITE OUT ENTIRE MATRIX                            PRMAT1     14
      C           =1 WRITE OUT LOWER TRIANGLE (OF SQUARE MATRIX)        PRMAT1     15
      C                                                                 PRMAT1     16
      C     IUOUT - UNIT TO BE WRITTEN ON                               PRMAT1     17
      C     LWIDE - NUMBER OF MATRIX ELEMENTS (NOT TO EXCEED 7) PER ROW OF  PRMAT1     18
      C             OUTPUT                                              PRMAT1     19
      C     NCHAR - NUMBER OF CHARACTERS IN DESCRIPTIVE COMMENT         PRMAT1     20
      C     A     - DESCRIPTIVE COMMENT                                 PRMAT1     21
      C                                                                 PRMAT1     22
      C                                                                 PRMAT1     23
            DIMENSION WORK(1),NAME(2),MES(4,2)                          PRMAT1     24
            DIMENSION HEAD(2)                                           PRMAT1     25
            DIMENSION A(1)                                              PRMAT1     26
      C                                                                 PRMAT1     27
            COMMON /CLIST / KOUNT,KPAGE,LINES,LINEST,KLABEL,KTPAGE,NPAGE  PRMAT1     28
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                 PRMAT1     29
            COMMON /COMPUT/ KOMPUT,NCHARW                               PRMAT1     30
      C                                                                 PRMAT1     31
            DATA MES/4HFULL,4H MAT,4HRIX ,4H     ,                      PRMAT1     32
           1         4HLOWE,4HR TR,4HIANG,4HLE  /                       PRMAT1     33
            DATA HEAD/4H   V,4HALUE/                                    PRMAT1     34
      C                                                                 PRMAT1     35
      C                                                                 PRMAT1     36
            NWIDE=LWIDE                                                 PRMAT1     37
            IF(NWIDE.GT.7) NWIDE=7                                      PRMAT1     38
      C                                                                 PRMAT1     39
            CALL GEDLAB(6HPRMAT1,IUNIT,NAME,IFILE,KROW,KCOL)            PRMAT1     40
            KLUTRI=LOWTRI                                               PRMAT1     41
            IF(KROW.NE.KCOL) KLUTRI=0                                   PRMAT1     42
            MTRI=KLUTRI+1                                               PRMAT1     43
            JMAX=KCOL                                                   PRMAT1     44
      C                                                                 PRMAT1     45
            NWORDS=(NCHAR-1)/NCHARW + 1                                 PRMAT1     46
            NLINES=(NCHAR-1)/120 + 1                                    PRMAT1     47
      C                                                                 PRMAT1     48
            KOUNT=LINES                                                 PRMAT1     49
      C                                                                 PRMAT1     50
            DO 100 I=1,KROW                                             PRMAT1     51
            IR=I                                                        PRMAT1     52
            IF(KLUTRI EQ 1) JMAX=IR                                     PRMAT1     53
            CALL GETROW(IUNIT,1,WORK,KCOL)                              PRMAT1     54
            JEND=0                                                      PRMAT1     55
      C                                                                 PRMAT1     56
         20 CONTINUE                                                    PRMAT1     57
            JBEG=JEND+1                                                 PRMAT1     58
```

```
                      JEND=JBEG+NWIDE-1                                          PRMAT1    59
                      IF(JEND.GT.JMAX) JEND=JMAX                                 PRMAT1    60
   60           C                                                                 PRMAT1    61
                      CALL TITLES(2)                                             PRMAT1    62
                      IF(KOUNT.GT.KOUNTH) GO TO 30                               PRMAT1    63
                      WRITE(IUOUT,900) NAME,KROW,KCOL,(MES(L,MTRI),L=1,4)        PRMAT1    64
                      KOUNT=KOUNT+2                                              PRMAT1    65
   65                 IF(NCHAR.LE.0) GO TO 25                                    PRMAT1    66
                      WRITE(IUOUT,902) (A(L),L=1,NWORDS)                         PRMAT1    67
                      KOUNT=KOUNT+NLINES                                         PRMAT1    68
                   25 CONTINUE                                                   PRMAT1    69
                      WRITE(IUOUT,903) (HEAD, L=1,NWIDE)                         PRMAT1    70
   70                 KOUNT=KOUNT+3                                              PRMAT1    71
               C                                                                 PRMAT1    72
                   30 CONTINUE                                                   PRMAT1    73
                      WRITE(IUOUT,901) IR,JBEG,(WORK(J),J=JBEG,JEND)             PRMAT1    74
                      KOUNT=KOUNT+1                                              PRMAT1    75
   75          C                                                                 PRMAT1    76
                      IF(JEND.LT.JMAX) GO TO 20                                  PRMAT1    77
               C                                                                 PRMAT1    78
                      LREST=LINES-KOUNT                                          PRMAT1    79
                      IF(LREST.LT.2) GO TO 40                                    PRMAT1    80
   80                 CALL PLB(1,2,IUOUT)                                        PRMAT1    81
                      KOUNT=KOUNT+2                                              PRMAT1    82
                      GO TO 100                                                  PRMAT1    83
                   40 KOUNT=LINES                                                PRMAT1    84
               C                                                                 PRMAT1    85
                  100 CONTINUE                                                   PRMAT1    86
   85          C                                                                 PRMAT1    87
                      CALL DCLOSE(IUNIT)                                         PRMAT1    88
               C                                                                 PRMAT1    89
                  900 FORMAT(/,10X,13HMATRIX NAME= ,2A4,2X,1H(,I4,3H X ,I4,1H),2X,  PRMAT1    90
   90                1       6HPRINT ,4A4)                                      PRMAT1    91
                  901 FORMAT(10X,2I5,7(1PE15.6))                                 PRMAT1    92
               CIBM                                                              PRMAT1    93
               C 902 FORMAT(10X,30A4)                                            PRMAT1    94
               CIBM                                                              PRMAT1    95
   95          CCDC                                                              PRMAT1    96
                  902 FORMAT (10X, 12A10)                                        PRMAT1    97
               CCDC                                                              PRMAT1    98
                  903 FORMAT(/,10X,   10H  ROW  COL,7(7X,2A4),/)                 PRMAT1    99
               C                                                                 PRMAT1   100
  100                 RETURN                                                     PRMAT1   101
                      END                                                        PRMAT1   102
```

SYMBOLIC REFERENCE MAP (R=3)

```
ENTRY POINTS      DEF LINE      REFERENCES
    3  PRMAT1          2        100

VARIABLES      SN  TYPE            RELOCATION
    0  A           REAL        ARRAY      F.P.          REFS        25        66    DEFINED        2
```

VARIABLES	SN	TYPE		RELOCATION								
251	I	INTEGER			REFS	51	DEFINED	50				
0	IFILE	INTEGER		F.P.	REFS	39	DEFINED	2				
252	IR	INTEGER			REFS	52	73	DEFINED	51			
0	IUNIT	INTEGER		F.P.	REFS	39	53	87	DEFINED	2		
0	IUOUT	INTEGER		F.P.	REFS	80	DEFINED	2	I/O REFS	63	66	69
					73							
256	J	INTEGER			REFS	73	DEFINED	73				
254	JBEG	INTEGER			REFS	58	2*73	DEFINED	57			
253	JEND	INTEGER			REFS	57	59	73	76	DEFINED	54	58
					59							
246	JMAX	INTEGER			REFS	2*59	76	DEFINED	43	52		
7	KBPAGE	INTEGER		CLIST	REFS	27						
243	KCOL	INTEGER			REFS	39	41	43	53	63		
4	KLABEL	INTEGER		CLIST	REFS	27						
244	KLUTRI	INTEGER			REFS	42	52	DEFINED	40	41		
0	KOMPUT	INTEGER		COMPUT	REFS	29						
0	KOUNT	INTEGER		CLIST	REFS	27	62	64	67	70	74	78
					81	DEFINED	48	64	67	70	74	81
					83							
11	KOUNTH	INTEGER		CLIST	REFS	27	62					
12	KOUNTI	INTEGER		CLIST	REFS	27						
1	KPAGE	INTEGER		CLIST	REFS	27						
242	KROW	INTEGER			REFS	39	41	50	63			
5	KTPAGE	INTEGER		CLIST	REFS	27						
255	L	INTEGER			REFS	63	66	DEFINED	63	66	69	
2	LINES	INTEGER		CLIST	REFS	27	48	78	83			
10	LINESG	INTEGER		CLIST	REFS	27						
3	LINEST	INTEGER		CLIST	REFS	27						
0	LOWTRI	INTEGER		F.P.	REFS	40	DEFINED	2				
257	LREST	INTEGER			REFS	79	DEFINED	78				
0	LWIDE	INTEGER		F.P.	REFS	36	DEFINED	2				
262	MES	INTEGER	ARRAY		REFS	23	63	DEFINED	31			
245	MTRI	INTEGER			REFS	63	DEFINED	42				
260	NAME	INTEGER	ARRAY		REFS	23	39	63				
0	NCHAR	INTEGER		F.P.	REFS	45	46	65	DEFINED	2		
1	NCHARW	INTEGER		COMPUT	REFS	29	45					
250	NLINES	INTEGER			REFS	67	DEFINED	46				
6	NPAGE	INTEGER		CLIST	REFS	27						
241	NWIDE	INTEGER			REFS	37	58	69	DEFINED	36	37	
247	NWORDS	INTEGER			REFS	66	DEFINED	45				
0	WORK	REAL	ARRAY	F.P.	REFS	23	53	73	DEFINED	2		

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES
DCLOSE		1	87
GEDLAB		6	39
GETROW		4	53
PLB		3	80
TITLES		1	61

STATEMENT LABELS			DEF LINE	REFERENCES	
46	20		56	76	
100	25		68	65	
112	30		72	62	
134	40		83	79	
136	100		85	50	82
217	900	FMT	89	63	

```
STATEMENT LABELS                DEF LINE   REFERENCES
  226  901      FMT                  91         73
  231  902      FMT                  96         66
  233  903      FMT                  98         69

LOOPS  LABEL    INDEX     FROM-TO    LENGTH    PROPERTIES
   35  100      I          50 85       104B              EXT REFS  NOT INNER
  103           L          69 69        4B               EXT REFS

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       CLIST        11               0 KOUNT  (1)          1 KPAGE  (1)          2 LINES  (1)
                                     3 LINEST (1)          4 KLABEL (1)          5 KTPAGE (1)
                                     6 NPAGE  (1)          7 KBPAGE (1)          8 LINESG (1)
                                     9 KOUNTH (1)         10 KOUNTI (1)
       COMPUT        2               0 KOMPUT (1)          1 NCHARW (1)

STATISTICS
  PROGRAM LENGTH                  305B      197
  CM LABELED COMMON LENGTH         15B       13
        520000B CM USED
```

```
      C                                                                 PRMAT2      2
            SUBROUTINE PRMAT2(IUNIT,IFILE,WORK,LOWTRI,IUOUT,LWIDE,NCHAR,A)  PRMAT2      3
      C                                                                 PRMAT2      4
      C                                                                 PRMAT2      5
      C THIS ROUTINE WRITES OUT THE NON-ZERO ELEMENTS OF A MATRIX STORED (IN  PRMAT2      6
      C ROW SORT) ON AN I/O UNIT.                                       PRMAT2      7
      C                                                                 PRMAT2      8
      C     IUNIT - UNIT ON WHICH MATRIX RESIDES                        PRMAT2      9
      C     IFILE - FILE ON WHICH MATRIX RESIDES                        PRMAT2     10
      C     WORK  - STORAGE LOCATION IN CORE LARGE ENOUGH TO CONTAIN A ROW  PRMAT2     11
      C             OF THE MATRIX                                       PRMAT2     12
      C                                                                 PRMAT2     13
      C     LOWTRI=0 WRITE OUT ENTIRE MATRIX                            PRMAT2     14
      C           =1 WRITE OUT LOWER TRIANGLE (OF SQUARE MATRIX)        PRMAT2     15
      C                                                                 PRMAT2     16
      C     IUOUT - UNIT TO BE WRITTEN ON                               PRMAT2     17
      C     LWIDE - NUMBER OF MATRIX ELEMENTS (NOT TO EXCEED 4) PER ROW OF  PRMAT2     18
      C             OUTPUT                                              PRMAT2     19
      C     NCHAR - NUMBER OF CHARACTERS IN DESCRIPTIVE COMMENT         PRMAT2     20
      C     A     - DESCRIPTIVE COMMENT                                 PRMAT2     21
      C                                                                 PRMAT2     22
      C                                                                 PRMAT2     23
            DIMENSION WORK(1),NAME(2),ICOL(4),VALUE(4),MES(4,2)         PRMAT2     24
            DIMENSION HEAD1(2),HEAD2(2)                                 PRMAT2     25
            DIMENSION A(1)                                              PRMAT2     26
      C                                                                 PRMAT2     27
            COMMON /CLIST / KOUNT,KPAGE,LINES,LINEST,KLABEL,KTPAGE,NPAGE  PRMAT2     28
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                 PRMAT2     29
            COMMON /COMPUT/ KOMPUT,NCHARW                               PRMAT2     30
      C                                                                 PRMAT2     31
            DATA MES/4HFULL,4H MAT,4HRIX ,4H     ,                      PRMAT2     32
           1         4HLOWE,4HR TR,4HIANG,4HLE   /                      PRMAT2     33
            DATA HEAD1/4HROW ,4H COL/                                   PRMAT2     34
            DATA HEAD2/4H   V,4HALUE/                                   PRMAT2     35
      C                                                                 PRMAT2     36
      C                                                                 PRMAT2     37
            NWIDE=LWIDE                                                 PRMAT2     38
            IF(NWIDE.GT.4) NWIDE=4                                      PRMAT2     39
      C                                                                 PRMAT2     40
            CALL GEDLAB(6HPRMAT2,IUNIT,NAME,IFILE,KROW,KCOL)            PRMAT2     41
            KLUTRI=LOWTRI                                               PRMAT2     42
            IF(KROW.NE.KCOL) KLUTRI=0                                   PRMAT2     43
            MTRI=KLUTRI+1                                               PRMAT2     44
            JMAX=KCOL                                                   PRMAT2     45
      C                                                                 PRMAT2     46
            NWORDS=(NCHAR-1)/NCHARW + 1                                 PRMAT2     47
            NLINES=(NCHAR-1)/120 + 1                                    PRMAT2     48
      C                                                                 PRMAT2     49
            KOUNT=LINES                                                 PRMAT2     50
      C                                                                 PRMAT2     51
            DO 100 I=1,KROW                                             PRMAT2     52
            IR=I                                                        PRMAT2     53
            IF(KLUTRI.EQ.1) JMAX=IR                                     PRMAT2     54
            CALL GETROW(IUNIT,1,WORK,KCOL)                              PRMAT2     55
            K=0                                                         PRMAT2     56
            J=0                                                         PRMAT2     57
      C                                                                 PRMAT2     58
```

```
                10 J=J+1                                                        PRMAT2     59
C                                                                               PRMAT2     60
60              IF(J.GT.JMAX.AND.K.GT.0) GO TO 20                               PRMAT2     61
                IF(J.GT.JMAX.AND.K.EQ.0) GO TO 40                               PRMAT2     62
                IF(WORK(J).EQ.0.0) GO TO 10                                     PRMAT2     63
C                                                                               PRMAT2     64
                K=K+1                                                           PRMAT2     65
65              ICOL(K)=J                                                       PRMAT2     66
                VALUE(K)=WORK(J)                                                PRMAT2     67
                IF(K.LT.NWIDE) GO TO 10                                         PRMAT2     68
C                                                                               PRMAT2     69
                20 CALL TITLES(2)                                               PRMAT2     70
70              IF(KOUNT.GT.KOUNTH) GO TO 30                                    PRMAT2     71
                WRITE(IUOUT,900) NAME,KROW,KCOL,(MES(L,MTRI),L=1,4)             PRMAT2     72
                KOUNT=KOUNT+2                                                   PRMAT2     73
                IF(NCHAR.LE.0) GO TO 25                                         PRMAT2     74
                WRITE(IUOUT,902) (A(L),L=1,NWORDS)                              PRMAT2     75
75              KOUNT=KOUNT+NLINES                                              PRMAT2     76
                25 CONTINUE                                                     PRMAT2     77
                WRITE(IUOUT,903) ((HEAD1,HEAD2),L=1,NWIDE)                      PRMAT2     78
                KOUNT=KOUNT+3                                                   PRMAT2     79
                30 CONTINUE                                                     PRMAT2     80
80              WRITE(IUOUT,901) ((IR,ICOL(L),VALUE(L)),L=1,K)                  PRMAT2     81
                KOUNT=KOUNT+1                                                   PRMAT2     82
                K=0                                                             PRMAT2     83
                GO TO 10                                                        PRMAT2     84
C                                                                               PRMAT2     85
85              40 IF(KOUNT.GE.LINES) GO TO 100                                 PRMAT2     86
                CALL PLB(1,1,IUOUT)                                             PRMAT2     87
                KOUNT=KOUNT+1                                                   PRMAT2     88
C                                                                               PRMAT2     89
              100 CONTINUE                                                      PRMAT2     90
90          C                                                                   PRMAT2     91
                CALL DCLOSE(IUNIT)                                              PRMAT2     92
C                                                                               PRMAT2     93
              900 FORMAT(/,10X,13HMATRIX NAME= ,2A4,2X,1H(,I4,3H X ,I4,1H),2X,  PRMAT2     94
               1        6HPRINT ,4A4)                                           PRMAT2     95
95            901 FORMAT(10X,4(2I5,1PE15.6,4X))                                 PRMAT2     96
            CIBM                                                                PRMAT2     97
            C 902 FORMAT(10X,30A4)                                              PRMAT2     98
            CIBM                                                                PRMAT2     99
            CCDC                                                                PRMAT2    100
100           902 FORMAT (10X, 12A10)                                           PRMAT2    101
            CCDC                                                                PRMAT2    102
              903 FORMAT(/,10X,4(2X,2A4,7X,2A4,4X),/)                           PRMAT2    103
C                                                                               PRMAT2    104
                RETURN                                                          PRMAT2    105
105             END                                                             PRMAT2    106
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS	DEF LINE	REFERENCES
3 PRMAT2	2	104

VARIABLES	SN	TYPE		RELOCATION								
0	A	REAL	ARRAY	F.P.	REFS	25	74	DEFINED	2			
314	HEAD1	REAL	ARRAY		REFS	24	77	DEFINED	33			
316	HEAD2	REAL	ARRAY		REFS	24	77	DEFINED	34			
265	I	INTEGER			REFS	52	DEFINED	51				
274	ICOL	INTEGER	ARRAY		REFS	23	80	DEFINED	65			
0	IFILE	INTEGER		F.P.	REFS	40	DEFINED	2				
266	IR	INTEGER			REFS	53	80	DEFINED	52			
0	IUNIT	INTEGER		F.P.	REFS	40	54	91	DEFINED	2		
0	IUOUT	INTEGER		F.P.	REFS	86	DEFINED	2	I/O REFS	71	74	77
					80							
270	J	INTEGER			REFS	58	60	61	62	65	66	
					DEFINED	56	58					
262	JMAX	INTEGER			REFS	60	61	DEFINED	44	53		
267	K	INTEGER			REFS	60	61	64	65	66	67	80
					DEFINED	55	64	82				
7	KBPAGE	INTEGER		CLIST	REFS	27						
257	KCOL	INTEGER			REFS	40	42	44	54	71		
4	KLABEL	INTEGER		CLIST	REFS	27						
260	KLUTRI	INTEGER			REFS	43	53	DEFINED	41	42		
0	KOMPUT	INTEGER		COMPUT	REFS	29						
0	KOUNT	INTEGER		CLIST	REFS	27	70	72	75	78	81	85
					87	DEFINED	49	72	75	78	81	87
11	KOUNTH	INTEGER		CLIST	REFS	27	70					
12	KOUNTI	INTEGER		CLIST	REFS	27						
1	KPAGE	INTEGER		CLIST	REFS	27						
256	KROW	INTEGER			REFS	40	42	51	71			
5	KTPAGE	INTEGER		CLIST	REFS	27						
271	L	INTEGER			REFS	71	74	2*80	DEFINED	71	74	77
					80							
2	LINES	INTEGER		CLIST	REFS	27	49	85				
10	LINESG	INTEGER		CLIST	REFS	27						
3	LINEST	INTEGER		CLIST	REFS	27						
0	LOWTRI	INTEGER		F.P.	REFS	41	DEFINED	2				
0	LWIDE	INTEGER		F.P.	REFS	37	DEFINED	2				
304	MES	INTEGER	ARRAY		REFS	23	71	DEFINED	31			
261	MTRI	INTEGER			REFS	71	DEFINED	43				
272	NAME	INTEGER	ARRAY		REFS	23	40	71				
0	NCHAR	INTEGER		F.P.	REFS	46	47	73	DEFINED	2		
1	NCHARW	INTEGER		COMPUT	REFS	29	46					
264	NLINES	INTEGER			REFS	75	DEFINED	47				
6	NPAGE	INTEGER		CLIST	REFS	27						
255	NWIDE	INTEGER			REFS	38	67	77	DEFINED	37	38	
263	NWORDS	INTEGER			REFS	74	DEFINED	46				
300	VALUE	REAL	ARRAY		REFS	23	80	DEFINED	66			
0	WORK	REAL	ARRAY	F.P.	REFS	23	54	62	66	DEFINED	2	

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES
DCLOSE		1	91
GEDLAB		6	40
GETROW		4	54
PLB		3	86
TITLES		1	69

STATEMENT LABELS			DEF LINE	REFERENCES		
47	10		58	62	67	83
61	20		69	60		
105	25		76	73		
117	30		79	70		
137	40		85	61		
146	100		89	51	85	
232	900	FMT	93	71		
241	901	FMT	95	80		
245	902	FMT	100	74		
247	903	FMT	102	77		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
35	100	I	51 89	114B	EXT REFS	NOT INNER
110		L	77 77	4B	EXT REFS	
122		L	80 80	11B	EXT REFS	

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
COMPUT	2	0 KOMPUT (1)	1 NCHARW (1)	

STATISTICS

PROGRAM LENGTH	331B	217
CM LABELED COMMON LENGTH	15B	13

520000B CM USED

```
      C45700. FUN  SCAPRO                                                    SCAPRO      2
      C                                                                      SCAPRO      3
      C*********************************************************************** SCAPRO      4
      C                                                                     * SCAPRO      5
      C***  FUNCTION   SCAPRO  ********************************************** SCAPRO      6
      C                                                                     * SCAPRO      7
      C***  OBJECTIVE  ****************************************************** SCAPRO      8
      C     ---------                                                       * SCAPRO      9
      C     ACCUMULATES PRODUCTS OF ROW AND COLUMN ELEMENTS OF MATRICES.    * SCAPRO     10
      C                                                                     * SCAPRO     11
      C***  INPUT/OUTPUT  *************************************************** SCAPRO     12
      C     ------------                                                    * SCAPRO     13
      C                                                                     * SCAPRO     14
      C***  SUMMARY OF SYMBOLS  ********************************************* SCAPRO     15
      C     ------------------                                              * SCAPRO     16
      C                                                                     * SCAPRO     17
      C***  ERROR MESSAGES  ************************************************* SCAPRO     18
      C     --------------                                                  * SCAPRO     19
      C     NONE.                                                           * SCAPRO     20
      C                                                                     * SCAPRO     21
      C*********************************************************************** SCAPRO     22
      C                                                                      SCAPRO     23
      C                                                                      SCAPRO     24
            FUNCTION SCAPRO(X,Y,S,N,IX,IY)                                   SCAPRO     25
      C  FOR ADDED ACCURACY ( AT A COST IN TIME ) ACTIVATE SEVERAL COMMENT    SCAPRO     26
      C     CARDS AS SHOWN.  ( NOT RECOMMENDED FOR CDC 6000 MACHINES )       SCAPRO     27
            DIMENSION X(1),Y(1)                                              SCAPRO     28
      C  FOR D.P., ACTIVATE NEXT CARD.                                       SCAPRO     29
      C     DOUBLE PRECISION S,SCAPRO                                        SCAPRO     30
            IF (N) 120,120,100                                               SCAPRO     31
        100 JX = 1                                                           SCAPRO     32
            JY = 1                                                           SCAPRO     33
            DO 110  J = 1,N                                                  SCAPRO     34
            S = S + X(JX)*Y(JY)                                              SCAPRO     35
      C  FOR D.P., REPLACE PREVIOUS CARD WITH NEXT CARD.                     SCAPRO     36
      C     S = S + DBLE(X(JX)) * DBLE(Y(JY))                                SCAPRO     37
            JX = JX + IX                                                     SCAPRO     38
        110 JY = JY + IY                                                     SCAPRO     39
        120 SCAPRO = S                                                       SCAPRO     40
      C                                                                      SCAPRO     41
            RETURN                                                           SCAPRO     42
            END                                                              SCAPRO     43
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
4	SCAPRO	24	41

VARIABLES	SN	TYPE	RELOCATION				
0	IX	INTEGER	F P	REFS	37	DEFINED	24
0	IY	INTEGER	F P	REFS	38	DEFINED	24
34	J	* INTEGER		DEFINED	33		

VARIABLES	SN	TYPE	RELOCATION							
33	JY	INTEGER			REFS	34	38	DEFINED	32	38
0	N	INTEGER		F P.	REFS	30	33	DEFINED	24	
0	S	REAL		F P.	REFS	34	39	DEFINED	24	34
31	SCAPRO	REAL			DEFINED	39				
0	X	REAL	ARRAY	F P	REFS	27	34	DEFINED	24	
0	Y	REAL	ARRAY	F P.	REFS	27	34	DEFINED	24	

STATEMENT LABELS			DEF LINE	REFERENCES
0	100	INACTIVE	31	30
0	110		38	33
27	120		39	2*30

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
21	110	J	33 38	4B	INSTACK

STATISTICS

PROGRAM LENGTH 408 32

520008 CM USED

```
      1          C45700, FUN  DSQRTF (SQUARE ROOT)                                  DSQRTF      2
                 C                                                                  DSQRTF      3
                       FUNCTION DSQRTF(ARG)                                         DSQRTF      4
                 C                                                                  DSQRTF      5
      5          CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS DSQRTF      6
                 C     DOUBLE PRECISION ARG, DSQRTF                                 DSQRTF      7
                 C     DSQRTF =  DSQRT(ARG)                                         DSQRTF      8
                 CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   DSQRTF      9
                 C                                                                  DSQRTF     10
     10          C                                                                  DSQRTF     11
                 CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS DSQRTF     12
                       DSQRTF =   SQRT(ARG)                                         DSQRTF     13
                 CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS   DSQRTF     14
                 C                                                                  DSQRTF     15
     15                RETURN                                                       DSQRTF     16
                       END                                                          DSQRTF     17
```

SYMBOLIC REFERENCE MAP (R=3)

```
ENTRY POINTS      DEF LINE     REFERENCES
    4  DSQRTF          3        15

VARIABLES     SN  TYPE           RELOCATION
    0  ARG        REAL                F.P.        REFS        12    DEFINED        3
   10  DSQRTF     REAL                            DEFINED     12

EXTERNALS           TYPE    ARGS       REFERENCES
      SQRT          REAL       1 LIBRARY      12

STATISTICS
  PROGRAM LENGTH                  11B        9
        520008 CM USED
```

```
      WRITE (ITAPEW,135)                                                TAVAM     59
      WRITE (ITAPEW,140)                                                TAVAM     60
      WRITE (ITAPEW,145)                                                TAVAM     61
      WRITE (ITAPEW,150)                                                TAVAM     62
      WRITE (ITAPEW,155)                                                TAVAM     63
      WRITE (ITAPEW,160)                                                TAVAM     64
      WRITE (ITAPEW,165)                                                TAVAM     65
      WRITE (ITAPEW,170)                                                TAVAM     66
      WRITE (ITAPEW,175)                                                TAVAM     67
  100 FORMAT (                                                          TAVAM     68
     *    5X,122(1H*)                                                   TAVAM     69
     *,/, 5X,1H* ,120X,1H*                                              TAVAM     70
     *,/, 5X,1H*,15X                                                    TAVAM     71
     A,13H      A                                                       TAVAM     72
     *,52X, 36H.....                                .,4X,1H*           TAVAM     73
     *,/, 5X,1H*,15X                                                    TAVAM     74
     A,13H     AAA                                                     TAVAM     75
     *,52X, 36H.                                    .,4X,1H*           TAVAM     76
     *,/, 5X,1H*,15X                                                    TAVAM     77
     A,13H    AAAAA                                                    TAVAM     78
     *,52X, 36H.          **** FASTOP ****          .,4X,1H*           TAVAM     79
     *,/, 5X,1H*,15X                                                    TAVAM     80
     A,13H    AAAAA                                                    TAVAM     81
     *,52X, 36H.       FLUTTER AND STRUCTURAL       .,4X,1H*           TAVAM     82
     *,/, 5X,1H*,15X                                                    TAVAM     83
     A,13H   AAA AAA                                                    TAVAM     84
     *,52X, 36H.        OPTIMIZATION PROGRAM        .,4X,1H*)          TAVAM     85
  105 FORMAT (                                                          TAVAM     86
     *    5X,1H*,15X                                                    TAVAM     87
     A,13H   AAA AAA                                                    TAVAM     88
     *,52X, 36H                                     .,4X,1H*           TAVAM     89
     *,/, 5X,1H*,15X                                                    TAVAM     90
     A,13H   AAA AAA                                                    TAVAM     91
     *,52X, 36H.          **** FOP ****             .,4X,1H*           TAVAM     92
     *,/, 5X,1H*,15X                                                    TAVAM     93
     A,13H   AAA AAA                                                    TAVAM     94
     *,52X, 36H.   FLUTTER OPTIMIZATION PACKAGE     .,4X,1H*           TAVAM     95
     *,/, 5X,1H*,15X                                                    TAVAM     96
     A,13H   AAA AAA                                                    TAVAM     97
     *,52X, 36H.                                    .,4X,1H*           TAVAM     98
     *,/, 5X,1H*,15X                                                    TAVAM     99
     A,13H  AAAAAAAAA                                                   TAVAM    100
     *,52X, 36H.          **** AVAM ****            .,4X,1H*)          TAVAM    101
  110 FORMAT (                                                          TAVAM    102
     *    5X,1H*,15X                                                    TAVAM    103
     A,13H  AAAAAAAAA                                                   TAVAM    104
     *,13X                                                              TAVAM    105
     V,13HVVV       VVV                                                 TAVAM    106
     *,26X, 36H.            AUTOMATED               ,4X,1H*            TAVAM    107
     *,/, 5X,1H*,15X                                                    TAVAM    108
     A,13H  AAAA AAAA                                                   TAVAM    109
     *,13X                                                              TAVAM    110
     V,13HVVV       VVV                                                 TAVAM    111
     *,26X, 36H.    VIBRATION ANALYSIS MODULE       .,4X,1H*           TAVAM    112
     *,/, 5X,1H*,15X                                                    TAVAM    113
     A,13H  AAA   AAA                                                   TAVAM    114
     *,13X                                                              TAVAM    115
```

```
      C                                                                       TAVAM      2
      C45700, SUB. TAVAM (TITLE FOR AUTOMATED VIBRATION ANALYSIS MODULE)      TAVAM      3
      C                                                                       TAVAM      4
      C*************************************************************************TAVAM      5
      C                                                                      * TAVAM      6
      C***  SUBROUTINE TAVAM  ************************************************** TAVAM      7
      C                                                                      * TAVAM      8
      C***  OBJECTIVE  ********************************************************* TAVAM      9
      C     ---------                                                        * TAVAM     10
      C     PRINTS THE TITLE PAGE FOR THE AUTOMATED VIBRATION ANALYSIS       * TAVAM     11
      C     MODULE                                                           * TAVAM     12
            SUBROUTINE TAVAM                                                  TAVAM     13
      C                                                                       TAVAM     14
            DIMENSION AFFDL(4)                                                TAVAM     15
      C                                                                       TAVAM     16
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              TAVAM     17
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE   TAVAM     18
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                       TAVAM     19
            COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA  TAVAM     20
           1               ,ITAPET                                            TAVAM     21
            COMMON /CAFFDL/ AFFDL                                             TAVAM     22
      C                                                                       TAVAM     23
      C                                                                       TAVAM     24
      C PREPARE TABLE OF CONTENTS                                             TAVAM     25
      C                                                                       TAVAM     26
            KOUNT  =  LINES                                                   TAVAM     27
            CALL TITLES (-1)                                                  TAVAM     28
            NCOLS  =  0                                                       TAVAM     29
            NROWS  =  2                                                       TAVAM     30
            KTABLE =  2                                                       TAVAM     31
            CALL PTABLE (1,60,60                                              TAVAM     32
           *   H ***    *   *    ***    *   *                               ) TAVAM     33
            NROWS  =  0                                                       TAVAM     34
            KTABLE =  2                                                       TAVAM     35
            CALL PTABLE (1,60,60                                              TAVAM     36
           *   H*   *   *   *   *   ** **          AUTOMATED                ) TAVAM     37
            KTABLE =  2                                                       TAVAM     38
            CALL PTABLE (1,60,60                                              TAVAM     39
           *   H***** -  * *  - ***** - * * *      VIBRATION                ) TAVAM     40
            KTABLE =  2                                                       TAVAM     41
            CALL PTABLE (1,60,60                                              TAVAM     42
           *   H*   *    * *    *   *   * * *       ANALYSIS                ) TAVAM     43
            KTABLE =  2                                                       TAVAM     44
            CALL PTABLE (2,60,60                                              TAVAM     45
           *   H*   *     *    *   *   * * *         MODULE                 ) TAVAM     46
            KOUNT  =  LINES                                                   TAVAM     47
      C                                                                       TAVAM     48
      C                                                                       TAVAM     49
      C LIST TITLE PAGE                                                       TAVAM     50
      C                                                                       TAVAM     51
            WRITE (ITAPEW,100)                                                TAVAM     52
            WRITE (ITAPEW,105)                                                TAVAM     53
            WRITE (ITAPEW,110)                                                TAVAM     54
            WRITE (ITAPEW,115)                                                TAVAM     55
            WRITE (ITAPEW,120) AFFDL                                          TAVAM     56
            WRITE (ITAPEW,125)                                                TAVAM     57
            WRITE (ITAPEW,130)                                                TAVAM     58
```

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
		69 IFL (1)	70 IUYT (1)	71 IFYT (1)
		72 IUZ (1)	73 IFZ (1)	74 IUZR (1)
		75 IFZR (1)	76 IULR (1)	77 IFLR (1)
		78 IUBR (1)	79 IFBR (1)	80 IUPHTF (1)
		81 IFPHTF (1)	82 IUMODM (1)	83 IFMODM (1)
		84 IUMODK (1)	85 IFMODK (1)	86 IUPHT (1)
		87 IFPHT (1)	88 IUQT (1)	89 IFQT (1)
		90 IUQ (1)	91 IFQ (1)	92 IUPH (1)
		93 IFPH (1)	94 IUINCM (1)	95 IFINCM (1)
		96 IUINCK (1)	97 IFINCK (1)	
KLUES	24	0 KLUSE (1)	1 KLUNAL (1)	2 IRED (1)
		3 KLUMD (1)	4 KLUBAL (1)	5 MSADD (1)
		6 NPAS (1)	7 IDNOPT (1)	8 VDES (1)
		9 EPS1 (1)	10 DWMAX (1)	11 NBAR (1)
		12 NFIX (1)	13 D (1)	14 DEL (1)
		15 EPS2 (1)	16 NCYC (1)	17 NNN (1)
		18 IBAND (1)	19 IFIN (1)	20 KLUB (1)
		21 KLUQ (1)	22 MORBAL (1)	23 DBAL (1)
SIZES	6	0 NSTMEM (1)	1 NSTDOF (1)	2 NDYDOF (1)
		3 NNOPT (1)	4 NDESNO (1)	5 NDESYS (1)

STATISTICS

PROGRAM LENGTH	145B	101
CM LABELED COMMON LENGTH	333B	219

520000B CM USED

EXTERNALS	TYPE	ARGS	REFERENCES
READY		0	189
TAVAM		0	170
TIMEB		2	201
VIBIFO		5	199

STATEMENT LABELS			DEF LINE	REFERENCES
0 100		INACTIVE	158	
0 150		INACTIVE	165	
0 190		INACTIVE	176	
21 195			177	178
34 198			181	175
0 210			187	186
0 290		INACTIVE	190	
0 400		INACTIVE	200	
121 5060	FMT		205	177

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
41	210	L	186 187	3B	INSTACK

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CFMTA	1	0 FMTA (1)		
CLUEV	21	0 LKLUEV (1)	1 KLUEV (20)	
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CTSHV	2	0 LTSHV (1)	1 TSHV (1)	
CTSH	3	0 KTSH (1)	1 LTSH (1)	2 TSH (1)
CONSTS	2	0 NO (1)	1 YES (1)	
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)
		6 NPAGEA (1)	7 ITAPET (1)	
FREAKS	40	0 FREQ (40)		
PLACES	98	0 IUIN1 (1)	1 IUIN2 (1)	2 IUOUT1 (1)
		3 IUOUT2 (1)	4 IUGO1 (1)	5 IUGO2 (1)
		6 IUGO3 (1)	7 IUGO4 (1)	8 IUSCR (1)
		9 IFSCR (1)	10 IFS1 (1)	11 IFS2 (1)
		12 IFS3 (1)	13 IFS4 (1)	14 IUCD (1)
		15 IUPR (1)	16 IUA (1)	17 IFA (1)
		18 IUY (1)	19 IFY (1)	20 IUMEMN (1)
		21 IFMEMN (1)	22 IUSTFN (1)	23 IFSTFN (1)
		24 IUKS (1)	25 IFKS (1)	26 IUB (1)
		27 IFB (1)	28 IUDESO (1)	29 IFDESO (1)
		30 IUMDBI (1)	31 IFMDBI (1)	32 IUADDI (1)
		33 IFADDI (1)	34 IUBALI (1)	35 IFBALI (1)
		36 IUDESI (1)	37 IFDESI (1)	38 IUWTI (1)
		39 IFWTI (1)	40 IUMEMO (1)	41 IFMEMO (1)
		42 IUBT (1)	43 IFBT (1)	44 IUDESN (1)
		45 IFDESN (1)	46 IUMD (1)	47 IFMD (1)
		48 IUMEMF (1)	49 IFMEMF (1)	50 IUSTFO (1)
		51 IFSTFO (1)	52 IUMDB (1)	53 IFMDB (1)
		54 IUADD (1)	55 IFADD (1)	56 IUBAL (1)
		57 IFBAL (1)	58 IUDESF (1)	59 IFDESF (1)
		60 IUWT (1)	61 IFWT (1)	62 IUDUM1 (1)
		63 IFDUM1 (1)	64 IUDUM2 (1)	65 IFDUM2 (1)
		66 IUDUM3 (1)	67 IFDUM3 (1)	68 IUL (1)

VARIABLES	SN	TYPE		RELOCATION						
3	KLUMD	INTEGER		KLUES	REFS	151				
1	KLUNAL	INTEGER		KLUES	REFS	151				
25	KLUQ	INTEGER		KLUES	REFS	151				
0	KLUSE	INTEGER		KLUES	REFS	151	198			
137	KLUZ	INTEGER			REFS	199	DEFINED	198		
132	KMATV	INTEGER			REFS	197	DEFINED	184		
0	KOUNT	INTEGER		CLIST	REFS	129				
11	KOUNTH	INTEGER		CLIST	REFS	129				
12	KOUNTI	INTEGER		CLIST	REFS	129				
1	KPAGE	INTEGER		CLIST	REFS	129				
0	KPLOTV	INTEGER		F.P.	DEFINED	114	185			
0	KTABLE	INTEGER		CTABLE	REFS	131				
5	KTABLO	INTEGER		CTABLE	REFS	131				
5	KTPAGE	INTEGER		CLIST	REFS	129				
0	KTSH	INTEGER		CTSH	REFS	127	160			
131	L	INTEGER			REFS	179	2*187	DEFINED	179	186
2	LINES	INTEGER		CLIST	REFS	129				
10	LINESG	INTEGER		CLIST	REFS	129				
3	LINEST	INTEGER		CLIST	REFS	129				
0	LKLUEV	INTEGER		CLUEV	REFS	124	163			
1	LTSH	INTEGER		CTSH	REFS	127	159	160	186	
124	LTSHR	INTEGER			REFS	179	DEFINED	159	160	
0	LTSHV	INTEGER		CTSHV	REFS	126				
26	MORBAL	INTEGER		KLUES	REFS	151				
5	MSADD	INTEGER		KLUES	REFS	151				
13	NBAR	INTEGER		KLUES	REFS	151				
125	NCC	INTEGER			REFS	180	DEFINED	162		
3	NCOLS	INTEGER		CTABLE	REFS	131				
4	NCOLST	INTEGER		CTABLE	REFS	131				
20	NCYC	INTEGER		KLUES	REFS	151	175	196		
134	NCYCE	INTEGER			REFS	197	199	DEFINED	196	
4	NDESNO	INTEGER		SIZES	REFS	154				
5	NDESYS	INTEGER		SIZES	REFS	154				
2	NDYDOF	INTEGER		SIZES	REFS	154	192			
14	NFIX	INTEGER		KLUES	REFS	151				
126	NKLUEV	INTEGER			REFS	180	DEFINED	163		
21	NNN	INTEGER		KLUES	REFS	151				
3	NNOPT	INTEGER		SIZES	REFS	154				
0	NO	INTEGER		CONSTS	REFS	128				
6	NPAGE	INTEGER		CLIST	REFS	129				
6	NPAGEA	INTEGER		CTABLE	REFS	131				
6	NPAS	INTEGER		KLUES	REFS	151				
1	NPASS	INTEGER		CTABLE	REFS	131				
2	NROWS	INTEGER		CTABLE	REFS	131				
1	NSTDOF	INTEGER		SIZES	REFS	154				
0	NSTMEM	INTEGER		SIZES	REFS	154				
2	TSH	REAL	ARRAY	CTSH	REFS	121	127	DEFINED	187	
1	TSHV	REAL	ARRAY	CTSHV	REFS	121	126	187	DEFINED	179
130	VAOOD	REAL			REFS	178	DEFINED	177		
105	VAOOR	REAL			REFS	178	DEFINED	161		
10	VDES	REAL		KLUES	REFS	151				
1	YES	INTEGER		CONSTS	REFS	116	128	160		

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES
CLUES		4	180
EIGEN		6	197

VARIABLES	SN	TYPE	RELOCATION		
20	IUA	INTEGER	PLACES	REFS	134
66	IUADD	INTEGER	PLACES	REFS	134
40	IUADDI	INTEGER	PLACES	REFS	134
32	IUB	INTEGER	PLACES	REFS	134
70	IUBAL	INTEGER	PLACES	REFS	134
42	IUBALI	INTEGER	PLACES	REFS	134
116	IUBR	INTEGER	PLACES	REFS	134
52	IUBT	INTEGER	PLACES	REFS	134
16	IUCD	INTEGER	PLACES	REFS	134
72	IUDESF	INTEGER	PLACES	REFS	134
44	IUDESI	INTEGER	PLACES	REFS	134
54	IUDESN	INTEGER	PLACES	REFS	134
34	IUDESO	INTEGER	PLACES	REFS	134
76	IUDUM1	INTEGER	PLACES	REFS	134
100	IUDUM2	INTEGER	PLACES	REFS	134
102	IUDUM3	INTEGER	PLACES	REFS	134
4	IUGO1	INTEGER	PLACES	REFS	134
5	IUGO2	INTEGER	PLACES	REFS	134
6	IUGO3	INTEGER	PLACES	REFS	134
7	IUGO4	INTEGER	PLACES	REFS	134
140	IUINCK	INTEGER	PLACES	REFS	134
136	IUINCM	INTEGER	PLACES	REFS	134
0	IUIN1	INTEGER	PLACES	REFS	134
1	IUIN2	INTEGER	PLACES	REFS	134
30	IUKS	INTEGER	PLACES	REFS	134
104	IUL	INTEGER	PLACES	REFS	134
114	IULR	INTEGER	PLACES	REFS	134
56	IUMD	INTEGER	PLACES	REFS	134
64	IUMDB	INTEGER	PLACES	REFS	134
36	IUMDBI	INTEGER	PLACES	REFS	134
60	IUMEMF	INTEGER	PLACES	REFS	134
24	IUMEMN	INTEGER	PLACES	REFS	134
50	IUMEMO	INTEGER	PLACES	REFS	134
124	IUMODK	INTEGER	PLACES	REFS	134
122	IUMODM	INTEGER	PLACES	REFS	134
2	IUOUT1	INTEGER	PLACES	REFS	134
3	IUOUT2	INTEGER	PLACES	REFS	134
134	IUPH	INTEGER	PLACES	REFS	134
126	IUPHT	INTEGER	PLACES	REFS	134
120	IUPHTF	INTEGER	PLACES	REFS	134
17	IUPR	INTEGER	PLACES	REFS	134
132	IUQ	INTEGER	PLACES	REFS	134
130	IUQT	INTEGER	PLACES	REFS	134
10	IUSCR	INTEGER	PLACES	REFS	134
26	IUSTFN	INTEGER	PLACES	REFS	134
62	IUSTFO	INTEGER	PLACES	REFS	134
74	IUWT	INTEGER	PLACES	REFS	134
46	IUWTI	INTEGER	PLACES	REFS	134
22	IUY	INTEGER	PLACES	REFS	134
106	IUYT	INTEGER	PLACES	REFS	134
110	IUZ	INTEGER	PLACES	REFS	134
112	IUZR	INTEGER	PLACES	REFS	134
7	KBPAGE	INTEGER	CLIST	REFS	129
4	KLABEL	INTEGER	CLIST	REFS	129
24	KLUB	INTEGER	KLUES	REFS	151
4	KLUBAL	INTEGER	KLUES	REFS	151

VARIABLES	SN	TYPE	RELOCATION							
7	IDNOPT	INTEGER	KLUES	REFS	151					
21	IFA	INTEGER	PLACES	REFS	134					
67	IFADD	INTEGER	PLACES	REFS	134					
41	IFADDI	INTEGER	PLACES	REFS	134					
33	IFB	INTEGER	PLACES	REFS	134					
71	IFBAL	INTEGER	PLACES	REFS	134					
43	IFBALI	INTEGER	PLACES	REFS	134					
117	IFBR	INTEGER	PLACES	REFS	134					
53	IFBT	INTEGER	PLACES	REFS	134					
73	IFDESF	INTEGER	PLACES	REFS	134					
45	IFDESI	INTEGER	PLACES	REFS	134					
55	IFDESN	INTEGER	PLACES	REFS	134					
35	IFDESO	INTEGER	PLACES	REFS	134					
77	IFDUM1	INTEGER	PLACES	REFS	134					
101	IFDUM2	INTEGER	PLACES	REFS	134					
103	IFDUM3	INTEGER	PLACES	REFS	134					
23	IFIN	INTEGER	KLUES	REFS	151					
141	IFINCK	INTEGER	PLACES	REFS	134					
137	IFINCM	INTEGER	PLACES	REFS	134					
31	IFKS	INTEGER	PLACES	REFS	134					
105	IFL	INTEGER	PLACES	REFS	134					
115	IFLR	INTEGER	PLACES	REFS	134					
57	IFMD	INTEGER	PLACES	REFS	134					
65	IFMDB	INTEGER	PLACES	REFS	134					
37	IFMDBI	INTEGER	PLACES	REFS	134					
61	IFMEMF	INTEGER	PLACES	REFS	134					
25	IFMEMN	INTEGER	PLACES	REFS	134					
51	IFMEMO	INTEGER	PLACES	REFS	134					
125	IFMODK	INTEGER	PLACES	REFS	134					
123	IFMODM	INTEGER	PLACES	REFS	134					
135	IFPH	INTEGER	PLACES	REFS	134					
127	IFPHT	INTEGER	PLACES	REFS	134					
121	IFPHTF	INTEGER	PLACES	REFS	134					
133	IFQ	INTEGER	PLACES	REFS	134					
131	IFQT	INTEGER	PLACES	REFS	134					
11	IFSCR	INTEGER	PLACES	REFS	134					
27	IFSTFN	INTEGER	PLACES	REFS	134					
63	IFSTFO	INTEGER	PLACES	REFS	134					
12	IFS1	INTEGER	PLACES	REFS	134					
13	IFS2	INTEGER	PLACES	REFS	134					
14	IFS3	INTEGER	PLACES	REFS	134					
15	IFS4	INTEGER	PLACES	REFS	134					
75	IFWT	INTEGER	PLACES	REFS	134					
47	IFWTI	INTEGER	PLACES	REFS	134					
23	IFY	INTEGER	PLACES	REFS	134					
107	IFYT	INTEGER	PLACES	REFS	134					
111	IFZ	INTEGER	PLACES	REFS	134					
113	IFZR	INTEGER	PLACES	REFS	134					
136	INDEX1	INTEGER		REFS	197	199				
2	IRED	INTEGER	KLUES	REFS	151	184				
133	IROW	INTEGER		REFS	197	199	DEFINED	192		
127	IROWD	INTEGER		REFS	197	DEFINED	164			
135	ISCR	INTEGER		REFS	197	199				
2	ITAPEP	INTEGER	COMRWP	REFS	125					
0	ITAPER	INTEGER	COMRWP	REFS	125	180	I/O REFS	176	177	179
7	ITAPET	INTEGER	CTABLE	REFS	131					
1	ITAPEW	INTEGER	COMRWP	REFS	125					

```
                C                                                                   AVAM     173
                C READ INPUT DATA                                                   AVAM     174
                C .... PSN(190) TO PSN(290) ....                                    AVAM     175
      175           IF(NCYC.GT.0) GO TO 198                                         AVAM     176
                  190 REWIND ITAPER                                                 AVAM     177
                  195 READ (ITAPER,5060) VAOOD                                      AVAM     178
                      IF (VAOOD .NE. VAOOR) GO TO 195                               AVAM     179
                      READ (ITAPER,FMTA) (TSHV(L), L=1,LTSHR)                       AVAM     180
      180             CALL CLUES (ITAPER,NCC,NKLUEV,KLUEV)                          AVAM     181
                  198 CONTINUE                                                      AVAM     182
                C                                                                   AVAM     183
                C                                                                   AVAM     184
                      KMATV  =   IRED + 1                                           AVAM     185
      185             KPLOTV=KLUEV(2)                                             AVAM     186
                      DO 210 L=1,LTSH                                               AVAM     187
                  210 TSH(L) =  TSHV(L)                                             AVAM     188
                C                                                                   AVAM     189
                      CALL READY                                                    AVAM     190
      190         290 CONTINUE                                                      AVAM     191
                C                                                                   AVAM     192
                      IROW  =  NDYDOF                                               AVAM     193
                C                                                                   AVAM     194
                C SOLVE FOR EIGENVALUES AND EIGENVECTORS                            AVAM     195
      195       C                                                                   AVAM     196
                      NCYCE= NCYC                                                   AVAM     197
                      CALL EIGEN (IROWD,KMATV,ISCR,IROW,NCYCE,INDEX1)               AVAM     198
                      KLUZ = KLUSE                                                  AVAM     199
                      CALL VIBIFO (ISCR,IROW,NCYCE,INDEX1,KLUZ)                     AVAM     200
      200           400 CONTINUE                                                    AVAM     201
                      CALL TIMEB (37, 37HFROM AVAM - END OF VIBRATION ANALYSIS)     AVAM     202
                C                                                                   AVAM     203
                C                                                                   AVAM     204
                C FORMATS                                                           AVAM     205
      205        5060 FORMAT ( 18A4)                                                AVAM     206
                C                                                                   AVAM     207
                      RETURN                                                        AVAM     208
                      END                                                           AVAM     209
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY	POINTS	DEF LINE	REFERENCES
3	AVAM	114	207

VARIABLES	SN	TYPE		RELOCATION					
15	D	REAL		KLUES	REFS	151			
27	DBAL	REAL		KLUES	REFS	151			
16	DEL	REAL		KLUES	REFS	151			
12	DWMAX	REAL		KLUES	REFS	151			
11	EPS1	REAL		KLUES	REFS	151			
17	EPS2	REAL		KLUES	REFS	151			
0	FMTA	REAL	ARRAY	CFMTA	REFS	118	123	179	
0	FREQ	REAL	ARRAY	FREAKS	REFS	120	133		
22	IBAND	INTEGER		KLUES	REFS	151			

```
115           C                                                                  AVAM      116
                    INTEGER YES                                                  AVAM      117
              C                                                                  AVAM      118
                    DIMENSION FMTA(1)                                            AVAM      119
                    DIMENSION KLUEV(20)                                          AVAM      120
120                 DIMENSION FREQ(40)                                           AVAM      121
                    DIMENSION TSH(1)             ,TSHV(1)                        AVAM      122
              C                                                                  AVAM      123
                    COMMON /CFMTA / FMTA                                         AVAM      124
                    COMMON /CLUEV / LKLUEV,KLUEV                                 AVAM      125
125                 COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                         AVAM      126
                    COMMON /CTSHV / LTSHV ,TSHV                                  AVAM      127
                    COMMON /CTSH  / KTSH  ,LTSH  ,TSH                            AVAM      128
                    COMMON /CONSTS/ NO    ,YES                                   AVAM      129
                    COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE  AVAM    130
130                1                ,KBPAGE,LINESG,KOUNTH,KOUNTI                 AVAM      131
                    COMMON /CTABLE/ KTABLE,NPASS ,NROWS, NCOLS , NCOLST,KTABLO,NPAGEA AVAM    132
                   1                ,ITAPET                                      AVAM      133
                    COMMON /FREAKS/  FREQ                                        AVAM      134
                    COMMON/PLACES/ IUIN1,IUIN2,IUOUT1,IUOUT2,IUGO1,IUGO2,IUGO3,IUGO4,  AVAM  135
135                1               IUSCR,IFSCR,IFS1,IFS2,IFS3,IFS4,IUCD,IUPR,   AVAM      136
                   2               IUA,IFA,IUY,IFY,IUMEMN,IFMEMN,IUSTFN,IFSTFN, AVAM      137
                   3               IUKS,IFKS,IUB,IFB,IUDESO,IFDESO,             AVAM      138
                   4               IUMDBI,IFMDBI,IUADDI,IFADDI,IUBALI,IFBALI,   AVAM      139
                   5               IUDESI,IFDESI,IUWTI,IFWTI,                   AVAM      140
140                6               IUMEMO,IFMEMO,IUBT,IFBT,                     AVAM      141
                   7               IUDESN,IFDESN,IUMD,IFMD,                     AVAM      142
                   8               IUMEMF,IFMEMF,                               AVAM      143
                   9               IUSTFO,IFSTFO,IUMDB,IFMDB,IUADD,IFADD,IUBAL,IFBAL,  AVAM  144
                   A               IUDESF,IFDESF,IUWT,IFWT,                     AVAM      145
145                B               IUDUM1,IFDUM1,IUDUM2,IFDUM2,IUDUM3,IFDUM3,   AVAM      146
                   C               IUL,IFL,IUYT,IFYT,IUZ,IFZ,IUZR,IFZR,IULR,IFLR,  AVAM   147
                   D               IUBR,IFBR,                                   AVAM      148
                   E               IUPHTF,IFPHTF,IUMODM,IFMODM,                 AVAM      149
                   F               IUMODK,IFMODK,IUPHT,IFPHT,IUQT,IFQT,IUQ,IFQ, AVAM      150
150                G               IUPH,IFPH,IUINCM,IFINCM,IUINCK,IFINCK        AVAM      151
                    COMMON/KLUES/ KLUSE,KLUNAL,IRED,KLUMD,KLUBAL,MSADD,NPAS, IDNOPT,  AVAM   152
                   1              VDES,EPS1,DWMAX,NBAR,NFIX,D,DEL,EPS2,NCYC,NNN,IBAND,  AVAM 153
                   2              IFIN,KLUB,KLUQ,MORBAL,DBAL                   AVAM      154
                    COMMON /SIZES / NSTMEM,NSTDOF,NDYDOF,NNOPT,NDESNO,NDESYS     AVAM      155
155           C                                                                  AVAM      156
              C INITIAL CONDITIONS                                               AVAM      157
              C...  PSN(100) TO PSN(150) ....                                    AVAM      158
                100 CONTINUE                                                     AVAM      159
                    LTSHR  =  LTSH                                               AVAM      160
160                 IF (KTSH .EQ. YES) LTSHR = LTSH-2                            AVAM      161
                    DATA VAOOR  /4HVA00/                                         AVAM      162
                    NCC    =  10                                                 AVAM      163
                    NKLUEV=LKLUEV                                                AVAM      164
                    IROWD = 220                                                  AVAM      165
165               150 CONTINUE                                                   AVAM      166
              C                                                                  AVAM      167
              C                                                                  AVAM      168
              C PRINT TITLE FOR AUTOMATED VIBRATION ANALYSIS MODULE              AVAM      169
              C                                                                  AVAM      170
170                 CALL TAVAM                                                   AVAM      171
              C                                                                  AVAM      172
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      C     KLUEV( 4) = 0. DO NOT LIST DYNAMIC MASS MATRIX                    AVAM       59
      C                 = 4. LIST DYNAMIC MASS MATRIX                         AVAM       60
   60 C     KLUEV( 5) = 0. DO NOT LIST INTERMEDIATE RESULTS USED IN           AVAM       61
      C                    COMPUTATION OF DYNAMIC MASS MATRIX(E G  INCREMENTAL AVAM       62
      C                    MASS MATRIX IN STRUCTURAL AND DYNAMICS GRIDS)      AVAM       63
      C     KLUEV( 5) = 5. LIST INTERMEDIATE MASS RESULTS                     AVAM       64
      C     KLUEV( 6) = 0. DO NOT LIST TRANSFORMATION MATRIX BETWEEN DYNAMIC  AVAM       65
   65 C                    AND STRUCTURAL COORDINATES                         AVAM       66
      C     KLUEV( 6) = 6  LIST TRANSFORMATION MATRIX BETWEEN DYNAMIC AND     AVAM       67
      C                    STRUCTURAL COORDINATES                             AVAM       68
      C                                                                     *  AVAM       69
      C     THE VALUES OF THE CARD INPUT DATA CONTROL WORD OPTIONS (KLUEV(I))*  AVAM       70
   70 C     GIVEN ABOVE ARE ENTERED INTO THE PROGRAM BY THE SUBROUTINE CLUES *  AVAM       71
      C     AND THEN CHANGED, WITHIN THE SUBROUTINE CLUES, TO A NEW SET OF   *  AVAM       72
      C     NUMERICAL VALUES.                                                *  AVAM       73
      C     A VALUE OF ONE (CORRESPONDING TO THE ORIGINAL ZERO VALUE)        *  AVAM       74
      C     INDICATES THAT THE OPTION IS TO BE DELETED WHEREAS A VALUE OF TWO*  AVAM       75
   75 C     (CORRESPONDING TO THE ORIGINAL I'TH VALUE) INDICATES THAT THE    *  AVAM       76
      C     OPTION IS TO BE EXERCISED.                                       *  AVAM       77
      C     FINALLY, FOR PROGRAMMING CONVENIENCE, A NEW SET OF OPTIONS       *  AVAM       78
      C     REFERRED TO AS PROGRAM CONTROL WORD OPTIONS (KXXXXX) ARE DEFINED *  AVAM       79
      C     TO BE EQUIVALENT TO THE CARD INPUT CONTROL WORD OPTIONS.          *  AVAM       80
   80 C                                                                     *  AVAM       81
      C     KLUEV(I) = 0, IS CHANGED TO 1, AND CORRESPONDS TO  KXXXXX = 1    *  AVAM       82
      C     KLUEV(I) = I, IS CHANGED TO 2, AND CORRESPONDS TO  KXXXXX = 2    *  AVAM       83
      C                                                                     *  AVAM       84
      C     THE SPECIFIC RELATIONSHIP OF THE CARD INPUT DATA AND PROGRAM     *  AVAM       85
   85 C     CONTROL WORD OPTIONS IS GIVEN BELOW.                             *  AVAM       86
      C                                                                     *  AVAM       87
      C     KLUEV( 1) = NOT USED                                              AVAM       88
      C     KLUEV( 2) = KPLOTV                                                AVAM       89
      C     KLUEV( 3) = KLISTV                                                AVAM       90
   90 C     KLUEV( 4) = IOMD                                                  AVAM       91
      C     KLUEV( 5) = IOMALL                                                AVAM       92
      C     KLUEV( 6) = IOB                                                   AVAM       93
      C                                                                     *  AVAM       94
      C.... KLUEV(I) ..... INTERMEDIATE, (I = LKLUEV+1,...,2*LKLUEV)         *  AVAM       95
   95 C     PROGRAM CONTROL WORD OPTION FOR INDICATING WHICH OF THE OPTIONS  *  AVAM       96
      C     IN VIBRATION ANALYSIS HAVE BEEN PERFORMED.                       *  AVAM       97
      C                                                                     *  AVAM       98
      C     VALUES DEFINED WITHIN THE PROGRAM HAVE THE FOLLOWING GENERAL     *  AVAM       99
      C     FUNCTION ...                                                     *  AVAM      100
  100 C     KLUEV(I) = 0, THE I'TH VIBRATION ANALYSIS OPTION HAS NOT         *  AVAM      101
      C                   BEEN PERFORMED IN THE CURRENT RUN.                 *  AVAM      102
      C              = I, THE I'TH VIBRATION ANALYSIS OPTION HAS BEEN       *  AVAM      103
      C                   PERFORMED IN THE CURRENT RUN.                     *  AVAM      104
      C     WHERE THE SPECIFIC FUNCTION OF EACH VARIABLE IS ASSOCIATED WITH  *  AVAM      105
  105 C     THE SPECIFIC FUNCTION OF THE VARIABLE KLUEV(I) FOR               *  AVAM      106
      C     I = 1,...,LKLUEV.                                                *  AVAM      107
      C                                                                     *  AVAM      108
      C***  ERROR MESSAGES  ************************************************  AVAM      109
      C     --------------                                                  *  AVAM      110
  110 C     NONE.                                                             AVAM      111
      C                                                                     *  AVAM      112
      C*************************************************************************  AVAM      113
      C                                                                        AVAM      114
            SUBROUTINE AVAM (KPLOTV)                                           AVAM      115
```

```
      C                                                                       AVAM       2
      C45700, SUB  AVAM (AUTOMATED VIBRATION ANALYSIS MODULE)                 AVAM       3
      C                                                                       AVAM       4
      C                                                                     * AVAM       5
      C*********************************************************************** AVAM       6
      C*********************************************************************** AVAM       7
      C*********************************************************************** AVAM       8
      C*********************************************************************** AVAM       9
      C*********************************************************************** AVAM      10
      C*****                                                              ****** AVAM      11
      C*****                  AAA    V   V    AAA    M   M               ****** AVAM      12
      C*****                 A   A   V   V   A   A   MM MM               ****** AVAM      13
      C*****                 AAAAA -  V V  - AAAAA - M M M               ****** AVAM      14
      C*****                 A   A    V V    A   A   M M M               ****** AVAM      15
      C*****                 A   A     V     A   A   M M M               ****** AVAM      16
      C*****                                                              ****** AVAM      17
      C*********************************************************************** AVAM      18
      C*********************************************************************** AVAM      19
      C*********************************************************************** AVAM      20
      C*********************************************************************** AVAM      21
      C*********************************************************************** AVAM      22
      C                                                                     * AVAM      23
      C*********************************************************************** AVAM      24
      C                                                                     * AVAM      25
      C***  SUBROUTINE AVAM  ************************************************ AVAM      26
      C                                                                     * AVAM      27
      C***  COMPUTER VERSION                                                * AVAM      28
      C     ----------------                                                * AVAM      29
      C     IBM  . . . AS IS.                                               * AVAM      30
      C                                                                     * AVAM      31
      C     CDC  . . . AS IS.                                               * AVAM      32
      C                                                                     * AVAM      33
      C***  OBJECTIVE  ****************************************************** AVAM      34
      C     ---------                                                       * AVAM      35
      C     MAJOR PROGRAM, WHICH CALLS OTHER PROGRAMS, FOR PERFORMING       * AVAM      36
      C     VIBRATION ANALYSIS, THAT IS, CALCULATING THE FREQUENCIES,       * AVAM      37
      C     MODE SHAPES, AND GENERALIZED MASSES FOR FLUTTER ANALYSIS        * AVAM      38
      C                                                                     * AVAM      39
      C***  INPUT/OUTPUT  *************************************************** AVAM      40
      C     ------------                                                    * AVAM      41
      C                                                                     * AVAM      42
      C***  SUMMARY OF SYMBOLS  ********************************************* AVAM      43
      C     ------------------                                              * AVAM      44
      C...  KLUEV(I)  . . .  INPUT, (I = 1, . . ,LKLUEV)                    * AVAM      45
      C     INPUT DATA CONTROL WORD OPTIONS TO OBTAIN VIBRATION INFORMATION  * AVAM      46
      C                                                                     * AVAM      47
      C     VALUES ENTERED AS DATA HAVE THE FOLLOWING GENERAL FUNCTION ...  * AVAM      48
      C     KLUEV( I) = 0, DO NOT PERFORM THE I'TH OPTION OF VIBRATION      * AVAM      49
      C                    ANALYSIS                                         * AVAM      50
      C               = 1, PERFORM THE I'TH OPTION OF VIBRATION ANALYSIS.   * AVAM      51
      C                                                                     * AVAM      52
      C     WHERE THE SPECIFIC FUNCTION OF EACH VARIABLE IS.                * AVAM      53
      C     KLUEV( 1) =  , DUMMY VARIABLE                                     AVAM      54
      C     KLUEV( 2) = 0, DO NOT PLOT VIBRATION MODES ON CALCOMP             AVAM      55
      C               = 2, PLOT VIBRATION MODES ON CALCOMP                    AVAM      56
      C     KLUEV( 3) = 0, DO NOT LIST FLEXIBILITY (OR STIFFNESS) MATRIX      AVAM      57
      C               = 3, LIST FLEXIBILITY (OR STIFFNESS) MATRIX             AVAM      58
```

```
      C45700. FUN  RDM (RANDOM FUNCTION)                                    RDM        2
      C                                                                     RDM        3
            FUNCTION RDM (ARG)                                              RDM        4
      C                                                                     RDM        5
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   RDM        6
      C     DATA IY /5757403/                                               RDM        7
      C     IY      = IY*65539                                              RDM        8
      C     IF (IY  GE  0) GO TO 6                                          RDM        9
      C     IY      = IY + 2147483647 + 1                                   RDM       10
      C   6 YFL     = IY                                                    RDM       11
      C     RDM     = YFL*0.4656613E-09                                     RDM       12
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS      RDM       13
      C                                                                     RDM       14
      C                                                                     RDM       15
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS   RDM       16
            RDM     = RANF (ARG)                                            RDM       17
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS      RDM       18
      C                                                                     RDM       19
            RETURN                                                          RDM       20
            END                                                             RDM       21
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
4	RDM	3	19

VARIABLES	SN	TYPE	RELOCATION				
0	ARG	REAL	F.P.	REFS	16	DEFINED	3
11	RDM	REAL		DEFINED	16		

INLINE FUNCTIONS	TYP	ARGS	DEF LINE	REFERENCES
RANF	REAL	1	INTRIN	16

STATISTICS

PROGRAM LENGTH 128 10

52000B CM USED

```
      C45700. FUN. CDABSF (ABSOLUTE VALUE)                                  CDABSF     2
      C                                                                     CDABSF     3
            FUNCTION CDABSF(ARG)                                            CDABSF     4
      C                                                                     CDABSF     5
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   CDABSF     6
      C     COMPLEX*16 ARG                                                  CDABSF     7
      C     DOUBLE PRECISION CDABSF                                         CDABSF     8
      C     CDABSF =  CDABS(ARG)                                            CDABSF     9
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS      CDABSF    10
      C                                                                     CDABSF    11
      C                                                                     CDABSF    12
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS   CDABSF    13
            COMPLEX ARG                                                     CDABSF    14
            CDABSF =   CABS(ARG)                                            CDABSF    15
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS      CDABSF    16
      C                                                                     CDABSF    17
            RETURN                                                          CDABSF    18
            END                                                             CDABSF    19
```

SYMBOLIC REFERENCE MAP (R=3)

```
ENTRY POINTS      DEF LINE      REFERENCES
    4  CDABSF          3         17

VARIABLES     SN  TYPE            RELOCATION
    0  ARG        COMPLEX              F.P.        REFS        13        14    DEFINED        3
   11  CDABSF     REAL                             DEFINED     14

EXTERNALS           TYPE    ARGS       REFERENCES
      CABS          REAL       1 LIBRARY      14

STATISTICS
  PROGRAM LENGTH                  128       10
        520008 CM USED
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```
      1          C45700. FUN. DCMPLF (COMPLEX FUNCTION)                                DCMPLF      2
                 C                                                                     DCMPLF      3
                 CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   DCMPLF      4
                 C     COMPLEX FUNCTION DCMPLF*16 (ARG1,ARG2)                          DCMPLF      5
      5          C     DOUBLE PRECISION ARG1, ARG2                                     DCMPLF      6
                 C     DCMPLF =  DCMPLX (ARG1,ARG2)                                    DCMPLF      7
                 CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS      DCMPLF      8
                 C                                                                     DCMPLF      9
                 C                                                                     DCMPLF     10
     10          CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS   DCMPLF     11
                       COMPLEX FUNCTION DCMPLF (ARG1,ARG2)                           DCMPLF     12
                       DCMPLF =  CMPLX (ARG1,ARG2)                                   DCMPLF     13
                 CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS     DCMPLF     14
                 C                                                                     DCMPLF     15
     15                RETURN                                                        DCMPLF     16
                       END                                                           DCMPLF     17
```

SYMBOLIC REFERENCE MAP (R=3)

```
ENTRY POINTS      DEF LINE      REFERENCES
    5  DCMPLF          11          15

VARIABLES     SN  TYPE            RELOCATION
    0  ARG1       REAL                 F.P.        REFS        12    DEFINED       11
    0  ARG2       REAL                 F.P.        REFS        12    DEFINED       11
   13  DCMPLF     COMPLEX                       DEFINED        12

INLINE FUNCTIONS    TYPE    ARGS        DEF LINE  REFERENCES
       CMPLX      COMPLEX     2  INTRIN                12

STATISTICS
  PROGRAM LENGTH                  15B       13
         520008 CM USED
```

```
115               V,13HVVV        VVV                                          TAVAM     116
                  *,26X, 36H.                                  .,4X,1H*)       TAVAM     117
                 115 FORMAT (                                                   TAVAM     118
                  *     5X,1H*,15X                                             TAVAM     119
                  A,13H  AAA    AAA                                            TAVAM     120
120               *,13X                                                        TAVAM     121
                  V,13H VVV      VVV                                          TAVAM     122
                  *,26X, 36H. ..................................,4X,1H*       TAVAM     123
                  *,/, 5X,1H*,15X                                             TAVAM     12-
                  A,13H AAA      AAA                                          TAVAM     125
125               *,13X                                                        TAVAM     126
                  V,13H VVV      VVV                                          TAVAM     127
                  *,26X, 36H.                                  .,4X,1H*       TAVAM     128
                  *,/, 5X,1H*,15X                                             TAVAM     129
                  A,13H AAA      AAA                                          TAVAM     130
130               *,13X                                                        TAVAM     131
                  V,13H VVV      VVV                                          TAVAM     132
                  *,26X, 36H              AIR FORCE            .,4X,1H*)      TAVAM     133
                 120 FORMAT (                                                   TAVAM     134
                  *     5X,1H*,15X                                             TAVAM     135
135               A,13H AAA      AAA                                          TAVAM     136
                  *,13X                                                        TAVAM     137
                  V,13H  VVV    VVV                                          TAVAM     138
                  *,26X, 36H.    FLIGHT DYNAMICS LABORATORY    .,4X,1H*       TAVAM     139
                  *,/, 5X,1H*,15X                                             TAVAM     140
140               A,13HAAA        AAA                                          TAVAM     141
                  *,13X                                                        TAVAM     142
                  V,13H  VVV    VVV                                          TAVAM     143
                  *.26X, 36H.                                  .,4X,1H*       TAVAM     144
                  *./, 5X,1H*,15X                                             TAVAM     145
145               A,13HAAA        AAA                                          TAVAM     146
                  *.13X                                                        TAVAM     147
                  V,13H  VVV    VVV                                          TAVAM     148
                  *,26X, 10H.          ,4A4, 10H          .,4X,1H*)           TAVAM     149
                 125 FORMAT (                                                   TAVAM     150
150               *     5X,1H*,15X                                             TAVAM     151
                  A,13HAAA        AAA                                          TAVAM     152
                  *,13X                                                        TAVAM     153
                  V,13H  VVV    VVV                                          TAVAM     154
                  *,26X, 36H.                                  .,4X,1H*       TAVAM     155
155               *,/, 5X,1H*,41X                                             TAVAM     156
                  V,13H  VVV    VVV                                          TAVAM     157
                  *.13X                                                        TAVAM     158
                  A,13H       A                                                TAVAM     159
                  *,      36H. ..................................,4X,1H*       TAVAM     160
160               *,/, 5X,1H*,41X                                             TAVAM     161
                  V,13H   VVV VVV                                             TAVAM     162
                  *,13X                                                        TAVAM     163
                  A,13H      AAA                                              TAVAM     164
                  *,40X,1H*)                                                   TAVAM     165
165               130 FORMAT (                                                  TAVAM     166
                  *     5X,1H*,41X                                             TAVAM     167
                  V,13H   VVV VVV                                             TAVAM     168
                  *.13X                                                        TAVAM     169
                  A,13H     AAAAA                                              TAVAM     170
170               *.40X,1H*                                                    TAVAM     171
                  * /  5X 1H* 41X                                              TAVAM     172
```

```
      V,13H   VVV VVV                                                   TAVAM  173
     *,13X                                                              TAVAM  174
      A,13H    AAAAA                                                    TAVAM  175
  75 *,40X, 1H*                                                         TAVAM  176
     *,/, 5X,1H*,41X                                                    TAVAM  177
      V,13H   VVV VVV                                                   TAVAM  178
     *,13X                                                              TAVAM  179
      A,13H   AAA AAA                                                   TAVAM  180
 180 *,40X,1H*)                                                         TAVAM  181
 135 FORMAT (                                                           TAVAM  182
     *    5X,1H*,41X                                                    TAVAM  183
      V,13H   VVV VVV                                                   TAVAM  184
     *,13X                                                              TAVAM  185
 185  A,13H   AAA AAA                                                   TAVAM  186
     *,40X,1H*                                                          TAVAM  187
     *,/, 5X,1H*,41X                                                    TAVAM  188
      V,13H    VVVVV                                                    TAVAM  189
     *,13X                                                              TAVAM  190
 190  A,13H   AAA AAA                                                   TAVAM  191
     *,40X,1H*                                                          TAVAM  192
     *,/, 5X,1H*,41X                                                    TAVAM  193
      V,13H    VVVVV                                                    TAVAM  194
     *,13X                                                              TAVAM  195
 195  A,13H   AAA AAA                                                   TAVAM  196
     *,40X,1H*)                                                         TAVAM  197
 140 FORMAT (                                                           TAVAM  198
     *    5X,1H*,41X                                                    TAVAM  199
      V,13H     VVV                                                     TAVAM  200
 200 *,13X                                                              TAVAM  201
      A,13H   AAA AAA                                                   TAVAM  202
     *,40X,1H*                                                          TAVAM  203
     *,/, 5X,1H*,41X                                                    TAVAM  204
      V,13H      V                                                      TAVAM  205
 205 *,13X                                                              TAVAM  206
      A,13H  AAAAAAAAA                                                  TAVAM  207
     *,40X,1H*                                                          TAVAM  208
     *,/, 5X,1H*,67X                                                    TAVAM  209
      A,13H  AAAAAAAAA                                                  TAVAM  210
 210 *,13X                                                              TAVAM  211
      M,13HMMM        MMM                                               TAVAM  212
     *,14X,1H*)                                                         TAVAM  213
 145 FORMAT (                                                           TAVAM  214
     *    5X,1H*,2X                                                     TAVAM  215
 215 *,65X                                                              TAVAM  216
      A,13H  AAAA AAAA                                                  TAVAM  217
     *,13X                                                              TAVAM  218
      M,13HMMM        MMM                                               TAVAM  219
     *,14X,1H*                                                          TAVAM  220
 220 *,/, 5X,1H*,2X                                                     TAVAM  221
     *,65X                                                              TAVAM  222
      A,13H  AAA   AAA                                                  TAVAM  223
     *,13X                                                              TAVAM  224
      M,13HMMMM      MMMM                                               TAVAM  225
 225 *,14X,1H*                                                          TAVAM  226
     *,/, 5X,1H*,2X                                                     TAVAM  227
     *,65X                                                              TAVAM  228
     *,13H   ...   ...                                                  TAVAM  229
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```
                *,13X                                                                                                TAVAM   230
230             M,13HMMMM      MMMM                                                                                  TAVAM   231
                *,14X, 1H*)                                                                                          TAVAM   232
              150 FORMAT (                                                                                           TAVAM   233
                *    5X,1H*,2X                                                                                       TAVAM   234
                *,65X                                                                                                TAVAM   235
235             A,13H AAA      AAA                                                                                   TAVAM   236
                *,13X                                                                                                TAVAM   237
                M,13HMMMMM    MMMMM                                                                                  TAVAM   238
                *,14X,1H*                                                                                            TAVAM   239
                *,/, 5X,1H*,2X                                                                                       TAVAM   240
240             *,65X                                                                                                TAVAM   241
                A,13H AAA      AAA                                                                                   TAVAM   242
                *,13X                                                                                                TAVAM   243
                M,13HMMMMM    MMMMM                                                                                  TAVAM   244
                *,14X,1H*                                                                                            TAVAM   245
245             *,/, 5X,1H*,2X                                                                                       TAVAM   246
                *,8(3HGGG), 4OHGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG,1X                                       TAVAM   247
                A,13H AAA      AAA                                                                                   TAVAM   248
                *,13X                                                                                                TAVAM   249
                M,13HMMMMM    MMMMM                                                                                  TAVAM   250
250             *,14X,1H*)                                                                                           TAVAM   251
              155 FORMAT (                                                                                           TAVAM   252
                *    5X,1H*,2X                                                                                       TAVAM   253
                *,8(3HGGG), 4OHGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG       ,1X                                      TAVAM   254
                A,13HAAA       AAA                                                                                   TAVAM   255
255             *,13X                                                                                                TAVAM   256
                M,13HMMMMMM MMMMMM                                                                                   TAVAM   257
                *,14X,1H*                                                                                            TAVAM   258
                *,/, 5X,1H*,2X                                                                                       TAVAM   259
                *,24X,       4OH  GGGGGGGGGGGGGGGGGGGGGGGGGGGG          ,1X                                      TAVAM   260
260             A,13HAAA       AAA                                                                                   TAVAM   261
                *,13X                                                                                                TAVAM   262
                M,13HMMM MM MM MMM                                                                                   TAVAM   263
                *,14X,1H*                                                                                            TAVAM   264
                *,/, 5X,1H*,2X                                                                                       TAVAM   265
265             *,24X,       4OH   GGGGGGGGGGGGGGGGGGGG          ,1X                                              TAVAM   266
                A,13HAAA       AAA                                                                                   TAVAM   267
                *,13X                                                                                                TAVAM   268
                M,13HMMM MM MM MMM                                                                                   TAVAM   269
                *,14X,1H*)                                                                                           TAVAM   270
270           160 FORMAT (                                                                                           TAVAM   271
                *    5X,1H*,2X                                                                                       TAVAM   272
                *,5X,  15H ..............,4X                                                                        TAVAM   273
                *,          4OH    GGGGGGGGGGGGGGGG          ,1X                                                    TAVAM   274
                *,26X                                                                                                TAVAM   275
275             M,13HMMM MMMMM MMM                                                                                   TAVAM   276
                *,14X,1H*                                                                                            TAVAM   277
                *,/, 5X,1H*,2X                                                                                       TAVAM   278
                *,5X,  15H.             .,4X                                                                         TAVAM   279
                *,          4OH   GGGGGGGGGGGGGGG          ,1X                                                     TAVAM   280
280             *,26X                                                                                                TAVAM   281
                M,13HMMM MMMMM MMM                                                                                   TAVAM   282
                *,14X,1H*                                                                                            TAVAM   283
                *,/, 5X,1H*,2X                                                                                       TAVAM   284
                *,5X,  15H.   GRUMMAN   .,4X                                                                         TAVAM   285
285             *           4OH  GGGGGGGGGGGGGG          1X                                                         TAVAM   286
```

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                     *,26X                                                                  TAVAM     287
                     M,13HMMM  MMM  MMM                                                     TAVAM     288
                     *,14X,1H*)                                                             TAVAM     289
                   165 FORMAT (                                                             TAVAM     290
290                  *    5X,1H*,2X                                                         TAVAM     291
                     *,5X,  15H  AEROSPACE  .,4X                                            TAVAM     292
                     *,          4OH  GGGGGGGGGGGG                          ,1X             TAVAM     293
                     *,26X                                                                  TAVAM     294
                     M,13HMMM  MMM  MMM                                                     TAVAM     295
295                  *,14X,1H*                                                              TAVAM     296
                     *,/, 5X,1H*,2X                                                         TAVAM     297
                     *,5X,  15H. CORPORATION  ,4X                                           TAVAM     298
                     *,          4OH  GGGGGGGGGG                            ,1X             TAVAM     299
                     *,26X                                                                  TAVAM     300
300                  M,13HMMM  MMM  MMM                                                     TAVAM     301
                     *,14X,1H*                                                              TAVAM     302
                     *,/, 5X,1H*,2X                                                         TAVAM     303
                     *,5X,  15H.              .,4X                                          TAVAM     304
                     *,          4OH  GGGGGGGG                              ,1X             TAVAM     305
305                  *,26X                                                                  TAVAM     306
                     M,13HMMM  MMM  MMM                                                     TAVAM     307
                     *,14X,1H*)                                                             TAVAM     308
                   170 FORMAT (  5X, 1H*, 2X                                                TAVAM     309
                     *,5X,  15H............,4X                                            TAVAM     310
310                  *,          4OH  GGGGGG                                ,1X             TAVAM     311
                     *,26X                                                                  TAVAM     312
                     M,13HMMM  MMM  MMM                                                     TAVAM     313
                     *,14X,1H*                                                              TAVAM     314
                     *,/, 5X,1H*,2X                                                         TAVAM     315
315                  *,24X,      4OH  GGGG                                  ,1X             TAVAM     316
                     *,26X                                                                  TAVAM     317
                     M,13HMMM  MMM  MMM                                                     TAVAM     318
                     *,14X,1H*                                                              TAVAM     319
                     *,/, 5X,1H*,2X                                                         TAVAM     320
320                  *,24X,      4OH  GG                                    ,1X             TAVAM     321
                     *,26X                                                                  TAVAM     322
                     M,13HMMM  MMM  MMM                                                     TAVAM     323
                     *,14X,1H*                                                              TAVAM     324
                     *,/, 5X,1H*,2X                                                         TAVAM     325
325                  *,24X,      4OH  G                                     ,1X             TAVAM     326
                     *,26X                                                                  TAVAM     327
                     M,13HMMM  MMM  MMM      ,14X,1H*)                                      TAVAM     328
                   175 FORMAT ( 5X,1H*,120X,1H*,/,5X,122(1H*))                              TAVAM     329
                 C                                                                          TAVAM     330
330                   RETURN                                                               TAVAM     331
                      END                                                                   TAVAM     332
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS	DEF LINE	REFERENCES
1 TAVAM	12	330

VARIABLES	SN	TYPE	RELOCATION								
0	AFFDL	REAL	ARRAY	CAFFDL	REFS	14	21	55			
2	ITAPEP	INTEGER		COMRWP	REFS	16					
0	ITAPER	INTEGER		COMRWP	REFS	16					
7	ITAPET	INTEGER		CTABLE	REFS	19					
1	ITAPEW	INTEGER		COMRWP	REFS	16	I/O REFS	51	52	53	54	55
					56	57	58	59	60	61	62	63
					64	65	66					
7	KBPAGE	INTEGER		CLIST	REFS	17					
4	KLABEL	INTEGER		CLIST	REFS	17					
0	KOUNT	INTEGER		CLIST	REFS	17	DEFINED	26	46			
11	KOUNTH	INTEGER		CLIST	REFS	17					
12	KOUNTI	INTEGER		CLIST	REFS	17					
1	KPAGE	INTEGER		CLIST	REFS	17					
0	KTABLE	INTEGER		CTABLE	REFS	19	DEFINED	30	34	37	40	43
5	KTABLO	INTEGER		CTABLE	REFS	19					
5	KTPAGE	INTEGER		CLIST	REFS	17					
2	LINES	INTEGER		CLIST	REFS	17	26	46			
10	LINESG	INTEGER		CLIST	REFS	17					
3	LINEST	INTEGER		CLIST	REFS	17					
3	NCOLS	INTEGER		CTABLE	REFS	19	DEFINED	28				
4	NCOLST	INTEGER		CTABLE	REFS	19					
6	NPAGE	INTEGER		CLIST	REFS	17					
6	NPAGEA	INTEGER		CTABLE	REFS	19					
1	NPASS	INTEGER		CTABLE	REFS	19					
2	NROWS	INTEGER		CTABLE	REFS	19	DEFINED	29	33			

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES					
PTABLE		3	31	35	38	41	44	
TITLES		1	27					

STATEMENT LABELS			DEF LINE	REFERENCES
201	100	FMT	67	51
251	105	FMT	85	52
317	110	FMT	101	53
354	115	FMT	117	54
411	120	FMT	133	55
445	125	FMT	149	56
475	130	FMT	165	57
516	135	FMT	181	58
537	140	FMT	197	59
560	145	FMT	213	60
601	150	FMT	232	61
627	155	FMT	251	62
666	160	FMT	270	63
726	165	FMT	289	64
766	170	FMT	308	65
1032	175	FMT	328	66

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)
		6 NPAGEA (1)	7 ITAPET (1)	
CAFFDL	4	0 AFFDL (4)		

STATISTICS

PROGRAM LENGTH	1104B	580
CM LABELED COMMON LENGTH	32B	26

520000B CM USED

```
      SUBROUTINE READY                                                  READY      2
C                                                                       READY      3
C                                                                       READY      4
C                                                                       READY      5
CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS     READY      6
C     DOUBLE PRECISION ELSTF                                            READY      7
C     DOUBLE PRECISION BUFFD(220)                                       READY      8
CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS        READY      9
C                                                                       READY     10
C                                                                       READY     11
      DIMENSION WORK(28000),BUFFER(310)                                 READY     12
      DIMENSION MUMJ(4),IDJ(4),FACTJ(4),JCHART(4,1),CHART(4,1)          READY     13
      DIMENSION NUMB(10),VALUE(10)                                      READY     14
      DIMENSION ROE(15)                                                 READY     15
      DIMENSION NAME(2),NAM1(2),NAM2(2),NAM3(2),NAM4(2)                 READY     16
      DIMENSION IPOS(20)                                                READY     17
      DIMENSION J1(3),MB(1)                                             READY     18
      DIMENSION MSTOR(1),KSTOR(1),F(3),G(3)                             READY     19
      DIMENSION B(3),C(3),IJS(6),IJD(6)                                 READY     20
      DIMENSION S(6), T(6)                                              READY     21
      DIMENSION NAMFLX(2)                                               READY     22
      DIMENSION DMAPNM(2)                                               READY     23
C                                                                       READY     24
      EQUIVALENCE (WORK(1),IWORK,JCHART(1,1),CHART(1,1)),               READY     25
     *            (BUFFER(1),IBUF),(ROE(1),IROE),(MB(1),NMBAL)          READY     26
C                                                                       READY     27
C  ******************************************************             READY     28
C  *       THE FOLLOWING LINE OF FASTOP CODE HAS        *             READY     29
C  *       BEEN COMMENTED OUT BECAUSE IT IS NOT         *             READY     30
C  *       USED IN THE CURRENT VERSION OF ESP.          *             READY     31
C  ******************************************************             READY     32
C     EQUIVALENCE (PATTY(1),MEM),(PATTY(2),NODES),(PATTY(3),IROW),    READY     33
C    *            (PATTY(4),ICOL),(PATTY(5),WT),(PATTY(6),MEMTYP)     READY     34
C                                                                       READY     35
      EQUIVALENCE (MSTOR(1),NUMSTR) , (KSTOR(1),ICYCLE)                 READY     36
C                                                                       READY     37
      COMMON/BAL/ NMBAL,IDBAL(20),VMBIN(20),VMBOLD(20),VMBNEW(20),      READY     38
     1            MBDOF(20,3),DRVMB(20),DRVMBO(20),                     READY     39
     2            S1MB(20),S2MB(20),S3MB(20)                            READY     40
C                                                                       READY     41
C  ******************************************************             READY     42
C  *       THE FOLLOWING LINE OF FASTOP CODE HAS        *             READY     43
C  *       BEEN COMMENTED OUT BECAUSE IT IS NOT         *             READY     44
C  *       USED IN THE CURRENT VERSION OF ESP.          *             READY     45
C  ******************************************************             READY     46
C     COMMON /ELMNT/ ELSTF(24,24),PATTY(6),NSTART(8),NGO(8)             READY     47
C                                                                       READY     48
      COMMON/COLS/ IT,IMINT,IMAXT,IDENS,IOLDT,IOLDW,ISRAT,IMINTO,       READY     49
     A             IINITT,IWPUT,                                       READY     50
     1             NVAR,JWPUT,JINITT,JMINT,JMAXT,JOLDT,JNEWT,JDRV,     READY     51
     2             JDRVO,JSPR1,JSPR2,JSPR3                             READY     52
      COMMON/SIZES/ NSTMEM,NSTDOF,NDYDOF,NNOPT,NDESNO,NDESYS            READY     53
      COMMON/PLACES/ IUIN1,IUIN2,IUOUT1,IUOUT2,IUGO1,IUGO2,IUGO3,IUGO4, READY     54
     1               IUSCR,IFSCR,IFS1,IFS2,IFS3,IFS4,IUCD,IUPR,         READY     55
     2               IUA,IFA,IUY,IFY,IUMEMN,IFMEMN,IUSTFN,IFSTFN,       READY     56
     3               IUKS,IFKS,IUB,IFB,IUDESO,IFDESO,                   READY     57
     4               IUMDBT,IFMDBT,IUADDT,IFADDT,IUBALT,IFBALT,         READY     58
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      5               IUDESI,IFDESI,IUWTI,IFWTI,                              READY      59
      6               IUMEMO,IFMEMO,IUBT,IFBT,                                READY      60
60    7               IUDESN,IFDESN,IUMD,IFMD,                                READY      61
      8               IUMEMF,IFMEMF,                                          READY      62
      9               IUSTFO,IFSTFO,IUMDB,IFMDB,IUADD,IFADD,IUBAL,IFBAL,      READY      63
      A               IUDESF,IFDESF,IUWT,IFWT,                                READY      64
      B               IUDUM1,IFDUM1,IUDUM2,IFDUM2,IUDUM3,IFDUM3,              READY      65
65    C               IUL,IFL,IUYT,IFYT,IUZ,IFZ,IUZR,IFZR,IULR,IFLR,          READY      66
      D               IUBR,IFBR,                                              READY      67
      E               IUPHTF,IFPHTF,IUMODM,IFMODM,                            READY      68
      F               IUMODK,IFMODK,IUPHT,IFPHT,IUQT,IFQT,IUQ,IFQ,            READY      69
      G               IUPH,IFPH,IUINCM,IFINCM,IUINCK,IFINCK                   READY      70
70     COMMON/KLUES/ KLUSE,KLUNAL,IRED,KLUMD,KLUBAL,MSADD,NPASS,IDNOPT,       READY      71
      1              VDES,EPS1,DWMAX,NBAR,NFIX,D,DEL,EPS2,NCYC,NNN,IDAND,    READY      72
      2              IFIN,KLUB,KLUQ,MORBAL,DBAL                              READY      73
       COMMON/WAYTS/ WINITT,WST,WMB,WBOTH,WPRES,DW                            READY      74
       COMMON /CBYTES/ NBYTES                                                 READY      75
75     COMMON /FILE  / IPOS                                                   READY      76
       COMMON /CORE  / KORE  ,KOREDP                                          READY      77
       COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE        READY      78
      1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                            READY      79
       COMMON /STORES/ NUMSTR,KCONST,ISTDOF(5,6),IDYDOF(5,6),IDSTR(5)         READY      80
80    A               ,STRWI(5),STRWO(5),STRWN(5),STRII(5,3),STRIO(5,3)       READY      81
      B               ,STRIN(5,3),STRRI(5,3),STRRO(5,3),STRRN(5,3)            READY      82
      C               ,STRWDO(5),STRWDN(5),STRIDO(5,3),STRIDN(5,3)            READY      83
      D     ,STRRDO(5,3),STRRDN(5,3),SCALE(5,13)                              READY      84
      E     ,STRFI(5,6),STRFO(5,6),STRFN(5,6)                                 READY      85
85    F     ,STRFDO(5,6),STRFDN(5,6)                                          READY      86
       COMMON /STRCLU/ ICYCLE,ISTEP,M1,M2,M3,M4,VS,VOLD,VNEW,STPOLD           READY      87
       COMMON /LOCSTR/ IUSTRI,IFSTRI,IUMREF,IFMREF                            READY      88
      1               ,IUMOD,IFMOD                                            READY      89
       COMMON/RESIZE/ ISIZE,SCLNEW(5,4),SCLOLD(5,4),ITESTO,SAVSTP,IDUB        READY      90
90     COMMON/ACCEL/ ISTOP,IPAR,DWNEW(5),DINEW(5,3),DWOLD(5),DIOLD(5,3)       READY      91
      1             ,RILSTP                                                  READY      92
       COMMON/COMRWP/ ITAPER,ITAPEW,ITAPEP                                    READY      93
       COMMON/CTAPES/ ITAPES(50)                                              READY      94
       COMMON/ INVERT / INVERT,IUA2,IFLEX,AORD(30),IPERM(30),NSTOR(30,2)      READY      95
95    A,IPREV,NDOFT                                                           READY      96
       COMMON/ VSAVE / VNSAVE, VOSAVE                                         READY      97
       COMMON /CLUEV/ LKLUEV,KLUEV(20)                                        READY      98
C                                                                             READY      99
       DATA NAME /4HMEMB,4HERS /                                              READY     100
100    DATA NAM1/4HDESA,4HRRAY/                                               READY     101
       DATA NAMFLX /4HDYNF,4HLEX /                                            READY     102
C                                                                             READY     103
       KORE = 28000                                                           READY     104
       KOREDP=KORE/2                                                          READY     105
105   C                                                                       READY     106
CCDC   BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS          READY     107
       KOREDP=KORE                                                            READY     108
CCDC   ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS             READY     109
C                                                                             READY     110
110   C                                                                       READY     111
       CALL PROGNA(4H(REA,4HDY ))                                             READY     112
       KOUNT=LINES                                                            READY     113
       CALL MESAGE(1,5,5HREADY)                                               READY     114
       CALL TIMEB(10,10HFROM READY)                                           READY     115
```

```
      C                                                                 READY  116
      C  ***************************************************************READY  117
      C  *       THE FOLLOWING LINE OF FASTOP CODE HAS                 *READY  118
      C  *       BEEN COMMENTED OUT BECAUSE IT IS NOT                  *READY  119
      C  *       USED IN THE CURRENT VERSION OF ESP.                   *READY  120
      C  ***************************************************************READY  121
      C     CALL DSIOPT                                                 READY  122
      C                                                                 READY  123
      C INITIALIZATIONS                                                 READY  124
      C                                                                 READY  125
      CIBM                                                              READY  126
      C     IFLEXS = 8                                                  READY  127
      CIBM                                                              READY  128
      CCDC                                                              READY  129
            IFLEXS = 5                                                  READY  130
      CCDC                                                              READY  131
            IFLEXI = 20                                                 READY  132
            IT=26                                                       READY  133
            IMINT=84                                                    READY  134
            IMAXT=85                                                    READY  135
            IDENS=94                                                    READY  136
            IOLDT=97                                                    READY  137
            IOLDW=96                                                    READY  138
            ISRAT=95                                                    READY  139
            IMINTO=99                                                   READY  140
            IINITT=98                                                   READY  141
            IWPUT=100                                                   READY  142
      C                                                                 READY  143
            NVAR=12                                                     READY  144
            JWPUT=2                                                     READY  145
            JINITT=3                                                    READY  146
            JMINT=4                                                     READY  147
            JMAXT=5                                                     READY  148
            JOLDT=6                                                     READY  149
            JNEWT=7                                                     READY  150
            JDRV=8                                                      READY  151
            JDRVO=9                                                     READY  152
            JSPR1=10                                                    READY  153
            JSPR2=11                                                    READY  154
            JSPR3=12                                                    READY  155
      C                                                                 READY  156
            IF(NCYC.GT.0) GO TO 95                                      READY  157
            NCYC=0                                                      READY  158
            IBAND=0                                                     READY  159
            IFIN=KLUSE                                                  READY  160
      C                                                                 READY  161
            KLUB=0                                                      READY  162
      C  ***************************************************************READY  163
      C  *       KLUB IS ALWAYS SET TO ZERO IN THE CURRENT             *READY  164
      C  *       VERSION OF ESP.  THIS CAUSES CERTAIN                  *READY  165
      C  *       OPERATIONS IN READY, AFOM, AND DRVTV                  *READY  166
      C  *       TO BE BY-PASSED.                                      *READY  167
      C  *       (IN FASTOP, THE ABOVE STATEMENT IS                    *READY  168
      C  *       'KLUB=1' )                                            *READY  169
      C  ***************************************************************READY  170
      C                                                                 READY  171
            IF(IRED.EQ.0) KLUB=0                                        READY  172
```

```
      IF(KLUSE.LE.0.AND.NPASS.EQ 0.AND.KLUMD.EQ.1) KLUB=0                READY   173
C                                                                        READY   174
      KLUQ=1                                                             READY   175
      IF(IRED.EQ.0.OR.KLUSE.LE.0) KLUQ=0                                 READY   176
C                                                                        READY   177
C ASSIGN UNITS AND FILES                                                 READY   178
C                                                                        READY   179
      CALL UNFIL(0)                                                      READY   180
      CALL PROGNA(4H(REA,4HDY ))                                         READY   181
C                                                                        READY   182
C                                                                        READY   183
C DETERMINE THE FOLLOWING- 1) NUMBER OF STRUCTURAL MEMBERS               READY   184
C                             (NOT USED IN ESP)                          READY   185
C                          2) NUMBER OF STRUCTURAL DEGREES OF FREEDOM     READY   186
C                             (NOT USED IN ESP)                          READY   187
C                          3) NUMBER OF DYNAMIC DEGREES OF FREEDOM        READY   188
C                             (NDYDOF)                                   READY   189
C                          4) SOURCE OF DYNAMIC FLEXIBILITY MATRIX        READY   190
C                             (IDYFLX)                                   READY   191
C                          5) SOURCE OF DYNAMIC MASS MATRIX AND,          READY   192
C                             IF FREE-FREE ANALYSIS, PLUG MASS MATRIX    READY   193
C                             (IMASS)                                    READY   194
C                          6) SOURCE OF TRANSFORMATION MATRIX FROM        READY   195
C                             RELATIVE TO ABSOLUTE COORDINATES           READY   196
C                             (ITRNSF)                                   READY   197
C                                                                        READY   198
C     IF SOURCE OF A MATRIX IS CARD IMAGES, CORRESPONDING INDEX = 0.     READY   199
C                                                                        READY   200
C     IF SOURCE IS OUTPUT4 ROUTINE IN MSC NASTRAN, INDEX = 1.            READY   201
C       FLEXIBILITY MATRIX, DYNAMIC MASS MATRIX, AND TRANSFORMATION      READY   202
C       MATRIX MUST BE SEPARATE FILES; PLUG MASS MATRIX, IF USED, MUST   READY   203
C       BE APPENDED TO FILE CONTAINING DYNAMIC MASS MATRIX.              READY   204
C       FLEXIBILITY, TRANSFORMATION, AND PLUG MASS MATRICES MUST BE      READY   205
C       WRITTEN WITH NONSPARSE OPTION; DYNAMIC MASS MATRIX MUST BE       READY   206
C       WRITTEN WITH SPARSE OPTION.                                      READY   207
C                                                                        READY   208
C     IF SOURCE IS OUTPUT2 ROUTINE IN COSMIC NASTRAN, INDEX = 2.         READY   209
C       ALL MATRICES MUST BE WRITTEN ON THE SAME I/O UNIT                READY   210
C       (DEFAULT CAPABILITY IN COSMIC NASTRAN); FILE REWIND              READY   211
C       SHOULD PRECEDE MATRIX WRITE OPERATIONS (P1=-1).                  READY   212
C       ORDER SHOULD BE: (1) FLEXIBILITY MATRIX, (2) DYNAMIC             READY   213
C       MASS MATRIX, AND, IF USED, (3) TRANSFORMATION MATRIX AND         READY   214
C       (4) PLUG MASS MATRIX.                                            READY   215
C                                                                        READY   216
      READ (IUCD,9000) NDYDOF,IDYFLX,IMASS,ITRNSF                        READY   217
C                                                                        READY   218
C     IN NASTRAN, MATRICES ARE WRITTEN BY COLUMNS.                       READY   219
C     IN ESP, FLEXIBILITY AND MASS MATRICES ARE NEEDED BY ROWS.          READY   220
C     SYMMETRY PROPERTY IS USED TO AVOID TAKING TRANSPOSE.               READY   221
C                                                                        READY   222
C                                                                        READY   223
C  ******************************************************              READY   224
C  *       THE FOLLOWING LINES OF FASTOP CODE HAVE      *             READY   225
C  *       BEEN COMMENTED OUT BECAUSE THEY ARE NOT      *             READY   226
C  *       USED IN THE CURRENT VERSION OF ESP.          *             READY   227
C  ******************************************************              READY   228
C                                                                        READY   229
```

```
      C     IPOS(IUMEMN)=IFMEMN                                              READY  230
230   C     CALL GEDLAB(8HREADY 01,IUMEMN,NAME,IFMEMN,KROW,KCOL)             READY  231
      C     NSTMEM=KROW                                                      READY  232
      C     CALL DCLOSE(IUMEMN)                                              READY  233
      C     IF(IRED.EQ.0) GO TO 40                                           READY  234
      C     IPOS(IUY)=IFY                                                    READY  235
235   C     CALL GEDLAB(8HREADY 02,IUY,NAME,IFY,KROW,KCOL)                   READY  236
      C     NSTDOF=KROW                                                      READY  237
      C     NDYDOF=KCOL                                                      READY  238
      C     CALL DCLOSE(IUY)                                                 READY  239
      C     GO TO 50                                                         READY  240
240   C  40 IPOS(IUKS)=IFKS                                                  READY  241
      C     CALL GEDLAB(8HREADY 03,IUKS,NAME,IFKS,KROW,KCOL)                 READY  242
      C     NSTDOF=KROW                                                      READY  243
      C     NDYDOF=NSTDOF                                                    READY  244
      C                                                                      READY  245
245   C  50 CONTINUE                                                         READY  246
      C                                                                      READY  247
      C                                                                      READY  248
      C     IF(KLUNAL.EQ.0) GO TO 95                                         READY  249
      C     IF(NPASS.EQ.0.AND.KLUSE.LT.2) GO TO 95                           READY  250
250   C                                                                      READY  251
      C LIST STRESS RATIOS FOR STRUCTURAL ELEMENTS WHICH ARE FREE TO BE      READY  252
      C RESIZED IN SOP.                                                      READY  253
      C                                                                      READY  254
      C     CALL GEDLAB(8HREADY 04,IUMEMN,NAME,IFMEMN,KROW,KCOL)             READY  255
255   C     KOUNT=LINES                                                      READY  256
      C     NFREE=0                                                          READY  257
      C     K=0                                                              READY  258
      C                                                                      READY  259
      C     DO 90 I=1,KROW                                                   READY  260
260   C     IR=I                                                             READY  261
      C     CALL GETROW(IUMEMN,1,BUFFER,KCOL)                                READY  262
      C     IF(BUFFER(IMINT).EQ.BUFFER(IMAXT)) GO TO 60                      READY  263
      C     K=K+1                                                            READY  264
      C     NFREE=NFREE+1                                                    READY  265
265   C     NUMB(K)=IBUF                                                     READY  266
      C     VALUE(K)=BUFFER(ISRAT)                                           READY  267
      C  60 IF(K.EQ.5) GO TO 65                                              READY  268
      C     IF(IR.EQ.KROW.AND.K.GT.0) GO TO 65                               READY  269
      C     GO TO 90                                                         READY  270
270   C  65 CALL TITLES(2)                                                   READY  271
      C     IF(KOUNT.GT.KOUNTH) GO TO 70                                     READY  272
      C     WRITE(IUPR,9004)                                                 READY  273
      C     KOUNT=KOUNT+5                                                    READY  274
      C  70 WRITE(IUPR,9005) (NUMB(L),VALUE(L),L=1,K)                        READY  275
275   C     KOUNT=KOUNT+1                                                    READY  276
      C     K=0                                                              READY  277
      C  90 CONTINUE                                                         READY  278
      C                                                                      READY  279
      C  ******************************************************              READY  280
280   C  *       END OF CODE THAT HAS BEEN COMMENTED OUT.      *              READY  281
      C  ******************************************************              READY  282
      C                                                                      READY  283
      C     READ DYNAMIC FLEXIBILITY MATRIX FROM EXTERNAL SOURCE             READY  284
      C     (VIA UNIT 20), AND WRITE ON FILE 1 OF UNIT 8.                    READY  285
285   C                                                                      READY  286
```

```
                KCOL = NDYDOF                                                   READY    287
                KROW = NDYDOF                                                   READY    288
                REWIND IFLEXI                                                   READY    289
                CALL PUDLAB (8HREADY 12,IFLEXS,NAMFLX,1,KROW,KCOL)              READY    290
290             IF (IDYFLX.NE.0)                                                READY    291
               1CALL NASTRD (IDYFLX,IFLEXI,1,1,1,NDYDOF,NDYDOF,BUFFER)          READY    292
                IF (IDYFLX.EQ.0.AND.KLUEV(7).EQ.2)                              READY    293
               1WRITE (6,9027) KROW,KCOL                                        READY    294
                DO 92 I=1,KROW                                                  READY    295
295             IF (IDYFLX.EQ.0)                                                READY    296
               1READ (IFLEXI,9026) (BUFFER(K),K=1,KCOL)                         READY    297
                IF (IDYFLX.EQ.0.AND.KLUEV(7).EQ.2)                              READY    298
               1WRITE (6,9028) I,(BUFFER(K),K=1,KCOL)                           READY    299
                IF (IDYFLX NE.0)                                                READY    300
300            1CALL NASTRD (IDYFLX,IFLEXI,1,1,2,NDYDOF,NDYDOF,BUFFER)          READY    301
                CALL PUTROW (IFLEXS,-1,BUFFER,KCOL)                             READY    302
              92 CONTINUE                                                       READY    303
                CALL DCLOSE (IFLEXS)                                            READY    304
                IF (IDYFLX.EQ.2)                                                READY    305
305            1CALL NASTRD (IDYFLX,IFLEXI,1,1,3,NDYDOF,NDYDOF,BUFFER)          READY    306
C                                                                               READY    307
              95 CONTINUE                                                       READY    308
C                                                                               READY    309
C                                                                               READY    310
310             IF(NPASS.NE.0) GO TO 400                                        READY    311
                IF(NCYC.GT.0) GO TO 700                                         READY    312
C                                                                               READY    313
C  ***************************************************                          READY    314
C  *       THE FOLLOWING LINES OF FASTOP CODE HAVE       *                       READY    315
315 C  *       BEEN COMMENTED OUT BECAUSE THEY ARE NOT       *                   READY    316
C  *       USED IN THE CURRENT VERSION OF ESP.           *                       READY    317
C  ***************************************************                          READY    318
C                                                                               READY    319
C NPASS=0  DO SOME OR ALL OF THE FOLLOWING-DEPENDING ON THE CURRENT             READY    320
320 C USE OF THE PROGRAM.                                                       READY    321
C                                                                               READY    322
C 1. IF NON-OPTIMUM FACTORS AND/OR FIXED GAGE ELEMENTS ARE PRESENT,             READY    323
C    READ ASSOCIATED DATA INTO CORE.                                            READY    324
C 2. IF NON-OPT FACTORS ARE PRESENT, UPDATE ELEMENT STIFFNESS FILE.             READY    325
325 C 3. UPDATE THE MEMBER MATRIX.                                              READY    326
C      A. COPY ORIGINAL SET OF MINIMUM ALLOWABLE GAGES ONTO COL IMINTO.         READY    327
C    B. COPY SET OF CURRENT GAGES ONTO COL IINITT.                              READY    328
C    C. INSERT WEIGHT PER UNIT GAGE INTO COL IWPUT.                             READY    329
C 4. CONSTRUCT THE DESIGN ARRAY.                                                READY    330
330 C 5. READ IN MASS BALANCE DATA(CARDS)-IF ANY.                               READY    331
C                                                                               READY    332
C     NNOPT=0                                                                   READY    333
C     NDESNO=0                                                                  READY    334
C                                                                               READY    335
335 C     IF(IDNOPT.NE.1) GO TO 145                                             READY    336
C                                                                               READY    337
C     K=0                                                                       READY    338
C     NBAD=0                                                                    READY    339
C 100 READ(IUCD,9002) (MUMJ(I),IDJ(I),FACTJ(I),I=1,4)                           READY    340
340 C     IF(MUMJ(1).EQ.0) GO TO 115                                            READY    341
C     DO 110 I=1,4                                                              READY    342
C     IF(MUMJ(I).EQ.0) GO TO 100                                                READY    343
```

```
      C     IF(K EQ 0) GO TO 106                                                    READY    344
      C     DO 104 L=1,KMAX                                                         READY    345
345   C     IF(MUMJ(I) NE JCHART(1,L)) GO TO 104                                    READY    346
      C     IF(NBAD.EQ.0) KOUNT=LINES                                               READY    347
      C     NBAD=NBAD+1                                                             READY    348
      C     LEFT=LINES-KOUNT                                                        READY    349
      C     IF(LEFT.LT.3) KOUNT=LINES                                               READY    350
350   C     CALL TITLES(2)                                                          READY    351
      C     WRITE(IUPR,9023) MUMJ(I)                                                READY    352
      C     KOUNT=KOUNT+3                                                           READY    353
      C     GO TO 110                                                               READY    354
      C 104 CONTINUE                                                                READY    355
355   C                                                                             READY    356
      C 106 CONTINUE                                                                READY    357
      C     K=K+1                                                                   READY    358
      C     KMAX=K                                                                  READY    359
      C     JCHART(1,K)=MUMJ(I)                                                     READY    360
360   C     JCHART(2,K)=IDJ(I)                                                      READY    361
      C     CHART(3,K)=FACTJ(I)                                                     READY    362
      C     CHART(4,K)=0.0                                                          READY    363
      C     IF(JCHART(2,K).EQ.1) NDESNO=NDESNO+1                                    READY    364
      C     IF(CHART(3,K).NE.0..AND.CHART(3,K).NE.1.) NNOPT=NNOPT+1                 READY    365
365   C 110 CONTINUE                                                                READY    366
      C     GO TO 100                                                               READY    367
      C                                                                             READY    368
      C 115 CONTINUE                                                                READY    369
      C                                                                             READY    370
370   C                                                                             READY    371
      C     DO 140 NTIME=1,2                                                        READY    372
      C     NMAX=10                                                                 READY    373
      C     IF(NTIME.EQ.2) NMAX=6                                                   READY    374
      C     IF(NTIME.EQ.1.AND.NDESNO.EQ.0) GO TO 140                                READY    375
375   C     IF(NTIME.EQ.2.AND.NNOPT.EQ.0)  GO TO 140                                READY    376
      C     KOUNT=LINES                                                             READY    377
      C     J=0                                                                     READY    378
      C                                                                             READY    379
      C     DO 135 K=1,KMAX                                                         READY    380
380   C     I=JCHART(1,K)                                                           READY    381
      C     M=JCHART(2,K)                                                           READY    382
      C     A=CHART(3,K)                                                            READY    383
      C     IF(NTIME.EQ.1.AND.M.NE.1) GO TO 120                                     READY    384
      C     IF(NTIME.EQ.2.AND.(A.EQ.0..OR.A.EQ.1.)) GO TO 120                       READY    385
385   C     J=J+1                                                                   READY    386
      C     NUMB(J)=I                                                               READY    387
      C     IF(NTIME.EQ.2) VALUE(J)=A                                               READY    388
      C 120 CONTINUE                                                                READY    389
      C     IF(J.EQ.NMAX) GO TO 125                                                 READY    390
390   C     IF(K.EQ.KMAX.AND.J.GT.0) GO TO 125                                      READY    391
      C     GO TO 135                                                               READY    392
      C 125 CALL TITLES(2)                                                          READY    393
      C     IF(KOUNT.GT.KOUNTH) GO TO 130                                           READY    394
      C     IF(NTIME.EQ.1) WRITE(IUPR,9006)                                         READY    395
395   C     IF(NTIME.EQ.2) WRITE(IUPR,9007)                                         READY    396
      C     KOUNT=KOUNT+5                                                           READY    397
      C 130 IF(NTIME.EQ.1) WRITE(IUPR,9008) (NUMB(L),L=1,J)                         READY    398
      C     IF(NTIME.EQ.2) WRITE(IUPR,9009) (NUMB(L),VALUE(L),L=1,J)                READY    399
      C     KOUNT=KOUNT+1                                                           READY    400
```

```
      C     J=0                                                              READY   401
      C 135 CONTINUE                                                         READY   402
      C                                                                      READY   403
      C     LEFT=LINES-KOUNT                                                 READY   404
      C     IF(LEFT.GE.3) GO TO 138                                          READY   405
      C     KOUNT=LINES                                                      READY   406
      C     CALL TITLES(2)                                                   READY   407
      C 138 IF(NTIME.EQ.1) WRITE(IUPR,9010) NDESNO                           READY   408
      C     IF(NTIME.EQ.2) WRITE(IUPR,9011) NNOPT                            READY   409
      C     KOUNT=KOUNT+3                                                    READY   410
      C 140 CONTINUE                                                         READY   411
      C                                                                      READY   412
      C                                                                      READY   413
      C 145 CONTINUE                                                         READY   414
      C                                                                      READY   415
      C  ******************************************************              READY   416
      C  *       END OF CODE THAT HAS BEEN COMMENTED OUT.     *              READY   417
      C  ******************************************************              READY   418
      C                                                                      READY   419
      C ASSIGN UNITS AND FILES.                                              READY   420
      C                                                                      READY   421
            CALL UNFIL(-1)                                                   READY   422
      C                                                                      READY   423
            CALL PROGNA(4H(REA,4HDY ))                                       READY   424
      C                                                                      READY   425
      C  ******************************************************              READY   426
      C  *       THE FOLLOWING LINES OF FASTOP CODE HAVE      *              READY   427
      C  *       BEEN COMMENTED OUT BECAUSE THEY ARE NOT      *              READY   428
      C  *       USED IN THE CURRENT VERSION OF ESP.          *              READY   429
      C  ******************************************************              READY   430
      C     IF(KLUSE.NE.2.AND.KLUMD.EQ.1.AND.NNOPT.EQ.0) GO TO 220           READY   431
      C                                                                      READY   432
      C     IUSTFN=IUDUM3-IUSTFN                                             READY   433
      C     IUSTFO=IUDUM3-IUSTFO                                             READY   434
      C     IFSTFN=IFDUM3-IFSTFN                                             READY   435
      C     IFSTFO=IFDUM3-IFSTFO                                             READY   436
      C                                                                      READY   437
      C     CALL GEDLAB(8HREADY 05,IUSTFO,NAME,IFSTFO,MROW,MCOL)             READY   438
      C     CALL PUDLAB(8HREADY 01,IUSTFN,NAME,IFSTFN,MROW,MCOL)             READY   439
      C                                                                      READY   440
      C     DO 200 I=1,NSTMEM                                                READY   441
      C     CALL PREAD(IUSTFO,PATTY(1),24)                                   READY   442
      C     IF(IDNOPT.NE.1) GO TO 180                                        READY   443
      C     IF(I.GT.KMAX)GO TO 150                                           READY   444
      C     IF(MEM.NE.JCHART(1,I)) GO TO 150                                 READY   445
      C     J=I                                                              READY   446
      C     GO TO 170                                                        READY   447
      C 150 CONTINUE                                                         READY   448
      C     DO 160 K=1,KMAX                                                  READY   449
      C     IF(MEM.NE.JCHART(1,K)) GO TO 160                                 READY   450
      C     J=K                                                              READY   451
      C     GO TO 170                                                        READY   452
      C 160 CONTINUE                                                         READY   453
      C     GO TO 180                                                        READY   454
      C                                                                      READY   455
      C 170 CONTINUE                                                         READY   456
      C     AA=CHART(3,J)                                                    READY   457
```

```
                     1        48H DYNAMIC FLEXIBILITY MATRIX FROM CARD-IMAGE FILE)      READY    1199
                  9028 FORMAT (//15X,4HROW .I3//(1P10E12.4))                            READY    1200
 1200             C                                                                     READY    1201
                   9999 CONTINUE                                                        READY    1202
                  C                                                                     READY    1203
                  C                                                                     READY    1204
                       RETURN                                                           READY    1205
 1205                  END                                                              READY    1206
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
1 READY 1 1204

VARIABLES		SN	TYPE	RELOCATION									
2024	A		REAL			REFS	699	700	701	DEFINED	684		
3	AORD		REAL	ARRAY	INVERT	REFS	94						
2033	ASTEP		REAL			REFS	766	DEFINED	764	767			
71402	B		REAL	ARRAY		REFS	19	706	707	708	DEFINED	684	
2071	BUFFER		REAL	ARRAY		REFS	11	24	290	297	299	301	304
						1101	DEFINED	295					
71405	C		REAL	ARRAY		REFS	19	711	712	713	DEFINED	684	
2557	CHART		REAL	ARRAY		REFS	12	24					
15	D		REAL		KLUES	REFS	70						
27	DBAL		REAL		KLUES	REFS	70						
16	DEL		REAL		KLUES	REFS	70						
7	DINEW		REAL	ARRAY	ACCEL	REFS	90						
33	DIOLD		REAL	ARRAY	ACCEL	REFS	90						
71442	DMAPNM		REAL	*UNDEF		REFS	22						
215	DRVMB		REAL	ARRAY	BAL	REFS	37						
241	DRVMBO		REAL	ARRAY	BAL	REFS	37						
2043	DSTFX		REAL			REFS	790	1045	DEFINED	784	1039		
2046	DSTFXX		REAL			REFS	790	1045	DEFINED	787	1042		
2044	DSTFY		REAL			REFS	790	1045	DEFINED	785	1040		
2047	DSTFYY		REAL			REFS	790	1045	DEFINED	788	1043		
2045	DSTFZ		REAL			REFS	790	1045	DEFINED	786	1041		
2050	DSTFZZ		REAL			REFS	790	1045	DEFINED	789	1044		
2035	DSTIX		REAL			REFS	790	1045	DEFINED	778	1033		
2036	DSTIY		REAL			REFS	790	1045	DEFINED	779	1034		
2037	DSTIZ		REAL			REFS	790	1045	DEFINED	780	1035		
2040	DSTRX		REAL			REFS	790	1045	DEFINED	781	1036		
2041	DSTRY		REAL			REFS	790	1045	DEFINED	782	1037		
2042	DSTRZ		REAL			REFS	790	1045	DEFINED	783	1038		
2034	DSTW		REAL			REFS	790	1045	DEFINED	777	1032		
5	DW		REAL		WAYTS	REFS	73						
12	DWMAX		REAL		KLUES	REFS	70						
2	DWNEW		REAL	ARRAY	ACCEL	REFS	90						
26	DWOLD		REAL	ARRAY	ACCEL	REFS	90						
2025	E		REAL			REFS	687	DEFINED	685				
11	EPS1		REAL		KLUES	REFS	70						
17	EPS2		REAL		KLUES	REFS	70						
71374	F		REAL	ARRAY		REFS	18	689	DEFINED	685			
71227	FACT1		REAL	*UNDEF		REFS	12						

```
      9006 FORMAT(/,10X,   45HMEMBERS TO BE EXCLUDED FROM FLUTTER REDESIGN ,  READY  1142
          1                 7HPROCESS,                                       READY  1143
          2      //,10X,10(4X,6HMEMBER),/)                                    READY  1144
      9007 FORMAT(/,10X,   43HMEMBERS FOR WHICH NON-OPTIMUM FACTORS HAVE ,    READY  1145
1145      1                 14HBEEN SPECIFIED,                               READY  1146
          2    //,10X,   6(20H    MEMBER    FACTOR),/)                       READY  1147
      9008 FORMAT(10X,10I10)                                                  READY  1148
      9009 FORMAT(10X,6(I10,F10.3))                                           READY  1149
      9010 FORMAT(//,10X,I5,    38H MEMBERS ARE EXCLUDED FROM THE FLUTTER,    READY  1150
1150      1                     17H REDESIGN PROCESS)                         READY  1151
      9011 FORMAT(//,10X,  43HNON-OPTIMUM FACTORS HAVE BEEN SPECIFIED FOR,I5, READY  1152
          1                  8H MEMBERS)                                     READY  1153
      9012 FORMAT(/,10X,   17HDESIGN ARRAY DATA,//,                           READY  1154
          1          10X,5H MEMB,                                            READY  1155
1155      2          8X,5H NEWT,                                             READY  1156
          3          10X,5H OLDT,                                            READY  1157
          4          10X,5HINITT,                                            READY  1158
          5          10X,5H MINT,                                            READY  1159
          6          10X,5H MAXT,                                            READY  1160
1160      7          10X,5H WPUT,4X,5H MEMB,/)                               READY  1161
      9013 FORMAT(10X,I5,6F15.4,I7)                                           READY  1162
      9014 FORMAT(/,10X,   25HINITIAL MASS BALANCE DATA,                      READY  1163
          1      //,10X,    8H  NUMBER,9X,6HWEIGHT,3(5X,3HDOF),/)            READY  1164
      9015 FORMAT(10X,I8,F15.4,3I8,/)                                         READY  1165
1165  9016 FORMAT(/,10X,   27HTOTAL MASS BALANCE WEIGHT =,F15.4)              READY  1166
      9017 FORMAT(/,10X,   25HCURRENT MASS BALANCE DATA,/)                    READY  1167
      9018 FORMAT(10X,49HTHE OLD MASS BALANCE DATA HAS BEEN SUPERSEDED BY ,   READY  1168
          1            9HTHIS DATA,//)                                      READY  1169
      9019 FORMAT(/,10X,    8H  NUMBER,   15H   INITIAL WGHT,                 READY  1170
1170      1           20H        CURRENT WGHT,3(5X,3HDOF),/)                  READY  1171
      9020 FORMAT(10X,I8,F15.4,F20.4,3I8,/)                                   READY  1172
      9021 FORMAT(/,10X,   34H**********WEIGHT SUMMARY**********,/)           READY  1173
      9022 FORMAT (/,10X,42HINITIAL REFERENCE WEIGHT.................,F12.4, READY  1174
          1       //,10X,42HWEIGHT CHANGE IN LAST PASS THROUGH SOP....,F12.4, READY  1175
1175      2       //,10X,42HCUMULATIVE STRUCT. WEIGHT CHANGE.........,F12.4, READY  1176
          3       //,10X,42HCUMULATIVE MASS BAL. WEIGHT CHANGE.......,F12.4, READY  1177
          4       //,10X,42HCUMULATIVE TOTAL WEIGHT CHANGE...........,F12.4, READY  1178
          5       //,10X,42HPERCENTAGE WEIGHT CHANGE (CUMULATIVE).....,F12.4, READY  1179
          6       //,10X,42HTOTAL NEW WEIGHT.........................,F12.4, READY  1180
1180      7       /)                                                          READY  1181
      9023 FORMAT(10X, 6HMEMBER,I5, 33H APPEARS REDUNDANTLY IN THE DATA ,     READY  1182
          1           45HBLOCK ASSOCIATED WITH NON-OPT FACTORS AND/OR ,       READY  1183
          2           32HEXCLUSION FROM FLUTTER REDESIGN.,                    READY  1184
          3     /,10X,43HTHE INITIAL DATA IS BEING ACCEPTED AND THE ,         READY  1185
1185      4           49HREDUNDANT DATA IS BEING IGNORED. CHECK THE INPUT ,   READY  1186
          5            5HDATA.,/)                                             READY  1187
      9024 FORMAT(10X,47HTHE FOLLOWING MEMBERS APPEAR IN THE DATA BLOCK ,     READY  1188
          1           49HASSOCIATED WITH NON-OPT FACTORS AND/OR EXCLUSION ,   READY  1189
          2           22HFROM FLUTTER REDESIGN.,                              READY  1190
1190      3     /,10X,49HHOWEVER, THERE ARE NO SUCH MEMBER NUMBERS IN THE ,   READY  1191
          4            9HSTRUCTURE,/)                                         READY  1192
      9025 FORMAT(10X,49HEXECUTION TERMINATES DUE TO ERRORS IN DATA BLOCK ,   READY  1193
          1           50HFOR NON-OPT FACTORS AND/OR EXCLUSION FROM FLUTTER ,  READY  1194
          2            9HREDESIGN.,                                           READY  1195
1195      3     /,10X,17HCHECK INPUT DATA.,/)                                 READY  1196
      9026 FORMAT (3(8X,1PE15.5,1X))                                          READY  1197
      9027 FORMAT (1H1,9X,8HREADING  I3,3H X  I3                              READY  1198
```

```
                C     CALL PROGNA(4H(REA,4HDY ))                                  READY    1085
1085            C                                                                 READY    1086
                C ADJUST SCRATCH FILES ON UNITS CONTAINING B AND BT.              READY    1087
                C                                                                 READY    1088
                C     CALL UNFIL(1)                                               READY    1089
                C                                                                 READY    1090
1090            C     CALL PROGNA(4H(REA,4HDY ))                                  READY    1091
                C                                                                 READY    1092
                C 750 CONTINUE                                                    READY    1093
                C                                                                 READY    1094
                C  ******************************************************         READY    1095
1095            C  *       END OF CODE THAT HAS BEEN COMMENTED OUT.      *        READY    1096
                C  ******************************************************         READY    1097
                C                                                                 READY    1098
                C CALL THE MASS SUBROUTINE TO OBTAIN THE DYNAMIC MASS MATRIX MD.  READY    1099
                C                                                                 READY    1100
1100              760 CONTINUE                                                    READY    1101
                      CALL DYNMAS(WORK,KORE,BUFFER,IERR,IDYFLX,IMASS,ITRNSF)      READY    1102
                C                                                                 READY    1103
                      CALL PROGNA(4H(REA,4HDY ))                                  READY    1104
                C                                                                 READY    1105
1105            C  ******************************************************         READY    1106
                C  *       THE FOLLOWING LINES OF FASTOP CODE HAVE       *       READY    1107
                C  *       BEEN COMMENTED OUT BECAUSE THEY ARE NOT       *       READY    1108
                C  *       USED IN THE CURRENT VERSION OF ESP.           *       READY    1109
                C  ******************************************************         READY    1110
1110            C                                                                 READY    1111
                C IF KLUB=1 READJUST SCRATCH FILE ON UNIT CONTAINING BT.          READY    1112
                C                                                                 READY    1113
                C     IF(KLUB.EQ.0) GO TO 770                                     READY    1114
                C                                                                 READY    1115
1115            C     CALL UNFIL(2)                                               READY    1116
                C                                                                 READY    1117
                C     CALL PROGNA(4H(REA,4HDY ))                                  READY    1118
                C                                                                 READY    1119
                C 770 CONTINUE                                                    READY    1120
1120            C                                                                 READY    1121
                C  ******************************************************         READY    1122
                C  *       END OF CODE THAT HAS BEEN COMMENTED OUT.      *        READY    1123
                C  ******************************************************         READY    1124
                C                                                                 READY    1125
1125            C SET UNITS AND FILES FOR VIBRATION OUTPUT.                       READY    1126
                C                                                                 READY    1127
                      CALL UNFIL(25)                                              READY    1128
                C                                                                 READY    1129
                      CALL PROGNA(4H(REA,4HDY ))                                  READY    1130
1130                  CALL TIMEB(10,10HFROM READY)                                READY    1131
                      CALL MESAGE(2,5,5HREADY)                                    READY    1132
                C                                                                 READY    1133
                C     '                                                           READY    1134
                 9000 FORMAT(4I5)                                                 READY    1135
1135             9002 FORMAT(4(2I5,F10.3))                                        READY    1136
                 9003 FORMAT(I5,F15.5,3I5)                                        READY    1137
                 9004 FORMAT(/,10X,   44HSTRESS RATIOS OF ACTIVE STRUCTURAL ELEMENTS ,  READY    1138
                    1              6HIN SOP,                                      READY    1139
                    2      //,10X, 5(20H MEMB   STRESS RATIO,4X),/)               READY    1140
1140             9005 FORMAT(10X,5(I5,F15.5,4X))                                  READY    1141
```

```
      IF (KLUSE.LE.0)  GO TO 760                                        READY  1028
C                                                                       READY  1029
      DO 680 I=1,NUMSTR                                                 READY  1030
1030  WRITE(IUPR,9051) IDSTR(I),(IDYDOF(I,K),K=1,6)                     READY  1031
      WRITE(IUPR,9052)                                                  READY  1032
      DSTW=STRWN(I)-STRWI(I)                                            READY  1033
      DSTIX=STRIN(I,1)-STRII(I,1)                                       READY  1034
      DSTIY=STRIN(I,2)-STRII(I,2)                                       READY  1035
1035  DSTIZ=STRIN(I,3)-STRII(I,3)                                       READY  1036
      DSTRX = STRRN(I,1) - STRRI(I,1)                                   READY  1037
      DSTRY = STRRN(I,2) - STRRI(I,2)                                   READY  1038
      DSTRZ = STRRN(I,3) - STRRI(I,3)                                   READY  1039
      DSTFX = STRFN(I,1) - STRFI(I,1)                                   READY  1040
1040  DSTFY = STRFN(I,2) - STRFI(I,2)                                   READY  1041
      DSTFZ = STRFN(I,3) - STRFI(I,3)                                   READY  1042
      DSTFXX = STRFN(I,4) - STRFI(I,4)                                  READY  1043
      DSTFYY = STRFN(I,5) - STRFI(I,5)                                  READY  1044
      DSTFZZ = STRFN(I,6) - STRFI(I,6)                                  READY  1045
1045  WRITE(IUPR,9053) STRWI(I),STRWN(I),DSTW,                          READY  1046
     1                 STRII(I,1),STRIN(I,1),DSTIX,                     READY  1047
     2                 STRII(I,2),STRIN(I,2),DSTIY,                     READY  1048
     3                  STRII(I,3),STRIN(I,3),DSTIZ,                    READY  1049
     4                  STRRI(I,1),STRRN(I,1),DSTRX,                    READY  1050
1050 5                  STRRI(I,2),STRRN(I,2),DSTRY,                    READY  1051
     6                  STRRI(I,3),STRRN(I,3),DSTRZ                     READY  1052
     7    ,STRFI(I,1),STRFN(I,1),DSTFX                                 READY  1053
     8    ,STRFI(I,2),STRFN(I,2),DSTFY                                 READY  1054
     9    ,STRFI(I,3),STRFN(I,3),DSTFZ                                 READY  1055
1055 A    ,STRFI(I,4),STRFN(I,4),DSTFXX                                READY  1056
     B    ,STRFI(I,5),STRFN(I,5),DSTFYY                                READY  1057
     C    ,STRFI(I,6),STRFN(I,6),DSTFZZ                                READY  1058
  680 CONTINUE                                                          READY  1059
C                                                                       READY  1060
1060  C                                                                 READY  1061
C     READ DSM FROM UNIT IUA AND REPLACE MAIN DIAGONAL                  READY  1062
C     TERMS OF STORE-ON-STORE PARTITION WITH NEW VALUES.                READY  1063
C                                                                       READY  1064
  701 CONTINUE                                                          READY  1065
1065  C                                                                 READY  1066
      CALL UPDATE( IUA, IUPR, NCYC )                                    READY  1067
C                                                                       READY  1068
C  ***************************************************                  READY  1069
C  *       THE FOLLOWING LINES OF FASTOP CODE HAVE     *               READY  1070
1070  C  *       BEEN COMMENTED OUT BECAUSE THEY ARE NOT     *         READY  1071
C  *       USED IN THE CURRENT VERSION OF ESP.         *               READY  1072
C  ***************************************************                  READY  1073
C                                                                       READY  1074
C     IF(NCYC.GT.0) GO TO 750                                           READY  1075
1075  C                                                                 READY  1076
C                                                                       READY  1077
C                                                                       READY  1078
C IF KLUB=1, OBTAIN TRANSFORMATION MATRIX B AND ITS TRANSPOSE BT.       READY  1079
C                                                                       READY  1080
1080  C     IF(KLUB.EQ.0) GO TO 750                                     READY  1081
C                                                                       READY  1082
C     CALL BSOLVE(KORE,WORK)                                            READY  1083
C                                                                       READY  1084
```

```
970           C 530 CONTINUE                                                    READY     971
              C     WMB=0.0                                                     READY     972
              C     DO 540 I=1,NMBAL                                            READY     973
              C 540 WMB=WMB+VMBNEW(I)                                           READY     974
              C                                                                 READY     975
975           C 600 CONTINUE                                                    READY     976
              C                                                                 READY     977
              C     IF(KLUBAL.EQ.0) GO TO 640                                   READY     978
              C                                                                 READY     979
              C     KOUNT=LINES                                                 READY     980
980           C     CALL TITLES(2)                                              READY     981
              C     WRITE(IUPR,9017)                                            READY     982
              C     KOUNT=KOUNT+3                                               READY     983
              C     IF(MORBAL.EQ.0) GO TO 610                                   READY     984
              C     WRITE(IUPR,9018)                                            READY     985
985           C     KOUNT=KOUNT+3                                               READY     986
              C 610 CONTINUE                                                    READY     987
              C     WRITE(IUPR,9019)                                            READY     988
              C     KOUNT=KOUNT+3                                               READY     989
              C     DO 620 I=1,NMBAL                                            READY     990
990           C     WRITE(IUPR,9020) IDBAL(I),VMBIN(I),VMBNEW(I),(MBDOF(I,J),J=1,3) READY 991
              C     KOUNT=KOUNT+2                                               READY     992
              C 620 CONTINUE                                                    READY     993
              C                                                                 READY     994
              C 640 CONTINUE                                                    READY     995
995           C                                                                 READY     996
              C     WBOTH=WMB+WST                                               READY     997
              C     WPRES=WINITT+WBOTH                                          READY     998
              C     WPCT=100.*(WBOTH/WINITT)                                    READY     999
              C                                                                 READY    1000
1000          C     KOUNT=LINES                                                 READY    1001
              C     CALL TITLES(2)                                              READY    1002
              C     WRITE(IUPR,9021)                                            READY    1003
              C     KOUNT=KOUNT+3                                               READY    1004
              C     WRITE(IUPR,9022) WINITT,WCHNGE,WST,WMB,WBOTH,WPCT,WPRES     READY    1005
1005          C     KOUNT=KOUNT+15                                              READY    1006
              C                                                                 READY    1007
              C                                                                 READY    1008
              C                                                                 READY    1009
              C COMMON /STORES/ CONTAINS 277 WORDS                              READY    1010
1010          C COMMON /STRCLU/ CONTAINS 10 WORDS                               READY    1011
              C     CALL GEDLAB(8HREADY 50,IUSTRI,NAME,IFSTRI,MROW,MCOL)        READY    1012
              C     NBYTE= 4*277                                                READY    1013
              C     CALL DREAD(IUSTRI,MSTOR(1),NBYTE)                           READY    1014
              C     NBYTE= 4*10                                                 READY    1015
1015          C     CALL DREAD(IUSTRI,KSTOR(1),NBYTE)                           READY    1016
              C     CALL DCLOSE(IUSTRI)                                         READY    1017
              C                                                                 READY    1018
              C     KOUNT=LINES                                                 READY    1019
              C     CALL TITLES(2)                                              READY    1020
1020          C                                                                 READY    1021
              C  ******************************************************         READY    1022
              C  *       END OF CODE THAT HAS BEEN COMMENTED OUT.     *         READY    1023
              C  ******************************************************         READY    1024
              C                                                                 READY    1025
1025            700 CONTINUE                                                    READY    1026
              C                                                                 READY    1027
```

```
      C     IF(SRMIN.LE.SZMIN) ROE(JMINT)=-SZMIN                                  READY    914
      C 440 CONTINUE                                                              READY    915
915   C     CALL TITLES(2)                                                        READY    916
      C     IF(KOUNT.GT.KOUNTH) GO TO 442                                         READY    917
      C     WRITE(IUPR,9012)                                                      READY    918
      C     KOUNT=KOUNT+5                                                         READY    919
      C     L=0                                                                   READY    920
920   C 442 CONTINUE                                                              READY    921
      C     AMINT=ABS(ROE(JMINT))                                                 READY    922
      C     WRITE(IUPR,9013) IROE,ROE(JNEWT),ROE(JOLDT),ROE(JINITT),              READY    923
      C    1                                  AMINT,ROE(JMAXT),ROE(JWPUT),IROE   READY    924
      C     KOUNT=KOUNT+1                                                         READY    925
925   C     L=L+1                                                                 READY    926
      C     IF(L.LT.4) GO TO 443                                                  READY    927
      C     L=0                                                                   READY    928
      C     IF(KOUNT.EQ.LINES) GO TO 443                                          READY    929
      C     CALL PLB(1,1,IUPR)                                                    READY    930
930   C     KOUNT=KOUNT+1                                                         READY    931
      C 443 CONTINUE                                                              READY    932
      C     CALL PUTROW(IUDESN,2,ROE,KCOL)                                        READY    933
      C     LYNE=LYNE+1                                                           READY    934
      C     GO TO 460                                                             READY    935
935   C 445 JUMP=1                                                                READY    936
      C 460 CONTINUE                                                              READY    937
      C                                                                           READY    938
      C     CALL DCLOSE(IUDESI)                                                   READY    939
      C     CALL DCLOSE(IUDESN)                                                   READY    940
940   C     CALL DCLOSE(IUMEMN)                                                   READY    941
      C                                                                           READY    942
      C                                                                           READY    943
      C     NMBAL=0                                                               READY    944
      C     WMB=0.0                                                               READY    945
945   C     IF(KLUBAL.EQ.0) GO TO 480                                             READY    946
      C     CALL GEDLAB(8HREADY 11,IUBALI,NAME,IFBALI,MROW,MCOL)                  READY    947
      C                                                                           READY    948
      C  COMMON/BAL/ CONTAINS 241 WORDS                                           READY    949
      C                                                                           READY    950
950   C     NBYTE=4*241                                                           READY    951
      C     CALL DREAD(IUBALI,MB(1),NBYTE)                                        READY    952
      C     CALL DCLOSE(IUBALI)                                                   READY    953
      C                                                                           READY    954
      C     DO 470 I=1,NMBAL                                                      READY    955
955   C 470 WMB=WMB+VMBNEW(I)                                                     READY    956
      C                                                                           READY    957
      C 480 CONTINUE                                                              READY    958
      C                                                                           READY    959
      C     WCHNGE=(WST+WMB)-WBOTH                                                READY    960
960   C                                                                           READY    961
      C     IF(KLUBAL.EQ.0.OR.MORBAL.EQ.0) GO TO 600                              READY    962
      C                                                                           READY    963
      C 500 READ(IUCD,9003) I1,A1                                                 READY    964
      C     IF(I1.EQ.0) GO TO 530                                                 READY    965
965   C     DO 520 I=1,NMBAL                                                      READY    966
      C     IF(I1.EQ.IDBAL(I)) VMBNEW(I)=A1                                       READY    967
      C 520 CONTINUE                                                              READY    968
      C     GO TO 500                                                             READY    969
      C                                                                           READY    970
```

```
                C     CALL PREAD(IUSTFO,PATTY(1),24)                                READY    857
                C     CALL PRITE(IUSTFN,PATTY(1),24)                                READY    858
                C     NBYTE=4*NODES                                                 READY    859
                C     CALL PREAD(IUSTFO,NSTART(1),NBYTE)                            READY    860
    860         C     CALL PRITE(IUSTFN,NSTART(1),NBYTE)                            READY    861
                C     CALL PREAD(IUSTFO,NGO(1),NBYTE)                               READY    862
                C     CALL PRITE(IUSTFN,NGO(1),NBYTE)                               READY    863
                C     NBYTE=NBYTES*IROW                                             READY    864
                C     DO 410 J=1,ICOL                                               READY    865
    865         C     CALL PREAD(IUSTFO,ELSTF(1,J),NBYTE)                           READY    866
                C 410 CALL PRITE(IUSTFN,ELSTF(1,J),NBYTE)                           READY    867
                C     CALL REND(IUSTFO)                                             READY    868
                C     CALL WEND(IUSTFN)                                             READY    869
                C                                                                   READY    870
    870         C 420 CONTINUE                                                      READY    871
                C                                                                   READY    872
                C     CALL DCLOSE(IUSTFO)                                           READY    873
                C     CALL DCLOSE(IUSTFN)                                           READY    874
                C                                                                   READY    875
    875         C 430 CONTINUE                                                      READY    876
                C                                                                   READY    877
                C     IPOS(IUWTI)=IFWTI                                             READY    878
                C     CALL GEDLAB(8HREADY 08,IUWTI,NAME,IFWTI,KROW,KCOL)            READY    879
                C     NBYTE=4*6                                                     READY    880
    880         C     CALL DREAD(IUWTI,WINITT,NBYTE)                                READY    881
                C     CALL DCLOSE(IUWTI)                                            READY    882
                C                                                                   READY    883
                C                                                                   READY    884
                C     IPOS(IUDESI)=IFDESI                                           READY    885
    885         C     IPOS(IUDESN)=IFDESN                                           READY    886
                C     IPOS(IUMEMN)=IFMEMN                                           READY    887
                C                                                                   READY    888
                C     CALL GEDLAB(8HREADY 09,IUDESI,NAME,IFDESI,KROW,KCOL)          READY    889
                C     CALL PUDLAB(8HREADY 05,IUDESN,NAME,IFDESN,KROW,KCOL)          READY    890
    890         C     NDESYS=KROW                                                   READY    891
                C     CALL GEDLAB(8HREADY 10,IUMEMN,NAME,IFMEMN,LROW,LCOL)          READY    892
                C                                                                   READY    893
                C     KOUNT=LINES                                                   READY    894
                C     LYNE=0                                                        READY    895
    895         C     WST=0.0                                                       READY    896
                C     JUMP=0                                                        READY    897
                C                                                                   READY    898
                C     DO 460 I=1,LROW                                               READY    899
                C     CALL GETROW(IUMEMN,1,BUFFER,LCOL)                             READY    900
    900         C     WST=WST+(BUFFER(IWPUT)*(BUFFER(IT)-BUFFER(IINITT)))           READY    901
                C     IF(LYNE.EQ.KROW) GO TO 460                                    READY    902
                C     IF(JUMP.EQ.1) GO TO 435                                       READY    903
                C     CALL GETROW(IUDESI,1,ROE,KCOL)                                READY    904
                C     ROE(JOLDT)=ROE(JNEWT)                                         READY    905
    905         C 435 CONTINUE                                                      READY    906
                C     IF(IBUF.NE.IROE) GO TO 445                                    READY    907
                C     JUMP=0                                                        READY    908
                C     ROE(JNEWT)=BUFFER(IT)                                         READY    909
                C     IF(KLUNAL.EQ.0) GO TO 440                                     READY    910
    910         C     SRMIN=BUFFER(ISRAT)*BUFFER(IT)                                READY    911
                C     SZMIN=BUFFER(IMINTO)                                          READY    912
                C     IF(SRMIN.GT.SZMIN) ROE(JMINT)=SRMIN                           READY    913
```

```
     9    ,STRFI(I,3),STRFN(I,3),DSTFZ                                    READY     800
800  A    ,STRFI(I,4),STRFN(I,4),DSTFXX                                   READY     801
     B    ,STRFI(I,5),STRFN(I,5),DSTFYY                                   READY     802
     C    ,STRFI(I,6),STRFN(I,6),DSTFZZ                                   READY     803
      398 CONTINUE                                                        READY     804
     9051 FORMAT(//10X,7HNUMBER=,I5//10X,13H NAMIC DOF = ,6I5//)          READY     805
805  9052 FORMAT(10X,10X, 15HINITIAL VALUE  ,5X,                          READY     806
     1                  15HCURRENT VALUE  ,5X,                          READY     807
     2                  15HDELTA VALUE    ,/)                           READY     808
     9053 FORMAT(10X,10H  WEIGHT..,3(E15.5,5X),                          READY     809
     1     /,10X,10H     IXX ..,3(E15.5,5X),                           READY     810
810  2     /,10X,10H     IYY ..,3(E15.5,5X),                           READY     811
     3        /,10X,10H     IZZ ..,3(E15.5,5X),                        READY     812
     4        /,10X,10H      RX ..,3(E15.5,5X),                        READY     813
     5        /,10X,10H      RY ..,3(E15.5,5X),                        READY     814
     6    /,10X,10H      RZ ..,3(E15.5,5X),                             READY     815
815  7    /,10X,10H     PFX ..,3(E15.5,5X),                             READY     816
     8    /,10X,10H     PFY ..,3(E15.5,5X),                             READY     817
     9    /,10X,10H     PFZ ..,3(E15.5,5X),                             READY     818
     A   /,10X,10H    PFXX ..,3(E15.5,5X),                             READY     819
     B   /,10X,10H    PFYY ..,3(E15.5,5X),                             READY     820
820  C   /,10X,10H    PFZZ ..,3(E15.5,5X),///)                         READY     821
C                                                                        READY     822
      CALL INCONS                                                        READY     823
      GO TO 701                                                          READY     824
C                                                                        READY     825
825   400 CONTINUE                                                       READY     826
C                                                                        READY     827
C  ******************************************************              READY     828
C  *       THE FOLLOWING LINES OF FASTOP CODE HAVE      *              READY     829
C  *       BEEN COMMENTED OUT BECAUSE THEY ARE NOT      *              READY     830
830 C  *       USED IN THE CURRENT VERSION OF ESP.          *          READY     831
C  ******************************************************              READY     832
C                                                                        READY     833
C     IF(NCYC.GT.0) GO TO 700                                            READY     834
C                                                                        READY     835
835 C                                                                    READY     836
C NPASS=1  DO SOME OR ALL OF THE FOLLOWING-DEPENDING ON THE CURRENT      READY     837
C USE OF THE PROGRAM AND THE MANNER IN WHICH ASOP WAS USED IN THE LAST   READY     838
C PASS THROUGH THE ANALYSIS PACKAGE.                                     READY     839
C                                                                        READY     840
840 C 1. TRANSFER THE ELEMENT STIFFNESS FILE TO AN OUTPUT UNIT.          READY     841
C 2. UPDATE THE DESIGN ARRAY TO REFLECT MODIFICATIONS MADE BY ASOP.      READY     842
C 3. TRANSFER WEIGHT DATA AND MASS BALANCE DATA FROM INPUT TAPE TO CORE. READY     843
C                                                                        READY     844
C                                                                        READY     845
845 C     IF(KLUSE.NE.2) GO TO 430                                       READY     846
C                                                                        READY     847
C     IUSTFN=IUDUM3-IUSTFN                                               READY     848
C     IUSTFO=IUDUM3-IUSTFO                                               READY     849
C     IFSTFN=IFDUM3-IFSTFN                                               READY     850
850 C     IFSTFO=IFDUM3-IFSTFO                                           READY     851
C                                                                        READY     852
C     CALL GEDLAB(8HREADY 07,IUSTFO,NAME,IFSTFO,MROW,MCOL)               READY     853
C     CALL PUDLAB(8HREADY 04,IUSTFN,NAME,IFSTFN,MROW,MCOL)               READY     854
C                                                                        READY     855
855 C     DO 420 I=1,NSTMEM                                              READY     856
```

```
      C     IUA = 14                                                  READY  743
      CI8M                                                            READY  744
      C                                                               READY  745
745   CCDC                                                            READY  746
            IUA = 11                                                  READY  747
      CCDC                                                            READY  748
      C                                                               READY  749
            IFA = 1                                                   READY  750
750         IF(ISTEP.LT.0) ISTEP=1                                    READY  751
            IF(ISTEP.GT.1) ISTEP=0                                    READY  752
            ITESTO = 0                                                READY  753
            ISTOP = 0                                                 READY  754
            IPAR = 0                                                  READY  755
755         IDUB = ISTEP                                              READY  756
            ITAPEN = ITAPES(40)                                       READY  757
            ISAVE = ITAPEW                                            READY  758
            ITAPEW = ITAPEN                                           READY  759
            CALL TITLES(1)                                            READY  760
760         ITAPEW = ISAVE                                            READY  761
            READ(IUCD,9055) VNEW,STPOLD,VS                            READY  762
            VNSAVE = VNEW                                             READY  763
         9055 FORMAT(3E10.3)                                          READY  764
            READ(IUCD,9055) STEP1,STEP2,ASTEP                         READY  765
765         SAVSTP = STEP2                                            READY  766
            RILSTP = ASTEP                                            READY  767
            ASTEP = 10.0 * RILSTP                                     READY  768
            NUMSTR=I                                                  READY  769
      C                                                               READY  770
770   C                                                               READY  771
            KOUNT=LINES                                               READY  772
            CALL TITLES(2)                                            READY  773
      C                                                               READY  774
            DO 398 I=1,NUMSTR                                         READY  775
775         WRITE(IUPR,9051) IDSTR(I),(IDYDOF(I,K),K=1,6)             READY  776
            WRITE(IUPR,9052)                                          READY  777
            DSTW=STRWN(I)-STRWI(I)                                    READY  778
            DSTIX=STRIN(I,1)-STRII(I,1)                               READY  779
            DSTIY=STRIN(I,2)-STRII(I,2)                               READY  780
780         DSTIZ=STRIN(I,3)-STRII(I,3)                               READY  781
            DSTRX = STRRN(I,1) - STRRI(I,1)                           READY  782
            DSTRY = STRRN(I,2) - STRRI(I,2)                           READY  783
            DSTRZ = STRRN(I,3) - STRRI(I,3)                           READY  784
            DSTFX = STRFN(I,1) - STRFI(I,1)                           READY  785
785         DSTFY = STRFN(I,2) - STRFI(I,2)                           READY  786
            DSTFZ = STRFN(I,3) - STRFI(I,3)                           READY  787
            DSTFXX = STRFN(I,4) - STRFI(I,4)                          READY  788
            DSTFYY = STRFN(I,5) - STRFI(I,5)                          READY  789
            DSTFZZ = STRFN(I,6) - STRFI(I,6)                          READY  790
790         WRITE(IUPR,9053) STRWI(I),STRWN(I),DSTW,                  READY  791
           1                 STRII(I,1),STRIN(I,1),DSTIX,             READY  792
           2                 STRII(I,2),STRIN(I,2),DSTIY,             READY  793
           3                  STRII(I,3),STRIN(I,3),DSTIZ,            READY  794
           4                  STRRI(I,1),STRRN(I,1),DSTRX,            READY  795
795        5                  STRRI(I,2),STRRN(I,2),DSTRY,            READY  796
           6                  STRRI(I,3),STRRN(I,3),DSTRZ             READY  797
           7     ,STRFI(I,1),STRFN(I,1),DSTFX                         READY  798
           8      STRFI(I,2),STRFN(I,2),DSTFY                         READY  799
```

```
                      READ(IUCD,9054) E, F, G, T                                READY    686
                 9054 FORMAT(E15.5,/,3E15.5,/,3E15.5,/,6E10.3)                  READY    687
                      SCALE(N,1) = E                                            READY    688
                      DO 386 NN= 1,3                                            READY    689
                      SCALE(N,NN+1)= F(NN)                                      READY    690
                      SCALE(N,NN+4)= G(NN)                                      READY    691
                  386 CONTINUE                                                  READY    692
                 9056 FORMAT(3E15.5)                                            READY    693
                 9050 FORMAT(E15.5,/,3E15.5,/,3E15.5,/,6E10.3,/,6I5,/,6I5)      READY    694
                      DO 387 NN = 1, 6                                          READY    695
                      SCALE(N,NN+7) = T(NN)                                     READY    696
                  387 CONTINUE                                                  READY    697
                      I=I+1                                                     READY    698
                      IDSTR(I)=N                                                READY    699
                      STRWI(I)=A                                                READY    700
                      STRWO(I)=A                                                READY    701
                      STRWN(I)=A                                                READY    702
                      STRWDO(I)=0.0                                             READY    703
                      STRWDN(I)=0.0                                             READY    704
                C                                                               READY    705
                      DO 391 K=1,3                                              READY    706
                      STRII(I,K)=B(K)                                           READY    707
                      STRIO(I,K)=B(K)                                           READY    708
                      STRIN(I,K)=B(K)                                           READY    709
                      STRIDO(I,K)=0.0                                           READY    710
                      STRIDN(I,K)=0.0                                           READY    711
                      STRRI(I,K) = C(K)                                         READY    712
                      STRRO(I,K) = C(K)                                         READY    713
                      STRRN(I,K) = C(K)                                         READY    714
                      STRRDO(I,K)= 0.                                           READY    715
                      STRRDN(I,K)= 0.                                           READY    716
                  391 CONTINUE                                                  READY    717
                C                                                               READY    718
                      DO 392 K=1,6                                              READY    719
                      ISTDOF(I,K)=IJS(K)                                        READY    720
                      IDYDOF(I,K)=IJD(K)                                        READY    721
                      STRFI(I,K) = S(K)                                         READY    722
                      STRFO(I,K) = S(K)                                         READY    723
                      STRFN(I,K) = S(K)                                         READY    724
                      STRFDO(I,K) = 0.0                                         READY    725
                      STRFDN(I,K) = 0.0                                         READY    726
                  392 CONTINUE                                                  READY    727
                      GO TO 390                                                 READY    728
                  395 CONTINUE                                                  READY    729
                      READ(IUCD,9000) ISTEP,KCONST,ISIZE                        READY    730
                C                                                               READY    731
                C     TRANSFER DYNAMIC FLEXIBILITY MATRIX( DSM ) TO DSIO        READY    732
                C     UNIT 14.  INVERT DSM AND PLACE ON FILE 2 OF UNIT 8.       READY    733
                C                                                               READY    734
                CIBM                                                            READY    735
                C     CALL DINIT(14,8HFT14F001)                                 READY    736
                C     CALL DINIT(15,8HFT15F001)                                 READY    737
                CIBM                                                            READY    738
                C                                                               READY    739
                      CALL DYNSTF                                               READY    740
                C                                                               READY    741
                CIBM                                                            READY    742
```

```
      C                                                                 READY    629
      C  ***************************************************            READY    630
630   C  *       THE FOLLOWING LINES OF FASTOP CODE HAVE   *            READY    631
      C  *       BEEN COMMENTED OUT BECAUSE THEY ARE NOT   *            READY    632
      C  *       USED IN THE CURRENT VERSION OF ESP.       *            READY    633
      C  ***************************************************            READY    634
      C                                                                 READY    635
635   C     IF(KLUBAL.EQ.0) GO TO 385                                   READY    636
      C     I=0                                                         READY    637
      C 365 READ(IUCD,9003) I1,A1,(J1(K),K=1,3)                         READY    638
      C     IF(I1.EQ.0) GO TO 375                                       READY    639
      C     I=I+1                                                       READY    640
640   C     IDBAL(I)=I1                                                 READY    641
      C     VMBIN(I)=A1                                                 READY    642
      C     VMBOLD(I)=A1                                                READY    643
      C     VMBNEW(I)=A1                                                READY    644
      C     DO 370 K=1,3                                                READY    645
645   C 370 MBDOF(I,K)=J1(K)                                            READY    646
      C     DRVMB(I)=0.0                                                READY    647
      C     DRVMBO(I)=0.0                                               READY    648
      C     S1MB(I)=0.0                                                 READY    649
      C     S2MB(I)=0.0                                                 READY    650
650   C     S3MB(I)=0.0                                                 READY    651
      C     GO TO 365                                                   READY    652
      C 375 NMBAL=I                                                     READY    653
      C                                                                 READY    654
      C     KOUNT=LINES                                                 READY    655
655   C     CALL TITLES(2)                                              READY    656
      C     WRITE(IUPR,9014)                                            READY    657
      C     KOUNT=KOUNT+5                                               READY    658
      C     DO 380 LL=1,NMBAL                                           READY    659
      C     WMB=WMB+VMBNEW(LL)                                          READY    660
660   C     WRITE(IUPR,9015) IDBAL(LL),VMBIN(LL),(MBDOF(LL,MM),MM=1,3)  READY    661
      C     KOUNT=KOUNT+2                                               READY    662
      C 380 CONTINUE                                                    READY    663
      C                                                                 READY    664
      C     WRITE(IUPR,9016) WMB                                        READY    665
665   C     KOUNT=KOUNT+2                                               READY    666
      C                                                                 READY    667
      C 385 CONTINUE                                                    READY    668
      C                                                                 READY    669
      C  ***************************************************            READY    670
670   C  *       END OF CODE THAT HAS BEEN COMMENTED OUT.  *            READY    671
      C  ***************************************************            READY    672
      C                                                                 READY    673
            WBOTH=WMB+WST                                               READY    674
      C                                                                 READY    675
675         IF (KLUSE.LE.0)  GO TO 400                                  READY    676
      C                                                                 READY    677
            NUMSTR=0                                                    READY    678
            I=0                                                         READY    679
          390 CONTINUE                                                  READY    680
680         READ(IUCD,9000) N                                           READY    681
            IF(N.EQ.0) GO TO 395                                        READY    682
            IFLEX = 29                                                  READY    683
            IPREV = 0                                                   READY    684
            READ(IUCD,9050) A, B, C, S, IJS, IJD                        READY    685
```

```
                C                                                                 READY     572
                C     IROE=IBUF                                                   READY     573
                C     ROE(JWPUT)=WT                                               READY     574
                C     ROE(JINITT)=BUFFER(IT)                                      READY     575
575             C     SRMIN=BUFFER(ISRAT)*BUFFER(IT)                              READY     576
                C     SZMIN=BUFFER(IMINTO)                                        READY     577
                C     IF(SRMIN.GT.SZMIN) ROE(JMINT)=SRMIN                         READY     578
                C     IF(SRMIN.LE.SZMIN) ROE(JMINT)=-SZMIN                        READY     579
                C     ROE(JMAXT)=BUFFER(IMAXT)                                    READY     580
580             C     ROE(JOLDT)=0.0                                              READY     581
                C     ROE(JNEWT)=BUFFER(IT)                                       READY     582
                C     ROE(JDRV)=0.0                                               READY     583
                C     ROE(JDRVO)=0.0                                              READY     584
                C     ROE(JSPR1)=0.0                                              READY     585
585             C     ROE(JSPR2)=0.0                                              READY     586
                C     ROE(JSPR3)=0.0                                              READY     587
                C     CALL PUTROW(IUDESN,2,ROE,NVAR)                              READY     588
                C                                                                 READY     589
                C     CALL TITLES(2)                                              READY     590
590             C     IF(KOUNT.GT.KOUNTH) GO TO 310                               READY     591
                C     WRITE(IUPR,9012)                                            READY     592
                C     KOUNT=KOUNT+5                                               READY     593
                C     L=0                                                         READY     594
                C 310 CONTINUE                                                    READY     595
595             C     AMINT=ABS(ROE(JMINT))                                       READY     596
                C     WRITE(IUPR,9013) IROE,ROE(JNEWT),ROE(JOLDT),ROE(JINITT),    READY     597
                C    1                                  AMINT,ROE(JMAXT),ROE(JWPUT),IROE  READY     598
                C     KOUNT=KOUNT+1                                               READY     599
                C     L=L+1                                                       READY     600
600             C     IF(L.LT.4) GO TO 320                                        READY     601
                C     L=0                                                         READY     602
                C     IF(KOUNT.EQ.LINES) GO TO 320                                READY     603
                C     CALL PLB(1,1,IUPR)                                          READY     604
                C     KOUNT=KOUNT+1                                               READY     605
605             C                                                                 READY     606
                C 320 CONTINUE                                                    READY     607
                C     CALL PUTROW(IUMEMN,1,BUFFER,KCOL)                           READY     608
                C                                                                 READY     609
                C 350 CONTINUE                                                    READY     610
610             C                                                                 READY     611
                C                                                                 READY     612
                C     CALL DCLOSE(IUMEMO)                                         READY     613
                C     CALL DCLOSE(IUMEMN)                                         READY     614
                C                                                                 READY     615
615             C     CALL DCLOSE(IUDESN)                                         READY     616
                C     CALL DCLOSE(IUSTFN)                                         READY     617
                C                                                                 READY     618
                C  ********************************************************       READY     619
                C  *       END OF CODE THAT HAS BEEN COMMENTED OUT.       *     READY     620
620             C  ********************************************************       READY     621
                C                                                                 READY     622
                  360 CONTINUE                                                    READY     623
                C                                                                 READY     624
                      WST=0.0                                                     READY     625
625                   WMB=0.0                                                     READY     626
                C                                                                 READY     627
```

```
      IPOS(IUMEMO)=IFMEMO                                                READY    515
515   IPOS(IUMEMN)=IFMEMN                                                READY    516
C                                                                        READY    517
C  ******************************************************              READY    518
C  *       THE FOLLOWING LINE OF FASTOP CODE HAS        *              READY    519
C  *       BEEN COMMENTED OUT BECAUSE IT IS NOT         *              READY    520
520C  *       USED IN THE CURRENT VERSION OF ESP.          *              READY    521
C  ******************************************************              READY    522
C     CALL GEDLAB(8HREADY 06,IUMEMO,NAME,IFMEMO,KROW,KCOL)               READY    523
C                                                                        READY    524
C  ******************************************************              READY    525
525C  *       THE FOLLOWING TWO LINES OF FASTOP CODE       *              READY    526
C  *       HAVE BEEN MODIFIED FOR THE CURRENT           *              READY    527
C  *       VERSION OF ESP.                              *              READY    528
C  ******************************************************              READY    529
C     CALL PUDLAB(8HREADY 02,IUMEMN,NAME,IFMEMN,KROW,KCOL)               READY    530
530C     NDESYS=NSTMEM-NDESNO                                            READY    531
      CALL PUDLAB (8HREADY 02,IUMEMN,NAME,IFMEMN,0,KCOL)                 READY    532
      NDESYS = 0                                                         READY    533
      CALL PUDLAB(8HREADY 03,IUDESN,NAM1,IFDESN,NDESYS,NVAR)             READY    534
      CALL DCLOSE (IUMEMN)                                               READY    535
535   CALL DCLOSE (IUDESN)                                               READY    536
C                                                                        READY    537
C  ******************************************************              READY    538
C  *       THE FOLLOWING LINES OF FASTOP CODE HAVE      *              READY    539
C  *       BEEN COMMENTED OUT BECAUSE THEY ARE NOT      *              READY    540
540C  *       USED IN THE CURRENT VERSION OF ESP.          *              READY    541
C  ******************************************************              READY    542
C                                                                        READY    543
C     KOUNT=LINES                                                        READY    544
C                                                                        READY    545
545C     DO 350 I=1,KROW                                                 READY    546
C     CALL GETROW(IUMEMO,1,BUFFER,KCOL)                                  READY    547
C     BUFFER(IMINTO)=BUFFER(IMINT)                                       READY    548
C     BUFFER(IINITT)=BUFFER(IT)                                          READY    549
C     BUFFER(IWPUT)=WT                                                   READY    550
550C                                                                      READY    551
C     IF(IDNOPT.NE.1) GO TO 300                                          READY    552
C                                                                        READY    553
C     IF(I GT.KMAX) GO TO 240                                            READY    554
C     IF(IBUF.NE.JCHART(1,I)) GO TO 240                                  READY    555
555C     J=I                                                             READY    556
C     GO TO 260                                                          READY    557
C                                                                        READY    558
C 240 CONTINUE                                                           READY    559
C     DO 250 K=1,KMAX                                                    READY    560
560C     IF(IBUF.NE.JCHART(1,K)) GO TO 250                               READY    561
C     J=K                                                                READY    562
C     GO TO 260                                                          READY    563
C 250 CONTINUE                                                           READY    564
C     GO TO 300                                                          READY    565
565C                                                                     READY    566
C 260 CONTINUE                                                           READY    567
C                                                                        READY    568
C     IF(JCHART(2,J).EQ.1) GO TO 320                                     READY    569
C                                                                        READY    570
570C 300 CONTINUE                                                        READY    571
```

```
      C     IF(AA.NE.O .AND.AA.NE.1.) WT=WT*AA                          READY   458
      C     CHART(4,J)=GOOD                                             READY   459
      C                                                                 READY   460
460   C 180 CALL PRITE(IUSTFN,PATTY(1),24)                              READY   461
      C     NBYTE=4*NODES                                               READY   462
      C     CALL PREAD(IUSTFO,NSTART(1),NBYTE)                          READY   463
      C     CALL PRITE(IUSTFN,NSTART(1),NBYTE)                          READY   464
      C     CALL PREAD(IUSTFO,NGO(1),NBYTE)                             READY   465
465   C     CALL PRITE(IUSTFN,NGO(1),NBYTE)                             READY   466
      C     NBYTE=NBYTES*IROW                                           READY   467
      C     DO 190 J=1,ICOL                                             READY   468
      C     CALL PREAD(IUSTFO,ELSTF(1,J),NBYTE)                         READY   469
      C 190 CALL PRITE(IUSTFN,ELSTF(1,J),NBYTE)                         READY   470
470   C     CALL REND(IUSTFO)                                           READY   471
      C     CALL WEND(IUSTFN)                                           READY   472
      C                                                                 READY   473
      C 200 CONTINUE                                                    READY   474
      C                                                                 READY   475
475   C     CALL DCLOSE(IUSTFO)                                         READY   476
      C     CALL DCLOSE(IUSTFN)                                         READY   477
      C                                                                 READY   478
      C     IF(IDNOPT.NE.1) GO TO 215                                   READY   479
      C     NUMBAD=O                                                    READY   480
480   C     DO 210 K=1,KMAX                                             READY   481
      C     IF(CHART(4,K).EQ.GOOD) GO TO 210                            READY   482
      C     IF(NUMBAD.EQ.O) KOUNT=LINES                                 READY   483
      C     CALL TITLES(2)                                              READY   484
      C     IF(KOUNT.GT.KOUNTH) GO TO 205                               READY   485
485   C     WRITE(IUPR,9024)                                            READY   486
      C     KOUNT=KOUNT+3                                               READY   487
      C 205 CONTINUE                                                    READY   488
      C     NUMBAD=NUMBAD+1                                             READY   489
      C     WRITE(IUPR,9013) JCHART(1,K)                                READY   490
490   C     KOUNT=KOUNT+1                                               READY   491
      C 210 CONTINUE                                                    READY   492
      C     IF(NBAD.EQ.O.AND.NUMBAD.EQ.O) GO TO 215                     READY   493
      C     KOUNT=LINES                                                 READY   494
      C     CALL TITLES(2)                                              READY   495
495   C     WRITE(IUPR,9025)                                            READY   496
      C     STOP                                                        READY   497
      C                                                                 READY   498
      C 215 CONTINUE                                                    READY   499
      C                                                                 READY   500
500   C 220 CONTINUE                                                    READY   501
      C                                                                 READY   502
      C  ******************************************************         READY   503
      C  *       END OF CODE THAT HAS BEEN COMMENTED OUT.     *         READY   504
      C  ******************************************************         READY   505
505   C                                                                 READY   506
            IF(KLUSE.NE.2) GO TO 360                                    READY   507
      C                                                                 READY   508
      C                                                                 READY   509
      C                                                                 READY   510
510         IUMEMN=IUDUM1-IUMEMN                                        READY   511
            IUMEMO=IUDUM1-IUMEMO                                        READY   512
            IFMEMN=IFDUM1-IFMEMN                                        READY   513
            IFMEMO=IFDUM1-IFMEMO                                        READY   514
```

VARIABLES		SN	TYPE		RELOCATION							
71377	G		REAL	ARRAY		REFS	18	690	DEFINED	685		
2021	I		INTEGER			REFS	297	697	698	699	700	701	702
							703	706	707	708	709	710	711	712
							713	714	715	719	720	721	722	723
							724	725	768	2*775	2*777	2*778	2*779	2*780
							2*781	2*782	2*783	2*784	2*785	2*786	2*787	2*788
							2*789	26*790	2*1030	2*1032	2*1033	2*1034	2*1035	2*1036
							2*1037	2*1038	2*1039	2*1040	2*1041	2*1042	2*1043	2*1044
							26*1045	DEFINED	294	678	697	774	1029	
22	IBAND		INTEGER		KLUES	REFS	70	DEFINED	158					
2071	IBUF		INTEGER			REFS	24							
0	ICYCLE		INTEGER		STRCLU	REFS	35	86						
1	IDBAL		INTEGER	ARRAY	BAL	REFS	37							
3	IDENS		INTEGER		COLS	REFS	48	DEFINED	135					
71323	IDJ		INTEGER	*UNDEF		REFS	12							
7	IDNOPT		INTEGER		KLUES	REFS	70							
76	IDSTR		INTEGER	ARRAY	STORES	REFS	79	775	1030	DEFINED	698			
53	IDUB		INTEGER		RESIZE	REFS	89	DEFINED	755					
40	IDYDOF		INTEGER	ARRAY	STORES	REFS	79	775	1030	DEFINED	720			
2014	IDYFLX		INTEGER			REFS	2*290	292	295	297	2*299	2*304	1101	
						DEFINED	216							
2051	IERR	*	INTEGER			REFS	1101							
21	IFA		INTEGER		PLACES	REFS	53	DEFINED	749					
67	IFADD		INTEGER		PLACES	REFS	53							
41	IFADDI		INTEGER		PLACES	REFS	53							
33	IFB		INTEGER		PLACES	REFS	53							
71	IFBAL		INTEGER		PLACES	REFS	53							
43	IFBALI		INTEGER		PLACES	REFS	53							
117	IFBR		INTEGER		PLACES	REFS	53							
53	IFBT		INTEGER		PLACES	REFS	53							
73	IFDESF		INTEGER		PLACES	REFS	53							
45	IFDESI		INTEGER		PLACES	REFS	53							
55	IFDESN		INTEGER		PLACES	REFS	53	533						
35	IFDESO		INTEGER		PLACES	REFS	53							
77	IFDUM1		INTEGER		PLACES	REFS	53	512	513					
101	IFDUM2		INTEGER		PLACES	REFS	53							
103	IFDUM3		INTEGER		PLACES	REFS	53							
23	IFIN		INTEGER		KLUES	REFS	70	DEFINED	159					
141	IFINCK		INTEGER		PLACES	REFS	53							
137	IFINCM		INTEGER		PLACES	REFS	53							
31	IFKS		INTEGER		PLACES	REFS	53							
105	IFL		INTEGER		PLACES	REFS	53							
2	IFLEX		INTEGER		INVERT	REFS	94	DEFINED	682					
2013	IFLEXI		INTEGER			REFS	290	299	304	DEFINED	131			
						I/O REFS	288	295						
2012	IFLEXS		INTEGER			REFS	289	301	303	DEFINED	129			
115	IFLR		INTEGER		PLACES	REFS	53							
57	IFMD		INTEGER		PLACES	REFS	53							
65	IFMDB		INTEGER		PLACES	REFS	53							
37	IFMDBI		INTEGER		PLACES	REFS	53							
61	IFMEMF		INTEGER		PLACES	REFS	53							
25	IFMEMN		INTEGER		PLACES	REFS	53	512	515	531	DEFINED	512		
51	IFMEMO		INTEGER		PLACES	REFS	53	513	514	DEFINED	513			
5	IFMOD		INTEGER		LOCSTR	REFS	87							
125	IFMODK		INTEGER		PLACES	REFS	53							
123	IFMODM		INTEGER		PLACES	REFS	53							
3	IFMREF		INTEGER		LOCSTR	REFS	87							

VARIABLES	SN	TYPE		RELOCATION								
135	IFPH	INTEGER		PLACES	REFS	53						
127	IFPHT	INTEGER		PLACES	REFS	53						
121	IFPHTF	INTEGER		PLACES	REFS	53						
133	IFQ	INTEGER		PLACES	REFS	53						
131	IFQT	INTEGER		PLACES	REFS	53						
11	IFSCR	INTEGER		PLACES	REFS	53						
27	IFSTFN	INTEGER		PLACES	REFS	53						
63	IFSTFO	INTEGER		PLACES	REFS	53						
1	IFSTRI	INTEGER		LOCSTR	REFS	87						
12	IFS1	INTEGER		PLACES	REFS	53						
13	IFS2	INTEGER		PLACES	REFS	53						
14	IFS3	INTEGER		PLACES	REFS	53						
15	IFS4	INTEGER		PLACES	REFS	53						
75	IFWT	INTEGER		PLACES	REFS	53						
47	IFWTI	INTEGER		PLACES	REFS	53						
23	IFY	INTEGER		PLACES	REFS	53						
107	IFYT	INTEGER		PLACES	REFS	53						
111	IFZ	INTEGER		PLACES	REFS	53						
113	IFZR	INTEGER		PLACES	REFS	53						
10	IINITT	INTEGER		COLS	REFS	48	DEFINED	140				
71416	IJD	INTEGER	ARRAY		REFS	19	720	DEFINED	684			
71410	IJS	INTEGER	ARRAY		REFS	19	719	DEFINED	684			
2015	IMASS	INTEGER			REFS	1101	DEFINED	216				
2	IMAXT	INTEGER		COLS	REFS	48	DEFINED	134				
1	IMINT	INTEGER		COLS	REFS	48	DEFINED	133				
7	IMINTO	INTEGER		COLS	REFS	48	DEFINED	139				
0	INVERT	INTEGER		INVERT	REFS	94						
4	IOLDT	INTEGER		COLS	REFS	48	DEFINED	136				
5	IOLDW	INTEGER		COLS	REFS	48	DEFINED	137				
1	IPAR	INTEGER		ACCEL	REFS	90	DEFINED	754				
41	IPERM	INTEGER	ARRAY	INVERT	REFS	94						
0	IPOS	INTEGER	ARRAY	FILE	REFS	16	75	DEFINED	514	515		
173	IPREV	INTEGER		INVERT	REFS	94	DEFINED	683				
2	IRED	INTEGER		KLUES	REFS	70	171	175				
2052	IROE	INTEGER	*UNDEF		REFS	24						
2030	ISAVE	INTEGER			REFS	760	DEFINED	757				
0	ISIZE	INTEGER		RESIZE	REFS	89	DEFINED	729				
6	ISRAT	INTEGER		COLS	REFS	48	DEFINED	138				
2	ISTDOF	INTEGER	ARRAY	STORES	REFS	79	DEFINED	719				
1	ISTEP	INTEGER		STRCLU	REFS	86	750	751	755	DEFINED	729	750
					751							
0	ISTOP	INTEGER		ACCEL	REFS	90	DEFINED	753				
0	IT	INTEGER		COLS	REFS	48	DEFINED	132				
2027	ITAPEN	INTEGER			REFS	758	DEFINED	756				
2	ITAPEP	INTEGER		COMRWP	REFS	92						
0	ITAPER	INTEGER		COMRWP	REFS	92						
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	93	756					
1	ITAPEW	INTEGER		COMRWP	REFS	92	757	DEFINED	758	760		
51	ITESTO	INTEGER		RESIZE	REFS	89	DEFINED	752				
2016	ITRNSF	INTEGER			REFS	1101	DEFINED	216				
20	IUA	INTEGER		PLACES	REFS	53	1066	DEFINED	746			
66	IUADD	INTEGER		PLACES	REFS	53						
40	IUADDI	INTEGER		PLACES	REFS	53						
1	IUA2	INTEGER		INVERT	REFS	94						
32	IUB	INTEGER		PLACES	REFS	53						
70	IUBAL	INTEGER		PLACES	REFS	53						
42	IUBALI	INTEGER		PLACES	REFS	53						

VARIABLES	SN	TYPE	RELOCATION								
116	IUBR	INTEGER	PLACES	REFS	53						
52	IUBT	INTEGER	PLACES	REFS	53						
16	IUCD	INTEGER	PLACES	REFS	53	I/O REFS	216	680	684	685	729
				761	764						
72	IUDESF	INTEGER	PLACES	REFS	53						
44	IUDESI	INTEGER	PLACES	REFS	53						
54	IUDESN	INTEGER	PLACES	REFS	53	533	535				
34	IUDESO	INTEGER	PLACES	REFS	53						
76	IUDUM1	INTEGER	PLACES	REFS	53	510	511				
100	IUDUM2	INTEGER	PLACES	REFS	53						
102	IUDUM3	INTEGER	PLACES	REFS	53						
4	IUGO1	INTEGER	PLACES	REFS	53						
5	IUGO2	INTEGER	PLACES	REFS	53						
6	IUGO3	INTEGER	PLACES	REFS	53						
7	IUGO4	INTEGER	PLACES	REFS	53						
140	IUINCK	INTEGER	PLACES	REFS	53						
136	IUINCM	INTEGER	PLACES	REFS	53						
0	IUIN1	INTEGER	PLACES	REFS	53						
1	IUIN2	INTEGER	PLACES	REFS	53						
30	IUKS	INTEGER	PLACES	REFS	53						
104	IUL	INTEGER	PLACES	REFS	53						
114	IULR	INTEGER	PLACES	REFS	53						
56	IUMD	INTEGER	PLACES	REFS	53						
64	IUMDB	INTEGER	PLACES	REFS	53						
36	IUMDBI	INTEGER	PLACES	REFS	53						
60	IUMEMF	INTEGER	PLACES	REFS	53						
24	IUMEMN	INTEGER	PLACES	REFS	53	510	515	531	534		
				DEFINED	510						
50	IUMEMO	INTEGER	PLACES	REFS	53	511	514	DEFINED	511		
4	IUMOD	INTEGER	LOCSTR	REFS	87						
124	IUMODK	INTEGER	PLACES	REFS	53						
122	IUMODM	INTEGER	PLACES	REFS	53						
2	IUMREF	INTEGER	LOCSTR	REFS	87						
2	IUOUT1	INTEGER	PLACES	REFS	53						
3	IUOUT2	INTEGER	PLACES	REFS	53						
134	IUPH	INTEGER	PLACES	REFS	53						
126	IUPHT	INTEGER	PLACES	REFS	53						
120	IUPHTF	INTEGER	PLACES	REFS	53						
17	IUPR	INTEGER	PLACES	REFS	53	1066	I/O REFS	775	776	790	1030
				1031	1045						
132	IUQ	INTEGER	PLACES	REFS	53						
130	IUQT	INTEGER	PLACES	REFS	53						
10	IUSCR	INTEGER	PLACES	REFS	53						
26	IUSTFN	INTEGER	PLACES	REFS	53						
62	IUSTFO	INTEGER	PLACES	REFS	53						
0	IUSTRI	INTEGER	LOCSTR	REFS	87						
74	IUWT	INTEGER	PLACES	REFS	53						
46	IUWTI	INTEGER	PLACES	REFS	53						
22	IUY	INTEGER	PLACES	REFS	53						
106	IUYT	INTEGER	PLACES	REFS	53						
110	IUZ	INTEGER	PLACES	REFS	53						
112	IUZR	INTEGER	PLACES	REFS	53						
2557	IWORK	INTEGER		REFS	24						
11	IWPUT	INTEGER	COLS	REFS	48	DEFINED	141				
2557	JCHART	INTEGER ARRAY		REFS	12	24					
21	JDRV	INTEGER	COLS	REFS	48	DEFINED	150				
22	JDRVO	INTEGER	COLS	REFS	48	DEFINED	151				

VARIABLES	SN	TYPE		RELOCATION							
14	JINITT	INTEGER		COLS	REFS	48	DEFINED	145			
16	JMAXT	INTEGER		COLS	REFS	48	DEFINED	147			
15	JMINT	INTEGER		COLS	REFS	48	DEFINED	146			
20	JNEWT	INTEGER		COLS	REFS	48	DEFINED	149			
17	JOLDT	INTEGER		COLS	REFS	48	DEFINED	148			
23	JSPR1	INTEGER		COLS	REFS	48	DEFINED	152			
24	JSPR2	INTEGER		COLS	REFS	48	DEFINED	153			
25	JSPR3	INTEGER		COLS	REFS	48	DEFINED	154			
13	JWPUT	INTEGER		COLS	REFS	48	DEFINED	144			
71371	J1	INTEGER	*UNDEF		REFS	17					
2022	K	INTEGER			REFS	295	297	2*706	2*707	2*708	709	710
					2*711	2*712	2*713	714	715	2*719	2*720	2*721
					2*722	2*723	724	725	775	1030		
					DEFINED	295	297	705	718	775	1030	
7	KBPAGE	INTEGER		CLIST	REFS	77					
2017	KCOL	INTEGER			REFS	289	292	295	297	301	531	
					DEFINED	286						
1	KCONST	INTEGER		STORES	REFS	79	DEFINED	729				
4	KLABEL	INTEGER		CLIST	REFS	77						
24	KLUB	INTEGER		KLUES	REFS	70	DEFINED	161	171	172		
4	KLUBAL	INTEGER		KLUES	REFS	70						
1	KLUEV	INTEGER	ARRAY	CLUEV	REFS	97	292	297				
3	KLUMD	INTEGER		KLUES	REFS	70	172					
1	KLUNAL	INTEGER		KLUES	REFS	70						
25	KLUQ	INTEGER		KLUES	REFS	70	DEFINED	174	175			
0	KLUSE	INTEGER		KLUES	REFS	70	159	172	175	506	675	1027
0	KORE	INTEGER		CORE	REFS	76	104	107	1101	DEFINED	103	
1	KOREDP	INTEGER		CORE	REFS	76	DEFINED	104	107			
0	KOUNT	INTEGER		CLIST	REFS	77	DEFINED	112	771			
11	KOUNTH	INTEGER		CLIST	REFS	77						
12	KOUNTI	INTEGER		CLIST	REFS	77						
1	KPAGE	INTEGER		CLIST	REFS	77						
2020	KROW	INTEGER			REFS	289	292	294	DEFINED	287		
0	KSTOR	INTEGER	ARRAY	STRCLU	REFS	18	35					
5	KTPAGE	INTEGER		CLIST	REFS	77						
2	LINES	INTEGER		CLIST	REFS	77	112	771				
10	LINESG	INTEGER		CLIST	REFS	77						
3	LINEST	INTEGER		CLIST	REFS	77						
0	LKLUEV	INTEGER		CLUEV	REFS	97						
0	MB	INTEGER	ARRAY	BAL	REFS	17	24					
121	MBDOF	INTEGER	ARRAY	BAL	REFS	37						
26	MORBAL	INTEGER		KLUES	REFS	70						
5	MSADD	INTEGER		KLUES	REFS	70						
0	MSTOR	INTEGER	ARRAY	STORES	REFS	18	35					
71317	MUMJ	INTEGER	*UNDEF		REFS	12						
2	M1	INTEGER		STRCLU	REFS	86						
3	M2	INTEGER		STRCLU	REFS	86						
4	M3	INTEGER		STRCLU	REFS	86						
5	M4	INTEGER		STRCLU	REFS	86						
2023	N	INTEGER			REFS	681	687	689	690	695	698	
					DEFINED	680						
71357	NAME	INTEGER	ARRAY		REFS	15	531	DEFINED	99			
71440	NAMFLX	INTEGER	ARRAY		REFS	21	289	DEFINED	101			
71361	NAM1	INTEGER	ARRAY		REFS	15	533	DEFINED	100			
71363	NAM2	INTEGER	*UNDEF		REFS	15						
71365	NAM3	INTEGER	*UNDEF		REFS	15						
71367	NAM4	INTEGER	*UNDEF		REFS	15						

VARIABLES		SN	TYPE		RELOCATION							
13	NBAR		INTEGER		KLUES	REFS	70					
0	NBYTES		INTEGER		CBYTES	REFS	74					
20	NCYC		INTEGER		KLUES	REFS	70	156	311	1066	DEFINED	157
4	NDESNO		INTEGER		SIZES	REFS	52					
5	NDESYS		INTEGER		SIZES	REFS	52	533	DEFINED	532		
174	NDOFT		INTEGER		INVERT	REFS	94					
2	NDYDOF		INTEGER		SIZES	REFS	52	286	287	2*290	2*299	2*304
						DEFINED	216					
14	NFIX		INTEGER		KLUES	REFS	70					
0	NMBAL		INTEGER		BAL	REFS	24	37	DEFINED	627		
2026	NN		INTEGER			REFS	2*689	2*690	2*695	DEFINED	688	694
21	NNN		INTEGER		KLUES	REFS	70					
3	NNOPT		INTEGER		SIZES	REFS	52					
6	NPAGE		INTEGER		CLIST	REFS	77					
6	NPASS		INTEGER		KLUES	REFS	70	172	310			
1	NSTDOF		INTEGER		SIZES	REFS	52					
0	NSTMEM		INTEGER		SIZES	REFS	52					
77	NSTOR		INTEGER	ARRAY	INVERT	REFS	94					
71333	NUMB		INTEGER	*UNDEF		REFS	13					
0	NUMSTR		INTEGER		STORES	REFS	35	79	774	1029	DEFINED	677 768
12	NVAR		INTEGER		COLS	REFS	48	533	DEFINED	143		
52	RILSTP		REAL		ACCEL	REFS	90	767	DEFINED	766		
2052	ROE		REAL	*UNDEF		REFS	14	24				
71424	S		REAL	ARRAY		REFS	20	721	722	723	DEFINED	684
52	SAVSTP		REAL		RESIZE	REFS	89	DEFINED	765			
362	SCALE		REAL	ARRAY	STORES	REFS	79	DEFINED	687	689	690	695
1	SCLNEW		REAL	ARRAY	RESIZE	REFS	89					
25	SCLOLD		REAL	ARRAY	RESIZE	REFS	89					
2031	STEP1	*	REAL			DEFINED	764					
2032	STEP2		REAL			REFS	765	DEFINED	764			
11	STPOLD		REAL		STRCLU	REFS	86	DEFINED	761			
653	STRFDN		REAL	ARRAY	STORES	REFS	79	DEFINED	725			
615	STRFDO		REAL	ARRAY	STORES	REFS	79	DEFINED	724			
463	STRFI		REAL	ARRAY	STORES	REFS	79	784	785	786	787	788 789
							6*790	1039	1040	1041	1042	1043 1044 6*1045
						DEFINED	721					
557	STRFN		REAL	ARRAY	STORES	REFS	79	784	785	786	787	788 789
							6*790	1039	1040	1041	1042	1043 1044 6*1045
						DEFINED	723					
521	STRFO		REAL	ARRAY	STORES	REFS	79	DEFINED	722			
305	STRIDN		REAL	ARRAY	STORES	REFS	79	DEFINED	710			
266	STRIDO		REAL	ARRAY	STORES	REFS	79	DEFINED	709			
122	STRII		REAL	ARRAY	STORES	REFS	79	778	779	780	3*790	1033 1034
							1035	3*1045	DEFINED	706		
160	STRIN		REAL	ARRAY	STORES	REFS	79	778	779	780	3*790	1033 1034
							1035	3*1045	DEFINED	708		
141	STRIO		REAL	ARRAY	STORES	REFS	79	DEFINED	707			
343	STRRDN		REAL	ARRAY	STORES	REFS	79	DEFINED	715			
324	STRRDO		REAL	ARRAY	STORES	REFS	79	DEFINED	714			
177	STRRI		REAL	ARRAY	STORES	REFS	79	781	782	783	3*790	1036 1037
							1038	3*1045	DEFINED	711		
235	STRRN		REAL	ARRAY	STORES	REFS	79	781	782	783	3*790	1036 1037
							1038	3*1045	DEFINED	713		
216	STRRO		REAL	ARRAY	STORES	REFS	79	DEFINED	712			
261	STRWDN		REAL	ARRAY	STORES	REFS	79	DEFINED	703			
254	STRWDO		REAL	ARRAY	STORES	REFS	79	DEFINED	702			
103	STRWI		REAL	ARRAY	STORES	REFS	79	777	790	1032	1045	

VARIABLES	SN	TYPE	RELOCATION							
					DEFINED	699				
115	STRWN	REAL	ARRAY	STORES	REFS	79	777	790	1032	1045
					DEFINED	701				
110	STRWO	REAL	ARRAY	STORES	REFS	79	DEFINED	700		
265	S1MB	REAL	ARRAY	BAL	REFS	37				
311	S2MB	REAL	ARRAY	BAL	REFS	37				
335	S3MB	REAL	ARRAY	BAL	REFS	37				
71432	T	REAL	ARRAY		REFS	20	695	DEFINED	685	
71345	VALUE	REAL	*UNDEF		REFS	13				
10	VDES	REAL		KLUES	REFS	70				
25	VMBIN	REAL	ARRAY	BAL	REFS	37				
75	VMBNEW	REAL	ARRAY	BAL	REFS	37				
51	VMBOLD	REAL	ARRAY	BAL	REFS	37				
10	VNEW	REAL		STRCLU	REFS	86	762	DEFINED	761	
0	VNSAVE	REAL		VSAVE	REFS	96	DEFINED	762		
7	VOLD	REAL		STRCLU	REFS	86				
1	VOSAVE	REAL		VSAVE	REFS	96				
6	VS	REAL		STRCLU	REFS	86	DEFINED	761		
3	WBOTH	REAL		WAYTS	REFS	73	DEFINED	673		
0	WINITT	REAL		WAYTS	REFS	73				
2	WMB	REAL		WAYTS	REFS	73	673	DEFINED	625	
2557	WORK	REAL	ARRAY		REFS	11	24	1101		
4	WPRES	REAL		WAYTS	REFS	73				
1	WST	REAL		WAYTS	REFS	73	673	DEFINED	624	

FILE NAMES	MODE			
TAPE6	FMT	WRITES	292	297
VARIABLES USED AS FILE NAMES, SEE ABOVE				

EXTERNALS	TYPE	ARGS	REFERENCES				
DCLOSE		1	303	534	535		
DYNMAS		7	1101				
DYNSTF		0	739				
INCONS		0	822				
MESAGE		3	113	1131			
NASTRD		8	290	299	304		
PROGNA		2	111	180	423	1103	1129
PUDLAB		6	289	531	533		
PUTROW		4	301				
TIMEB		2	114	1130			
TITLES		1	759	772			
UNFIL		1	179	421	1127		
UPDATE		3	1066				

STATEMENT LABELS		DEF LINE	REFERENCES	
0	92	302	294	
145	95	307	156	
176	360	622	506	
0	386	691	688	
0	387	696	694	
203	390	679	727	
0	391	716	705	
0	392	726	718	
304	395	728	681	
0	398	803	774	
500	400	825	310	675
0	680	1058	1029	

STATEMENT LABELS			DEF LINE	REFERENCES		
500	700		1025	311		
634	701		1064	823		
636	760		1100	1027		
1411	9000	FMT	1134	216	680	729
1413	9002	FMT NO REFS	1135			
1416	9003	FMT NO REFS	1136			
1421	9004	FMT NO REFS	1137			
1434	9005	FMT NO REFS	1140			
1437	9006	FMT NO REFS	1141			
1451	9007	FMT NO REFS	1144			
1465	9008	FMT NO REFS	1147			
1467	9009	FMT NO REFS	1148			
1472	9010	FMT NO REFS	1149			
1503	9011	FMT NO REFS	1151			
1513	9012	FMT NO REFS	1153			
1527	9013	FMT NO REFS	1161			
1532	9014	FMT NO REFS	1162			
1542	9015	FMT NO REFS	1164			
1545	9016	FMT NO REFS	1165			
1553	9017	FMT NO REFS	1166			
1560	9018	FMT NO REFS	1167			
1570	9019	FMT NO REFS	1169			
1600	9020	FMT NO REFS	1171			
1604	9021	FMT NO REFS	1172			
1612	9022	FMT NO REFS	1173			
1663	9023	FMT NO REFS	1181			
1715	9024	FMT NO REFS	1187			
1742	9025	FMT NO REFS	1192			
1762	9026	FMT	1196	295		
1765	9027	FMT	1197	292		
1776	9028	FMT	1199	297		
1120	9050	FMT	693	684		
1241	9051	FMT	804	775	1030	
1247	9052	FMT	805	776	1031	
1257	9053	FMT	808	790	1045	
1111	9054	FMT	686	685		
1144	9055	FMT	763	761	764	
1116	9056	FMT NO REFS	692			
0	9999	INACTIVE	1201			

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
110	92	I	294 302	30B	EXT REFS	
223	386	NN	688 691	4B	INSTACK	
235	387	NN	694 696	3B	INSTACK	
254	391	K	705 716	11B	OPT	
272	392	K	718 726	10B	OPT	
345	398	I	774 803	131B	EXT REFS	NOT INNER
353		K	775 775	11B	EXT REFS	
503	680	I	1029 1058	131B	EXT REFS	NOT INNER
511		K	1030 1030	11B	EXT REFS	

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
BAL	241	0 NMBAL (1)	1 IDBAL (20)	21 VMBIN (20)
		41 VMBOLD (20)	61 VMBNEW (20)	81 MBDOF (60)
		141 DRVMB (20)	161 DRVMBO (20)	181 S1MB (20)
		201 S2MB (20)	221 S3MB (20)	
COLS	22	0 IT (1)	1 IMINT (1)	2 IMAXT (1)

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
		3 IDENS (1)	4 IOLDT (1)	5 IOLDW (1)
		6 ISRAT (1)	7 IMINTO (1)	8 IINITT (1)
		9 IWPUT (1)	10 NVAR (1)	11 JWPUT (1)
		12 JINITT (1)	13 JMINT (1)	14 JMAXT (1)
		15 JOLDT (1)	16 JNEWT (1)	17 JDRV (1)
		18 JDRVO (1)	19 JSPR1 (1)	20 JSPR2 (1)
		21 JSPR3 (1)		
SIZES	6	0 NSTMEM (1)	1 NSTDOF (1)	2 NDYDOF (1)
		3 NNOPT (1)	4 NDESNO (1)	5 NDESYS (1)
PLACES	98	0 IUIN1 (1)	1 IUIN2 (1)	2 IUOUT1 (1)
		3 IUOUT2 (1)	4 IUGO1 (1)	5 IUGO2 (1)
		6 IUGO3 (1)	7 IUGO4 (1)	8 IUSCR (1)
		9 IFSCR (1)	10 IFS1 (1)	11 IFS2 (1)
		12 IFS3 (1)	13 IFS4 (1)	14 IUCD (1)
		15 IUPR (1)	16 IUA (1)	17 IFA (1)
		18 IUY (1)	19 IFY (1)	20 IUMEMN (1)
		21 IFMEMN (1)	22 IUSTFN (1)	23 IFSTFN (1)
		24 IUKS (1)	25 IFKS (1)	26 IUB (1)
		27 IFB (1)	28 IUDESO (1)	29 IFDESO (1)
		30 IUMDBI (1)	31 IFMDBI (1)	32 IUADDI (1)
		33 IFADDI (1)	34 IUBALI (1)	35 IFBALI (1)
		36 IUDESI (1)	37 IFDESI (1)	38 IUWTI (1)
		39 IFWTI (1)	40 IUMEMO (1)	41 IFMEMO (1)
		42 IUBT (1)	43 IFBT (1)	44 IUDESN (1)
		45 IFDESN (1)	46 IUMD (1)	47 IFMD (1)
		48 IUMEMF (1)	49 IFMEMF (1)	50 IUSTFO (1)
		51 IFSTFO (1)	52 IUMDB (1)	53 IFMDB (1)
		54 IUADD (1)	55 IFADD (1)	56 IUBAL (1)
		57 IFBAL (1)	58 IUDESF (1)	59 IFDESF (1)
		60 IUWT (1)	61 IFWT (1)	62 IUDUM1 (1)
		63 IFDUM1 (1)	64 IUDUM2 (1)	65 IFDUM2 (1)
		66 IUDUM3 (1)	67 IFDUM3 (1)	68 IUL (1)
		69 IFL (1)	70 IUYT (1)	71 IFYT (1)
		72 IUZ (1)	73 IFZ (1)	74 IUZR (1)
		75 IFZR (1)	76 IULR (1)	77 IFLR (1)
		78 IUBR (1)	79 IFBR (1)	80 IUPHTF (1)
		81 IFPHTF (1)	82 IUMODM (1)	83 IFMODM (1)
		84 IUMODK (1)	85 IFMODK (1)	86 IUPHT (1)
		87 IFPHT (1)	88 IUQT (1)	89 IFQT (1)
		90 IUQ (1)	91 IFQ (1)	92 IUPH (1)
		93 IFPH (1)	94 IUINCM (1)	95 IFINCM (1)
		96 IUINCK (1)	97 IFINCK (1)	
KLUES	24	0 KLUSE (1)	1 KLUNAL (1)	2 IRED (1)
		3 KLUMD (1)	4 KLUBAL (1)	5 MSADD (1)
		6 NPASS (1)	7 IDNOPT (1)	8 VDES (1)
		9 EPS1 (1)	10 DWMAX (1)	11 NBAR (1)
		12 NFIX (1)	13 D (1)	14 DEL (1)
		15 EPS2 (1)	16 NCYC (1)	17 NNN (1)
		18 IBAND (1)	19 IFIN (1)	20 KLUB (1)
		21 KLUQ (1)	22 MORBAL (1)	23 DBAL (1)
WAYTS	6	0 WINITT (1)	1 WST (1)	2 WMB (1)
		3 WBOTH (1)	4 WPRES (1)	5 DW (1)
CBYTES	1	0 NBYTES (1)		
FILE	20	0 IPOS (20)		
CORE	2	0 KORE (1)	1 KOREDP (1)	
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
	STORFS 457	0 NUMSTR (1)	1 KCONST (1)	2 ISTDOF (30)
		32 IDYDOF (30)	62 IDSTR (5)	67 STRWI (5)
		72 STRWO (5)	77 STRWN (5)	82 STRII (15)
		97 STRIO (15)	112 STRIN (15)	127 STRRI (15)
		142 STRRO (15)	157 STRRN (15)	172 STRWDO (5)
		177 STRWDN (5)	182 STRIDO (15)	197 STRIDN (15)
		212 STRRDO (15)	227 STRRDN (15)	242 SCALE (65)
		307 STRFI (30)	337 STRFO (30)	367 STRFN (30)
		397 STRFDO (30)	427 STRFDN (30)	
	STRCLU 10	0 ICYCLE (1)	1 ISTEP (1)	2 M1 (1)
		3 M2 (1)	4 M3 (1)	5 M4 (1)
		6 VS (1)	7 VOLD (1)	8 VNEW (1)
		9 STPOLD (1)		
	LOCSTR 6	0 IUSTRI (1)	1 IFSTRI (1)	2 IUMREF (1)
		3 IFMREF (1)	4 IUMOD (1)	5 IFMOD (1)
	RESIZE 44	0 ISIZE (1)	1 SCLNEW (20)	21 SCLOLD (20)
		41 ITESTO (1)	42 SAVSTP (1)	43 IDUB (1)
	ACCEL 43	0 ISTOP (1)	1 IPAR (1)	2 DWNEW (5)
		7 DINEW (15)	22 DWOLD (5)	27 DIOLD (15)
		42 RILSTP (1)		
	COMRWP 3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
	CTAPES 50	0 ITAPES (50)		
	INVERT 125	0 INVERT (1)	1 IUA2 (1)	2 IFLEX (1)
		3 AORD (30)	33 IPERM (30)	63 NSTOR (60)
		123 IPREV (1)	124 NDOFT (1)	
	VSAVE 2	0 VNSAVE (1)	1 VOSAVE (1)	
	CLUEV 21	0 LKLUEV (1)	1 KLUEV (20)	

EQUIV CLASSES		LENGTH	MEMBERS - BIAS NAME(LENGTH)		
	ROE	15	0 IROE (1)		
	BUFFER	310	0 IBUF (1)		
	WORK	28000	0 IWORK (1)	0 JCHART (4)	0 CHART (4)
NMBAL	NMBAL	1	0 MB (1)		
NUMSTR	NUMSTR	1	0 MSTOR (1)		
ICYCLE	ICYCLE	1	0 KSTOR (1)		

STATISTICS

PROGRAM LENGTH	71506B	29510
CM LABELED COMMON LENGTH	2250B	1192

52000B CM USED

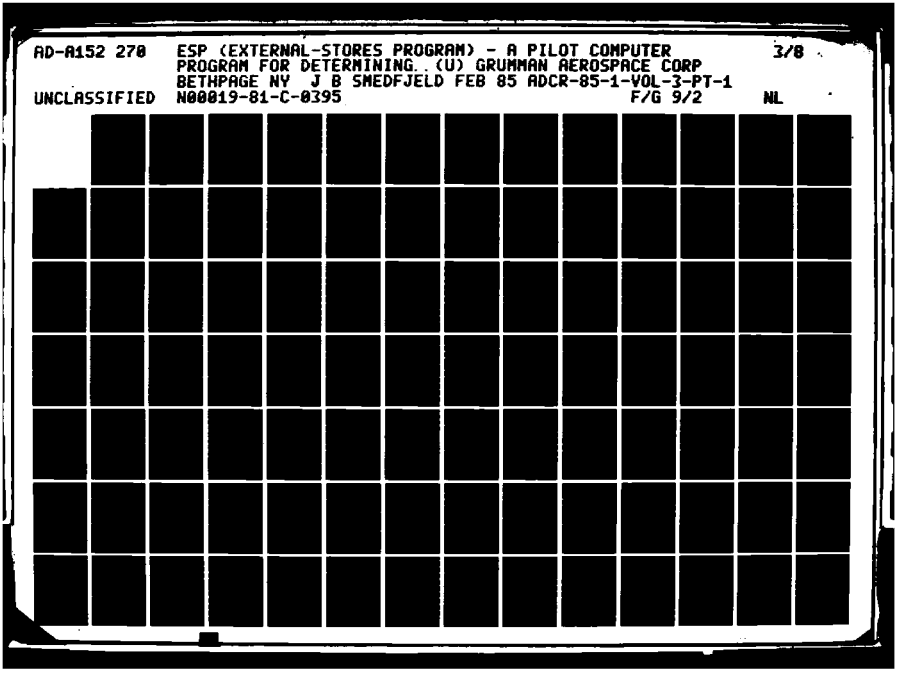
```
      SUBROUTINE DYNMAS(WORK,KORE,BUFFER,IERR,IDYFLX,IMASS,ITRNSF)
C
C
      DIMENSION WORK(1),BUFFER(1),NR(3),NC(3),WW(3)
      DIMENSION NAME(2),NAMMD(2),NAMMDB(2),NAMDUM(2),NADMDB(2),NAMADD(2)
      DIMENSION NAMMS(2)
      DIMENSION IPOS(20)
      DIMENSION ADDMS(550),JCHART(3,1),CHART(3,1)
      DIMENSION PAK(20),JPAK(20)
      DIMENSION NUMB(10),VALUE(10)
C
      EQUIVALENCE (ADDMS(1),NMS),(ADDMS(2),JCHART(1,1),CHART(1,1))
      EQUIVALENCE (PAK(1),JPAK(1))
C
      COMMON/BAL/ NMBAL,IDBAL(20),VMBIN(20),VMBOLD(20),VMBNEW(20),
     1            MBDOF(20,3),DRVMB(20),DRVMBO(20),
     2            S1MB(20),S2MB(20),S3MB(20)
      COMMON/PLACES/ IUIN1,IUIN2,IUOUT1,IUOUT2,IUGO1,IUGO2,IUGO3,IUGO4,
     1               IUSCR,IFSCR,IFS1,IFS2,IFS3,IFS4,IUCD,IUPR,
     2               IUA,IFA,IUY,IFY,IUMEMN,IFMEMN,IUSTFN,IFSTFN,
     3               IUKS,IFKS,IUB,IFB,IUDESO,IFDESO,
     4               IUMDBI,IFMDBI,IUADDI,IFADDI,IUBALI,IFBALI,
     5               IUDESI,IFDESI,IUWTI,IFWTI,
     6               IUMEMO,IFMEMO,IUBT,IFBT,
     7               IUDESN,IFDESN,IUMD,IFMD,
     8               IUMEMF,IFMEMF,
     9               IUSTFO,IFSTFO,IUMDB,IFMDB,IUADD,IFADD,IUBAL,IFBAL,
     A               IUDESF,IFDESF,IUWT,IFWT,
     B               IUDUM1,IFDUM1,IUDUM2,IFDUM2,IUDUM3,IFDUM3,
     C               IUL,IFL,IUYT,IFYT,IUZ,IFZ,IUZR,IFZR,IULR,IFLR,
     D               IUBR,IFBR,
     E               IUPHTF,IFPHTF,IUMODM,IFMODM,
     F               IUMODK,IFMODK,IUPHT,IFPHT,IUQT,IFQT,IUQ,IFQ,
     G               IUPH,IFPH,IUINCM,IFINCM,IUINCK,IFINCK
      COMMON /PLAYFF/ IUMDFF,IFMDFF,IUDLTI,IFDLTI,IUSLTI,IFSLTI
     1               ,IUMPLI,IFMPLI,IUTPGT,IFTPGT,IUPATF,IFPATF
     2               ,IUMPL,IFMPL,IUSLT,IFSLT,IUDLT,IFDLT
     3               ,IUQA,IFQA,IUQAT,IFQAT,IUPHA,IFPHA,IUPHAT,IFPHAT
      COMMON/KLUES/ KLUSE,KLUNAL,IRED,KLUMD,KLUBAL,MSADD,NPASS,IDNOPT,
     1              VDES,EPS1,DWMAX,NBAR,NFIX,D,DEL,EPS2,NCYC,NNN,IBAND,
     2              IFIN,KLUB,KLUQ,MORBAL,DBAL
      COMMON /KLUFF/ KFREE
      COMMON/SIZES/ NSTMEM,NSTDOF,NDYDOF,NNOPT,NDESNO,NDESYS
      COMMON /FILE  / IPOS
      COMMON/WAYTS/ WINITT,WST,WMB,WBOTH,WPRES,DW
      COMMON /CLIST / KOUNT,KPAGE,LINES,LINEST,KLABEL,KTPAGE,NPAGE
     1              ,KBPAGE,LINESG,KOUNTH,KOUNTI
      COMMON /CLUEV / LKLUEV,KLUEV(20)
C
      DATA NAMMD /4HMD  ,4H    /,NAMMDB/4HMDB ,4H    /,
     1     NAMDUM/4HDUMM,4HY   /,NADMDB/4HDMDB,4H    /,
     2     NAMMS /4HMS  ,4H    /,NAMADD/4HADDM,4HS   /
C
      CALL PROGNA(4H(DYN,4HMAS))
      CALL MESAGE(1,6,6HDYNMAS)
      CALL TIMEB(11,11HFROM DYNMAS)
C
```

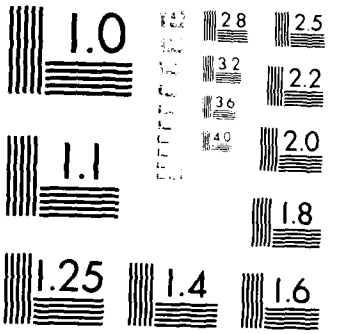
```
      IOMD=KLUEV(4)                                                    DYNMAS     59
      IOMALL=KLUEV(5)                                                  DYNMAS     60
60    IERR=0                                                           DYNMAS     61
      IF(NCYC.GT.0) GO TO 9999                                         DYNMAS     62
C                                                                      DYNMAS     63
C  ******************************************************              DYNMAS     64
C  *       THE FOLLOWING LINES OF FASTOP CODE HAVE      *              DYNMAS     65
65    C  *       BEEN COMMENTED OUT BECAUSE THEY ARE NOT      *       DYNMAS     66
C  *       USED IN THE CURRENT VERSION OF ESP.          *              DYNMAS     67
C  ******************************************************              DYNMAS     68
C                                                                      DYNMAS     69
C THERE ARE TWO INDEPENDENT PATHS THROUGH THIS SUBROUTINE, NAMELY PATHS DYNMAS     70
70    C FOR KLUMD=1 AND KLUMD=0, RESPECTIVELY.                         DYNMAS     71
C                                                                      DYNMAS     72
C     IF(KLUMD.EQ.0) GO TO 1000                                        DYNMAS     73
C                                                                      DYNMAS     74
C KLUMD=1  IF NPASS=0, READ IN THE INITIAL DYNAMIC MASS MATRIX,MDB,    DYNMAS     75
75    C          AND SET MD=MDB.                                       DYNMAS     76
C          IF NPASS=1, COMPUTE THE INCREMENTAL DYNAMIC MASS MATRIX     DYNMAS     77
C          (BEYOND MDB) AND UPDATE MD.                                 DYNMAS     78
C                                                                      DYNMAS     79
C     IF(NPASS.NE.0) GO TO 500                                         DYNMAS     80
80    C                                                                DYNMAS     81
C                                                                      DYNMAS     82
C     IF(KLUSE.LT.2) GO TO 50                                          DYNMAS     83
C                                                                      DYNMAS     84
C READ IN TOTAL INITIAL WEIGHT (STRUCTURAL+NON-OPTIMUM ITEMS)          DYNMAS     85
85    C                                                                DYNMAS     86
C     READ(IUCD,9002) WINITT                                           DYNMAS     87
C     WPRES=WINITT+WBOTH                                               DYNMAS     88
C     DW=0.0                                                           DYNMAS     89
C     WRITE(IUPR,9003) WINITT,WPRES                                    DYNMAS     90
90    C     KOUNT=KOUNT+5                                              DYNMAS     91
C  50 CONTINUE                                                         DYNMAS     92
C                                                                      DYNMAS     93
C  ******************************************************              DYNMAS     94
C  *       END OF CODE THAT HAS BEEN COMMENTED OUT.     *              DYNMAS     95
95    C  ******************************************************        DYNMAS     96
C                                                                      DYNMAS     97
C READ IN MDB-CARDS-LOWER TRIANGLE ONLY.                               DYNMAS     98
C                                                                      DYNMAS     99
      CALL PUDLAB(8HDYNMASO1,IUMD,NAMMD,IFMD,NDYDOF,NDYDOF)            DYNMAS    100
100   IF(KLUSE.NE.2) GO TO 60                                          DYNMAS    101
      IFDUM=1                                                          DYNMAS    102
      CALL PUDLAB(8HDYNMASO3,IUMDB,NAMMDB,IFDUM,NDYDOF,NDYDOF)         DYNMAS    103
      CALL PUDLAB(8HDYNMASO2,IUMDB,NAMMDB,IFMDB,NDYDOF,NDYDOF)         DYNMAS    104
C                                                                      DYNMAS    105
105   60 CONTINUE                                                      DYNMAS    106
C                                                                      DYNMAS    107
      IMIN = 25                                                        DYNMAS    108
      IF (IMASS.EQ.2)  IMIN = 20                                       DYNMAS    109
      IF (IMASS.EQ.0)  GO TO 70                                        DYNMAS    110
110   IF (IDYFLX.EQ.0)                                                 DYNMAS    111
     1CALL NASTRD(IMASS,IMIN,1,2,1,NDYDOF,NDYDOF,BUFFER)               DYNMAS    112
      IF (IDYFLX.NE.0)                                                 DYNMAS    113
     1CALL NASTRD(IMASS,IMIN,2,2,1,NDYDOF,NDYDOF,BUFFER)               DYNMAS    114
      NADD = 1                                                         DYNMAS    115
```

```
115         C                                                                   DYNMAS  116
               70 MORE = 0                                                      DYNMAS  117
                  IF (IMASS.EQ.0.AND.KLUEV(8).EQ.2)                             DYNMAS  118
                 1WRITE (6,9015) NDYDOF,NDYDOF                                  DYNMAS  119
            C                                                                   DYNMAS  120
120                DO 160 I=1,NDYDOF                                            DYNMAS  121
            C                                                                   DYNMAS  122
                   INEXT=I+1                                                    DYNMAS  123
                   DO 80 J=1,I                                                  DYNMAS  124
                80 BUFFER(J)=0.0                                                DYNMAS  125
125                IF (IMASS.NE.0)  GO TO 140                                   DYNMAS  126
                   NADD=0                                                       DYNMAS  127
            C                                                                   DYNMAS  128
                   IF(MORE.NE.0) GO TO 110                                      DYNMAS  129
            C                                                                   DYNMAS  130
130             85 READ(IMIN,9001) (NR(K),NC(K),WW(K),K=1,3)                    DYNMAS  131
                   KS=1                                                         DYNMAS  132
                   NCARD=0                                                      DYNMAS  133
                   DO 90 K=1,3                                                  DYNMAS  134
                   IF(NR(K).EQ.0) GO TO 100                                     DYNMAS  135
135             90 NCARD=NCARD+1                                                DYNMAS  136
            C                                                                   DYNMAS  137
                100 IF(NCARD.EQ.0) GO TO 170                                    DYNMAS  138
            C                                                                   DYNMAS  139
                110 DO 120 K=KS,NCARD                                           DYNMAS  140
140                 IF(NR(K)-I) 210,115,130                                     DYNMAS  141
            C                                                                   DYNMAS  142
                115 L=NC(K)                                                     DYNMAS  143
            C   ****************************************************            DYNMAS  144
            C   *       THE FOLLOWING LINE OF FASTOP CODE HAS      *            DYNMAS  145
145         C   *       BEEN COMMENTED OUT BECAUSE IT IS NOT       *            DYNMAS  146
            C   *       USED IN THE CURRENT VERSION OF ESP.        *            DYNMAS  147
            C   ****************************************************            DYNMAS  148
            C       IF(L.LT.1.OR.L.GT.I) GO TO 211                              DYNMAS  149
                    BUFFER(L)=WW(K)                                             DYNMAS  150
150                 IF(L.EQ.I.AND.BUFFER(L).GT.0.) NADD=1                       DYNMAS  151
                120 CONTINUE                                                    DYNMAS  152
            C                                                                   DYNMAS  153
                    MORE=0                                                      DYNMAS  154
                    GO TO 85                                                    DYNMAS  155
155         C                                                                   DYNMAS  156
                130 IF(NR(K).NE.INEXT) GO TO 212                                DYNMAS  157
                    IF(NADD.NE.1) GO TO 213                                     DYNMAS  158
                    IF (KLUEV(8).EQ.2)                                          DYNMAS  159
                   1WRITE (6,9016) I,(BUFFER(L),L=1,I)                          DYNMAS  160
160                 GO TO 150                                                   DYNMAS  161
                140 CALL NASTRD(IMASS,IMIN,1,2,2,NDYDOF,NDYDOF,BUFFER)          DYNMAS  162
                150 CONTINUE                                                    DYNMAS  163
                    IF(KLUSE.EQ.2) CALL PUTROW(IUMDB,-1,BUFFER,I)               DYNMAS  164
                    CALL PUTROW(IUMD,1,BUFFER,I)                                DYNMAS  165
165                 KS=K                                                        DYNMAS  166
                    MORE=1                                                      DYNMAS  167
            C                                                                   DYNMAS  168
                160 CONTINUE                                                    DYNMAS  169
            C                                                                   DYNMAS  170
170                 IF (IMASS.NE.0)                                             DYNMAS  171
                   1CALL NASTRD(IMASS,IMIN,1,2,3,NDYDOF,NDYDOF,BUFFER)          DYNMAS  172
```

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                IF (IMASS.NE.O)  GO TO 180                                      DYNMAS    173
              170 IF(I.NE.NDYDOF) GO TO 214                                     DYNMAS    174
                  IF(NADD.NE.1) GO TO 213                                       DYNMAS    175
175               IF (KLUEV(8).EQ.2)                                            DYNMAS    176
                 1WRITE (6,9016) I,(BUFFER(L),L=1,I)                            DYNMAS    177
                  IF(KLUSE.EQ.2) CALL PUTROW(IUMDB,-1,BUFFER,I)                 DYNMAS    178
                  CALL PUTROW(IUMD,1,BUFFER,I)                                  DYNMAS    179
              180 CALL DCLOSE(IUMD)                                             DYNMAS    180
180               IF(KLUSE.EQ.2) CALL DCLOSE(IUMDB)                             DYNMAS    181
            C                                                                   DYNMAS    182
                  GO TO 9999                                                    DYNMAS    183
            C                                                                   DYNMAS    184
              210 MAD=210                                                       DYNMAS    185
185               GO TO 220                                                     DYNMAS    186
            C  ******************************************************           DYNMAS    187
            C  *       THE FOLLOWING LINES OF FASTOP CODE HAVE      *           DYNMAS    188
            C  *       BEEN COMMENTED OUT BECAUSE THEY ARE NOT      *           DYNMAS    189
            C  *       USED IN THE CURRENT VERSION OF ESP.          *           DYNMAS    190
190         C  ******************************************************           DYNMAS    191
            C 211 MAD=211                                                       DYNMAS    192
            C     GO TO 220                                                     DYNMAS    193
            C  ******************************************************           DYNMAS    194
            C  *       END OF CODE THAT HAS BEEN COMMENTED OUT.     *           DYNMAS    195
195         C  ******************************************************           DYNMAS    196
              212 MAD=212                                                       DYNMAS    197
                  GO TO 220                                                     DYNMAS    198
              213 MAD=213                                                       DYNMAS    199
                  GO TO 220                                                     DYNMAS    200
200           214 MAD=214                                                       DYNMAS    201
            C                                                                   DYNMAS    202
              220 IERR=1                                                        DYNMAS    203
            C                                                                   DYNMAS    204
                  KOUNT=LINES                                                   DYNMAS    205
205               CALL TITLES(2)                                                DYNMAS    206
                  WRITE(IUPR,9004) MAD,(NR(M),NC(M),WW(M),M=1,3)                DYNMAS    207
            C                                                                   DYNMAS    208
            C                                                                   DYNMAS    209
                  GO TO 9999                                                    DYNMAS    210
210         C                                                                   DYNMAS    211
            C  ******************************************************           DYNMAS    212
            C  *       THE FOLLOWING LINES OF FASTOP CODE HAVE      *           DYNMAS    213
            C  *       BEEN COMMENTED OUT BECAUSE THEY ARE NOT      *           DYNMAS    214
            C  *       USED IN THE CURRENT VERSION OF ESP.          *           DYNMAS    215
215         C  ******************************************************           DYNMAS    216
            C                                                                   DYNMAS    217
            C 500 CONTINUE                                                      DYNMAS    218
            C                                                                   DYNMAS    219
            C 1. COMPUTE DMSB--THE INCREMENTAL MASS MATRIX (STRUCT.GRID,DIAGONAL) DYNMAS  220
220         C    BEYOND THE INITIAL DESIGN ASSOCIATED WITH MDB.                 DYNMAS    221
            C 2. TRANSFORM DMSB TO THE DYNAMICS GRID, DMDB=B*DMSB*BT.           DYNMAS    222
            C    IF IRED=O, DMDB=DMSB.                                          DYNMAS    223
            C 3. UPDATE MD, MD=MDB+DMDB                                         DYNMAS    224
            C                                                                   DYNMAS    225
225         C     CALL STRMAS(WORK,BUFFER,2,WALL)                               DYNMAS    226
            C                                                                   DYNMAS    227
            C     CALL PROGNA(4H(DYN,4HMAS))                                    DYNMAS    228
            C                                                                   DYNMAS    229
```

```
      C     IF(IOMALL.NE.2) GO TO 509                                          DYNMAS  230
230   C     KOUNT=LINES                                                        DYNMAS  231
      C     K=0                                                                DYNMAS  232
      C     DO 508 I=1,NSTDOF                                                  DYNMAS  233
      C     IR=I                                                               DYNMAS  234
      C     IF(WORK(I).EQ.0.0) GO TO 502                                       DYNMAS  235
235   C     K=K+1                                                              DYNMAS  236
      C     NUMB(K)=IR                                                         DYNMAS  237
      C     VALUE(K)=WORK(I)                                                   DYNMAS  238
      C 502 IF(K.EQ.6) GO TO 504                                               DYNMAS  239
      C     IF(IR.EQ.NSTDOF.AND.K.GT.0) GO TO 504                              DYNMAS  240
240   C     GO TO 508                                                          DYNMAS  241
      C 504 CALL TITLES(2)                                                     DYNMAS  242
      C     IF(KOUNT.GT.KOUNTH) GO TO 506                                      DYNMAS  243
      C     WRITE(IUPR,9005)                                                   DYNMAS  244
      C     KOUNT=KOUNT+5                                                      DYNMAS  245
245   C 506 WRITE(IUPR,9006) (NUMB(L),VALUE(L),L=1,K)                          DYNMAS  246
      C     KOUNT=KOUNT+1                                                      DYNMAS  247
      C     K=0                                                                DYNMAS  248
      C 508 CONTINUE                                                           DYNMAS  249
      C                                                                        DYNMAS  250
250   C 509 CONTINUE                                                           DYNMAS  251
      C                                                                        DYNMAS  252
      C     IF(IRED.EQ.0) GO TO 700                                            DYNMAS  253
      C                                                                        DYNMAS  254
      C     CALL GEDLAB(8HDYNMAS01,IUBT,NAME,IFBT,KROW,KCOL)                   DYNMAS  255
255   C     CALL PUDLAB(8HDYNMAS03,IUG02,NAMDUM,IFS2,KROW,KCOL)                DYNMAS  256
      C                                                                        DYNMAS  257
      C     DO 520 I=1,NSTDOF                                                  DYNMAS  258
      C     CALL GETROW(IUBT,1,BUFFER,KCOL)                                    DYNMAS  259
      C     DO 510 J=1,KCOL                                                    DYNMAS  260
260   C 510 BUFFER(J)=BUFFER(J)*WORK(I)                                        DYNMAS  261
      C 520 CALL PUTROW(IUG02,1,BUFFER,KCOL)                                   DYNMAS  262
      C                                                                        DYNMAS  263
      C     CALL DCLOSE(IUBT)                                                  DYNMAS  264
      C     CALL DCLOSE(IUG02)                                                 DYNMAS  265
265   C                                                                        DYNMAS  266
      C     IPOS(IUB)=IFB                                                      DYNMAS  267
      C     IPOS(IUG02)=IFS2                                                   DYNMAS  268
      C     IPOS(IUG01)=IFS1                                                   DYNMAS  269
      C     IPOS(IUG03)=IFS3                                                   DYNMAS  270
270   C     IPOS(IUG04)=IFS4                                                   DYNMAS  271
      C                                                                        DYNMAS  272
      C     CALL MULT(KORE,WORK,WORK,WORK,IUB,IUG02,IUG01,IUG03,IUG04,         DYNMAS  273
      C    *NADMDB,0)                                                          DYNMAS  274
      C                                                                        DYNMAS  275
275   C     IF(IOMALL.EQ.2) CALL PRMAT1(IUG01,IFS1,WORK,1,IUPR,7,81,           DYNMAS  276
      C    1 81H (INCREMENTAL MASS MATRIX (DYNAMIC GRID) WITH RESPECT TO INITI DYNMAS  277
      C    2AL MASS MATRIX MDB))                                               DYNMAS  278
      C     CALL PROGNA(4H(DYN,4HMAS))                                         DYNMAS  279
      C                                                                        DYNMAS  280
280   C     CALL GEDLAB(8HDYNMAS02,IUMDBI,NAME,IFMDBI,KROW,KCOL)               DYNMAS  281
      C     CALL GEDLAB(8HDYNMAS03,IUG01,NAME,IFS1,LROW,LCOL)                  DYNMAS  282
      C     CALL PUDLAB(8HDYNMAS04,IUMD,NAMMD,IFMD,KROW,KCOL)                  DYNMAS  283
      C                                                                        DYNMAS  284
      C     IF(KLUSE.NE.2) GO TO 530                                           DYNMAS  285
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AD-A152 270 ESP (EXTERNAL-STORES PROGRAM) - A PILOT COMPUTER 3/8
PROGRAM FOR DETERMINING..(U) GRUMMAN AEROSPACE CORP
BETHPAGE NY J B SMEDFJELD FEB 85 ADCR-85-1-VOL-3-PT-1
UNCLASSIFIED N00019-81-C-0395 F/G 9/2 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

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      C                                                                 DYNMAS  287
      C 530 CONTINUE                                                    DYNMAS  288
      C                                                                 DYNMAS  289
      C     DO 550 I=1,KROW                                             DYNMAS  290
290   C     CALL GETROW(IUMDBI,1,WORK,KCOL)                             DYNMAS  291
      C     CALL GETROW(IUG01,1,BUFFER,LCOL)                            DYNMAS  292
      C     DO 540 J=1,I                                                DYNMAS  293
      C 540 BUFFER(J)=BUFFER(J)+WORK(J)                                 DYNMAS  294
      C     CALL PUTROW(IUMD,1,BUFFER,I)                                DYNMAS  295
295   C     IF(KLUSE.EQ.2) CALL PUTROW(IUMDB,1,WORK,I)                  DYNMAS  296
      C 550 CONTINUE                                                    DYNMAS  297
      C                                                                 DYNMAS  298
      C     CALL DCLOSE(IUMDBI)                                         DYNMAS  299
      C     CALL DCLOSE(IUG01)                                          DYNMAS  300
300   C     CALL DCLOSE(IUMD)                                           DYNMAS  301
      C     IF(KLUSE.EQ.2) CALL DCLOSE(IUMDB)                           DYNMAS  302
      C                                                                 DYNMAS  303
      C     GO TO 9999                                                  DYNMAS  304
      C                                                                 DYNMAS  305
305   C 700 CONTINUE                                                    DYNMAS  306
      C                                                                 DYNMAS  307
      C     CALL GEDLAB(8HDYNMAS04,IUMDBI,NAME,IFMDBI,KROW,KCOL)        DYNMAS  308
      C     CALL PUDLAB(8HDYNMAS06,IUMD,NAMMD,IFMD,KROW,KCOL)           DYNMAS  309
      C     IF(KLUSE.NE.2) GO TO 720                                    DYNMAS  310
310   C     CALL PUDLAB(8HDYNMAS07,IUMDB,NAMMDB,IFMDB,KROW,KCOL)        DYNMAS  311
      C                                                                 DYNMAS  312
      C 720 CONTINUE                                                    DYNMAS  313
      C                                                                 DYNMAS  314
      C     DO 740 I=1,KROW                                             DYNMAS  315
315   C     CALL GETROW(IUMDBI,1,BUFFER,KCOL)                           DYNMAS  316
      C     IF(KLUSE.EQ.2) CALL PUTROW(IUMDB,-1,BUFFER,I)               DYNMAS  317
      C     BUFFER(I)=BUFFER(I)+WORK(I)                                 DYNMAS  318
      C     CALL PUTROW(IUMD,1,BUFFER,I)                                DYNMAS  319
      C 740 CONTINUE                                                    DYNMAS  320
320   C                                                                 DYNMAS  321
      C     CALL DCLOSE(IUMDBI)                                         DYNMAS  322
      C     CALL DCLOSE(IUMD)                                           DYNMAS  323
      C     IF(KLUSE.EQ.2) CALL DCLOSE(IUMDB)                           DYNMAS  324
      C                                                                 DYNMAS  325
325   C                                                                 DYNMAS  326
      C     GO TO 9999                                                  DYNMAS  327
      C                                                                 DYNMAS  328
      C                                                                 DYNMAS  329
      C1000 CONTINUE                                                    DYNMAS  330
330   C                                                                 DYNMAS  331
      C                                                                 DYNMAS  332
      C KLUMD=0  1. READ IN FIXED MASS DATA-IF ANY.                     DYNMAS  333
      C             (CARDS IF NPASS=0, TAPE IF NPASS=1)                 DYNMAS  334
      C          2. COMPUTE THE TOTAL MASS MATRIX,MS, (STRUCT.GRID,DIAGONAL) DYNMAS  335
335   C             DUE TO STRUCTURAL AND MASS BALANCE ELEMENTS.        DYNMAS  336
      C          3. UPDATE MS TO INCLUDE FIXED MASS ITEMS.           DYNMAS  337
      C          4. TRANSFORM THE TOTAL MASS MATRIX,MS, TO THE DYNAMICS DYNMAS  338
      C             GRID- MD=B*MS*BT (IF IRED=0, MD=MS).             DYNMAS  339
      C                                                                 DYNMAS  340
340   C     NMS=0                                                       DYNMAS  341
      C     WFIX=0.0                                                    DYNMAS  342
      C     IF(MSADD.EQ.0) GO TO 1100                                   DYNMAS  343
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                C                                                               DYNMAS  344
                C     IF(NPASS.NE.0) GO TO 1060                                 DYNMAS  345
345             C                                                               DYNMAS  346
                C READ IN FIXED MASS DATA-(CARDS, FULL MATRICES)                DYNMAS  347
                C                                                               DYNMAS  348
                C     IF(KLUSE.EQ.2) READ(IUCD,9002) WFIX                       DYNMAS  349
                C                                                               DYNMAS  350
350             C     I=0                                                       DYNMAS  351
                C     LASTR=1                                                   DYNMAS  352
                C1010 READ(IUCD,9001) (NR(K),NC(K),WW(K),K=1,3)                 DYNMAS  353
                C     IF(NR(1).EQ.0) GO TO 1030                                 DYNMAS  354
                C     DO 1020 K=1,3                                             DYNMAS  355
355             C     IF(NR(K).EQ.0) GO TO 1010                                 DYNMAS  356
                C     IF(NR(K).LT.LASTR) GO TO 1040                             DYNMAS  357
                C     LASTR=NR(K)                                               DYNMAS  358
                C     I=I+1                                                     DYNMAS  359
                C     JCHART(1,I)=NR(K)                                         DYNMAS  360
360             C     JCHART(2,I)=NC(K)                                         DYNMAS  361
                C     CHART(3,I)=WW(K)                                          DYNMAS  362
                C1020 CONTINUE                                                  DYNMAS  363
                C     GO TO 1010                                                DYNMAS  364
                C1030 NMS=I                                                     DYNMAS  365
365             C                                                               DYNMAS  366
                C     KOUNT=LINES                                               DYNMAS  367
                C     DO 1036 I=1,NMS                                           DYNMAS  368
                C     N=I                                                       DYNMAS  369
                C     CALL TITLES(2)                                            DYNMAS  370
370             C     IF(KOUNT.GT.KOUNTH) GO TO 1033                            DYNMAS  371
                C     WRITE(IUPR,9007)                                          DYNMAS  372
                C     KOUNT=KOUNT+5                                             DYNMAS  373
                C1033 CONTINUE                                                  DYNMAS  374
                C     WRITE(IUPR,9008) JCHART(1,N),JCHART(2,N),CHART(3,N)       DYNMAS  375
375             C     KOUNT=KOUNT+1                                             DYNMAS  376
                C1036 CONTINUE                                                  DYNMAS  377
                C                                                               DYNMAS  378
                C     LEFT=LINES-KOUNT                                          DYNMAS  379
                C     NEED=3                                                    DYNMAS  380
380             C     IF(KLUSE.EQ.2) NEED=NEED+2                                DYNMAS  381
                C     IF(LEFT.LT.NEED) KOUNT=LINES                              DYNMAS  382
                C     CALL TITLES(2)                                            DYNMAS  383
                C     WRITE(IUPR,9009) NMS                                      DYNMAS  384
                C     KOUNT=KOUNT+3                                             DYNMAS  385
385             C     IF(KLUSE.NE.2) GO TO 1038                                 DYNMAS  386
                C     WRITE(IUPR,9014) WFIX                                     DYNMAS  387
                C     KOUNT=KOUNT+2                                             DYNMAS  388
                C1038 CONTINUE                                                  DYNMAS  389
                C                                                               DYNMAS  390
390             C     GO TO 1080                                                DYNMAS  391
                C                                                               DYNMAS  392
                C1040 IERR=2                                                    DYNMAS  393
                C                                                               DYNMAS  394
                C     KOUNT=LINES                                               DYNMAS  395
395             C     CALL TITLES(2)                                            DYNMAS  396
                C     WRITE(IUPR,9010) (NR(K),NC(K),WW(K),K=1,3)                DYNMAS  397
                C                                                               DYNMAS  398
                C     GO TO 9999                                                DYNMAS  399
                C                                                               DYNMAS  400
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      C1060 CONTINUE                                                    DYNMAS  401
      C                                                                 DYNMAS  402
      C READ IN FIXED MASS DATA-(TAPE)                                  DYNMAS  403
      C                                                                 DYNMAS  404
      C     CALL GEDLAB(8HDYNMASO5,IUADDI,NAME,IFADDI,JROW,JCOL)        DYNMAS  405
      C     CALL DREAD(IUADDI,ADDMS(1),4)                               DYNMAS  406
      C     NBYTE=4*(NMS*3)                                             DYNMAS  407
      C     CALL DREAD(IUADDI,ADDMS(2),NBYTE)                           DYNMAS  408
      C     CALL DCLOSE(IUADDI)                                         DYNMAS  409
      C                                                                 DYNMAS  410
      C1080 CONTINUE                                                    DYNMAS  411
      C                                                                 DYNMAS  412
      C                                                                 DYNMAS  413
      C     IF(KLUSE.NE.2) GO TO 1100                                   DYNMAS  414
      C     JROW=2                                                      DYNMAS  415
      C     JCOL=9999                                                   DYNMAS  416
      C     CALL PUDLAB(8HDYNMASO8,IUADD,NAMADD,IFADD,JROW,JCOL)        DYNMAS  417
      C     CALL DWRITE(IUADD,NMS,4)                                    DYNMAS  418
      C     NBYTE=4*(NMS*3)                                             DYNMAS  419
      C     CALL DWRITE(IUADD,ADDMS(2),NBYTE)                           DYNMAS  420
      C     CALL DCLOSE(IUADD)                                          DYNMAS  421
      C                                                                 DYNMAS  422
      C                                                                 DYNMAS  423
      C                                                                 DYNMAS  424
      C1100 CONTINUE                                                    DYNMAS  425
      C                                                                 DYNMAS  426
      C COMPUTE MS--THE TOTAL MASS MATRIX (EXCLUDING FIXED MASS ITEMS) IN THE DYNMAS  427
      C STRUCTURES GRID. THIS MATRIX IS DIAGONAL.                       DYNMAS  428
      C                                                                 DYNMAS  429
      C     CALL STRMAS(WORK,BUFFER,3,WALL)                             DYNMAS  430
      C                                                                 DYNMAS  431
      C     CALL PROGNA(4H(DYN,4HMAS))                                  DYNMAS  432
      C                                                                 DYNMAS  433
      C     IF(NPASS.NE.O.OR.KLUSE.NE.2) GO TO 1105                     DYNMAS  434
      C     WINITT=WALL+WFIX                                            DYNMAS  435
      C     WPRES=WINITT+WBOTH                                          DYNMAS  436
      C     DW=O.O                                                      DYNMAS  437
      C     LEFT=LINES-KOUNT                                            DYNMAS  438
      C     IF(LEFT.LT.9) KOUNT=LINES                                   DYNMAS  439
      C     CALL TITLES(2)                                              DYNMAS  440
      C     WRITE(IUPR,9011) WINITT,WALL,WFIX,WPRES                     DYNMAS  441
      C     KOUNT=KOUNT+9                                               DYNMAS  442
      C1105 CONTINUE                                                    DYNMAS  443
      C                                                                 DYNMAS  444
      C                                                                 DYNMAS  445
      C UPDATE MS TO INCLUDE ANY FIXED MASS ITEMS AND THEN TRANSFORM TO DYNMAS  446
      C THE DYNAMICS GRID.                                              DYNMAS  447
      C                                                                 DYNMAS  448
      C     IF(MSADD-1) 1150,1110,1200                                  DYNMAS  449
      C                                                                 DYNMAS  450
      C1110 CONTINUE                                                    DYNMAS  451
      C                                                                 DYNMAS  452
      C MSADD=1 UPDATE MS (DIAGONAL RESULT)                             DYNMAS  453
      C                                                                 DYNMAS  454
      C     DO 1120 I=1,NMS                                             DYNMAS  455
      C     JR=JCHART(1,I)                                              DYNMAS  456
      C     JC=JCHART(2,I)                                              DYNMAS  457
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                C     IF(JR.NE.JC) GO TO 1130                                    DYNMAS   458
                C     WORK(JR)=WORK(JR)+CHART(3,I)                               DYNMAS   459
                C1120 CONTINUE                                                   DYNMAS   460
460             C                                                                DYNMAS   461
                C     GO TO 1150                                                 DYNMAS   462
                C                                                                DYNMAS   463
                C1130 IERR=3                                                     DYNMAS   464
                C     LEFT=LINES-KOUNT                                           DYNMAS   465
465             C     IF(LEFT.LT.5) KOUNT=LINES                                  DYNMAS   466
                C     CALL TITLES(2)                                             DYNMAS   467
                C     WRITE(IUPR,9012)                                           DYNMAS   468
                C                                                                DYNMAS   469
                C     GO TO 9999                                                 DYNMAS   470
470             C                                                                DYNMAS   471
                C1150 CONTINUE                                                   DYNMAS   472
                C                                                                DYNMAS   473
                C TRANSFORM DIAGONAL MS TO MD.  MD=B*MS*BT (IF IRED=0,MD=MS)     DYNMAS   474
                C                                                                DYNMAS   475
475             C     IF(IRED.EQ.0) GO TO 1180                                   DYNMAS   476
                C                                                                DYNMAS   477
                C     IF(IOMALL.NE.2) GO TO 1159                                 DYNMAS   478
                C     KOUNT=LINES                                                DYNMAS   479
                C     K=0                                                        DYNMAS   480
480             C     DO 1158 I=1,NSTDOF                                         DYNMAS   481
                C     IR=I                                                       DYNMAS   482
                C     IF(WORK(I).EQ.0.0) GO TO 1152                              DYNMAS   483
                C     K=K+1                                                      DYNMAS   484
                C     NUMB(K)=IR                                                 DYNMAS   485
485             C     VALUE(K)=WORK(I)                                           DYNMAS   486
                C1152 IF(K.EQ.6) GO TO 1154                                      DYNMAS   487
                C     IF(IR.EQ.NSTDOF.AND.K.GT.0) GO TO 1154                     DYNMAS   488
                C     GO TO 1158                                                 DYNMAS   489
                C1154 CALL TITLES(2)                                             DYNMAS   490
490             C     IF(KOUNT.GT.KOUNTH) GO TO 1156                             DYNMAS   491
                C     WRITE(IUPR,9013)                                           DYNMAS   492
                C     KOUNT=KOUNT+5                                              DYNMAS   493
                C1156 WRITE(IUPR,9006) (NUMB(L),VALUE(L),L=1,K)                  DYNMAS   494
                C     KOUNT=KOUNT+1                                              DYNMAS   495
495             C     K=0                                                        DYNMAS   496
                C1158 CONTINUE                                                   DYNMAS   497
                C                                                                DYNMAS   498
                C1159 CONTINUE                                                   DYNMAS   499
                C                                                                DYNMAS   500
500             C     CALL GEDLAB(8HDYNMAS06,IUBT,NAME,IFBT,KROW,KCOL)           DYNMAS   501
                C     CALL PUDLAB(8HDYNMAS09,IUG03,NAMDUM,IFS3,KROW,KCOL)        DYNMAS   502
                C                                                                DYNMAS   503
                C     DO 1170 I=1,NSTDOF                                         DYNMAS   504
                C     CALL GETROW(IUBT,1,BUFFER,KCOL)                            DYNMAS   505
505             C     DO 1160 J=1,KCOL                                           DYNMAS   506
                C1160 BUFFER(J)=BUFFER(J)*WORK(I)                                DYNMAS   507
                C1170 CALL PUTROW(IUG03,1,BUFFER,KCOL)                           DYNMAS   508
                C                                                                DYNMAS   509
                C     CALL DCLOSE(IUBT)                                          DYNMAS   510
510             C     CALL DCLOSE(IUG03)                                         DYNMAS   511
                C                                                                DYNMAS   512
                C     IPOS(IUB)=IFB                                              DYNMAS   513
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      C     IPOS(IUMD)=IFMD                                                  DYNMAS     515
515   C     IPOS(IUGO1)=IFS1                                                 DYNMAS     516
      C     IPOS(IUGO4)=IFS4                                                 DYNMAS     517
      C                                                                      DYNMAS     518
      C     CALL MULT(KORE,WORK,WORK,WORK,IUB,IUGO3,IUMD,IUGO1,IUGO4,NAMMD,O)DYNMAS     519
      C     CALL PROGNA(4H(DYN,4HMAS))                                       DYNMAS     520
520   C                                                                      DYNMAS     521
      C                                                                      DYNMAS     522
      C     GO TO 9999                                                       DYNMAS     523
      C                                                                      DYNMAS     524
      C1180 CONTINUE                                                         DYNMAS     525
525   C                                                                      DYNMAS     526
      C     CALL PUDLAB(8HDYNMAS1O,IUMD,NAMMD,IFMD,NSTDOF,NSTDOF)            DYNMAS     527
      C     DO 1185 I=1,NSTDOF                                               DYNMAS     528
      C     CALL PUTROW(IUMD,-1,WORK,I)                                      DYNMAS     529
      C     WORK(I)=O.O                                                      DYNMAS     530
530   C1185 CONTINUE                                                         DYNMAS     531
      C     CALL DCLOSE(IUMD)                                                DYNMAS     532
      C                                                                      DYNMAS     533
      C     GO TO 9999                                                       DYNMAS     534
      C                                                                      DYNMAS     535
535   C                                                                      DYNMAS     536
      C1200 CONTINUE                                                         DYNMAS     537
      C                                                                      DYNMAS     538
      C MSADD=2  UPDATE MS (OFF DIAGONAL TERMS ARE PRESENT)                  DYNMAS     539
      C                                                                      DYNMAS     540
540   C     IF(IRED.EQ.O) CALL PUDLAB(8HDYNMAS11,IUMD,NAMMD,IFMD,            DYNMAS     541
      C    1                                NDYDOF,NDYDOF)                   DYNMAS     542
      C     IF(IRED.NE.O) CALL PUDLAB(8HDYNMAS12,IUMD,NAMMS,IFMD,            DYNMAS     543
      C    1                                NSTDOF,NSTDOF)                   DYNMAS     544
      C                                                                      DYNMAS     545
545   C     KLUPAK=-2                                                        DYNMAS     546
      C     LYNE=1                                                           DYNMAS     547
      C     MORE=1                                                           DYNMAS     548
      C     KUP=NSTDOF-6                                                     DYNMAS     549
      C                                                                      DYNMAS     550
550   C     DO 1400 I=1,NSTDOF                                               DYNMAS     551
      C     IF(MORE.EQ.O) GO TO 1210                                         DYNMAS     552
      C     MROW=JCHART(1,LYNE)                                              DYNMAS     553
      C     IF(I.EQ.MROW) GO TO 1250                                         DYNMAS     554
      C                                                                      DYNMAS     555
555   C1210 JPAK(1)=1-I                                                      DYNMAS     556
      C     JPAK(2)=1                                                        DYNMAS     557
      C     PAK(3)=WORK(I)                                                   DYNMAS     558
      C     JPAK(4)=I-NSTDOF                                                 DYNMAS     559
      C                                                                      DYNMAS     560
560   C     NCOUNT=4                                                         DYNMAS     561
      C     IF(I.EQ.1.OR.I.EQ.NSTDOF) NCOUNT=3                               DYNMAS     562
      C                                                                      DYNMAS     563
      C     CALL DWRITE(IUMD,NCOUNT,4)                                       DYNMAS     564
      C     CALL DWRITE(IUMD,KLUPAK,4)                                       DYNMAS     565
565   C                                                                      DYNMAS     566
      C     J=1                                                              DYNMAS     567
      C     IF(I.EQ.1) J=2                                                   DYNMAS     568
      C     NBYTE=4*NCOUNT                                                   DYNMAS     569
      C                                                                      DYNMAS     570
570   C     CALL DWRITE(IUMD,PAK(J),NBYTE)                                   DYNMAS     571
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      C     GO TO 1400                                                    DYNMAS  572
      C                                                                   DYNMAS  573
      C1250 CONTINUE                                                      DYNMAS  574
      C                                                                   DYNMAS  575
575   C     DO 1260 L=1,15                                                DYNMAS  576
      C1260 PAK(L)=0.0                                                    DYNMAS  577
      C                                                                   DYNMAS  578
      C     IF(I.GT.6) GO TO 1270                                         DYNMAS  579
      C                                                                   DYNMAS  580
580   C     JPAK(1)=11                                                    DYNMAS  581
      C     IC=1+I                                                        DYNMAS  582
      C     JPAK(13)=11-NSTDOF                                            DYNMAS  583
      C     NCOUNT=13                                                     DYNMAS  584
      C     GO TO 1300                                                    DYNMAS  585
585   C                                                                   DYNMAS  586
      C1270 IF(I.GT.KUP) GO TO 1280                                       DYNMAS  587
      C                                                                   DYNMAS  588
      C     JPAK(1)=6-I                                                   DYNMAS  589
      C     JPAK(2)=11                                                    DYNMAS  590
590   C     IC=8                                                          DYNMAS  591
      C     JPAK(14)=(5+I)-NSTDOF                                         DYNMAS  592
      C     NCOUNT=14                                                     DYNMAS  593
      C     GO TO 1300                                                    DYNMAS  594
      C                                                                   DYNMAS  595
595   C1280 JPAK(1)=11-NSTDOF                                             DYNMAS  596
      C     JPAK(2)=11                                                    DYNMAS  597
      C     IC=13-(NSTDOF-I)                                              DYNMAS  598
      C     NCOUNT=13                                                     DYNMAS  599
      C                                                                   DYNMAS  600
600   C1300 CONTINUE                                                      DYNMAS  601
      C     PAK(IC)=WORK(I)                                               DYNMAS  602
      C1310 MCOL=JCHART(2,LYNE)                                           DYNMAS  603
      C     KK=IC+(MCOL-MROW)                                             DYNMAS  604
      C     PAK(KK)=PAK(KK)+CHART(3,LYNE)                                 DYNMAS  605
605   C     LYNE=LYNE+1                                                   DYNMAS  606
      C     IF(LYNE.GT.NMS) MORE=0                                        DYNMAS  607
      C     IF(MORE.EQ.0) GO TO 1350                                      DYNMAS  608
      C                                                                   DYNMAS  609
      C     MROW=JCHART(1,LYNE)                                           DYNMAS  610
610   C     IF(MROW.EQ.I) GO TO 1310                                      DYNMAS  611
      C                                                                   DYNMAS  612
      C1350 CONTINUE                                                      DYNMAS  613
      C                                                                   DYNMAS  614
      C     CALL DWRITE(IUMD,NCOUNT,4)                                    DYNMAS  615
615   C     CALL DWRITE(IUMD,KLUPAK,4)                                    DYNMAS  616
      C     NBYTE=4*NCOUNT                                                DYNMAS  617
      C     CALL DWRITE(IUMD,PAK(1),NBYTE)                                DYNMAS  618
      C                                                                   DYNMAS  619
      C                                                                   DYNMAS  620
620   C                                                                   DYNMAS  621
      C1400 CONTINUE                                                      DYNMAS  622
      C                                                                   DYNMAS  623
      C                                                                   DYNMAS  624
      C     CALL DCLOSE(IUMD)                                             DYNMAS  625
625   C                                                                   DYNMAS  626
      C                                                                   DYNMAS  627
      C TRANSFORM MS TO THE DYNAMICS GRID, MD=B*MS*BT   (IF IRED=0, MD=MS) DYNMAS  628
```

```
      C                                                                 DYNMAS   629
      C     IF(IRED.EQ.0) GO TO 9999                                    DYNMAS   630
630   C                                                                 DYNMAS   631
      C     IF(IOMALL.EQ.2) CALL PRMAT2(IUMD,IFMD,WORK,1,IUPR,4,71,     DYNMAS   632
      C    1 71H (MASS MATRIX GENERATED IN FULLY AUTOMATED MASS OPTION-STRUCTU DYNMAS   633
      C    2RES GRID))                                                  DYNMAS   634
      C                                                                 DYNMAS   635
635   C     IPOS(IUMD)=IFMD                                             DYNMAS   636
      C     IPOS(IUBT)=IFBT                                             DYNMAS   637
      C     IPOS(IUG03)=IFS3                                            DYNMAS   638
      C     IPOS(IUIN1)=IFSCR                                           DYNMAS   639
      C     IPOS(IUG04)=IFS4                                            DYNMAS   640
640   C                                                                 DYNMAS   641
      C     CALL MULT(KORE,WORK,WORK,WORK,IUMD,IUBT,IUG03,IUIN1,IUG04,  DYNMAS   642
      C    *NAMDUM,0)                                                   DYNMAS   643
      C                                                                 DYNMAS   644
      C                                                                 DYNMAS   645
645   C     IPOS(IUB)=IFB                                               DYNMAS   646
      C     IPOS(IUG03)=IFS3                                            DYNMAS   647
      C     IPOS(IUMD)=IFMD                                             DYNMAS   648
      C     IPOS(IUG01)=IFS1                                            DYNMAS   649
      C     IPOS(IUG04)=IFS4                                            DYNMAS   650
650   C                                                                 DYNMAS   651
      C     CALL MULT(KORE,WORK,WORK,WORK,IUB,IUG03,IUMD,IUG01,IUG04,NAMMD,0) DYNMAS 652
      C     CALL PROGNA(4H(DYN,4HMAS))                                  DYNMAS   653
      C                                                                 DYNMAS   654
      C  ********************************************************       DYNMAS   655
655   C  *       END OF CODE THAT HAS BEEN COMMENTED OUT.      *        DYNMAS   656
      C  ********************************************************       DYNMAS   657
      C                                                                 DYNMAS   658
       9001 FORMAT(3(2I4,F15.5,1X))                                     DYNMAS   659
       9002 FORMAT(E15.5)                                               DYNMAS   660
660    9003 FORMAT(/,10X,   45HINITIAL WEIGHT (EXCLUDING ANY MASS BALANCE) =, DYNMAS 661
           1      F15.4,                                                DYNMAS   662
           2     //,10X,    22HPRESENT TOTAL WEIGHT =,F15.4,/)          DYNMAS   663
       9004 FORMAT(/,10X,   42HTHERE IS AN ERROR IN THE INITIAL MASS DATA, DYNMAS 664
           1      //,10X,   33H(MAD=210) DATA IS NOT IN ROW SORT,       DYNMAS   665
665        2      //,10X,   42H(MAD=211) DATA LIES OUTSIDE LOWER TRIANGLE, DYNMAS 666
           3      //,10X,   31H(MAD=212) ENTIRE ROW IS MISSING,         DYNMAS   667
           4      //,10X,   39H(MAD=213) DIAGONAL TERM IS NOT POSITIVE, DYNMAS   668
           5      //,10X,   32H(MAD=214) BLANK CARD ENCOUNTERED,        DYNMAS   669
           6     ///,10X,   22HCURRENT VALUE OF MAD =,I5,              DYNMAS   670
670        7      //,10X,   27HOFFENDING DATA CARD FOLLOWS,             DYNMAS   671
           8      //,10X,3(2I4,F15.5,1X),/)                            DYNMAS   672
       9005 FORMAT(/,10X,   43HINCREMENTAL MASS MATRIX(STRUCT. GRID) WITH , DYNMAS 673
           1                35HRESPECT TO INITIAL MASS MATRIX MDB.,     DYNMAS   674
           2      //,10X, 6(20H  ROW          VALUE),/)                 DYNMAS   675
675    9006 FORMAT(10X,6(I5,1PE15.5))                                   DYNMAS   676
       9007 FORMAT(/,10X,   45HFIXED ADDITIONS TO MASS MATRIX (STRUCT. GRID), DYNMAS 677
           1      //,10X,   25H  ROW  COL          VALUE,/)            DYNMAS   678
       9008 FORMAT(10X,2I5,1PE15.5)                                     DYNMAS   679
       9009 FORMAT(/,10X,   10HTHERE ARE ,I5,   24H FIXED ADDITIONS TO THE , DYNMAS 680
680        1                23HSTRUCTURAL MASS MATRIX.,/)               DYNMAS   681
       9010 FORMAT(/,10X,   39HTHE FIXED MASS DATA IS NOT IN ROW SORT.,  DYNMAS   682
           1      //,10X,   38HTHE OFFENDING DATA CARD IS SHOWN BELOW,  DYNMAS   683
           2      //,10X,3(2I4,F15.5,1X),/)                            DYNMAS   684
       9011 FORMAT(/,10X,   26HINITIAL REFERENCE WEIGHT = F15.4         DYNMAS   685
```

```
685            1      //,10X,   31HCONTRIBUTION DUE TO STRUCTURE =,F12.4,          DYNMAS   686
               2      //,10X,   42HCONTRIBUTION DUE TO FIXED MASS ADDITIONS =,     DYNMAS   687
               3      F12.4,                                                      DYNMAS   688
               4      //,10X,   22HPRESENT TOTAL WEIGHT =,F12.4,/)                DYNMAS   689
             9012 FORMAT(/,10X,   44HOFF-DIAGONAL TERMS ARE PRESENT IN THE FIXED ,  DYNMAS   690
690            1                  15HMASS ADDITIONS.,                             DYNMAS   691
               2      //,10X,   45HHOWEVER, THE USER DID NOT SO INDICATE IN THE ,  DYNMAS   692
               3                  34HINPUT CLUES. (TERMINATE EXECUTION),/)        DYNMAS   693
             9013 FORMAT(/,10X,   47HMASS MATRIX (STRUCT. GRID) INCLUDING FIXED MASS DYNMAS   694
               1                  15H ITEMS-(IF ANY),                             DYNMAS   695
695            2      //,10X, 6(20H  ROW          VALUE),/)                       DYNMAS   696
             9014 FORMAT(10X,35HTHE TOTAL WEIGHT OF THESE ITEMS IS ,F15.4,/)       DYNMAS   697
             9015 FORMAT (1H1,9X,8HREADING ,I3,3H X ,I3,                           DYNMAS   698
               1        41H DYNAMIC MASS MATRIX FROM CARD-IMAGE FILE/              DYNMAS   699
               2        15X,24H(LOWER TRIANGLE PRINTED))                           DYNMAS   700
700          9016 FORMAT (//15X,4HROW ,I3//(1P10E12.4))                            DYNMAS   701
            C                                                                      DYNMAS   702
            C                                                                      DYNMAS   703
             9999 CONTINUE                                                         DYNMAS   704
            C                                                                      DYNMAS   705
705               IF(IERR.NE.0) STOP                                               DYNMAS   706
            C                                                                      DYNMAS   707
            C                                                                      DYNMAS   708
                  IF (KLUSE.LE.0)  GO TO 9940                                      DYNMAS   709
                  IUNIT=IUMD                                                       DYNMAS   710
710               IFILE=IFMD                                                       DYNMAS   711
                  NCIC=NCYC                                                        DYNMAS   712
                  CALL MASTOR(WORK,BUFFER.IUNIT,IFILE,NCIC)                        DYNMAS   713
                  CALL PROGNA(4H(DYN,4HMAS))                                       DYNMAS   714
             9940 CONTINUE                                                         DYNMAS   715
715         C                                                                      DYNMAS   716
                  IUCOM=IUMD                                                       DYNMAS   717
                  IFCOM=IFMD                                                       DYNMAS   718
            C                                                                      DYNMAS   719
            C IF THE STRUCTURE IS FREE-FREE, ADJUST THE MASS MATRIX                DYNMAS   720
720         C                                                                      DYNMAS   721
                  IF(KFREE.NE.2) GO TO 9950                                        DYNMAS   722
                  CALL FFMASS(WORK(1),WORK(25000),WORK(26000),WORK(27000),         DYNMAS   723
                 1            BUFFER(1),IDYFLX,IMASS,ITRNSF,IMIN)                 DYNMAS   724
                  CALL PROGNA(4H(DYN,4HMAS))                                       DYNMAS   725
725               IUCOM=IUMDFF                                                     DYNMAS   726
                  IFCOM=IFMDFF                                                     DYNMAS   727
            C                                                                      DYNMAS   728
             9950 CONTINUE                                                         DYNMAS   729
            C                                                                      DYNMAS   730
730               IF(IOMD.NE.2) GO TO 9990                                         DYNMAS   731
            C                                                                      DYNMAS   732
                  IF(KFREE.EQ.2) GO TO 9970                                        DYNMAS   733
                  IF(IRED.EQ.0) GO TO 9980                                         DYNMAS   734
                  IF(NPASS.EQ.0.AND.KLUMD.EQ.1) GO TO 9980                         DYNMAS   735
735         C                                                                      DYNMAS   736
             9970 CALL PRMAT1(IUCOM,IFCOM,WORK,1,IUPR,7,47,                        DYNMAS   737
                 1 47H (MASS MATRIX TO BE USED IN VIBRATION ANALYSIS))             DYNMAS   738
                  GO TO 9990                                                       DYNMAS   739
             9980 CALL PRMAT2(IUCOM,IFCOM,WORK,1,IUPR,4,47,                        DYNMAS   740
740              1 47H (MASS MATRIX TO BE USED IN VIBRATION ANALYSIS))             DYNMAS   741
            C                                                                      DYNMAS   742
```

```
                9990 CONTINUE                                                  DYNMAS   743
                C                                                              DYNMAS   744
                C                                                              DYNMAS   745
     745              CALL PROGNA(4H(DYN,4HMAS))                               DYNMAS   746
                      CALL TIMEB(11,11HFROM DYNMAS)                            DYNMAS   747
                      CALL MESAGE(2,6,6HDYNMAS)                                DYNMAS   748
                C                                                              DYNMAS   749
                      RETURN                                                   DYNMAS   750
     750              END                                                      DYNMAS   751
```

```
CARD NR.  SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

     722     I      WORK       ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
     722     I      WORK       ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
     722     I      WORK       ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
```

SYMBOLIC REFERENCE MAP (R=3)

```
ENTRY POINTS      DEF LINE      REFERENCES
    3  DYNMAS            1       749

VARIABLES     SN  TYPE           RELOCATION
 1204  ADDMS      REAL       *UNDEF                REFS        8       2*12
    0  BUFFER     REAL        ARRAY      F.P.      REFS        4        110      112      150      158      161      163
                                                     164      170      175      177      178      712      722
                                                 DEFINED        1      124      149
 1205  CHART      REAL       *UNDEF                REFS        8       12
   15  D          REAL                  KLUES      REFS       39
   27  DBAL       REAL                  KLUES      REFS       39
   16  DEL        REAL                  KLUES      REFS       39
  215  DRVMB      REAL        ARRAY     BAL        REFS       15
  241  DRVMBO     REAL        ARRAY     BAL        REFS       15
    5  DW         REAL                  WAYTS      REFS       45
   12  DWMAX      REAL                  KLUES      REFS       39
   11  EPS1       REAL                  KLUES      REFS       39
   17  EPS2       REAL                  KLUES      REFS       39
 1142  I          INTEGER                          REFS      122      123      140      150     2*158     163      164
                                                     173     2*175      177      178  DEFINED      120
   22  IBAND      INTEGER               KLUES      REFS       39
    1  IDBAL      INTEGER     ARRAY     BAL        REFS       15
    7  IDNOPT     INTEGER               KLUES      REFS       39
    0  IDYFLX     INTEGER                F.P.      REFS      110      112      722  DEFINED        1
    0  IERR       INTEGER                F.P.      REFS      705  DEFINED        1       60      202
   21  IFA        INTEGER               PLACES     REFS       18
   67  IFADD      INTEGER               PLACES     REFS       18
   41  IFADDI     INTEGER               PLACES     REFS       18
   33  IFB        INTEGER               PLACES     REFS       18
   71  IFBAL      INTEGER               PLACES     REFS       18
   43  IFBALI     INTEGER               PLACES     REFS       18
  117  IFBR       INTEGER               PLACES     REFS       18
```

VARIABLES	SN	TYPE	RELOCATION							
53	IFBT	INTEGER	PLACES	REFS	18					
1157	IFCOM	INTEGER		REFS	736	739	DEFINED	717	726	
73	IFDESF	INTEGER	PLACES	REFS	18					
45	IFDESI	INTEGER	PLACES	REFS	18					
55	IFDESN	INTEGER	PLACES	REFS	18					
35	IFDESO	INTEGER	PLACES	REFS	18					
21	IFDLT	INTEGER	PLAYFF	REFS	35					
3	IFDLTI	INTEGER	PLAYFF	REFS	35					
1136	IFDUM	INTEGER		REFS	102	DEFINED	101			
77	IFDUM1	INTEGER	PLACES	REFS	18					
101	IFDUM2	INTEGER	PLACES	REFS	18					
103	IFDUM3	INTEGER	PLACES	REFS	18					
1154	IFILE	INTEGER		REFS	712	DEFINED	710			
23	IFIN	INTEGER	KLUES	REFS	39					
141	IFINCK	INTEGER	PLACES	REFS	18					
137	IFINCM	INTEGER	PLACES	REFS	18					
31	IFKS	INTEGER	PLACES	REFS	18					
105	IFL	INTEGER	PLACES	REFS	18					
115	IFLR	INTEGER	PLACES	REFS	18					
57	IFMD	INTEGER	PLACES	REFS	18	99	710	717		
65	IFMDB	INTEGER	PLACES	REFS	18	103				
37	IFMDBI	INTEGER	PLACES	REFS	18					
1	IFMDFF	INTEGER	PLAYFF	REFS	35	726				
61	IFMEMF	INTEGER	PLACES	REFS	18					
25	IFMEMN	INTEGER	PLACES	REFS	18					
51	IFMEMO	INTEGER	PLACES	REFS	18					
125	IFMODK	INTEGER	PLACES	REFS	18					
123	IFMODM	INTEGER	PLACES	REFS	18					
15	IFMPL	INTEGER	PLAYFF	REFS	35					
7	IFMPLI	INTEGER	PLAYFF	REFS	35					
13	IFPATF	INTEGER	PLAYFF	REFS	35					
135	IFPH	INTEGER	PLACES	REFS	18					
27	IFPHA	INTEGER	PLAYFF	REFS	35					
31	IFPHAT	INTEGER	PLAYFF	REFS	35					
127	IFPHT	INTEGER	PLACES	REFS	18					
121	IFPHTF	INTEGER	PLACES	REFS	18					
133	IFQ	INTEGER	PLACES	REFS	18					
23	IFQA	INTEGER	PLAYFF	REFS	35					
25	IFQAT	INTEGER	PLAYFF	REFS	35					
131	IFQT	INTEGER	PLACES	REFS	18					
11	IFSCR	INTEGER	PLACES	REFS	18					
17	IFSLT	INTEGER	PLAYFF	REFS	35					
5	IFSLTI	INTEGER	PLAYFF	REFS	35					
27	IFSTFN	INTEGER	PLACES	REFS	18					
63	IFSTFO	INTEGER	PLACES	REFS	18					
12	IFS1	INTEGER	PLACES	REFS	18					
13	IFS2	INTEGER	PLACES	REFS	18					
14	IFS3	INTEGER	PLACES	REFS	18					
15	IFS4	INTEGER	PLACES	REFS	18					
11	IFTPGT	INTEGER	PLAYFF	REFS	35					
75	IFWT	INTEGER	PLACES	REFS	18					
47	IFWTI	INTEGER	PLACES	REFS	18					
23	IFY	INTEGER	PLACES	REFS	18					
107	IFYT	INTEGER	PLACES	REFS	18					
111	IFZ	INTEGER	PLACES	REFS	18					
113	IFZR	INTEGER	PLACES	REFS	18					
0	IMASS	INTEGER	F P	REFS	108	109	110	112	117	125	161

VARIABLES	SN	TYPE	RELOCATION									
				2*170	172	722	DEFINED	1				
1137	IMIN	INTEGER		REFS	110	112	161	170	722			
				DEFINED	107	108	I/O REFS	130				
1143	INEXT	INTEGER		REFS	156	DEFINED	122					
1135	IOMALL	* INTEGER		DEFINED	59							
1134	IOMD	INTEGER		REFS	730	DEFINED	58					
0	IPOS	INTEGER	ARRAY FILE	REFS	7	44						
2	IRED	INTEGER	KLUES	REFS	39	733						
0	ITRNSF	INTEGER	F.P.	REFS	722	DEFINED	1					
20	IUA	INTEGER	PLACES	REFS	18							
66	IUADD	INTEGER	PLACES	REFS	18							
40	IUADDI	INTEGER	PLACES	REFS	18							
32	IUB	INTEGER	PLACES	REFS	18							
70	IUBAL	INTEGER	PLACES	REFS	18							
42	IUBALI	INTEGER	PLACES	REFS	18							
116	IUBR	INTEGER	PLACES	REFS	18							
52	IUBT	INTEGER	PLACES	REFS	18							
16	IUCD	INTEGER	PLACES	REFS	18							
1156	IUCOM	INTEGER		REFS	736	739	DEFINED	716	725			
72	IUDESF	INTEGER	PLACES	REFS	18							
44	IUDESI	INTEGER	PLACES	REFS	18							
54	IUDESN	INTEGER	PLACES	REFS	18							
34	IUDESO	INTEGER	PLACES	REFS	18							
20	IUDLT	INTEGER	PLAYFF	REFS	35							
2	IUDLTI	INTEGER	PLAYFF	REFS	35							
76	IUDUM1	INTEGER	PLACES	REFS	18							
100	IUDUM2	INTEGER	PLACES	REFS	18							
102	IUDUM3	INTEGER	PLACES	REFS	18							
4	IUGO1	INTEGER	PLACES	REFS	18							
5	IUGO2	INTEGER	PLACES	REFS	18							
6	IUGO3	INTEGER	PLACES	REFS	18							
7	IUGO4	INTEGER	PLACES	REFS	18							
140	IUINCK	INTEGER	PLACES	REFS	18							
136	IUINCM	INTEGER	PLACES	REFS	18							
0	IUIN1	INTEGER	PLACES	REFS	18							
1	IUIN2	INTEGER	PLACES	REFS	18							
30	IUKS	INTEGER	PLACES	REFS	18							
104	IUL	INTEGER	PLACES	REFS	18							
114	IULR	INTEGER	PLACES	REFS	18							
56	IUMD	INTEGER	PLACES	REFS	18	99	164	178	179	709	716	
64	IUMDB	INTEGER	PLACES	REFS	18	102	103	163	177	180		
36	IUMDBI	INTEGER	PLACES	REFS	18							
0	IUMDFF	INTEGER	PLAYFF	REFS	35	725						
60	IUMEMF	INTEGER	PLACES	REFS	18							
24	IUMEMN	INTEGER	PLACES	REFS	18							
50	IUMEMO	INTEGER	PLACES	REFS	18							
124	IUMODK	INTEGER	PLACES	REFS	18							
122	IUMODM	INTEGER	PLACES	REFS	18							
14	IUMPL	INTEGER	PLAYFF	REFS	35							
6	IUMPLI	INTEGER	PLAYFF	REFS	35							
1153	IUNIT	INTEGER		REFS	712	DEFINED	709					
2	IUOUT1	INTEGER	PLACES	REFS	18							
3	IUOUT2	INTEGER	PLACES	REFS	18							
12	IUPATF	INTEGER	PLAYFF	REFS	35							
134	IUPH	INTEGER	PLACES	REFS	18							
26	IUPHA	INTEGER	PLAYFF	REFS	35							

VARIABLES	SN	TYPE		RELOCATION								
126	IUPHT	INTEGER		PLACES	REFS	18						
120	IUPHTF	INTEGER		PLACES	REFS	18						
17	IUPR	INTEGER		PLACES	REFS	18	736	739	I/O REFS	206		
132	IUQ	INTEGER		PLACES	REFS	18						
22	IUQA	INTEGER		PLAYFF	REFS	35						
24	IUQAT	INTEGER		PLAYFF	REFS	35						
130	IUQT	INTEGER		PLACES	REFS	18						
10	IUSCR	INTEGER		PLACES	REFS	18						
16	IUSLT	INTEGER		PLAYFF	REFS	35						
4	IUSLTI	INTEGER		PLAYFF	REFS	35						
26	IUSTFN	INTEGER		PLACES	REFS	18						
62	IUSTFO	INTEGER		PLACES	REFS	18						
10	IUTPGT	INTEGER		PLAYFF	REFS	35						
74	IUWT	INTEGER		PLACES	REFS	18						
46	IUWTI	INTEGER		PLACES	REFS	18						
22	IUY	INTEGER		PLACES	REFS	18						
106	IUYT	INTEGER		PLACES	REFS	18						
110	IUZ	INTEGER		PLACES	REFS	18						
112	IUZR	INTEGER		PLACES	REFS	18						
1144	J	INTEGER			REFS	124	DEFINED	123				
1205	JCHART	INTEGER	*UNDEF		REFS	8	12					
1160	JPAK	INTEGER	*UNDEF		REFS	9	13					
1145	K	INTEGER			REFS	3*130	134	140	142	149	156	165
					DEFINED	130	133	139				
7	KBPAGE	INTEGER		CLIST	REFS	46						
0	KFREE	INTEGER		KLUFF	REFS	42	721	732				
4	KLABEL	INTEGER		CLIST	REFS	46						
24	KLUB	INTEGER		KLUES	REFS	39						
4	KLUBAL	INTEGER		KLUES	REFS	39						
1	KLUEV	INTEGER	ARRAY	CLUEV	REFS	48	58	59	117	158	175	
3	KLUMD	INTEGER		KLUES	REFS	39	734					
1	KLUNAL	INTEGER		KLUES	REFS	39						
25	KLUQ	INTEGER		KLUES	REFS	39						
0	KLUSE	INTEGER		KLUES	REFS	39	100	163	177	180	708	
0	KORE	INTEGER	*UNUSED	F.P.	DEFINED	1						
0	KOUNT	INTEGER		CLIST	REFS	46	DEFINED	204				
11	KOUNTH	INTEGER		CLIST	REFS	46						
12	KOUNTI	INTEGER		CLIST	REFS	46						
1	KPAGE	INTEGER		CLIST	REFS	46						
1146	KS	INTEGER			REFS	139	DEFINED	131	165			
5	KTPAGE	INTEGER		CLIST	REFS	46						
1150	L	INTEGER			REFS	149	2*150	158	175	DEFINED	142	158
					175							
2	LINES	INTEGER		CLIST	REFS	46	204					
10	LINESG	INTEGER		CLIST	REFS	46						
3	LINEST	INTEGER		CLIST	REFS	46						
0	LKLUEV	INTEGER		CLUEV	REFS	48						
1152	M	INTEGER			REFS	3*206	DEFINED	206				
1151	MAD	INTEGER			REFS	206	DEFINED	184	196	198	200	
121	MBDOF	INTEGER	ARRAY	BAL	REFS	15						
26	MORBAL	INTEGER		KLUES	REFS	39						
1141	MORE	INTEGER			REFS	128	DEFINED	116	153	166		
5	MSADD	INTEGER		KLUES	REFS	39						
1140	NADD	INTEGER			REFS	157	174	DEFINED	114	126	150	
2273	NADMDB	INTEGER	ARRAY		REFS	5	DEFINED	50				
2275	NAMADD	INTEGER	ARRAY		REFS	5	DEFINED	50				
2271	NAMDUM	INTEGER	ARRAY		REFS	5	DEFINED	50				

```
115          C                                                                 FFMASS   116
             C FORM PRODUCT OF LAMBDA(TRAN)*MD. STORE RESULT IN ELTMD          FFMASS   117
             C                                                                 FFMASS   118
                   LROW=NCOL                                                   FFMASS   119
                   LCOL=NROW                                                   FFMASS   120
120                DO 80 I=1,LCOL                                              FFMASS   121
                   DO 80 K=1,MCOL                                              FFMASS   122
                   A=0.0                                                       FFMASS   123
                   DO 75 J=1,LROW                                              FFMASS   124
                   IF(K.LE.J) L=((J-1)*J/2)+K                                  FFMASS   125
125                IF(K.GT.J) L=((K-1)*K/2)+J                                  FFMASS   126
                   A=A+ELAM(J,I)*EMAS(L)                                       FFMASS   127
                75 CONTINUE                                                    FFMASS   128
                   ELTMD(I,K)=A                                                FFMASS   129
                80 CONTINUE                                                    FFMASS   130
130          C                                                                 FFMASS   131
             C FORM THE PRODUCT LAMBDA(TRAN)*MD*LAMBDA. STORE RESULT IN XM     FFMASS   132
             C                                                                 FFMASS   133
                   DO 82 I=1,3                                                 FFMASS   134
                   DO 82 J=1,3                                                 FFMASS   135
135             82 XM(I,J)=0.0                                                 FFMASS   136
             C                                                                 FFMASS   137
                   DO 90 I=1,LCOL                                              FFMASS   138
                   DO 90 K=1,LCOL                                              FFMASS   139
                   A=0.0                                                       FFMASS   140
140                DO 85 J=1,LROW                                              FFMASS   141
                   A=A+ELTMD(I,J)*ELAM(J,K)                                    FFMASS   142
                85 CONTINUE                                                    FFMASS   143
                   XM(I,K)=A                                                   FFMASS   144
                90 CONTINUE                                                    FFMASS   145
145                IF(NCYC.GT.0) GO TO 130                                     FFMASS   146
             C                                                                 FFMASS   147
             C READ PLUG MASS INTO CORE.                                       FFMASS   148
             C (IF NPASS=0, DATA IS ON CARDS. OTHERWISE, DATA IS ON TAPE.)     FFMASS   149
             C                                                                 FFMASS   150
150                DO 100 I=1,3                                                FFMASS   151
                   DO 100 J=1,3                                                FFMASS   152
                   EMP(I,J)=0.0                                                FFMASS   153
                   IF(J.EQ.I) EMP(I,J)=1.0                                     FFMASS   154
               100 CONTINUE                                                    FFMASS   155
155          C                                                                 FFMASS   156
                   IF(NPASS.NE.0) GO TO 120                                    FFMASS   157
             C                                                                 FFMASS   158
                   IF (IMASS.EQ.0)  GO TO 105                                  FFMASS   159
                   CALL NASTRD(IMASS,IMIN,2,4,1,NPGDOF,NPGDOF,EMP(1,1))        FFMASS   160
160                DO 102 I=1,NPGDOF                                           FFMASS   161
                   CALL NASTRD(IMASS,IMIN,2,4,2,NPGDOF,NPGDOF,EMP(1,I))        FFMASS   162
               102 CONTINUE                                                    FFMASS   163
                   GO TO 112                                                   FFMASS   164
               105 READ (IMIN,9000) (NR(K),NC(K),WW(K),K=1,3)                  FFMASS   165
165                NCARD=0                                                     FFMASS   166
                   DO 110 K=1,3                                                FFMASS   167
                   IF(NR(K).EQ.0) GO TO 110                                    FFMASS   168
                   EMP(NR(K),NC(K))=WW(K)                                      FFMASS   169
                   EMP(NC(K),NR(K))=WW(K)                                      FFMASS   170
170                NCARD=NCARD+1                                               FFMASS   171
               110 CONTINUE                                                    FFMASS   172
```

```
                  CALL GETROW(IUMD,1,EMAS(J),MCOL)                          FFMASS     59
                  J=J+I                                                     FFMASS     60
60             50 CONTINUE                                                  FFMASS     61
                  CALL DCLOSE(IUMD)                                         FFMASS     62
               C                                                            FFMASS     63
               C READ DYNAMIC LAMBDA MATRIX INTO CORE                       FFMASS     64
               C                                                            FFMASS     65
65                IF (NCYC.GT.O)  GO TO 69                                  FFMASS     66
                  READ (IUCD,9004) NPGDOF                                   FFMASS     67
                  NCOL = NDYDOF                                             FFMASS     68
                  NROW = NPGDOF                                             FFMASS     69
                  DO 60 I=1,NROW                                            FFMASS     70
70                DO 55 J=1,NCOL                                            FFMASS     71
                  ELAM(J,I) = O.O                                           FFMASS     72
               55 CONTINUE                                                  FFMASS     73
               60 CONTINUE                                                  FFMASS     74
                  ITRIN = 26                                                FFMASS     75
75                IF (ITRNSF.EQ.2)  ITRIN = 20                              FFMASS     76
                  IF (ITRNSF.EQ.O)  GO TO 62                                FFMASS     77
                  IF (IDYFLX.EQ.O.AND.IMASS.EQ.O)                           FFMASS     78
                 1CALL NASTRD(ITRNSF,ITRIN,1,3,1,NDYDOF,NPGDOF,ELAM(1,1))   FFMASS     79
                  IF (IDYFLX.NE.O.OR.IMASS.NE.O)                            FFMASS     80
80               1CALL NASTRD(ITRNSF,ITRIN,2,3,1,NDYDOF,NPGDOF,ELAM(1,1))   FFMASS     81
                  DO 61 I=1,NPGDOF                                          FFMASS     82
                  CALL NASTRD(ITRNSF,ITRIN,1,3,2,NDYDOF,NPGDOF,ELAM(1,I))   FFMASS     83
               61 CONTINUE                                                  FFMASS     84
                  IF (ITRNSF.EQ.2)                                          FFMASS     85
85               1CALL NASTRD(ITRNSF,ITRIN,1,3,3,NDYDOF,NPGDOF,ELAM(1,1))   FFMASS     86
                  GO TO 67                                                  FFMASS     87
               62 READ (ITRIN,9003) ((IROW(K),ICOL(K),ELAMIN(K)),K=1,3)     FFMASS     88
                  DO 65 K=1,3                                               FFMASS     89
                  I = IROW(K)                                               FFMASS     90
90                IF (K.EQ.1.AND.I.EQ.O)  GO TO 66                          FFMASS     91
                  IF (I.EQ.O)  GO TO 65                                     FFMASS     92
                  J = ICOL(K)                                               FFMASS     93
                  ELAM(J,I) = ELAMIN(K)                                     FFMASS     94
               65 CONTINUE                                                  FFMASS     95
95                GO TO 62                                                  FFMASS     96
               66 WRITE (6,9005) NPGDOF,NDYDOF                              FFMASS     97
                  DO 666 J=1,NPGDOF                                         FFMASS     98
              666 WRITE (6,9006) J,(ELAM(I,J),I=1,NDYDOF)                   FFMASS     99
               67 CONTINUE                                                  FFMASS    100
100               IFDLTI = 5                                                FFMASS    101
                  IF (KLUSE.LE.O)  IFDLTI = 2                               FFMASS    102
                  CALL PUDLAB (8HFFMASSO2,IUDLTI,NAME2,IFDLTI,NROW,NCOL)    FFMASS    103
                  DO 68 I=1,NROW                                            FFMASS    104
                  CALL PUTROW (IUDLTI,-1,ELAM(1,I),NCOL)                    FFMASS    105
105            68 CONTINUE                                                  FFMASS    106
                  CALL DCLOSE (IUDLTI)                                      FFMASS    107
                  GO TO 72                                                  FFMASS    108
               69 CONTINUE                                                  FFMASS    109
                  CALL GEDLAB (8HFFMASSO2,IUDLTI,NAME.5,NROW,NCOL)          FFMASS    110
110               DO 70 I=1,NROW                                            FFMASS    111
                  CALL GETROW(IUDLTI,1,ELAM(1,I),NCOL)                      FFMASS    112
               70 CONTINUE                                                  FFMASS    113
                  CALL DCLOSE(IUDLTI)                                       FFMASS    114
               72 CONTINUE                                                  FFMASS    115
```

```
      SUBROUTINE FFMASS(EMAS,ELAM,ELTMD,TPLUG,BUFFER,IDYFLX,IMASS,      FFMASS      2
     1            ITRNSF,IMIN)                                          FFMASS      3
C                                                                        FFMASS      4
C                                                                        FFMASS      5
C THIS SUBROUTINE MODIFIES THE CANTILEVER MASS MATRIX,MD, AND CREATES    FFMASS      6
C A NEW MASS MATRIX,MDFF, FOR FREE-FREE VIBRATION ANALYSIS               FFMASS      7
C                                                                        FFMASS      8
C MDFF = MD-(MD*LAMBDA)*XMI*(LAMBDA(TRAN)*MD)                            FFMASS      9
C WHERE XMI= INVERSE OF (LAMBDA(TRAN)*MD*LAMBDA)+EMP)                    FFMASS     10
C                                                                        FFMASS     11
      DIMENSION EMAS(1),ELAM(220,3),ELTMD(3,220),TPLUG(3,220),BUFFER(1)  FFMASS     12
      DIMENSION         NAME(2),XM(3,3),NR(3),NC(3),WW(3),XMI(3,3)       FFMASS     13
      DIMENSION NAM(2),NAMFFM(2)                                         FFMASS     14
      DIMENSION ELAMIN(3), IROW(3), ICOL(3), NAME2(2)                    FFMASS     15
C                                                                        FFMASS     16
      COMMON /PLACES/ IUIN1,IUIN2,IUOUT1,IUOUT2,IUGO1,IUGO2,IUGO3,IUGO4, FFMASS     17
     1            IUSCR,IFSCR,IFS1,IFS2,IFS3,IFS4,IUCD,IUPR,             FFMASS     18
     2                IUA,IFA,IUY,IFY,IUMEMN,IFMEMN,IUSTFN,IFSTFN,       FFMASS     19
     3                IUKS,IFKS,IUB,IFB,IUDESO,IFDESO,                   FFMASS     20
     4                IUMDBI,IFMDBI,IUADDI,IFADDI,IUBALI,IFBALI,         FFMASS     21
     5                IUDESI,IFDESI,IUWTI,IFWTI,                         FFMASS     22
     6                IUMEMO,IFMEMO,IUBT,IFBT,                           FFMASS     23
     7                IUDESN,IFDESN,IUMD,IFMD,                           FFMASS     24
     8                IUMEMF,IFMEMF,                                     FFMASS     25
     9                IUSTFO,IFSTFO,IUMDB,IFMDB,IUADD,IFADD,IUBAL,IFBAL, FFMASS     26
     A                IUDESF,IFDESF,IUWT,IFWT,                           FFMASS     27
     B                IUDUM1,IFDUM1,IUDUM2,IFDUM2,IUDUM3,IFDUM3,         FFMASS     28
     C                IUL,IFL,IUYT,IFYT,IUZ,IFZ,IUZR,IFZR,IULR,IFLR,     FFMASS     29
     D                IUBR,IFBR,                                         FFMASS     30
     E                IUPHTF,IFPHTF,IUMODM,IFMODM,                       FFMASS     31
     F                IUMODK,IFMODK,IUPHT,IFPHT,IUQT,IFQT,IUQ,IFQ,       FFMASS     32
     G                IUPH,IFPH,IUINCM,IFINCM,IUINCK,IFINCK              FFMASS     33
      COMMON /KLUES / KLUSE,KLUNAL,IRED,KLUMD,KLUBAL,MSADD,NPASS,IDNOPT, FFMASS     34
     1               VDES,EPS1,DWMAX,NBAR,NFIX,D,DEL,EPS2,NCYC,NNN,IBAND, FFMASS     35
     2               IFIN,KLUB,KLUQ,MORBAL,DBAL                          FFMASS     36
      COMMON /PLAYFF/ IUMDFF,IFMDFF,IUDLTI,IFDLTI,IUSLTI,IFSLTI          FFMASS     37
     1               ,IUMPLI,IFMPLI,IUTPGT,IFTPGT,IUPATF,IFPATF          FFMASS     38
     2               ,IUMPL,IFMPL,IUSLT,IFSLT,IUDLT,IFDLT                FFMASS     39
     3               ,IUQA,IFQA,IUQAT,IFQAT,IUPHA,IFPHA,IUPHAT,IFPHAT    FFMASS     40
      COMMON /KLUFF/ KFREE                                               FFMASS     41
      COMMON /PLUG/ EMP(3,3), PHP(3,40)                                  FFMASS     42
      COMMON /CLIST/ KOUNT,KPAGE,LINES,LINEST,KLABEL,KTPAGE,NPAGE        FFMASS     43
     1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                        FFMASS     44
      COMMON /SIZES/ NSTMEM,NSTDOF,NDYDOF,NNOPT,NDESNO,NDESYS            FFMASS     45
      COMMON /CLUEV/ LKLUEV,KLUEV(20)                                    FFMASS     46
C                                                                        FFMASS     47
      DATA NAM /4HTPLU,4HGT  /, NAMFFM/4HMDFF,4H    /                    FFMASS     48
      DATA NAME2 /4HDYNL,4HAMT /                                         FFMASS     49
C                                                                        FFMASS     50
      CALL PROGNA(4H(FFM,4HASS))                                         FFMASS     51
      CALL MESAGE(1,6,6HFFMASS)                                          FFMASS     52
C                                                                        FFMASS     53
C READ LOWER TRIANGLE OF MASS MATRIX (MD) INTO CORE                      FFMASS     54
C                                                                        FFMASS     55
      CALL GEDLAB(8HFFMASSO1,IUMD,NAME,IFMD,MROW,MCOL)                   FFMASS     56
      J=1                                                                FFMASS     57
      DO 50 I=1,MROW                                                     FFMASS     58
```

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
222	146	J	122 124	2B	INSTACK
246		K	136 136	11B	EXT REFS
261	160	J	137 139	25B	EXT REFS NOT INNER
270		K	138 138	12B	EXT REFS
314	220	K	149 152	7B	EXT REFS
326	250	I	155 168	33B	NOT INNER
331	240	J	158 167	26B	NOT INNER
350	230	M	163 166	3B	INSTACK
367	300	K	173 176	10B	EXT REFS

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
STORES	277	0 NUMSTR (1)	1 KCONST (1)	2 ISTDOF (30)
		32 IDYDOF (30)	62 IDSTR (5)	67 STRWI (5)
		72 STRWO (5)	77 STRWN (5)	82 STRII (15)
		97 STRIO (15)	112 STRIN (15)	127 STRRI (15)
		142 STRRO (15)	157 STRRN (15)	172 STRWDO (5)
		177 STRWDN (5)	182 STRIDO (15)	197 STRIDN (15)
		212 STRRDO (15)	227 STRRDN (15)	242 SCALE (35)
STRCLU	10	0 ICYCLE (1)	1 ISTEP (1)	2 M1 (1)
		3 M2 (1)	4 M3 (1)	5 M4 (1)
		6 VS (1)	7 VOLD (1)	8 VNEW (1)
		9 STPOLD (1)		
LOCSTR	6	0 IUSTRI (1)	1 IFSTRI (1)	2 IUMREF (1)
		3 IFMREF (1)	4 IUMOD (1)	5 IFMOD (1)
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)

STATISTICS

PROGRAM LENGTH	1202B	642
CM LABELED COMMON LENGTH	463B	307

52000B CM USED

VARIABLES	SN	TYPE		RELOCATION								
567	SY	REAL			REFS	82	2*83	87	94	97	2*98	
					DEFINED	64						
570	SZ	REAL			REFS	81	2*83	85	2*88	96	97	
					DEFINED	65						
10	VNEW	REAL		STRCLU	REFS	16						
7	VOLD	REAL		STRCLU	REFS	16						
6	VS	REAL		STRCLU	REFS	16						
562	W	REAL			REFS	77	78	79	81	82	83	85
						86	87	88	94	95	96	97	98
					DEFINED	59						
0	WORK	REAL	ARRAY	F.P.	REFS	4	45	150	174	DEFINED	1	164
563	XI	REAL			REFS	83	DEFINED	60				
564	YI	REAL			REFS	88	DEFINED	61				
565	ZI	REAL			REFS	98	DEFINED	62				

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES			
DCLOSE		1	42	43	153	177
GEDLAB		6	35	147		
GETROW		4	39	150		
MESAGE		3	28			
PRMAT2		8	45			
PROGNA		2	27	49		
PUDLAB		6	36	170		
PUTROW		4	40	174		
TITLES		1	132			

STATEMENT LABELS			DEF LINE	REFERENCES	
0	50		41	38	
47	100		51	30	
0	120		69	66	67
0	140		103	100	101
0	144		114	112	
175	145		115	108	109
0	146		124	122	
225	147		125	118	119
0	160		139	137	
0	200		141	57	
0	220		152	149	
0	230		166	163	
0	240		167	158	
0	250		168	155	
0	300		176	173	
535	9000	FMT	180	134	
543	9001	FMT	181	136	
546	9002	FMT	182	138	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
24	50	I	38 41	12B	EXT REFS	
50	200	I	57 141	240B	EXT REFS	NOT INNER
64	120	J	66 69	14B	NOT INNER	
72	120	K	67 69	2B	INSTACK	
127	140	J	100 103	21B	NOT INNER	
141	140	K	101 103	3B	INSTACK	
152	145	J	108 115	26B	NOT INNER	
172	144	L	112 114	2B	INSTACK	

VARIABLES	SN	TYPE		RELOCATION
7	KBPAGE	INTEGER		CLIST
560	KCOL	INTEGER		
1	KCONST	INTEGER		STORES
4	KLABEL	INTEGER		CLIST
0	KOUNT	INTEGER		CLIST
11	KOUNTH	INTEGER		CLIST
12	KOUNTI	INTEGER		CLIST
1	KPAGE	INTEGER		CLIST
557	KROW	INTEGER		
5	KTPAGE	INTEGER		CLIST
573	L	INTEGER		
576	LF	INTEGER		
2	LINES	INTEGER		CLIST
10	LINESG	INTEGER		CLIST
3	LINEST	INTEGER		CLIST
577	LS	INTEGER		
600	M	INTEGER		
2	M1	INTEGER		STRCLU
3	M2	INTEGER		STRCLU
4	M3	INTEGER		STRCLU
5	M4	INTEGER		STRCLU
574	N	INTEGER		
601	NAME	INTEGER	ARRAY	
1067	NAMREF	INTEGER	ARRAY	
1134	NAMUP	INTEGER	ARRAY	
0	NCYC	INTEGER		F.P.
1071	NDOF	INTEGER	ARRAY	
6	NPAGE	INTEGER		CLIST
0	NUMSTR	INTEGER		STORES
362	SCALE	REAL	ARRAY	STORES
603	STM	REAL	ARRAY	
11	STPOLD	REAL		STRCLU
305	STRIDN	REAL	ARRAY	STORES
266	STRIDO	REAL	ARRAY	STORES
122	STRII	REAL	ARRAY	STORES
160	STRIN	REAL	ARRAY	STORES
141	STRIO	REAL	ARRAY	STORES
343	STRRDN	REAL	ARRAY	STORES
324	STRRDO	REAL	ARRAY	STORES
177	STRRI	REAL	ARRAY	STORES
235	STRRN	REAL	ARRAY	STORES
216	STRRO	REAL	ARRAY	STORES
261	STRWDN	REAL	ARRAY	STORES
254	STRWDO	REAL	ARRAY	STORES
103	STRWI	REAL	ARRAY	STORES
115	STRWN	REAL	ARRAY	STORES
110	STRWO	REAL	ARRAY	STORES
566	SX	REAL		

123	127	136	138	151	2*160	174	175
DEFINED	67	101	107	110	117	120	136
138	149	159	173				
REFS	9						
REFS	35	36	39	147	150	170	
REFS	11						
REFS	9						
REFS	9	DEFINED	131				
REFS	9						
REFS	9						
REFS	9						
REFS	35	36	38	147	149	170	173
REFS	9						
REFS	2*113	119	121	123	136	137	138
164	165	DEFINED	112	118	135	162	165
REFS	161	DEFINED	160				
REFS	9	131					
REFS	9						
REFS	9						
REFS	162	DEFINED	161				
REFS	164	DEFINED	163				
REFS	16						
REFS	16						
REFS	16						
REFS	16						
REFS	150	151	174	175	DEFINED	148	151
172	175						
REFS	4	35	147				
REFS	4	36	DEFINED	22			
REFS	6	170	DEFINED	21			
REFS	30	DEFINED	1				
REFS	5	135	157	DEFINED	127		
REFS	9						
REFS	11	57	155				
REFS	11						
REFS	4	102	113	123	138	164	
DEFINED	68	77	78	79	81	82	83
85	86	87	88	94	95	96	97
98	102	113	123				
REFS	16						
REFS	11						
REFS	11						
REFS	11						
REFS	11	60	61	62			
REFS	11						
REFS	11						
REFS	11						
REFS	11						
REFS	11	63	64	65			
REFS	11						
REFS	11						
REFS	11						
REFS	11						
REFS	11	59					
REFS	11						
REFS	86	87	2*88	95	96	2*98	
DEFINED	63						

```
                      N=1                                                    MASTOR    173
                      DO 300 K=1,KROW                                        MASTOR    174
                      CALL PUTROW(IUMD,1,WORK(N),K)                          MASTOR    175
  175                 N=N+K                                                  MASTOR    176
                300   CONTINUE                                               MASTOR    177
                      CALL DCLOSE(IUMD)                                      MASTOR    178
                C                                                            MASTOR    179
                C                                                            MASTOR    180
  180           9000  FORMAT(//,10X,32HNEW MASS MATRIX FOR STORE NUMBER,1X,I4,/)  MASTOR 181
                9001  FORMAT(15X,6(5X,I5,5X))                                MASTOR    182
                9002  FORMAT(/,10X,I5,1P6E15.5)                              MASTOR    183
                C                                                            MASTOR    184
                      RETURN                                                 MASTOR    185
  185                 END                                                    MASTOR    186
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

3	MASTOR	1

DEF LINE: 184

VARIABLES

		SN	TYPE		RELOCATION							
0	BUFFER		REAL	ARRAY	F.P.	REFS	4	39	40	DEFINED	1	
561	I		INTEGER			REFS	40	59	60	61	62	63	64
							65	68	77	78	79	81	82	83
							85	86	87	88	94	95	96	97
							98	2*102	109	2*111	2*113	119	2*121	2*123
							127	134	135	136	2*138	157	159	164
						DEFINED	38	57	155					
0	ICYCLE		INTEGER		STRCLU	REFS	16							
1076	IDDOF		INTEGER	ARRAY		REFS	5	136	138	159	DEFINED	111	121
76	IDSTR		INTEGER	ARRAY	STORES	REFS	11	134					
40	IDYDOF		INTEGER	ARRAY	STORES	REFS	11	109	111	119	121		
0	IFMD		INTEGER		F.P.	REFS	35	170	DEFINED	1			
5	IFMOD		INTEGER		LOCSTR	REFS	17						
3	IFMREF		INTEGER		LOCSTR	REFS	17	36	45	147			
1	IFSTRI		INTEGER		LOCSTR	REFS	17						
2	ISTDOF		INTEGER	ARRAY	STORES	REFS	11						
1	ISTEP		INTEGER		STRCLU	REFS	16						
2	ITAPEP		INTEGER		COMRWP	REFS	19						
0	ITAPER		INTEGER		COMRWP	REFS	19						
1	ITAPEW		INTEGER		COMRWP	REFS	19	24					
0	IUMD		INTEGER		F.P.	REFS	35	39	42	170	174	177	
						DEFINED	1						
4	IUMOD		INTEGER		LOCSTR	REFS	17						
2	IUMREF		INTEGER		LOCSTR	REFS	17	36	40	43	45	147	150
							153						
556	IUPR		INTEGER			REFS	45	DEFINED	24	I/O REFS	134	136	138
0	IUSTRI		INTEGER		LOCSTR	REFS	17						
571	J		INTEGER			REFS	68	101	2*102	109	111	113	2*123
							2*138	159	161	163	164	DEFINED	66	100
							108	122	137	158				
575	JJ		INTEGER			REFS	158	DEFINED	157					
572	K		INTEGER			REFS	68	2*102	110	111	113	120	121

```
115           145 CONTINUE                                                    MASTOR    116
              C                                                               MASTOR    117
                  K = 0                                                       MASTOR    118
                  DO 147 L=1,6                                                MASTOR    119
                  IF (IDYDOF(I,L).EQ.0) GO TO 147                             MASTOR    120
120               K = K+ 1                                                    MASTOR    121
                  IDDOF(I,K) = IDYDOF(I,L)                                    MASTOR    122
                  DO 146  J=1,6                                               MASTOR    123
                  STM (I,J,K) = STM(I,J,L)                                    MASTOR    124
              146 CONTINUE                                                    MASTOR    125
125           147 CONTINUE                                                    MASTOR    126
              C                                                               MASTOR    127
                  NDOF(I)=K                                                   MASTOR    128
              C                                                               MASTOR    129
              C LIST STORE MASS MATRICES.                                     MASTOR    130
130           C                                                               MASTOR    131
                  KOUNT=LINES                                                 MASTOR    132
                  CALL TITLES(2)                                              MASTOR    133
              C                                                               MASTOR    134
                  WRITE(IUPR,9000) IDSTR(I)                                   MASTOR    135
135               L=NDOF(I)                                                   MASTOR    136
                  WRITE(IUPR,9001) (IDDOF(I,K),K=1,L)                         MASTOR    137
                  DO 160 J=1,L                                                MASTOR    138
                  WRITE(IUPR,9002) IDDOF(I,J),(STM(I,J,K),K=1,L)              MASTOR    139
              160 CONTINUE                                                    MASTOR    140
140           C                                                               MASTOR    141
              200 CONTINUE                                                    MASTOR    142
              C                                                               MASTOR    143
              C 1. READ REFERENCE MASS MATRIX BACK INTO CORE.                 MASTOR    144
              C 2. REPLACE STORE MASS MATRIX BY NEW VALUES                    MASTOR    145
145           C 3. WRITE UPDATED MASS MATRIX BACK ONTO STANDARD LOCATION.     MASTOR    146
              C                                                               MASTOR    147
                  CALL GEDLAB(8HMASTORO2,IUMREF,NAME,IFMREF,KROW,KCOL)        MASTOR    148
                  N=1                                                         MASTOR    149
                  DO 220 K=1,KROW                                             MASTOR    150
150               CALL GETROW(IUMREF,1,WORK(N),KCOL)                          MASTOR    151
                  N=N+K                                                       MASTOR    152
              220 CONTINUE                                                    MASTOR    153
                  CALL DCLOSE(IUMREF)                                         MASTOR    154
              C                                                               MASTOR    155
155               DO 250 I=1,NUMSTR                                           MASTOR    156
              C                                                               MASTOR    157
                  JJ=NDOF(I)                                                  MASTOR    158
                  DO 240 J=1,JJ                                               MASTOR    159
                  K=IDDOF(I,J)                                                MASTOR    160
160               LF=(K+1)*K/2                                                MASTOR    161
                  LS=LF-J+1                                                   MASTOR    162
                  L=LS                                                        MASTOR    163
                  DO 230 M=1,J                                                MASTOR    164
                  WORK(L)= STM(I,J,M)                                         MASTOR    165
165               L=L+1                                                       MASTOR    166
              230 CONTINUE                                                    MASTOR    167
              240 CONTINUE                                                    MASTOR    168
              250 CONTINUE                                                    MASTOR    169
              C                                                               MASTOR    170
170               CALL PUDLAB(8HMASTORO2,IUMD,NAMUP,IFMD,KROW,KCOL)           MASTOR    171
              C                                                               MASTOR    172
```

```
      C                                                                 MASTOR     59
            W = STRWN(I)                                                MASTOR     60
   60       XI= STRIN(I,1)                                              MASTOR     61
            YI= STRIN(I,2)                                              MASTOR     62
            ZI= STRIN(I,3)                                              MASTOR     63
            SX= STRRN(I,1)                                              MASTOR     64
            SY= STRRN(I,2)                                              MASTOR     65
   65       SZ= STRRN(I,3)                                              MASTOR     66
            DO 120 J=1,6                                                MASTOR     67
            DO 120 K=1,6                                                MASTOR     68
            STM(I,J,K)=0.0                                              MASTOR     69
         120 CONTINUE                                                   MASTOR     70
   70    C                                                              MASTOR     71
      C     CURRENT EQUATIONS FOR STORE MASS MATRIX ARE BASED ON RIGHT-HAND MASTOR  72
      C     COORDINATE SYSTEM.                                          MASTOR     73
      C                                                                 MASTOR     74
      C     ORIGINAL EQUATIONS, TAKEN FROM GAC REPORT ADCR-80-1, ARE    MASTOR     75
   75 C     RETAINED AS COMMENTS.                                       MASTOR     76
      C                                                                 MASTOR     77
            STM(I,1,1)=W                                                MASTOR     78
            STM(I,2,2)=W                                                MASTOR     79
            STM(I,3,3)=W                                                MASTOR     80
   80    C                                                              MASTOR     81
            STM(I,4,2)=-W*SZ                                            MASTOR     82
            STM(I,4,3)= W*SY                                            MASTOR     83
            STM(I,4,4)=XI+W*(SY*SY+SZ*SZ)                               MASTOR     84
      C                                                                 MASTOR     85
   85       STM(I,5,1)= W*SZ                                            MASTOR     86
            STM(I,5,3)=-W*SX                                            MASTOR     87
            STM(I,5,4)=-W*SX*SY                                         MASTOR     88
            STM(I,5,5)=YI+W*(SZ*SZ+SX*SX)                               MASTOR     89
      C                                                                 MASTOR     90
   90    C     STM(I,6,1)= W*SY                                        MASTOR     91
      C     STM(I,6,2)=-W*SX                                            MASTOR     92
      C     STM(I,6,4)= W*SX*SZ                                         MASTOR     93
      C     STM(I,6,5)= W*SY*SZ                                         MASTOR     94
            STM(I,6,1)=-W*SY                                            MASTOR     95
   95       STM(I,6,2)= W*SX                                            MASTOR     96
            STM(I,6,4)=-W*SX*SZ                                         MASTOR     97
            STM(I,6,5)=-W*SY*SZ                                         MASTOR     98
            STM(I,6,6)=ZI+W*(SX*SX+SY*SY)                               MASTOR     99
      C                                                                 MASTOR    100
  100       DO 140 J=1,6                                                MASTOR    101
            DO 140 K=1,J                                                MASTOR    102
            STM(I,K,J)=STM(I,J,K)                                       MASTOR    103
         140 CONTINUE                                                   MASTOR    104
      C                                                                 MASTOR    105
  105 C CONTRACT STORE MASS MATRICES                                    MASTOR    106
      C                                                                 MASTOR    107
            K=0                                                         MASTOR    108
            DO 145 J=1,6                                                MASTOR    109
            IF(IDYDOF(I,J).EQ.0) GO TO 145                              MASTOR    110
  110       K=K+1                                                       MASTOR    111
            IDDOF(I,K)=IDYDOF(I,J)                                      MASTOR    112
            DO 144 L=1,6                                                MASTOR    113
            STM(I,K,L)=STM(I,J,L)                                       MASTOR    114
         144 CONTINUE                                                   MASTOR    115
```

```
      SUBROUTINE MASTOR(WORK,BUFFER,IUMD,IFMD,NCYC)                     MASTOR     2
C                                                                       MASTOR     3
C                                                                       MASTOR     4
      DIMENSION WORK(1),BUFFER(1),NAME(2),STM(5,6,6),NAMREF(2)          MASTOR     5
      DIMENSION NDOF(5),IDDOF(5,6)                                      MASTOR     6
      DIMENSION NAMUP(2)                                                MASTOR     7
C                                                                       MASTOR     8
C                                                                       MASTOR     9
      COMMON /CLIST/ KOUNT,KPAGE,LINES,LINEST,KLABEL,KTPAGE,NPAGE       MASTOR    10
     1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                       MASTOR    11
      COMMON /STORES/ NUMSTR,KCONST,ISTDOF(5,6),IDYDOF(5,6),IDSTR(5)    MASTOR    12
     A               ,STRWI(5),STRWO(5),STRWN(5),STRII(5,3),STRIO(5,3)  MASTOR    13
     B               ,STRIN(5,3),STRRI(5,3),STRRO(5,3),STRRN(5,3)       MASTOR    14
     C               ,STRWDO(5),STRWDN(5),STRIDO(5,3),STRIDN(5,3)       MASTOR    15
     D               ,STRRDO(5,3),STRRDN(5,3),SCALE(5,7)                MASTOR    16
      COMMON /STRCLU/ ICYCLE,ISTEP,M1,M2,M3,M4,VS,VOLD,VNEW,STPOLD      MASTOR    17
      COMMON /LOCSTR/ IUSTRI,IFSTRI,IUMREF,IFMREF                       MASTOR    18
     1               ,IUMOD,IFMOD                                       MASTOR    19
      COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              MASTOR    20
C                                                                       MASTOR    21
      DATA NAMUP /4HUPDA,4HTEMD/                                        MASTOR    22
      DATA NAMREF /4HREF ,4HMASS/                                       MASTOR    23
C                                                                       MASTOR    24
      IUPR=ITAPEW                                                       MASTOR    25
C                                                                       MASTOR    26
C                                                                       MASTOR    27
      CALL PROGNA(4H(MAS,4HTOR))                                        MASTOR    28
      CALL MESAGE(1,6,6HMASTOR)                                         MASTOR    29
C                                                                       MASTOR    30
      IF(NCYC.GT.0) GO TO 100                                           MASTOR    31
C                                                                       MASTOR    32
C TRANSFER REFERENCE DYNAMIC MASS MATRIX TO NEW UNIT. THIS MATRIX DOES  MASTOR    33
C NOT INCLUDE ANY STORE REDESIGN.                                       MASTOR    34
C                                                                       MASTOR    35
      CALL GEDLAB(8HMASTORO1,IUMD,NAME,IFMD,KROW,KCOL)                  MASTOR    36
      CALL PUDLAB(8HMASTORO1,IUMREF,NAMREF,IFMREF,KROW,KCOL)            MASTOR    37
C                                                                       MASTOR    38
      DO 50 I=1,KROW                                                    MASTOR    39
      CALL GETROW(IUMD,1,BUFFER,KCOL)                                   MASTOR    40
      CALL PUTROW(IUMREF,1,BUFFER,I)                                    MASTOR    41
   50 CONTINUE                                                          MASTOR    42
      CALL DCLOSE(IUMD)                                                 MASTOR    43
      CALL DCLOSE(IUMREF)                                               MASTOR    44
C                                                                       MASTOR    45
      CALL PRMAT2(IUMREF,IFMREF,WORK,1,IUPR,4,81,                       MASTOR    46
     1 81H (DYNAMIC MASS MATRIX ENTERING CURRENT FOP RUN - DOES NOT REFL MASTOR    47
     2ECT STORE REDESIGN))                                              MASTOR    48
C                                                                       MASTOR    49
      CALL PROGNA(4H(MAS,4HTOR))                                        MASTOR    50
C                                                                       MASTOR    51
  100 CONTINUE                                                          MASTOR    52
C                                                                       MASTOR    53
C                                                                       MASTOR    54
C                                                                       MASTOR    55
C COMPUTE NEW MASS MATRIX FOR EACH STORE.  (6X6)                        MASTOR    56
C                                                                       MASTOR    57
      DO 200 I=1,NUMSTR                                                 MASTOR    58
```

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
		3 NNOPT (1)	4 NDESNO (1)	5 NDESYS (1)
FILE	20	0 IPOS (20)		
WAYTS	6	0 WINITT (1)	1 WST (1)	2 WMB (1)
		3 WBOTH (1)	4 WPRES (1)	5 DW (1)
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CLUEV	21	0 LKLUEV (1)	1 KLUEV (20)	

EQUIV CLASSES	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
PAK	20	0 JPAK (20)		
ADDMS	550	0 NMS (1)	1 JCHART (3)	1 CHART (3)

STATISTICS

PROGRAM LENGTH	2412B	1290
CM LABELED COMMON LENGTH	706B	454

52000B CM USED

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
BAL	241	0 NMBAL (1)	1 IDBAL (20)	21 VMBIN (20)
		41 VMBOLD (20)	61 VMBNEW (20)	81 MBDOF (60)
		141 DRVMB (20)	161 DRVMBO (20)	181 S1MB (20)
		201 S2MB (20)	221 S3MB (20)	
PLACES	98	0 IUIN1 (1)	1 IUIN2 (1)	2 IUOUT1 (1)
		3 IUOUT2 (1)	4 IUGO1 (1)	5 IUGO2 (1)
		6 IUGO3 (1)	7 IUGO4 (1)	8 IUSCR (1)
		9 IFSCR (1)	10 IFS1 (1)	11 IFS2 (1)
		12 IFS3 (1)	13 IFS4 (1)	14 IUCD (1)
		15 IUPR (1)	16 IUA (1)	17 IFA (1)
		18 IUY (1)	19 IFY (1)	20 IUMEMN (1)
		21 IFMEMN (1)	22 IUSTFN (1)	23 IFSTFN (1)
		24 IUKS (1)	25 IFKS (1)	26 IUB (1)
		27 IFB (1)	28 IUDESO (1)	29 IFDESO (1)
		30 IUMDBI (1)	31 IFMDBI (1)	32 IUADDI (1)
		33 IFADDI (1)	34 IUBALI (1)	35 IFBALI (1)
		36 IUDESI (1)	37 IFDESI (1)	38 IUWTI (1)
		39 IFWTI (1)	40 IUMEMO (1)	41 IFMEMO (1)
		42 IUBT (1)	43 IFBT (1)	44 IUDESN (1)
		45 IFDESN (1)	46 IUMD (1)	47 IFMD (1)
		48 IUMEMF (1)	49 IFMEMF (1)	50 IUSTFO (1)
		51 IFSTFO (1)	52 IUMDB (1)	53 IFMDB (1)
		54 IUADD (1)	55 IFADD (1)	56 IUBAL (1)
		57 IFBAL (1)	58 IUDESF (1)	59 IFDESF (1)
		60 IUWT (1)	61 IFWT (1)	62 IUDUM1 (1)
		63 IFDUM1 (1)	64 IUDUM2 (1)	65 IFDUM2 (1)
		66 IUDUM3 (1)	67 IFDUM3 (1)	68 IUL (1)
		69 IFL (1)	70 IUYT (1)	71 IFYT (1)
		72 IUZ (1)	73 IFZ (1)	74 IUZR (1)
		75 IFZR (1)	76 IULR (1)	77 IFLR (1)
		78 IUBR (1)	79 IFBR (1)	80 IUPHTF (1)
		81 IFPHTF (1)	82 IUMODM (1)	83 IFMODM (1)
		84 IUMODK (1)	85 IFMODK (1)	86 IUPHT (1)
		87 IFPHT (1)	88 IUQT (1)	89 IFQT (1)
		90 IUQ (1)	91 IFQ (1)	92 IUPH (1)
		93 IFPH (1)	94 IUINCM (1)	95 IFINCM (1)
		96 IUINCK (1)	97 IFINCK (1)	
PLAYFF	26	0 IUMDFF (1)	1 IFMDFF (1)	2 IUDLTI (1)
		3 IFDLTI (1)	4 IUSLTI (1)	5 IFSLTI (1)
		6 IUMPLI (1)	7 IFMPLI (1)	8 IUTPGT (1)
		9 IFTPGT (1)	10 IUPATF (1)	11 IFPATF (1)
		12 IUMPL (1)	13 IFMPL (1)	14 IUSLT (1)
		15 IFSLT (1)	16 IUDLT (1)	17 IFDLT (1)
		18 IUQA (1)	19 IFQA (1)	20 IUQAT (1)
		21 IFQAT (1)	22 IUPHA (1)	23 IFPHA (1)
		24 IUPHAT (1)	25 IFPHAT (1)	
KLUES	24	0 KLUSE (1)	1 KLUNAL (1)	2 IRED (1)
		3 KLUMD (1)	4 KLUBAL (1)	5 MSADD (1)
		6 NPASS (1)	7 IDNOPT (1)	8 VDES (1)
		9 EPS1 (1)	10 DWMAX (1)	11 NBAR (1)
		12 NFIX (1)	13 D (1)	14 DEL (1)
		15 EPS2 (1)	16 NCYC (1)	17 NNN (1)
		18 IBAND (1)	19 IFIN (1)	20 KLUB (1)
		21 KLUQ (1)	22 MORBAL (1)	23 DBAL (1)
KLUFF	1	0 KFREE (1)		
SIZES	6	0 NSTMEM (1)	1 NSTDOF (1)	2 NDYDOF (1)

EXTERNALS	TYPE	ARGS	REFERENCES			
PUTROW		4	163	164	177	178
TIMEB		2	56	746		
TITLES		1	205			

STATEMENT	LABELS			DEF LINE	REFERENCES		
32	60			105	100		
54	70			116	109		
0	80			124	123		
77	85			130	154		
0	90			135	133		
125	100			137	134		
126	110			139	128		
0	115		INACTIVE	142	140		
0	120			151	139		
146	130			156	140		
163	140			161	125		
167	150			162	160		
0	160			168	120		
214	170			173	137		
240	180			179	172		
247	210			184	140		
251	212			196	156		
253	213			198	157	174	
255	214			200	173		
256	220			202	185	197	199
643	9001	FMT		658	130		
646	9002	FMT	NO REFS	659			
650	9003	FMT	NO REFS	660			
663	9004	FMT		663	206		
730	9005	FMT	NO REFS	672			
746	9006	FMT	NO REFS	675			
751	9007	FMT	NO REFS	676			
763	9008	FMT	NO REFS	678			
766	9009	FMT	NO REFS	679			
777	9010	FMT	NO REFS	681			
1014	9011	FMT	NO REFS	684			
1037	9012	FMT	NO REFS	689			
1061	9013	FMT	NO REFS	693			
1075	9014	FMT	NO REFS	696			
1103	9015	FMT		697	117		
1117	9016	FMT		700	158	175	
320	9940			714	708		
345	9950			728	721		
356	9970			736	732		
362	9980			739	733	734	
365	9990			742	730	738	
301	9999			703	61	182	209

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES			
64	160	I	120 168	120B		EXT REFS	EXITS	NOT INNER
71	80	J	123 124	2B	INSTACK			
102		K	130 130	12B		EXT REFS		
120	90	K	133 135	5B	INSTACK	EXITS		
130	120	K	139 151	15B	OPT	EXITS		
265		M	206 206	12B		EXT REFS		

VARIABLES	SN	TYPE	RELOCATION								
2263	NAME	INTEGER	*UNDEF		REFS	5					
2265	NAMMD	INTEGER	ARRAY		REFS	5	99	DEFINED	50		
2267	NAMMDB	INTEGER	ARRAY		REFS	5	102	103	DEFINED	50	
2277	NAMMS	INTEGER	ARRAY		REFS	6	DEFINED	50			
13	NBAR	INTEGER		KLUES	REFS	39					
2255	NC	INTEGER	ARRAY		REFS	4	142	206	DEFINED	130	
1147	NCARD	INTEGER			REFS	135	137	139	DEFINED	132	135
1155	NCIC	INTEGER			REFS	712	DEFINED	711			
20	NCYC	INTEGER		KLUES	REFS	39	61	711			
4	NDESNO	INTEGER		SIZES	REFS	43					
5	NDESYS	INTEGER		SIZES	REFS	43					
2	NDYDOF	INTEGER		SIZES	REFS	43	2*99	2*102	2*103	2*110	2*112	2*117
						120	2*161	2*170	173			
14	NFIX	INTEGER		KLUES	REFS	39					
0	NMBAL	INTEGER		BAL	REFS	15					
1204	NMS	INTEGER	*UNDEF		REFS	12					
21	NNN	INTEGER		KLUES	REFS	39					
3	NNOPT	INTEGER		SIZES	REFS	43					
6	NPAGE	INTEGER		CLIST	REFS	46					
6	NPASS	INTEGER		KLUES	REFS	39	734				
2252	NR	INTEGER	ARRAY		REFS	4	134	140	156	206	
					DEFINED	130					
1	NSTDOF	INTEGER		SIZES	REFS	43					
0	NSTMEM	INTEGER		SIZES	REFS	43					
2301	NUMB	INTEGER	*UNDEF		REFS	10					
1160	PAK	REAL	*UNDEF		REFS	9	13				
265	S1MB	REAL	ARRAY	BAL	REFS	15					
311	S2MB	REAL	ARRAY	BAL	REFS	15					
335	S3MB	REAL	ARRAY	BAL	REFS	15					
2313	VALUE	REAL	*UNDEF		REFS	10					
10	VDES	REAL		KLUES	REFS	39					
25	VMBIN	REAL	ARRAY	BAL	REFS	15					
75	VMBNEW	REAL	ARRAY	BAL	REFS	15					
51	VMBOLD	REAL	ARRAY	BAL	REFS	15					
3	WBOTH	REAL		WAYTS	REFS	45					
0	WINITT	REAL		WAYTS	REFS	45					
2	WMB	REAL		WAYTS	REFS	45					
0	WORK	REAL	ARRAY	F.P.	REFS	4	712	4*722	736	739	
					DEFINED	1					
4	WPRES	REAL		WAYTS	REFS	45					
1	WST	REAL		WAYTS	REFS	45					
2260	WW	REAL	ARRAY		REFS	4	149	206	DEFINED	130	

FILE NAMES	MODE				
TAPE6	FMT	WRITES	117	158	175
VARIABLES USED AS FILE NAMES, SEE ABOVE					

EXTERNALS	TYPE	ARGS	REFERENCES				
DCLOSE		1	179	180			
FFMASS		9	722				
MASTOR		5	712				
MESAGE		3	55	747			
NASTRD		8	110	112	161	170	
PRMAT1		8	736				
PRMAT2		8	739				
PROGNA		2	54	713	724	745	
PUDLAB		6	99	102	103		

```
                IF(NCARD.GT.0) GO TO 105                                    FFMASS   173
              112 CONTINUE                                                  FFMASS   174
            C                                                               FFMASS   175
175             KOUNT=LINES                                                 FFMASS   176
                CALL TITLES(2)                                              FFMASS   177
                WRITE(IUPR,9001)                                            FFMASS   178
                KOUNT=KOUNT+5                                               FFMASS   179
                DO 115 I=1,LCOL                                             FFMASS   180
180             WRITE(IUPR,9002) (I,J,EMP(I,J),J=1,LCOL)                    FFMASS   181
                KOUNT=KOUNT+2                                               FFMASS   182
              115 CONTINUE                                                  FFMASS   183
            C                                                               FFMASS   184
                GO TO 130                                                   FFMASS   185
185         C                                                               FFMASS   186
              120 CONTINUE                                                  FFMASS   187
                CALL GEDLAB(8HFFMASS03,IUMPLI,NAME,IFMPLI,KROW,KCOL)        FFMASS   188
                NBYTE=(3*3)*4                                               FFMASS   189
                CALL DREAD(IUMPLI,EMP(1,1),NBYTE)                           FFMASS   190
190             CALL DCLOSE(IUMPLI)                                         FFMASS   191
            C                                                               FFMASS   192
              130 CONTINUE                                                  FFMASS   193
            C                                                               FFMASS   194
            C ADD (EMP) TO (XM) AND INVERT THE RESULT. STORE RESULT IN XMI. FFMASS   195
195         C                                                               FFMASS   196
                DO 140 I=1,3                                                FFMASS   197
                DO 140 J=1,3                                                FFMASS   198
              140 XM(I,J)=XM(I,J)+EMP(I,J)                                  FFMASS   199
            C                                                               FFMASS   200
200             CALL IV33(XM,XMI)                                           FFMASS   201
            C                                                               FFMASS   202
            C FORM THE PRODUCT OF XMI AND LAMBDA(TRAN)*MD. STORE RESULT IN TPLUG. FFMASS 203
            C ALSO, STORE TPLUG(TRAN) ON I/O UNIT                           FFMASS   204
            C                                                               FFMASS   205
205             DO 150 I=1,LCOL                                             FFMASS   206
                DO 150 K=1,MCOL                                             FFMASS   207
                A=0.0                                                       FFMASS   208
                DO 145 J=1,LCOL                                             FFMASS   209
                A=A+XMI(I,J)*ELTMD(J,K)                                     FFMASS   210
210           145 CONTINUE                                                  FFMASS   211
                TPLUG(I,K)=A                                                FFMASS   212
              150 CONTINUE                                                  FFMASS   213
            C                                                               FFMASS   214
                CALL PUDLAB(8HFFMASS01,IUTPGT,NAM,IFTPGT,MCOL,LCOL)         FFMASS   215
215             DO 160 K=1,MCOL                                             FFMASS   216
                CALL PUTROW(IUTPGT,2,TPLUG(1,K),LCOL)                       FFMASS   217
              160 CONTINUE                                                  FFMASS   218
                CALL DCLOSE(IUTPGT)                                         FFMASS   219
            C                                                               FFMASS   220
220         C FORM FREE-FREE MASS MATRIX (MDFF) AND STORE LOWER TRIANGLE ON I/O UNIT FFMASS 221
            C                                                               FFMASS   222
                CALL PUDLAB(8HFFMASS02,IUMDFF,NAMFFM,IFMDFF,MROW,MCOL)      FFMASS   223
                DO 190 I=1,MCOL                                             FFMASS   224
                DO 180 K=1,I                                                FFMASS   225
225             L=((I-1)*I/2)+K                                             FFMASS   226
                A=0.0                                                       FFMASS   227
                DO 170 J=1,LCOL                                             FFMASS   228
                A=A+ELTMD(J,I)*TPLUG(J,K)                                   FFMASS   229
```

```
                  170 CONTINUE                                                    FFMASS   230
     230              BUFFER(K)=EMAS(L)-A                                         FFMASS   231
                  180 CONTINUE                                                    FFMASS   232
                      CALL PUTROW(IUMDFF,1,BUFFER,I)                              FFMASS   233
                  190 CONTINUE                                                    FFMASS   234
                      CALL DCLOSE(IUMDFF)                                         FFMASS   235
     235          C                                                               FFMASS   236
                  C                                                               FFMASS   237
                   9000 FORMAT(3(2I4,E15.5,1X))                                   FFMASS   238
                   9001 FORMAT(/,10X,   16HPLUG MASS MATRIX,                      FFMASS   239
                      1      //,10X, 3(25H  ROW  COL          VALUE,5X),/)       FFMASS   240
     240           9002 FORMAT(/,10X,3(2I5,1PE15.5,5X))                           FFMASS   241
                   9003 FORMAT (3(2I4,1PE15.5,1X))                                FFMASS   242
                   9004 FORMAT (4I5)                                              FFMASS   243
                   9005 FORMAT (1H1,9X,8HREADING ,I3,3H X ,I3,                    FFMASS   244
                      1        52H RIGID-BODY-DISPLACEMENT MATRIX FROM CARD-IMAGE FILE)  FFMASS   245
     245           9006 FORMAT (//15X,4HROW ,I3//(1P10E12.4))                     FFMASS   246
                  C                                                               FFMASS   247
                       RETURN                                                     FFMASS   248
                       END                                                        FFMASS   249
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	FFMASS	1	247

VARIABLES

		SN	TYPE		RELOCATION							
1175	A		REAL			REFS	126	128	141	143	209	211	228
							230	DEFINED	122	126	139	141	207	209
							226	228						
0	BUFFER		REAL	ARRAY	F.P.	REFS	11	232	DEFINED	1	230			
15	D		REAL		KLUES	REFS	33							
27	DBAL		REAL		KLUES	REFS	33							
16	DEL		REAL		KLUES	REFS	33							
12	DWMAX		REAL		KLUES	REFS	33							
0	ELAM		REAL	ARRAY	F.P.	REFS	11	77	79	82	84	98	104	
							111	126	141	DEFINED	1	71	93	
1244	ELAMIN		REAL	ARRAY		REFS	14	93	DEFINED	87				
0	ELTMD		REAL	ARRAY	F.P.	REFS	11	141	209	228	DEFINED	1	128	
0	EMAS		REAL	ARRAY	F.P.	REFS	11	58	126	230	DEFINED	1		
0	EMP		REAL	ARRAY	PLUG	REFS	41	159	161	180	189	198		
						DEFINED	152	153	168	169				
11	EPS1		REAL		KLUES	REFS	33							
17	EPS2		REAL		KLUES	REFS	33							
1165	I		INTEGER			REFS	59	71	82	90	91	93	98	
							104	111	126	128	135	141	143	152
							2*153	161	2*180	3*198	209	211	224	2*225
							228	232	DEFINED	57	69	81	89	98
							103	110	120	133	137	150	160	179
							196	205	223					
22	IBAND		INTEGER		KLUES	REFS	33							
1252	ICOL		INTEGER	ARRAY		REFS	14	92	DEFINED	87				
7	IDNOPT		INTEGER		KLUES	REFS	33							

VARIABLES	SN	TYPE	RELOCATION						
0	IDYFLX	INTEGER	F.P.	REFS	77	79	DEFINED	1	
21	IFA	INTEGER	PLACES	REFS	16				
67	IFADD	INTEGER	PLACES	REFS	16				
41	IFADDI	INTEGER	PLACES	REFS	16				
33	IFB	INTEGER	PLACES	REFS	16				
71	IFBAL	INTEGER	PLACES	REFS	16				
43	IFBALI	INTEGER	PLACES	REFS	16				
117	IFBR	INTEGER	PLACES	REFS	16				
53	IFBT	INTEGER	PLACES	REFS	16				
73	IFDESF	INTEGER	PLACES	REFS	16				
45	IFDESI	INTEGER	PLACES	REFS	16				
55	IFDESN	INTEGER	PLACES	REFS	16				
35	IFDESO	INTEGER	PLACES	REFS	16				
21	IFDLT	INTEGER	PLAYFF	REFS	36				
3	IFDLTI	INTEGER	PLAYFF	REFS	36	102	DEFINED	100	101
77	IFDUM1	INTEGER	PLACES	REFS	16				
101	IFDUM2	INTEGER	PLACES	REFS	16				
103	IFDUM3	INTEGER	PLACES	REFS	16				
23	IFIN	INTEGER	KLUES	REFS	33				
141	IFINCK	INTEGER	PLACES	REFS	16				
137	IFINCM	INTEGER	PLACES	REFS	16				
31	IFKS	INTEGER	PLACES	REFS	16				
105	IFL	INTEGER	PLACES	REFS	16				
115	IFLR	INTEGER	PLACES	REFS	16				
57	IFMD	INTEGER	PLACES	REFS	16	55			
65	IFMDB	INTEGER	PLACES	REFS	16				
37	IFMDBI	INTEGER	PLACES	REFS	16				
1	IFMDFF	INTEGER	PLAYFF	REFS	36	222			
61	IFMEMF	INTEGER	PLACES	REFS	16				
25	IFMEMN	INTEGER	PLACES	REFS	16				
51	IFMEMO	INTEGER	PLACES	REFS	16				
125	IFMODK	INTEGER	PLACES	REFS	16				
123	IFMODM	INTEGER	PLACES	REFS	16				
15	IFMPL	INTEGER	PLAYFF	REFS	36				
7	IFMPLI	INTEGER	PLAYFF	REFS	36	187			
13	IFPATF	INTEGER	PLAYFF	REFS	36				
135	IFPH	INTEGER	PLACES	REFS	16				
27	IFPHA	INTEGER	PLAYFF	REFS	36				
31	IFPHAT	INTEGER	PLAYFF	REFS	36				
127	IFPHT	INTEGER	PLACES	REFS	16				
121	IFPHTF	INTEGER	PLACES	REFS	16				
133	IFQ	INTEGER	PLACES	REFS	16				
23	IFQA	INTEGER	PLAYFF	REFS	36				
25	IFQAT	INTEGER	PLAYFF	REFS	36				
131	IFQT	INTEGER	PLACES	REFS	16				
11	IFSCR	INTEGER	PLACES	REFS	16				
17	IFSLT	INTEGER	PLAYFF	REFS	36				
5	IFSLTI	INTEGER	PLAYFF	REFS	36				
27	IFSTFN	INTEGER	PLACES	REFS	16				
63	IFSTFO	INTEGER	PLACES	REFS	16				
12	IFS1	INTEGER	PLACES	REFS	16				
13	IFS2	INTEGER	PLACES	REFS	16				
14	IFS3	INTEGER	PLACES	REFS	16				
15	IFS4	INTEGER	PLACES	REFS	16				
11	IFTPGT	INTEGER	PLAYFF	REFS	36	214			
75	IFWT	INTEGER	PLACES	REFS	16				

VARIABLES	SN	TYPE		RELOCATION								
23	IFY	INTEGER		PLACES	REFS	16						
107	IFYT	INTEGER		PLACES	REFS	16						
111	IFZ	INTEGER		PLACES	REFS	16						
113	IFZR	INTEGER		PLACES	REFS	16						
0	IMASS	INTEGER		F.P.	REFS	77	79	158	159	161		
					DEFINED	1						
0	IMIN	INTEGER		F.P.	REFS	159	161	DEFINED	1	I/O REFS	164	
2	IRED	INTEGER		KLUES	REFS	33						
1247	IROW	INTEGER	ARRAY		REFS	14	89	DEFINED	87			
1171	ITRIN	INTEGER			REFS	77	79	82	84	DEFINED	74	75
					I/O REFS	87						
0	ITRNSF	INTEGER		F.P.	REFS	75	76	77	79	82	2*84	
					DEFINED	1						
20	IUA	INTEGER		PLACES	REFS	16						
66	IUADD	INTEGER		PLACES	REFS	16						
40	IUADDI	INTEGER		PLACES	REFS	16						
32	IUB	INTEGER		PLACES	REFS	16						
70	IUBAL	INTEGER		PLACES	REFS	16						
42	IUBALI	INTEGER		PLACES	REFS	16						
116	IUBR	INTEGER		PLACES	REFS	16						
52	IUBT	INTEGER		PLACES	REFS	16						
16	IUCD	INTEGER		PLACES	REFS	16	I/O REFS	66				
72	IUDESF	INTEGER		PLACES	REFS	16						
44	IUDESI	INTEGER		PLACES	REFS	16						
54	IUDESN	INTEGER		PLACES	REFS	16						
34	IUDESO	INTEGER		PLACES	REFS	16						
20	IUDLT	INTEGER		PLAYFF	REFS	36						
2	IUDLTI	INTEGER		PLAYFF	REFS	36	102	104	106	109	111	113
76	IUDUM1	INTEGER		PLACES	REFS	16						
100	IUDUM2	INTEGER		PLACES	REFS	16						
102	IUDUM3	INTEGER		PLACES	REFS	16						
4	IUGO1	INTEGER		PLACES	REFS	16						
5	IUGO2	INTEGER		PLACES	REFS	16						
6	IUGO3	INTEGER		PLACES	REFS	16						
7	IUGO4	INTEGER		PLACES	REFS	16						
140	IUINCK	INTEGER		PLACES	REFS	16						
136	IUINCM	INTEGER		PLACES	REFS	16						
0	IUIN1	INTEGER		PLACES	REFS	16						
1	IUIN2	INTEGER		PLACES	REFS	16						
30	IUKS	INTEGER		PLACES	REFS	16						
104	IUL	INTEGER		PLACES	REFS	16						
114	IULR	INTEGER		PLACES	REFS	16						
56	IUMD	INTEGER		PLACES	REFS	16	55	58	61			
64	IUMDB	INTEGER		PLACES	REFS	16						
36	IUMDBI	INTEGER		PLACES	REFS	16						
0	IUMDFF	INTEGER		PLAYFF	REFS	36	222	232	234			
60	IUMEMF	INTEGER		PLACES	REFS	16						
24	IUMEMN	INTEGER		PLACES	REFS	16						
50	IUMEMO	INTEGER		PLACES	REFS	16						
124	IUMODK	INTEGER		PLACES	REFS	16						
122	IUMODM	INTEGER		PLACES	REFS	16						
14	IUMPL	INTEGER		PLAYFF	REFS	36						
6	IUMPLI	INTEGER		PLAYFF	REFS	36	187	189	190			
2	IUOUT1	INTEGER		PLACES	REFS	16						
3	IUOUT2	INTEGER		PLACES	REFS	16						
12	IUPATF	INTEGER		PLAYFF	REFS	36						
134	IUPH	INTEGER		PLACES	REFS	16						

VARIABLES	SN	TYPE		RELOCATION								
26	IUPHA		INTEGER		PLAYFF	REFS	36					
30	IUPHAT		INTEGER		PLAYFF	REFS	36					
126	IUPHT		INTEGER		PLACES	REFS	16					
120	IUPHTF		INTEGER		PLACES	REFS	16					
17	IUPR		INTEGER		PLACES	REFS	16	I/O REFS	177	180		
132	IUQ		INTEGER		PLACES	REFS	16					
22	IUQA		INTEGER		PLAYFF	REFS	36					
24	IUQAT		INTEGER		PLAYFF	REFS	36					
130	IUQT		INTEGER		PLACES	REFS	16					
10	IUSCR		INTEGER		PLACES	REFS	16					
16	IUSLT		INTEGER		PLAYFF	REFS	36					
4	IUSLTI		INTEGER		PLAYFF	REFS	36					
26	IUSTFN		INTEGER		PLACES	REFS	16					
62	IUSTFO		INTEGER		PLACES	REFS	16					
10	IUTPGT		INTEGER		PLAYFF	REFS	36	214	216	218		
74	IUWT		INTEGER		PLACES	REFS	16					
46	IUWTI		INTEGER		PLACES	REFS	16					
22	IUY		INTEGER		PLACES	REFS	16					
106	IUYT		INTEGER		PLACES	REFS	16					
110	IUZ		INTEGER		PLACES	REFS	16					
112	IUZR		INTEGER		PLACES	REFS	16					
1164	J		INTEGER			REFS	58	59	71	93	2*98	3*124	2*125
						126	135	2*141	152	2*153	2*180	3*198	2*209
						2*228	DEFINED	56	59	70	92	97	123
						134	140	151	180	197	208	227	
1172	K		INTEGER			REFS	3*87	89	90	92	93	2*124	3*125
						128	141	143	3*164	167	3*168	3*169	209
						211	216	225	228	230	DEFINED	87	88
						121	138	164	166	206	215	224	
7	KBPAGE		INTEGER		CLIST	REFS	42					
1201	KCOL	*	INTEGER			REFS	187					
0	KFREE		INTEGER		KLUFF	REFS	40					
4	KLABEL		INTEGER		CLIST	REFS	42					
24	KLUB		INTEGER		KLUES	REFS	33					
4	KLUBAL		INTEGER		KLUES	REFS	33					
1	KLUEV		INTEGER	ARRAY	CLUEV	REFS	45					
3	KLUMD		INTEGER		KLUES	REFS	33					
1	KLUNAL		INTEGER		KLUES	REFS	33					
25	KLUQ		INTEGER		KLUES	REFS	33					
0	KLUSE		INTEGER		KLUES	REFS	33	101				
0	KOUNT		INTEGER		CLIST	REFS	42	178	181	DEFINED	175	178	181
11	KOUNTH		INTEGER		CLIST	REFS	42					
12	KOUNTI		INTEGER		CLIST	REFS	42					
1	KPAGE		INTEGER		CLIST	REFS	42					
1200	KROW	*	INTEGER			REFS	187					
5	KTPAGE		INTEGER		CLIST	REFS	42					
1176	L		INTEGER			REFS	126	230	DEFINED	124	125	225	
1174	LCOL		INTEGER			REFS	120	137	138	179	180	205	208
						214	216	227	DEFINED	119			
2	LINES		INTEGER		CLIST	REFS	42	175					
10	LINESG		INTEGER		CLIST	REFS	42						
3	LINEST		INTEGER		CLIST	REFS	42						
0	LKLUEV		INTEGER		CLUEV	REFS	45						
1173	LROW		INTEGER			REFS	123	140	DEFINED	118			
1163	MCOL		INTEGER			REFS	55	58	121	206	214	215	222
						223							
26	MORBAL		INTEGER		KLUES	REFS	33						

VARIABLES	SN	TYPE	RELOCATION								
1162	MROW	INTEGER		REFS	55	57	222				
5	MSADD	INTEGER	KLUES	REFS	33						
1240	NAM	INTEGER	ARRAY	REFS	13	214	DEFINED	47			
1203	NAME	INTEGER	ARRAY	REFS	12	55	109	187			
1255	NAME2	INTEGER	ARRAY	REFS	14	102	DEFINED	48			
1242	NAMFFM	INTEGER	ARRAY	REFS	13	222	DEFINED	47			
13	NBAR	INTEGER	KLUES	REFS	33						
1202	NBYTE	INTEGER		REFS	189	DEFINED	188				
1221	NC	INTEGER	ARRAY	REFS	12	168	169	DEFINED	164		
1177	NCARD	INTEGER		REFS	170	172	DEFINED	165	170		
1167	NCOL	INTEGER		REFS	70	102	104	109	111	118	
				DEFINED	67						
20	NCYC	INTEGER	KLUES	REFS	33	65	145				
4	NDESNO	INTEGER	SIZES	REFS	44						
5	NDESYS	INTEGER	SIZES	REFS	44						
2	NDYDOF	INTEGER	SIZES	REFS	44	67	77	79	82	84	96
				98							
14	NFIX	INTEGER	KLUES	REFS	33						
21	NNN	INTEGER	KLUES	REFS	33						
3	NNOPT	INTEGER	SIZES	REFS	44						
6	NPAGE	INTEGER	CLIST	REFS	42						
6	NPASS	INTEGER	KLUES	REFS	33	156					
1166	NPGDOF	INTEGER		REFS	68	77	79	81	82	84	96
				97	2*159	160	2*161	DEFINED	66		
1216	NR	INTEGER	ARRAY	REFS	12	167	168	169	DEFINED	164	
1170	NROW	INTEGER		REFS	69	102	103	109	110	119	
				DEFINED	68						
1	NSTDOF	INTEGER	SIZES	REFS	44						
0	NSTMEM	INTEGER	SIZES	REFS	44						
11	PHP	REAL	ARRAY PLUG	REFS	41						
0	TPLUG	REAL	ARRAY F.P.	REFS	11	216	228	DEFINED	1	211	
10	VDES	REAL	KLUES	REFS	33						
1224	WW	REAL	ARRAY	REFS	12	168	169	DEFINED	164		
1205	XM	REAL	ARRAY	REFS	12	198	200	DEFINED	135	143	198
1227	XMI	REAL	ARRAY	REFS	12	200	209				

FILE NAMES	MODE				
TAPE6	FMT	WRITES	96	98	
VARIABLES USED AS FILE NAMES, SEE ABOVE					

EXTERNALS	TYPE	ARGS	REFERENCES					
DCLOSE		1	61	106	113	190	218	234
DREAD		3	189					
GEDLAB		6	55	109	187			
GETROW		4	58	111				
IV33		2	200					
MESAGE		3	51					
NASTRD		8	77	79	82	84	159	161
PROGNA		2	50					
PUDLAB		6	102	214	222			
PUTROW		4	104	216	232			
TITLES		1	176					

STATEMENT LABELS	DEF LINE	REFERENCES
0 50	60	57
0 55	72	70
0 60	73	69

STATEMENT LABELS			DEF LINE	REFERENCES	
0	61		83	81	
116	62		87	76	95
147	65		94	88	91
152	66		96	90	
167	67		99	86	
0	68		105	103	
210	69		108	65	
0	70		112	110	
223	72		114	107	
0	75		127	123	
0	80		129	120	121
0	82		135	133	134
0	85		142	140	
0	90		144	137	138
0	100		154	150	151
0	102		162	160	
372	105		164	158	172
424	110		171	166	167
427	112		173	163	
0	115		182	179	
460	120		186	156	
467	130		192	145	184
0	140		198	196	197
0	145		210	208	
0	150		212	205	206
0	160		217	215	
0	170		229	227	
0	180		231	224	
0	190		233	223	
0	666		98	97	
1111	9000	FMT	237	164	
1114	9001	FMT	238	177	
1124	9002	FMT	240	180	
1130	9003	FMT	241	87	
1133	9004	FMT	242	66	
1135	9005	FMT	243	96	
1147	9006	FMT	245	98	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
16	50	I	57 60	7B	EXT REFS
36	60	I	69 73	12B	NOT INNER
43	55	J	70 72	2B	INSTACK
77	61	I	81 83	10B	EXT REFS
121		K	87 87	12B	EXT REFS
135	65	K	88 94	15B	OPT EXITS
155	666	J	97 98	12B	EXT REFS
176	68	I	103 105	10B	EXT REFS
213	70	I	110 112	7B	EXT REFS
227	80	I	120 129	37B	NOT INNER
230	80	K	121 129	33B	NOT INNER
241	75	J	123 127	14B	OPT
267	82	I	133 135	13B	NOT INNER
274	82	J	134 135	2B	INSTACK
303	90	I	137 144	27B	NOT INNER
304	90	K	138 144	23B	NOT INNER
315	85	J	140 142	4B	INSTACK

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
341	100	J	151 154	5B	INSTACK
361	102	I	160 162	11B	EXT REFS
375		K	164 164	12B	EXT REFS
415	110	K	166 171	10B	OPT
437	115	I	179 182	20B	EXT REFS NOT INNER
442		J	180 180	10B	EXT REFS
470	140	I	196 198	14B	NOT INNER
475	140	J	197 198	3B	INSTACK
506	150	I	205 212	27B	NOT INNER
507	150	K	206 212	23B	NOT INNER
520	145	J	208 210	4B	INSTACK
537	160	K	215 217	7B	EXT REFS
552	190	I	223 233	34B	EXT REFS NOT INNER
553	180	K	224 231	26B	NOT INNER
567	170	J	227 229	4B	INSTACK

COMMON BLOCKS LENGTH MEMBERS - BIAS NAME(LENGTH)

PLACES	98	0	IUIN1 (1)	1	IUIN2 (1)	2	IUOUT1 (1)
		3	IUOUT2 (1)	4	IUGO1 (1)	5	IUGO2 (1)
		6	IUGO3 (1)	7	IUGO4 (1)	8	IUSCR (1)
		9	IFSCR (1)	10	IFS1 (1)	11	IFS2 (1)
		12	IFS3 (1)	13	IFS4 (1)	14	IUCD (1)
		15	IUPR (1)	16	IUA (1)	17	IFA (1)
		18	IUY (1)	19	IFY (1)	20	IUMEMN (1)
		21	IFMEMN (1)	22	IUSTFN (1)	23	IFSTFN (1)
		24	IUKS (1)	25	IFKS (1)	26	IUB (1)
		27	*IFB* (1)	28	IUDESO (1)	29	IFDESO (1)
		30	IUMDBI (1)	31	IFMDBI (1)	32	*IUADDI* (1)
		33	IFADDI (1)	34	IUBALI (1)	35	IFBALI (1)
		36	IUDESI (1)	37	IFDESI (1)	38	IUWTI (1)
		39	IFWTI (1)	40	IUMEMO (1)	41	IFMEMO (1)
		42	IUBT (1)	43	IFBT (1)	44	IUDESN (1)
		45	IFDESN (1)	46	IUMD (1)	47	IFMD (1)
		48	IUMEMF (1)	49	IFMEMF (1)	50	IUSTFO (1)
		51	IFSTFO (1)	52	IUMDB (1)	53	IFMDB (1)
		54	IUADD (1)	55	IFADD (1)	56	IUBAL (1)
		57	IFBAL (1)	58	IUDESF (1)	59	IFDESF (1)
		60	IUWT (1)	61	IFWT (1)	62	IUDUM1 (1)
		63	IFDUM1 (1)	64	IUDUM2 (1)	65	IFDUM2 (1)
		66	IUDUM3 (1)	67	IFDUM3 (1)	68	IUL (1)
		69	IFL (1)	70	IUYT (1)	71	IFYT (1)
		72	IUZ (1)	73	IFZ (1)	74	IUZR (1)
		75	IFZR (1)	76	IULR (1)	77	IFLR (1)
		78	IUBR (1)	79	IFBR (1)	80	IUPHTF (1)
		81	IFPHTF (1)	82	IUMODM (1)	83	IFMODM (1)
		84	IUMODK (1)	85	IFMODK (1)	86	IUPHT (1)
		87	IFPHT (1)	88	IUQT (1)	89	IFQT (1)
		90	IUQ (1)	91	IFQ (1)	92	IUPH (1)
		93	IFPH (1)	94	IUINCM (1)	95	IFINCM (1)
		96	IUINCK (1)	97	IFINCK (1)		
KLUES	24	0	KLUSE (1)	1	KLUNAL (1)	2	IRED (1)
		3	KLUMD (1)	4	KLUBAL (1)	5	MSADD (1)
		6	NPASS (1)	7	IDNOPT (1)	8	VDES (1)
		9	EPS1 (1)	10	DWMAX (1)	11	NBAR (1)
		12	NFIX (1)	13	D (1)	14	DEL (1)
		15	EPS2 (1)	16	NCYC (1)	17	NNN (1)
		18	IBAND (1)	19	IFIN (1)	20	KLUB (1)

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
		21 KLUQ (1)	22 MORBAL (1)	23 DBAL (1)
PLAYFF	26	0 IUMDFF (1)	1 IFMDFF (1)	2 IUDLTI (1)
		3 IFDLTI (1)	4 IUSLTI (1)	5 IFSLTI (1)
		6 IUMPLI (1)	7 IFMPLI (1)	8 IUTPGT (1)
		9 IFTPGT (1)	10 IUPATF (1)	11 IFPATF (1)
		12 IUMPL (1)	13 IFMPL (1)	14 IUSLT (1)
		15 IFSLT (1)	16 IUDLT (1)	17 IFDLT (1)
		18 IUQA (1)	19 IFQA (1)	20 IUQAT (1)
		21 IFQAT (1)	22 IUPHA (1)	23 IFPHA (1)
		24 IUPHAT (1)	25 IFPHAT (1)	
KLUFF	1	0 KFREE (1)		
PLUG	129	0 EMP (9)	9 PHP (120)	
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
SIZES	6	0 NSTMEM (1)	1 NSTDOF (1)	2 NDYDOF (1)
		3 NNOPT (1)	4 NDESNO (1)	5 NDESYS (1)
CLUEV	21	0 LKLUEV (1)	1 KLUEV (20)	

STATISTICS

PROGRAM LENGTH	13328	730
CM LABELED COMMON LENGTH	474B	316

520000B CM USED

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      1                 SUBROUTINE IV33(A,B)                                  IV33      2
                      C                                                       IV33      3
                        DIMENSION A(3,3),B(3,3)                               IV33      4
                      C                                                       IV33      5
      5                 A11=A(1,1)                                            IV33      6
                        A21=A(2,1)                                            IV33      7
                        A22=A(2,2)                                            IV33      8
                        A31=A(3,1)                                            IV33      9
                        A32=A(3,2)                                            IV33     10
     10                 A33=A(3,3)                                            IV33     11
                      C                                                       IV33     12
                        D=A11*(A22*A33-A32*A32)                               IV33     13
                       1 -A21*(A21*A33-A32*A31)                               IV33     14
                       2 +A31*(A21*A32-A22*A31)                               IV33     15
     15               C                                                       IV33     16
                        B(1,1)= (A22*A33-A32*A32)/D                           IV33     17
                        B(2,1)=-(A21*A33-A32*A31)/D                           IV33     18
                        B(2,2)= (A11*A33-A31*A31)/D                           IV33     19
                        B(3,1)= (A21*A32-A22*A31)/D                           IV33     20
     20                 B(3,2)=-(A11*A32-A21*A31)/D                           IV33     21
                        B(3,3)= (A11*A22-A21*A21)/D                           IV33     22
                        B(1,2)=B(2,1)                                         IV33     23
                        B(1,3)=B(3,1)                                         IV33     24
                        B(2,3)=B(3,2)                                         IV33     25
     25               C                                                       IV33     26
                        RETURN                                                IV33     27
                        END                                                   IV33     28
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	IV33	1	26

VARIABLES	SN	TYPE	RELOCATION								
0	A	REAL	ARRAY	F.P.	REFS	3	5	6	7	8	9	10
					DEFINED	1						
56	A11	REAL			REFS	12	18	20	21	DEFINED	5	
57	A21	REAL			REFS	3*12	17	19	20	2*21		
					DEFINED	6						
60	A22	REAL			REFS	2*12	16	19	21	DEFINED	7	
61	A31	REAL			REFS	3*12	17	2*18	19	20		
					DEFINED	8						
62	A32	REAL			REFS	4*12	2*16	17	19	20		
					DEFINED	9						
63	A33	REAL			REFS	2*12	16	17	18	DEFINED	10	
0	B	REAL	ARRAY	F.P.	REFS	3	22	23	24	DEFINED	1	16
						17	18	19	20	21	22	23	24
64	D	REAL			REFS	16	17	18	19	20	21	
					DEFINED	12						

STATISTICS

PROGRAM LENGTH 658 53

[redacted] CM USED

```
      SUBROUTINE BSOLVE(KORE,WORK)                                          BSOLVE     2
C                                                                           BSOLVE     3
C                                                                           BSOLVE     4
      DIMENSION KLUEV(20)                                                   BSOLVE     5
      DIMENSION NAMEYT(2)          ,NAMEZR(2)          ,NAMELR(2)           BSOLVE     6
     1          ,NAMEB (2)          ,NAMEBR(2)          ,NAMEBT(2)          BSOLVE     7
      DIMENSION IPOS(20)                                                    BSOLVE     8
      DIMENSION WORK(1),NAME(2)                                             BSOLVE     9
C                                                                           BSOLVE    10
C                                                                           BSOLVE    11
C GIVEN MATRICES A AND Y, THIS SUBROUTINE SOLVES THE MATRIX EQUATION        BSOLVE    12
C AB=Y(TRAN) FOR B,AND THEN OBTAINS B(TRAN).                                BSOLVE    13
C                                                                           BSOLVE    14
      COMMON/PLACES/ IUIN1,IUIN2,IUOUT1,IUOUT2,IUGO1,IUGO2,IUGO3,IUGO4,     BSOLVE    15
     1               IUSCR,IFSCR,IFS1,IFS2,IFS3,IFS4,IUCD,IUPR,            BSOLVE    16
     2               IUA,IFA,IUY,IFY,IUMEMN,IFMEMN,IUSTFN,IFSTFN,          BSOLVE    17
     3               IUKS,IFKS,IUB,IFB,IUDESO,IFDESO,                      BSOLVE    18
     4               IUMDBI,IFMDBI,IUADDI,IFADDI,IUBALI,IFBALI,            BSOLVE    19
     5               IUDESI,IFDESI,IUWTI,IFWTI,                            BSOLVE    20
     6               IUMEMO,IFMEMO,IUBT,IFBT,                              BSOLVE    21
     7               IUDESN,IFDESN,IUMD,IFMD,                              BSOLVE    22
     8               IUMEMF,IFMEMF,                                        BSOLVE    23
     9               IUSTFO,IFSTFO,IUMDB,IFMDB,IUADD,IFADD,IUBAL,IFBAL,    BSOLVE    24
     A               IUDESF,IFDESF,IUWT,IFWT,                              BSOLVE    25
     B               IUDUM1,IFDUM1,IUDUM2,IFDUM2,IUDUM3,IFDUM3,            BSOLVE    26
     C               IUL,IFL,IUYT,IFYT,IUZ,IFZ,IUZR,IFZR,IULR,IFLR,        BSOLVE    27
     D               IUBR,IFBR,                                            BSOLVE    28
     E               IUPHTF,IFPHTF,IUMODM,IFMODM,                          BSOLVE    29
     F               IUMODK,IFMODK,IUPHT,IFPHT,IUQT,IFQT,IUQ,IFQ,          BSOLVE    30
     G               IUPH,IFPH,IUINCM,IFINCM,IUINCK,IFINCK                 BSOLVE    31
      COMMON /FILE  / IPOS                                                  BSOLVE    32
      COMMON /CLUEV / LKLUEV ,KLUEV                                         BSOLVE    33
      COMMON /CLIST / KOUNT,KPAGE,LINES,LINEST,KLABEL,KTPAGE,NPAGE          BSOLVE    34
     1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                           BSOLVE    35
      COMMON /KLUFF/ KFREE                                                  BSOLVE    36
C                                                                           BSOLVE    37
      DATA NAMEYT /4HYTRA, 4HNSPO/                                          BSOLVE    38
      DATA NAMEZR /4HZREV, 4HERSE/                                          BSOLVE    39
      DATA NAMELR /4HLREV, 4HERSE/                                          BSOLVE    40
      DATA NAMEBR /4HBREV, 4HERSE/                                          BSOLVE    41
      DATA NAMEBT /4HBTRA, 4HNSPO/                                          BSOLVE    42
      DATA NAMEB /4HBMAT,4HRIX /                                            BSOLVE    43
      IOB=KLUEV(6)                                                          BSOLVE    44
      KLISTM=1                                                              BSOLVE    45
      KTYPE  =  2                                                           BSOLVE    46
      KOUNT=LINES                                                           BSOLVE    47
      IPOS(IUGO3)=IFS3                                                      BSOLVE    48
      IPOS(IUGO4)=IFS4                                                      BSOLVE    49
C                                                                           BSOLVE    50
C                                                                           BSOLVE    51
C STEP1. SPLIT A, A=L*L(TRAN). OBTAIN LOWER TRIANGLE L.                     BSOLVE    52
C                                                                           BSOLVE    53
      CALL PROGNA (4H(BSO. 4HLVE))                                          BSOLVE    54
      CALL MSGO2 (1)                                                        BSOLVE    55
      IPOS(IUA)=IFA                                                         BSOLVE    56
      IPOS(IUL)=IFL                                                         BSOLVE    57
      CALL SFACT (KORE,WORK,IUA,IUL,IUGO2,IUGO1,KLISTM,KTYPE)               BSOLVE    58
```

```
      C                                                                 BSOLVE     59
      C                                                                 BSOLVE     60
60    C STEP2. TRANSPOSE Y TO OBTAIN YT.                                BSOLVE     61
      C                                                                 BSOLVE     62
            JUNITF =  IUY + 1                                           BSOLVE     63
            CALL PROGNA (4H(BSO, 4HLVE))                                BSOLVE     64
            CALL MSGO2 (2)                                              BSOLVE     65
65          IPOS(IUY)=IFY                                               BSOLVE     66
            IPOS(IUYT)=IFYT                                             BSOLVE     67
            CALL TRAN (KORE,WORK,WORK,IUY,IUYT,IUGO3,IUGO4,JUNITF,NAMEYT)  BSOLVE  68
      C                                                                 BSOLVE     69
      C                                                                 BSOLVE     70
70    C STEP3. SOLVE LZ=YT FOR Z.                                       BSOLVE     71
      C                                                                 BSOLVE     72
            CALL PROGNA (4H(BSO, 4HLVE))                                BSOLVE     73
            CALL MSGO2 (3)                                              BSOLVE     74
            IPOS(IUL)=IFL                                               BSOLVE     75
75          IPOS(IUYT)=IFYT                                             BSOLVE     76
            IPOS(IUZ)=IFZ                                               BSOLVE     77
            CALL QFSOL(KORE,WORK,IUL,IUYT,IUZ,IUGO3,IUGO4)              BSOLVE     78
      C                                                                 BSOLVE     79
      C                                                                 BSOLVE     80
80    C STEP4. REVERSE Z TO OBTAIN ZR.                                  BSOLVE     81
            CALL PROGNA (4H(BSO, 4HLVE))                                BSOLVE     82
            CALL MSGO2 (4)                                              BSOLVE     83
      C                                                                 BSOLVE     84
            IPOS(IUZ)=IFZ                                               BSOLVE     85
85          IPOS(IUZR)=IFZR                                             BSOLVE     86
            CALL REVERS (KORE,WORK,WORK,IUZ,IUZR,NAMEZR)                BSOLVE     87
      C                                                                 BSOLVE     88
      C                                                                 BSOLVE     89
      C STEP5  REVERSE L TO OBTAIN LR.                                  BSOLVE     90
90          CALL PROGNA (4H(BSO, 4HLVE))                                BSOLVE     91
            CALL MSGO2 (5)                                              BSOLVE     92
      C                                                                 BSOLVE     93
            IPOS(IUL)=IFL                                               BSOLVE     94
            IPOS(IULR)=IFLR                                             BSOLVE     95
95          CALL REVERS (KORE,WORK,WORK,IUL,IULR,NAMELR)                BSOLVE     96
      C                                                                 BSOLVE     97
      C                                                                 BSOLVE     98
      C STEP6  SOLVE LR(TRAN)*BR=ZR FOR BR.                             BSOLVE     99
      C                                                                 BSOLVE    100
100         CALL PROGNA (4H(BSO, 4HLVE))                                BSOLVE    101
            CALL MSGO2 (6)                                              BSOLVE    102
            IPOS(IULR)=IFLR                                             BSOLVE    103
            IPOS(IUZR)=IFZR                                             BSOLVE    104
            IPOS(IUBR)=IFBR                                             BSOLVE    105
105         CALL QBSOL (KORE,WORK,NAMEBR,IULR,IUZR,IUBR,IUGO3,IUGO4)    BSOLVE    106
      C                                                                 BSOLVE    107
      C                                                                 BSOLVE    108
      C STEP7  REVERSE BR TO OBTAIN B.                                  BSOLVE    109
      C                                                                 BSOLVE    110
110         CALL PROGNA (4H(BSO, 4HLVE))                                BSOLVE    111
            CALL MSGO2 (7)                                              BSOLVE    112
            IPOS(IUBR)=IFBR                                             BSOLVE    113
            IPOS(IUB)=IFB                                               BSOLVE    114
            CALL REVERS (KORE,WORK,WORK,IUBR,IUB,NAMEB)                 BSOLVE    115
```

```
      C                                                                 BSOLVE   116
      C                                                                 BSOLVE   117
      C STEP8. TRANSPOSE B TO OBTAIN BT.                                BSOLVE   118
      C                                                                 BSOLVE   119
            JUNITF=IUB+1                                                BSOLVE   120
      120   CALL PROGNA (4H(BSO, 4HLVE))                                BSOLVE   121
            CALL MSGO2 (8)                                              BSOLVE   122
            IPOS(IUB)=IFB                                               BSOLVE   123
            IPOS(IUBT)=IFBT                                             BSOLVE   124
            CALL TRAN (KORE,WORK,WORK,IUB,IUBT,IUGO3,IUGO4,JUNITF,NAMEBT) BSOLVE 125
      125   C                                                           BSOLVE   126
            CALL PROGNA (4H(BSO, 4HLVE))                                BSOLVE   127
      C                                                                 BSOLVE   128
            IF(IOB.NE.2) GO TO 100                                      BSOLVE   129
            IF(KFREE.EQ.1) CALL PRMAT1(IUB,IFB,WORK,0,IUPR,7,88,        BSOLVE   130
      130   1 88H (TRANSPOSE OF BMATRIX TRANSFORMS DISPLACEMENTS FROM DYNAMICS BSOLVE 131
           2MODEL TO STRUCTURES MODEL))                                 BSOLVE   132
      C                                                                 BSOLVE   133
            IF(KFREE.EQ.2) CALL PRMAT1(IUB,IFB,WORK,0,IUPR,7,97,        BSOLVE   134
           1 97H (TRANSPOSE OF BMATRIX TRANSFORMS RELATIVE DISPLACEMENTS FROM BSOLVE 135
      135  2DYNAMICS MODEL TO STRUCTURES MODEL))                        BSOLVE   136
         100 CONTINUE                                                   BSOLVE   137
      C                                                                 BSOLVE   138
      C                                                                 BSOLVE   139
            RETURN                                                      BSOLVE   140
      140   END                                                         BSOLVE   141
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	BSOLVE	1	139

VARIABLES

		SN	TYPE	RELOCATION						
21	IFA		INTEGER	PLACES	REFS	14	55			
67	IFADD		INTEGER	PLACES	REFS	14				
41	IFADDI		INTEGER	PLACES	REFS	14				
33	IFB		INTEGER	PLACES	REFS	14	113	122	129	133
71	IFBAL		INTEGER	PLACES	REFS	14				
43	IFBALI		INTEGER	PLACES	REFS	14				
117	IFBR		INTEGER	PLACES	REFS	14	104	112		
53	IFBT		INTEGER	PLACES	REFS	14	123			
73	IFDESF		INTEGER	PLACES	REFS	14				
45	IFDESI		INTEGER	PLACES	REFS	14				
55	IFDESN		INTEGER	PLACES	REFS	14				
35	IFDESO		INTEGER	PLACES	REFS	14				
77	IFDUM1		INTEGER	PLACES	REFS	14				
101	IFDUM2		INTEGER	PLACES	REFS	14				
103	IFDUM3		INTEGER	PLACES	REFS	14				
141	IFINCK		INTEGER	PLACES	REFS	14				
137	IFINCM		INTEGER	PLACES	REFS	14				
31	IFKS		INTEGER	PLACES	REFS	14				
105	IFL		INTEGER	PLACES	REFS	14	56	74	93	
115	IFLR		INTEGER	PLACES	REFS	14	94	102		

VARIABLES	SN	TYPE		RELOCATION								
57	IFMD	INTEGER		PLACES	REFS	14						
65	IFMDB	INTEGER		PLACES	REFS	14						
37	IFMDBI	INTEGER		PLACES	REFS	14						
61	IFMEMF	INTEGER		PLACES	REFS	14						
25	IFMEMN	INTEGER		PLACES	REFS	14						
51	IFMEMO	INTEGER		PLACES	REFS	14						
125	IFMODK	INTEGER		PLACES	REFS	14						
123	IFMODM	INTEGER		PLACES	REFS	14						
135	IFPH	INTEGER		PLACES	REFS	14						
127	IFPHT	INTEGER		PLACES	REFS	14						
121	IFPHTF	INTEGER		PLACES	REFS	14						
133	IFQ	INTEGER		PLACES	REFS	14						
131	IFQT	INTEGER		PLACES	REFS	14						
11	IFSCR	INTEGER		PLACES	REFS	14						
27	IFSTFN	INTEGER		PLACES	REFS	14						
63	IFSTFO	INTEGER		PLACES	REFS	14						
12	IFS1	INTEGER		PLACES	REFS	14						
13	IFS2	INTEGER		PLACES	REFS	14						
14	IFS3	INTEGER		PLACES	REFS	14	47					
15	IFS4	INTEGER		PLACES	REFS	14	48					
75	IFWT	INTEGER		PLACES	REFS	14						
47	IFWTI	INTEGER		PLACES	REFS	14						
23	IFY	INTEGER		PLACES	REFS	14	65					
107	IFYT	INTEGER		PLACES	REFS	14	66	75				
111	IFZ	INTEGER		PLACES	REFS	14	76	84				
113	IFZR	INTEGER		PLACES	REFS	14	85	103				
417	IOB	INTEGER			REFS	128	DEFINED	43				
0	IPOS	INTEGER	ARRAY	FILE	REFS	7	31	DEFINED	47	48	55	56
						65	66	74	75	76	84	85	93
						94	102	103	104	112	113	122	123
20	IUA	INTEGER		PLACES	REFS	14	55	57				
66	IUADD	INTEGER		PLACES	REFS	14						
40	IUADDI	INTEGER		PLACES	REFS	14						
32	IUB	INTEGER		PLACES	REFS	14	113	114	119	122	124	129
						133						
70	IUBAL	INTEGER		PLACES	REFS	14						
42	IUBALI	INTEGER		PLACES	REFS	14						
116	IUBR	INTEGER		PLACES	REFS	14	104	105	112	114		
52	IUBT	INTEGER		PLACES	REFS	14	123	124				
16	IUCD	INTEGER		PLACES	REFS	14						
72	IUDESF	INTEGER		PLACES	REFS	14						
44	IUDESI	INTEGER		PLACES	REFS	14						
54	IUDESN	INTEGER		PLACES	REFS	14						
34	IUDESO	INTEGER		PLACES	REFS	14						
76	IUDUM1	INTEGER		PLACES	REFS	14						
100	IUDUM2	INTEGER		PLACES	REFS	14						
102	IUDUM3	INTEGER		PLACES	REFS	14						
4	IUGO1	INTEGER		PLACES	REFS	14						
5	IUGO2	INTEGER		PLACES	REFS	14						
6	IUGO3	INTEGER		PLACES	REFS	14	47	57	67	77	105	124
7	IUGO4	INTEGER		PLACES	REFS	14	48	57	67	77	105	124
140	IUINCK	INTEGER		PLACES	REFS	14						
136	IUINCM	INTEGER		PLACES	REFS	14						
0	IUIN1	INTEGER		PLACES	REFS	14						
1	IUIN2	INTEGER		PLACES	REFS	14						
30	IUKS	INTEGER		PLACES	REFS	14						

```
      C45700  SUB  QCHOL (FACTORIZATION OF STIFFNESS MATRIX)                    QCHOL     2
      C                                                                         QCHOL     3
      C*************************************************************************QCHOL     4
      C                                                                        *QCHOL     5
      C***  SUBROUTINE QCHOL  (A      ,X      ,L      ,M      ,NU     ,KORE   *QCHOL     6
      C                       ,ML     ,MI     ,MO     ,KEY    ,KEE    ,NIX    *QCHOL     7
      C                       ,WORST  ,NAME)                                   *QCHOL     8
      C                                                                        *QCHOL     9
      C***  COMPUTER VERSION  ***************************************************QCHOL    10
      C     ----------------                                                   *QCHOL    11
      C     IBM .... INCLUDES DOUBLE PRECISION TYPE STATEMENTS.  COLUMN ONE    *QCHOL    12
      C               SHOULD BE BLANK.                                         *QCHOL    13
      C                                                                        *QCHOL    14
      C     CDC .... DOES NOT INCLUDE DOUBLE PRECISION TYPE STATEMENTS.        *QCHOL    15
      C               THESE STATEMENTS ARE CONVERTED INTO COMMENTS BY          *QCHOL    16
      C               INSERTING THE LETTER C IN COLUMN ONE.                    *QCHOL    17
      C                                                                        *QCHOL    18
      C***  OBJECTIVE  ***********************************************************QCHOL    19
      C     ---------                                                          *QCHOL    20
      C     PERFORMS THE FACTORIZATION OF THE STIFFNESS MATRIX UNDER THE       *QCHOL    21
      C     CONTROL OF QFACT   THE FACTORIZATION IS DONE IN BLOCKS.  IF THE    *QCHOL    22
      C     END OF THE MATRIX FITS IN CORE THE CLUE KEY IS SET TO ZERO.        *QCHOL    23
      C                                                                        *QCHOL    24
      C***  INPUT/OUTPUT  ********************************************************QCHOL    25
      C     ------------                                                       *QCHOL    26
      C     THE SUBROUTINE RECEIVES THE STIFFNESS MATRIX IN BLOCKS FROM THE    *QCHOL    27
      C     CALLING ROUTINE QFACT, AND RETURNS THE LOWER TRIANGLE              *QCHOL    28
      C     FACTORIZATION ON THE TAPE ML.                                      *QCHOL    29
      C                                                                        *QCHOL    30
      C***  SUMMARY OF SYMBOLS  **************************************************QCHOL    31
      C     ------------------                                                 *QCHOL    32
      C                                                                        *QCHOL    33
      C***  ERROR MESSAGES  ******************************************************QCHOL    34
      C     --------------                                                     *QCHOL    35
      C     NONE.                                                               QCHOL    36
      C                                                                        *QCHOL    37
      C*************************************************************************QCHOL    38
      C                                                                         QCHOL    39
            SUBROUTINE QCHOL (A,X,L,M,NU,KORE,ML,MI,MO,KEY,KEE,NIX,WORST        QCHOL    40
           1                 ,NAME,KLISTM,KTYPE)                              QCHOL    41
      C                                                                         QCHOL    42
            INTEGER YES                                                         QCHOL    43
      C                                                                         QCHOL    44
      CIBM  BEGINNING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS  QCHOL    45
      C     DOUBLE PRECISION S                                                  QCHOL    46
      CIBM  ENDING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS     QCHOL    47
      C                                                                         QCHOL    48
            DIMENSION HEAD(5,5),HOLD(5)                                         QCHOL    49
            DIMENSION LCOL(5)            ,LROW(5)                               QCHOL    50
            DIMENSION A(1),X(1),L(1),NAME(2)                                    QCHOL    51
            DIMENSION ROW(5)                                                    QCHOL    52
      C                                                                         QCHOL    53
            COMMON /PROBSZ/M2,N,IBANDW,H,K1,M1,MILSUM,IDEBUG                    QCHOL    54
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                                QCHOL    55
            COMMON /CONSTS/ NO     ,YES                                         QCHOL    56
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE     QCHOL    57
           1                KPRACE,LINESC,KOUNTH,KOUNTI                         QCHOL    58
```

```
COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
      COMRWP         3              0 ITAPER (1)          1 ITAPEW (1)          2 ITAPEP (1)
      CIDIV          1              0 IDIV   (1)
      CONSTS         2              0 NO     (1)          1 YES    (1)
      CLIST         11              0 KOUNT  (1)          1 KPAGE  (1)          2 LINES  (1)
                                    3 LINEST (1)          4 KLABEL (1)          5 KTPAGE (1)
                                    6 NPAGE  (1)          7 KBPAGE (1)          8 LINESG (1)
                                    9 KOUNTH (1)         10 KOUNTI (1)
      FILE          20              0 IPOS   (20)

STATISTICS
  PROGRAM LENGTH                 435B      285
  CM LABELED COMMON LENGTH        45B       37
        520008 CM USED
```

VARIABLES	SN	TYPE	RELOCATION								
363	LEFT	INTEGER		REFS	70	80	DEFINED	69			
2	LINES	INTEGER	CLIST	REFS	48	84	85	98	99	105	106
					112	113					
10	LINESG	INTEGER	CLIST	REFS	48						
3	LINEST	INTEGER	CLIST	REFS	48						
357	M	INTEGER		REFS	65	66	67	68	70	2*76	2*79
					80						
0	MA	INTEGER	F.P.	REFS	64	65	72	119	DEFINED	36	
377	MATNAM	INTEGER	ARRAY	REFS	42	76	DEFINED	58			
401	MATNAN	INTEGER	ARRAY	REFS	42	79	DEFINED	59			
364	MI	INTEGER		REFS	80	91	92	93	DEFINED	72	90
0	ML	INTEGER	F.P.	REFS	75	76	80	120	DEFINED	36	
365	MO	INTEGER		REFS	78	79	80	90	DEFINED	73	91
0	M1	INTEGER	F.P.	REFS	71	73	121	DEFINED	36		
0	M2	INTEGER	F.P.	REFS	71	122	DEFINED	36			
374	N *	INTEGER		REFS	93						
403	NAME	INTEGER	ARRAY	REFS	43	65	80	93			
356	NFILMA	INTEGER		REFS	65	DEFINED	64				
373	NFILMI	INTEGER		REFS	93	DEFINED	92				
367	NFILML	INTEGER		REFS	76	DEFINED	75				
370	NFILMO	INTEGER		REFS	79	DEFINED	78				
353	NIX	INTEGER		REFS	80	82	97	DEFINED	61		
0	NO	INTEGER	CONSTS	REFS	47						
6	NPAGE	INTEGER	CLIST	REFS	48						
366	NU	INTEGER		REFS	80	DEFINED	74				
355	W	REAL		REFS	80	DEFINED	63				
1	YES	INTEGER	CONSTS	REFS	38	47					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES				
DCLOSE		1	119	120	121	122	
GEDLAB		6	65	93			
MESAGE		3	55	124			
PROGNA		2	54				
PUDLAB		6	76	79			
QCHOL		16	80				
TIMEB		2	57	123			
TITLES		1	86	100	107	114	

STATEMENT LABELS			DEF LINE	REFERENCES			
321	4	FMT	127	101	108		
325	5	FMT	128	87			
333	20	FMT	129	115			
0	60	INACTIVE	61				
0	70	INACTIVE	66				
0	80	INACTIVE	67	66			
0	100	INACTIVE	71	2*70			
45	110		77	94			
0	120	INACTIVE	83	82			
0	130	INACTIVE	84	2*83			
110	150		95	83			
111	160		97	82			
124	920		104	70			
137	930		111	2*66			
152	950		118	82	96	103	110

```
                      WRITE(ITAPEW,20)                                          QFACT    116
                      KOUNT=KOUNT+2                                             QFACT    117
                C                                                               QFACT    118
                  950 CONTINUE                                                  QFACT    119
                      CALL DCLOSE (MA)                                          QFACT    120
                      CALL DCLOSE (ML)                                          QFACT    121
                      CALL DCLOSE (M1)                                          QFACT    122
                      CALL DCLOSE (M2)                                          QFACT    123
                      CALL TIMEB (10,10HFROM QFACT)                             QFACT    124
                      CALL MESAGE (2, 5, 5HQFACT)                               QFACT    125
                C FORMAT STATEMENTS                                             QFACT    126
                C                                                               QFACT    127
                    4 FORMAT(/,10X,10(1H*),5HERROR,I4,10(1H*))                  QFACT    128
                    5 FORMAT(/,10X,   38HLOWER TRIANGLE EXCEEDS STORAGE IN CORE)QFACT    129
                   20 FORMAT(/,10X,   46HERROR...MATRIX LABEL INDICATES THAT MATRIX TO ,QFACT    130
                     1                22HBE SPLIT IS NOT SQUARE)                QFACT    131
                C                                                               QFACT    132
                      RETURN                                                    QFACT    133
                      END                                                       QFACT    134
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	QFACT	36	132

VARIABLES

		SN	TYPE		RELOCATION								
0	A		REAL	ARRAY	F.P.	REFS	40	3*80	DEFINED	36			
0	IDIV		INTEGER		CIDIV	REFS	46	68					
376	IND		INTEGER			REFS	101	108	DEFINED	97	104	111	
360	IO		INTEGER			REFS	65	66	91	DEFINED	71		
0	IPOS		INTEGER	ARRAY	FILE	REFS	41	50	64	75	78	92	
2	ITAPEP		INTEGER		COMRWP	REFS	45						
0	ITAPER		INTEGER		COMRWP	REFS	45						
1	ITAPEW		INTEGER		COMRWP	REFS	45	I/O REFS	87	101	108	115	
375	K	*	INTEGER			REFS	93						
7	KBPAGE		INTEGER		CLIST	REFS	48						
354	KEE		INTEGER			REFS	80	DEFINED	62	89			
371	KEY		INTEGER			REFS	80	83					
4	KLABEL		INTEGER		CLIST	REFS	48						
0	KLISTM		INTEGER		F.P.	REFS	80	DEFINED	36				
0	KORE		INTEGER		F.P.	REFS	68	DEFINED	36				
0	KOUNT		INTEGER		CLIST	REFS	48	84	88	98	102	105	109
							112	116	DEFINED	85	88	99	102	106
							109	113	116					
11	KOUNTH		INTEGER		CLIST	REFS	48						
12	KOUNTI		INTEGER		CLIST	REFS	48						
1	KPAGE		INTEGER		CLIST	REFS	48						
5	KTPAGE		INTEGER		CLIST	REFS	48						
0	KTYPE		INTEGER		F.P.	REFS	80	DEFINED	36				
372	LAFT		INTEGER			REFS	85	99	106	113	DEFINED	84	98
							105	112					
361	LARGE		INTEGER			REFS	69	80	DEFINED	67			

```
                  DATA MATNAM/4HLOTR,4HISTF/                                    QFACT      59
                  DATA MATNAN/4HSCRA,4HTCH2/                                    QFACT      60
60          C                                                                   QFACT      61
             60 NIX = 0                                                         QFACT      62
                KEE = 0                                                         QFACT      63
                W = 2.                                                          QFACT      64
                NFILMA =  IPOS(MA)                                              QFACT      65
65              CALL GEDLAB (8HQFACT 01,MA,NAME  ,NFILMA,M,IO)                  QFACT      66
             70 IF (M-IO) 930,80,930                                            QFACT      67
             80 LARGE = M + 2                                                   QFACT      68
                LEAVE = KORE - M / IDIV                                         QFACT      69
                LEFT = LEAVE - LARGE                                            QFACT      70
70              IF (LEFT - M) 920,100,100                                       QFACT      71
            100 IO = M1 + M2                                                    QFACT      72
                MI = MA                                                         QFACT      73
                MO = M1                                                         QFACT      74
                NU = 1                                                          QFACT      75
75              NFILML =  IPOS(ML)                                              QFACT      76
                CALL PUDLAB (8HQFACT 01,ML,MATNAM,NFILML,M,M )                  QFACT      77
            110 CONTINUE                                                        QFACT      78
                NFILMO =  IPOS(MO)                                              QFACT      79
                CALL PUDLAB (8HQFACT 02,MO,MATNAN,NFILMO,M,M )                  QFACT      80
80              CALL QCHOL (A(LARGE),A,A(LEAVE),M,NU,LEFT,ML,MI,MO,KEY,KEE,NIX,W,  QFACT   81
               1            NAME,KLISTM,KTYPE)                                  QFACT      82
                IF (NIX) 950,120,160                                            QFACT      83
            120 IF (KEY) 130,150,130                                            QFACT      84
            130 LAFT=LINES-KOUNT                                                QFACT      85
85              IF(LAFT.LT.2) KOUNT=LINES                                       QFACT      86
                CALL TITLES(2)                                                  QFACT      87
                WRITE(ITAPEW,5)                                                 QFACT      88
                KOUNT=KOUNT+2                                                   QFACT      89
                KEE = 1                                                         QFACT      90
90              MI = MO                                                         QFACT      91
                MO = IO - MI                                                    QFACT      92
                NFILMI =  IPOS(MI)                                              QFACT      93
                CALL GEDLAB (8HQFACT 02,MI,NAME  ,NFILMI,N,K )                  QFACT      94
                GO TO 110                                                       QFACT      95
95          150 CONTINUE                                                        QFACT      96
                GO TO 950                                                       QFACT      97
            160 IND=NIX                                                         QFACT      98
                LAFT=LINES-KOUNT                                                QFACT      99
                IF(LAFT.LT.2) KOUNT=LINES                                       QFACT     100
100             CALL TITLES(2)                                                  QFACT     101
                WRITE(ITAPEW,4) IND                                             QFACT     102
                KOUNT=KOUNT+2                                                   QFACT     103
                GO TO 950                                                       QFACT     104
            920 IND=52                                                          QFACT     105
105             LAFT=LINES-KOUNT                                                QFACT     106
                IF(LAFT.LT.2) KOUNT=LINES                                       QFACT     107
                CALL TITLES(2)                                                  QFACT     108
                WRITE(ITAPEW,4) IND                                             QFACT     109
                KOUNT=KOUNT+2                                                   QFACT     110
110             GO TO 950                                                       QFACT     111
            930 IND=16                                                          QFACT     112
                LAFT=LINES-KOUNT                                                QFACT     113
                IF(LAFT.LT.2) KOUNT=LINES                                       QFACT     114
                CALL TITLES(2)                                                  QFACT     115
```

```
      C45700. SUB. QFACT (REND STIFFNESS MATRIX - DECOMPOSE TO LOWER TRIANG.)
      C
      C*********************************************************************
      C                                                                    *
      C***  SUBROUTINE QFACT  (MA    ,ML    ,M1    ,M2) ******************
      C                                                                    *
      C***  COMPUTER VERSION                                              *
      C     ----------------                                               *
      C     IBM .... AS IS.                                                *
      C                                                                    *
      C     CDC .... AS IS.                                                *
      C                                                                    *
      C***  OBJECTIVE  ****************************************************
      C     ---------                                                      *
      C     READS THE POSITIVE DEFINITE SYMMETRIC STIFFNESS MATRIX AND SETS *
      C     UP INDICES FOR THE SUBROUTINE QCHOL TO GET THE LOWER TRIANGLE  *
      C     OF AN L X L TRANSPOSE DECOMPOSITION ONE ROW AT A TIME.         *
      C                                                                    *
      C***  INPUT/OUTPUT  *************************************************
      C     ------------                                                   *
      C     THIS SUBROUTINE RECEIVES THE NAMES OF THE STIFFNESS AND LOWER  *
      C     TRIANGULAR MATRICES AND USES THEM TOGETHER WITH THEIR SIZES TO *
      C     CONTROL QCHOL.                                                 *
      C                                                                    *
      C***  SUMMARY OF SYMBOLS  *******************************************
      C     ------------------                                             *
      C                                                                    *
      C***  ERROR MESSAGES  ***********************************************
      C     --------------                                                 *
      C     **** ERROR --- ****.                                           *
      C     **** ERROR - DIMENSIONS READ FROM LABEL OF TOTAL STIFFNESS     *
      C     MATRIX INDICATE THAT THE MATRIX IS NOT SQUARE ****.
      C                                                                    *
      C*********************************************************************
      C
            SUBROUTINE QFACT (KORE,A,MA,ML,M1,M2,KLISTM,KTYPE)
      C
            INTEGER YES
      C
            DIMENSION A(1)
            DIMENSION IPOS(20)
            DIMENSION MATNAM(2)          ,MATNAN(2)
            DIMENSION NAME(2)
      C
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP
            COMMON /CIDIV / IDIV
            COMMON /CONSTS/ NO     ,YES
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI
            COMMON /FILE  / IPOS
      C
      C DATA INITIALIZATION
      C
            CALL PROGNA (4H(QFA,4HCT ))
            CALL MESAGE (1,38,38
           1   HQFACT - MANAGES CHOLESKY FACTORIZATION)
            CALL TIMEB (11,11HFROM QFACT )
```

COMMON BLOCKS LENGTH MEMBERS - BIAS NAME(LENGTH)

6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
9 KOUNTH (1)	10 KOUNTI (1)	

STATISTICS

PROGRAM LENGTH	361B	241
CM LABELED COMMON LENGTH	16B	14

520000B CM USED

VARIABLES	SN	TYPE	RELOCATION							
				64	2*66	79	2*81	94	2*96	109	2*111
				124	2*126	DEFINED	20	23	34	36	49
				51	64	66	79	81	94	96	109
				111	124	126					
11	KOUNTH	INTEGER	CLIST	REFS	7	23	36	51	66	81	96
				111	126						
12	KOUNTI	INTEGER	CLIST	REFS	7	20	23	34	36	49	51
				64	66	79	81	94	96	109	111
				124	126	DEFINED	19	33	48	63	78
				93	108	123					
1	KPAGE	INTEGER	CLIST	REFS	7						
0	KSTEP	INTEGER	F.P.	REFS	11	DEFINED	4				
5	KTPAGE	INTEGER	CLIST	REFS	7						
2	LINES	INTEGER	CLIST	REFS	7						
10	LINESG	INTEGER	CLIST	REFS	7						
3	LINEST	INTEGER	CLIST	REFS	7						
357	LSKIPA	INTEGER		REFS	19	25	33	39	48	54	63
				69	78	84	93	99	108	114	123
				129	DEFINED	17	31	46	61	76	91
				106	121						
360	LSKIPB	INTEGER		REFS	19	21	33	37	48	52	63
				67	78	82	93	97	108	112	123
				127	DEFINED	18	32	47	62	77	92
				107	122						
356	LTEXT	INTEGER		REFS	19	33	48	63	78	93	108
				123	DEFINED	10					
6	NPAGE	INTEGER	CLIST	REFS	7						

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES							
PLB		3	21	25	37	39	52	54	67	69	82
			84	97	99	112	114	127	129		
TITLES		1	22	35	50	65	80	95	110	125	

STATEMENT LABELS			DEF LINE	REFERENCES						
23	100		16	11						
42	200		30	11						
62	300		45	11						
102	400		60	11						
122	500		75	11						
142	600		90	11						
162	700		105	11						
202	800		120	11						
221	1000		131	26	40	55	70	85	100	115
264	1100	FMT	133	24						
273	1200	FMT	135	38						
302	1300	FMT	137	53						
311	1400	FMT	139	68						
320	1500	FMT	141	83						
327	1600	FMT	143	98						
336	1700	FMT	145	113						
345	1800	FMT	147	128						

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)

```
115                GO TO 1000                                                    MSGO2   116
                C                                                                MSGO2   117
                C                                                                MSGO2   118
                C STEP 8                                                         MSGO2   119
                C                                                                MSGO2   120
120               800 CONTINUE                                                   MSGO2   121
                      LSKIPA =  0                                                MSGO2   122
                      LSKIPB =  2                                                MSGO2   123
                      KOUNTI =  LSKIPB + LSKIPA + LTEXT                          MSGO2   124
                      KOUNT  =  KOUNT + KOUNTI                                   MSGO2   125
125                   CALL TITLES (2)                                            MSGO2   126
                      IF (KOUNT .EQ. KOUNTH) KOUNT = KOUNT + KOUNTI              MSGO2   127
                      CALL PLB (1,LSKIPB,ITAPEW)                                 MSGO2   128
                      WRITE (ITAPEW,1800)                                        MSGO2   129
                      CALL PLB (1,LSKIPA,ITAPEW)                                 MSGO2   130
130             C                                                                MSGO2   131
                 1000 CONTINUE                                                   MSGO2   132
                C                                                                MSGO2   133
                 1100 FORMAT (10X,20(1H*),2X,28HSTEP  1  FROM PROGRAM BSOLVE,2X,20(1H*)  MSGO2   134
                     1,/)                                                        MSGO2   135
135              1200 FORMAT (10X,20(1H*),2X,28HSTEP  2  FROM PROGRAM BSOLVE,2X,20(1H*)  MSGO2   136
                     1,/)                                                        MSGO2   137
                 1300 FORMAT (10X,20(1H*),2X,28HSTEP  3  FROM PROGRAM BSOLVE,2X,20(1H*)  MSGO2   138
                     1,/)                                                        MSGO2   139
                 1400 FORMAT (10X,20(1H*),2X,28HSTEP  4  FROM PROGRAM BSOLVE,2X,20(1H*)  MSGO2   140
140                  1,/)                                                        MSGO2   141
                 1500 FORMAT (10X,20(1H*),2X,28HSTEP  5  FROM PROGRAM BSOLVE,2X,20(1H*)  MSGO2   142
                     1,/)                                                        MSGO2   143
                 1600 FORMAT (10X,20(1H*),2X,28HSTEP  6  FROM PROGRAM BSOLVE,2X,20(1H*)  MSGO2   144
                     1,/)                                                        MSGO2   145
145              1700 FORMAT (10X,20(1H*),2X,28HSTEP  7  FROM PROGRAM BSOLVE,2X,20(1H*)  MSGO2   146
                     1,/)                                                        MSGO2   147
                 1800 FORMAT (10X,20(1H*),2X,28HSTEP  8  FROM PROGRAM BSOLVE,2X,20(1H*)  MSGO2   148
                     1,/)                                                        MSGO2   149
                C                                                                MSGO2   150
150                RETURN                                                        MSGO2   151
                   END                                                           MSGO2   152
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES							
3	MSGO2	4	150							
VARIABLES	**SN**	**TYPE**	**RELOCATION**							
2	ITAPEP	INTEGER	COMRWP	REFS	6					
0	ITAPER	INTEGER	COMRWP	REFS	6					
1	ITAPEW	INTEGER	COMRWP	REFS	6	21	25	37	39	52	54
					67	69	82	84	97	99	112	114
					127	129	I/O REFS	24	38	53	68	83
					98	113	128					
7	KBPAGE	INTEGER	CLIST	REFS	7					
4	KLABEL	INTEGER	CLIST	REFS	7					
0	KOUNT	INTEGER	CLIST	REFS	7	20	2*23	34	2*36	49	2*51

```
      C STEP 4                                                          MSGO2   59
      C                                                                 MSGO2   60
60      400 CONTINUE                                                    MSGO2   61
            LSKIPA =  0                                                 MSGO2   62
            LSKIPB =  2                                                 MSGO2   63
            KOUNTI =  LSKIPB + LSKIPA + LTEXT                           MSGO2   64
            KOUNT  =  KOUNT + KOUNTI                                    MSGO2   65
65          CALL TITLES (2)                                             MSGO2   66
            IF (KOUNT .EQ. KOUNTH) KOUNT = KOUNT + KOUNTI               MSGO2   67
            CALL PLB (1,LSKIPB,ITAPEW)                                  MSGO2   68
            WRITE (ITAPEW,1400)                                         MSGO2   69
            CALL PLB (1,LSKIPA,ITAPEW)                                  MSGO2   70
70          GO TO 1000                                                  MSGO2   71
      C                                                                 MSGO2   72
      C                                                                 MSGO2   73
      C STEP 5                                                          MSGO2   74
      C                                                                 MSGO2   75
75      500 CONTINUE                                                    MSGO2   76
            LSKIPA =  0                                                 MSGO2   77
            LSKIPB =  2                                                 MSGO2   78
            KOUNTI =  LSKIPB + LSKIPA + LTEXT                           MSGO2   79
            KOUNT  =  KOUNT + KOUNTI                                    MSGO2   80
80          CALL TITLES (2)                                             MSGO2   81
            IF (KOUNT .EQ. KOUNTH) KOUNT = KOUNT + KOUNTI               MSGO2   82
            CALL PLB (1,LSKIPB,ITAPEW)                                  MSGO2   83
            WRITE (ITAPEW,1500)                                         MSGO2   84
            CALL PLB (1,LSKIPA,ITAPEW)                                  MSGO2   85
85          GO TO 1000                                                  MSGO2   86
      C                                                                 MSGO2   87
      C                                                                 MSGO2   88
      C STEP 6                                                          MSGO2   89
      C                                                                 MSGO2   90
90      600 CONTINUE                                                    MSGO2   91
            LSKIPA =  0                                                 MSGO2   92
            LSKIPB =  2                                                 MSGO2   93
            KOUNTI =  LSKIPB + LSKIPA + LTEXT                           MSGO2   94
            KOUNT  =  KOUNT + KOUNTI                                    MSGO2   95
95          CALL TITLES (2)                                             MSGO2   96
            IF (KOUNT .EQ. KOUNTH) KOUNT = KOUNT + KOUNTI               MSGO2   97
            CALL PLB (1,LSKIPB,ITAPEW)                                  MSGO2   98
            WRITE (ITAPEW,1600)                                         MSGO2   99
            CALL PLB (1,LSKIPA,ITAPEW)                                  MSGO2  100
100         GO TO 1000                                                  MSGO2  101
      C                                                                 MSGO2  102
      C                                                                 MSGO2  103
      C STEP 7                                                          MSGO2  104
      C                                                                 MSGO2  105
105     700 CONTINUE                                                    MSGO2  106
            LSKIPA =  0                                                 MSGO2  107
            LSKIPB =  2                                                 MSGO2  108
            KOUNTI =  LSKIPB + LSKIPA + LTEXT                           MSGO2  109
            KOUNT  =  KOUNT + KOUNTI                                    MSGO2  110
110         CALL TITLES (2)                                             MSGO2  111
            IF (KOUNT .EQ. KOUNTH) KOUNT = KOUNT + KOUNTI               MSGO2  112
            CALL PLB (1,LSKIPB,ITAPEW)                                  MSGO2  113
            WRITE (ITAPEW,1700)                                         MSGO2  114
            CALL PLB (1,LSKIPA,ITAPEW)                                  MSGO2  115
```

```
      C                                                                 MSG02    2
      C45700, SUB. MSG02 (LIST MESSAGES - VERSION 02)                   MSG02    3
      C                                                                 MSG02    4
            SUBROUTINE MSG02 (KSTEP)                                    MSG02    5
      C                                                                 MSG02    6
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                        MSG02    7
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE MSG02    8
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                 MSG02    9
      C                                                                 MSG02   10
            LTEXT=2                                                     MSG02   11
            GO TO (100, 200, 300, 400, 500,600, 700, 800), KSTEP        MSG02   12
      C                                                                 MSG02   13
      C                                                                 MSG02   14
      C STEP 1                                                          MSG02   15
      C                                                                 MSG02   16
        100 CONTINUE                                                    MSG02   17
            LSKIPA =  0                                                 MSG02   18
            LSKIPB=0                                                    MSG02   19
            KOUNTI =  LSKIPB + LSKIPA + LTEXT                           MSG02   20
            KOUNT  =  KOUNT + KOUNTI                                    MSG02   21
            CALL PLB (1,LSKIPB,ITAPEW)                                  MSG02   22
            CALL TITLES (2)                                             MSG02   23
            IF (KOUNT .EQ. KOUNTH) KOUNT = KOUNT + KOUNTI               MSG02   24
            WRITE (ITAPEW,1100)                                         MSG02   25
            CALL PLB (1,LSKIPA,ITAPEW)                                  MSG02   26
            GO TO 1000                                                  MSG02   27
      C                                                                 MSG02   28
      C STEP 2                                                          MSG02   29
      C                                                                 MSG02   30
        200 CONTINUE                                                    MSG02   31
            LSKIPA =  0                                                 MSG02   32
            LSKIPB =  2                                                 MSG02   33
            KOUNTI =  LSKIPB + LSKIPA + LTEXT                           MSG02   34
            KOUNT  =  KOUNT + KOUNTI                                    MSG02   35
            CALL TITLES (2)                                             MSG02   36
            IF (KOUNT .EQ. KOUNTH) KOUNT = KOUNT + KOUNTI               MSG02   37
            CALL PLB (1,LSKIPB,ITAPEW)                                  MSG02   38
            WRITE (ITAPEW,1200)                                         MSG02   39
            CALL PLB (1,LSKIPA,ITAPEW)                                  MSG02   40
            GO TO 1000                                                  MSG02   41
      C                                                                 MSG02   42
      C                                                                 MSG02   43
      C STEP 3                                                          MSG02   44
      C                                                                 MSG02   45
        300 CONTINUE                                                    MSG02   46
            LSKIPA =  0                                                 MSG02   47
            LSKIPB =  2                                                 MSG02   48
            KOUNTI =  LSKIPB + LSKIPA + LTEXT                           MSG02   49
            KOUNT  =  KOUNT + KOUNTI                                    MSG02   50
            CALL TITLES (2)                                             MSG02   51
            IF (KOUNT .EQ. KOUNTH) KOUNT = KOUNT + KOUNTI               MSG02   52
            CALL PLB (1,LSKIPB,ITAPEW)                                  MSG02   53
            WRITE (ITAPEW,1300)                                         MSG02   54
            CALL PLB (1,LSKIPA,ITAPEW)                                  MSG02   55
            GO TO 1000                                                  MSG02   56
      C                                                                 MSG02   57
```

STATISTICS

PROGRAM LENGTH	532B	346
CM LABELED COMMON LENGTH	227B	151

520000B CM USED

EXTERNALS	TYPE	ARGS	REFERENCES								
MSGO2		1	54	64	73	82	91	101	111	121	
PRMAT1		8	129	133							
PROGNA		2	53	63	72	81	90	100	110	120	126
QBSOL		8	105								
QFACT		8	57								
QFSOL		7	77								
REVERS		6	86	95	114						
TRAN		9	67	124							

STATEMENT LABELS	DEF LINE	REFERENCES
203 100	136	128

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
PLACES	98	0 IUIN1 (1)	1 IUIN2 (1)	2 IUOUT1 (1)
		3 IUOUT2 (1)	4 IUGO1 (1)	5 IUGO2 (1)
		6 IUGO3 (1)	7 IUGO4 (1)	8 IUSCR (1)
		9 IFSCR (1)	10 IFS1 (1)	11 IFS2 (1)
		12 IFS3 (1)	13 IFS4 (1)	14 IUCD (1)
		15 IUPR (1)	16 IUA (1)	17 IFA (1)
		18 IUY (1)	19 IFY (1)	20 IUMEMN (1)
		21 IFMEMN (1)	22 IUSTFN (1)	23 IFSTFN (1)
		24 IUKS (1)	25 IFKS (1)	26 IUB (1)
		27 IFB (1)	28 IUDESO (1)	29 IFDESO (1)
		30 IUMDBI (1)	31 IFMDBI (1)	32 IUADDI (1)
		33 IFADDI (1)	34 IUBALI (1)	35 IFBALI (1)
		36 IUDESI (1)	37 IFDESI (1)	38 IUWTI (1)
		39 IFWTI (1)	40 IUMEMO (1)	41 IFMEMO (1)
		42 IUBT (1)	43 IFBT (1)	44 IUDESN (1)
		45 IFDESN (1)	46 IUMD (1)	47 IFMD (1)
		48 IUMEMF (1)	49 IFMEMF (1)	50 IUSTFO (1)
		51 IFSTFO (1)	52 IUMDB (1)	53 IFMDB (1)
		54 IUADD (1)	55 IFADD (1)	56 IUBAL (1)
		57 IFBAL (1)	58 IUDESF (1)	59 IFDESF (1)
		60 IUWT (1)	61 IFWT (1)	62 IUDUM1 (1)
		63 IFDUM1 (1)	64 IUDUM2 (1)	65 IFDUM2 (1)
		66 IUDUM3 (1)	67 IFDUM3 (1)	68 IUL (1)
		69 IFL (1)	70 IUYT (1)	71 IFYT (1)
		72 IUZ (1)	73 IFZ (1)	74 IUZR (1)
		75 IFZR (1)	76 IULR (1)	77 IFLR (1)
		78 IUBR (1)	79 IFBR (1)	80 IUPHTF (1)
		81 IFPHTF (1)	82 IUMODM (1)	83 IFMODM (1)
		84 IUMODK (1)	85 IFMODK (1)	86 IUPHT (1)
		87 IFPHT (1)	88 IUQT (1)	89 IFQT (1)
		90 IUQ (1)	91 IFQ (1)	92 IUPH (1)
		93 IFPH (1)	94 IUINCM (1)	95 IFINCM (1)
		96 IUINCK (1)	97 IFINCK (1)	
FILE	20	0 IPOS (20)		
CLUEV	21	0 LKLUEV (1)	1 KLUEV (20)	
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
KLUFF	1	0 KFREE (1)		

VARIABLES	SN	TYPE		RELOCATION								
114	IULR	INTEGER		PLACES	REFS	14	94	95	102	105		
56	IUMD	INTEGER		PLACES	REFS	14						
64	IUMDB	INTEGER		PLACES	REFS	14						
36	IUMDBI	INTEGER		PLACES	REFS	14						
60	IUMEMF	INTEGER		PLACES	REFS	14						
24	IUMEMN	INTEGER		PLACES	REFS	14						
50	IUMEMO	INTEGER		PLACES	REFS	14						
124	IUMODK	INTEGER		PLACES	REFS	14						
122	IUMODM	INTEGER		PLACES	REFS	14						
2	IUOUT1	INTEGER		PLACES	REFS	14						
3	IUOUT2	INTEGER		PLACES	REFS	14						
134	IUPH	INTEGER		PLACES	REFS	14						
126	IUPHT	INTEGER		PLACES	REFS	14						
120	IUPHTF	INTEGER		PLACES	REFS	14						
17	IUPR	INTEGER		PLACES	REFS	14	129	133				
132	IUQ	INTEGER		PLACES	REFS	14						
130	IUQT	INTEGER		PLACES	REFS	14						
10	IUSCR	INTEGER		PLACES	REFS	14						
26	IUSTFN	INTEGER		PLACES	REFS	14						
62	IUSTFO	INTEGER		PLACES	REFS	14						
74	IUWT	INTEGER		PLACES	REFS	14						
46	IUWTI	INTEGER		PLACES	REFS	14						
22	IUY	INTEGER		PLACES	REFS	14	62	65	67			
106	IUYT	INTEGER		PLACES	REFS	14	66	67	75	77		
110	IUZ	INTEGER		PLACES	REFS	14	76	77	84	86		
112	IUZR	INTEGER		PLACES	REFS	14	85	86	103	105		
422	JUNITF	INTEGER			REFS	67	124	DEFINED	62	119		
7	KBPAGE	INTEGER		CLIST	REFS	33						
0	KFREE	INTEGER		KLUFF	REFS	35	129	133				
4	KLABEL	INTEGER		CLIST	REFS	33						
420	KLISTM	INTEGER			REFS	57	DEFINED	44				
1	KLUEV	INTEGER	ARRAY	CLUEV	REFS	4	32	43				
0	KORE	INTEGER		F.P.	REFS	57	67	77	86	95	105	114
					124	DEFINED	1					
0	KOUNT	INTEGER		CLIST	REFS	33	DEFINED	46				
11	KOUNTH	INTEGER		CLIST	REFS	33						
12	KOUNTI	INTEGER		CLIST	REFS	33						
1	KPAGE	INTEGER		CLIST	REFS	33						
5	KTPAGE	INTEGER		CLIST	REFS	33						
421	KTYPE	INTEGER			REFS	57	DEFINED	45				
2	LINES	INTEGER		CLIST	REFS	33	46					
10	LINESG	INTEGER		CLIST	REFS	33						
3	LINEST	INTEGER		CLIST	REFS	33						
0	LKLUEV	INTEGER		CLUEV	REFS	32						
437	NAME	INTEGER	*UNDEF		REFS	8						
431	NAMEB	INTEGER	ARRAY		REFS	5	114	DEFINED	42			
433	NAMEBR	INTEGER	ARRAY		REFS	5	105	DEFINED	40			
435	NAMEBT	INTEGER	ARRAY		REFS	5	124	DEFINED	41			
427	NAMELR	INTEGER	ARRAY		REFS	5	95	DEFINED	39			
423	NAMEYT	INTEGER	ARRAY		REFS	5	67	DEFINED	37			
425	NAMEZR	INTEGER	ARRAY		REFS	5	86	DEFINED	38			
6	NPAGE	INTEGER		CLIST	REFS	33						
0	WORK	REAL	ARRAY	F.P.	REFS	8	57	2*67	77	2*86	2*95	105
					2*114	2*124	129	133	DEFINED	1		

```
                COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA   QCHOL     59
               1               ,ITAPET                                             QCHOL     60
60              COMMON /REPORT/ KREPOR                                             QCHOL     61
          C                                                                        QCHOL     62
                EQUIVALENCE (S,T)                                                  QCHOL     63
          C                                                                        QCHOL     64
          ^                                                                        QCHOL     65
65        C FUNCTION DEFINITION                                                    QCHOL     66
                ABSF(X)       =  ABS(X)                                          QCHOL     67
                ALOGCF(X)     =  ALOG10(X)                                       QCHOL     68
                IABSF(I)      =  IABS(I)                                         QCHOL     69
                MAXOF(I,J)    =  MAXO(I,J)                                       QCHOL     70
70              MINOF(I,J)    =  MINO(I,J)                                       QCHOL     71
                SQRTF(X)      =  SQRT(X)                                         QCHOL     72
          C                                                                        QCHOL     73
          C                                                                        QCHOL     74
          C DATA INITIALIZATION                                                    QCHOL     75
75        C                                                                        QCHOL     76
                CALL MESAGE (1,30,30HQCHOL - CHOLESKY FACTORIZATION)               QCHOL     77
                IF (NU .GT. 1) GO TO 80                                            QCHOL     78
                NROWS  =  0                                                        QCHOL     79
                NCOLS  =  6                                                        QCHOL     80
80              KTABLE =  2                                                        QCHOL     81
               80 CONTINUE                                                         QCHOL     82
                DATA HOLD /4HROW ,4H COL,4H    ,4H   V,4HALUE/                     QCHOL     83
                DO 12 IH=1,5                                                       QCHOL     84
                DO 12 JH=1,5                                                       QCHOL     85
85             12 HEAD(IH,JH) = HOLD(IH)                                           QCHOL     86
                CALL PROGNA (4H(QCH,4HOL ))                                        QCHOL     87
                KOLUMN =  5                                                        QCHOL     88
                IF (KREPOR .EQ. YES) KOLUMN = 3                                    QCHOL     89
                IF(KEE.EQ.1) GO TO 101                                             QCHOL     90
90              IF (KLISTM .EQ. YES) KOUNT = LINES                                 QCHOL     91
              101 MP2 = M+2                                                        QCHOL     92
                KEY = 0                                                            QCHOL     93
                LOST = 0                                                           QCHOL     94
                LOLD = 0                                                           QCHOL     95
95              LAG = NU - 1                                                       QCHOL     96
          C                                                                        QCHOL     97
          C                                                                        QCHOL     98
          C READ AND UNPACK STIFFNESS OR FLEXIBILITY MATRIX                        QCHOL     99
          C                                                                        QCHOL    100
100             DO 320  K = NU,M                                                   QCHOL    101
                KP1 = K + 1                                                        QCHOL    102
                CALL GETROW (MI,-1,DUMMY,KOUNTO)                                   QCHOL    103
                LOC    =  MP2 - KOUNTO                                             QCHOL    104
                CALL GETROW (MI,0,X(LOC),KOUNTO)                                   QCHOL    105
105             CALL UNPACK (X(LOC),KOUNTO,X,K,LD)                                 QCHOL    106
                IF(KEE.EQ.1) GO TO 91                                              QCHOL    107
          C                                                                        QCHOL    108
          C                                                                        QCHOL    109
          C LIST STIFFNESS OR FLEXIBILITY MATRIX                                   QCHOL    110
110       C                                                                        QCHOL    111
                IF (KLISTM .EQ. NO) GO TO 115                                      QCHOL    112
                LOC    =  0                                                        QCHOL    113
                J      =  0                                                        QCHOL    114
                JCOLS  =  K                                                        QCHOL    115
```

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115          52 KOL     =  0                                                    QCHOL    116
             55 LOC     =  LOC + 1                                              QCHOL    117
                J       =  J + 1                                                QCHOL    118
                IF (J  GE  JCOLS) GO TO 60                                      QCHOL    119
                IF (    X(LOC)) 60, 55, 60                                      QCHOL    120
120          60 KOL     =  KOL + 1                                              QCHOL    121
                LROW(KOL) =  K                                                  QCHOL    122
                LCOL(KOL) =  J                                                  QCHOL    123
                 ROW(KOL) =  X(LOC)                                             QCHOL    124
                IF (J .EQ. JCOLS) GO TO 65                                      QCHOL    125
125             IF (KOL .LT. KOLUMN) GO TO 55                                   QCHOL    126
             65 JCU     =  KOL                                                  QCHOL    127
                CALL TITLES (2)                                                 QCHOL    128
                IF (K .EQ. 1) KTABLE = 2                                        QCHOL    129
                IF (KTYPE .EQ. 1)                                               QCHOL    130
130            1CALL PTABLE (2,34,34                                            QCHOL    131
               2   HLOWER TRIANGLE OF STIFFNESS MATRIX)                         QCHOL    132
                IF (KTYPE .EQ. 2)                                               QCHOL    133
               1CALL PTABLE (2,36,36                                            QCHOL    134
               2   HLOWER TRIANGLE OF FLEXIBILITY MATRIX)                       QCHOL    135
135             IF (KOUNT .GT. KOUNTH) GO TO 70                                 QCHOL    136
                IF (KTYPE .EQ. 1) WRITE (ITAPEW,2001)                           QCHOL    137
                IF (KTYPE .EQ. 2) WRITE (ITAPEW,2005)                           QCHOL    138
                CALL PLB (1,1,ITAPEW)                                           QCHOL    139
                WRITE (ITAPEW,2002)   ((HEAD(IH,JH),IH=1,5),JH=1,KOLUMN)        QCHOL    140
140             KOUNT  = KOUNT + 3                                              QCHOL    141
             70 CONTINUE                                                        QCHOL    142
                KOUNT  = KOUNT + 1                                              QCHOL    143
                WRITE (ITAPEW,2003) (LROW(KOL), LCOL(KOL), ROW(KOL), KOL=1,JCU) QCHOL    144
                IF (J .LT. JCOLS) GO TO 52                                      QCHOL    145
145          115 CONTINUE                                                       QCHOL    146
          C                                                                     QCHOL    147
          C                                                                     QCHOL    148
          C FORM CHOLESKY DECOMPOSITION OF STIFFNESS OR FLEXIBILITY MATRIX      QCHOL    149
          C                                                                     QCHOL    150
150          91 IF(NU-1) 130,100,130                                            QCHOL    151
            100 IF (LD - K) 120,920,920                                         QCHOL    152
            120 L(K) = K    - LD                                                QCHOL    153
            130 IF (KEY) 170,140,170                                            QCHOL    154
            140 LEST = LOST + L(K)                                              QCHOL    155
155             IF (LEST - KORE) 160,160,150                                    QCHOL    156
            150 KEY = 1                                                         QCHOL    157
            160 LAST = K - 1                                                    QCHOL    158
            170 LOW = KP1 - L(K)                                                QCHOL    159
                LD      =  MAXOF(LOW,NU)                                        QCHOL    160
160             LD1 = LD - 1                                                    QCHOL    161
            180 IF (LD - LAG) 190,230,200                                       QCHOL    162
            190 LATE = LAG                                                      QCHOL    163
                LAG = LD + 1                                                    QCHOL    164
                LDLD = -LDLD                                                    QCHOL    165
165             GO TO 210                                                       QCHOL    166
            200 LATE = LD                                                       QCHOL    167
                LAG = LAG + 1                                                   QCHOL    168
            210 DO 220  I = LAG,LATE                                            QCHOL    169
            220 LDLD = LDLD + L(I)                                              QCHOL    170
170             LDLD    =  IABSF(LDLD)                                          QCHOL    171
            230 II = LDLD                                                       QCHOL    172
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```
                      LARK = LDLD - LD1                                          QCHOL   173
                C     FORM THE INNER PRODUCT                                     QCHOL   174
                      CALL HOTDOT (LD1,1,X,A(LARK),S,LEAST,INC,1)                QCHOL   175
175                   LAG = LD                                                   QCHOL   176
                      I = LD                                                     QCHOL   177
                      INC = L(I) - 1                                             QCHOL   178
                  240 S = -X(I)                                                  QCHOL   179
                      LEAST  =  MAXOF(I-INC,LOW)                                 QCHOL   180
180                   IF (I - LAST) 250,250,260                                  QCHOL   181
                  250 INC = L(I+1) - 1                                           QCHOL   182
                      CALL HOTDOT (LD1,1,X,A(LARK),S,LEAST,INC,3)                QCHOL   183
                      X(I) = -S/A(II)                                            QCHOL   184
                      I = I + 1                                                  QCHOL   185
185                   II = II + L(I)                                             QCHOL   186
                      GO TO 240                                                  QCHOL   187
                  260 IF (KEY) 310,270,310                                       QCHOL   188
                C   KEEP TRACK OF MOST SERIOUS CANCELLATION. QUIT IF IT GETS TOO BAD.  QCHOL   189
                  270 ORIG   =  ABSF(T)                                          QCHOL   190
190                   KJ = LOST                                                  QCHOL   191
                      DO 280  J = LOW,K                                          QCHOL   192
                      KJ = KJ + 1                                                QCHOL   193
                  280 A(KJ) = X(J)                                               QCHOL   194
                      CALL HOTDOT (LD1,1,X,A(LARK),S,LEAST,INC,3)                QCHOL   195
195                   T      = -S                                                QCHOL   196
                      IF (T .LE. ORIG*1.E-7) GO TO 930                           QCHOL   197
                      IF (T / ORIG .GE. WORST) GO TO 290                         QCHOL   198
                      WORST = T / ORIG                                           QCHOL   199
                      INDEX = K                                                  QCHOL   200
200               290 X(I)   =  SQRTF(T)                                         QCHOL   201
                      A(II) = X(I)                                               QCHOL   202
                      LOST = LEST                                                QCHOL   203
                      DO 300  J = KP1,M                                          QCHOL   204
                  300 X(J) = 0.                                                  QCHOL   205
205                   CALL PUTROW (ML,1,X,M)                                     QCHOL   206
                      GO TO 320                                                  QCHOL   207
                  310 CALL PUTROW (MO,1,X,K)                                     QCHOL   208
                  320 CONTINUE                                                   QCHOL   209
                C                                                                QCHOL   210
210             C                                                                QCHOL   211
                C ERROR MESSAGES                                                 QCHOL   212
                C                                                                QCHOL   213
                      NU = LAST + 1                                              QCHOL   214
                      GO TO 990                                                  QCHOL   215
215               920 NIX = 42                                                   QCHOL   216
                      LAFT=LINES-KOUNT                                           QCHOL   217
                      IF(LAFT.LT.3) KOUNT=LINES                                  QCHOL   218
                      CALL TITLES(2)                                             QCHOL   219
                      WRITE(ITAPEW,4) NIX                                        QCHOL   220
220                   WRITE(ITAPEW,921) K                                        QCHOL   221
                      KOUNT=KOUNT+3                                              QCHOL   222
                      GO TO 980                                                  QCHOL   223
                  930 NIX = 43                                                   QCHOL   224
                  980 JND=K                                                      QCHOL   225
225               990 IF (WORST .GE. .001) GO TO 1000                            QCHOL   226
                      I      = -ALOGCF(WORST)                                    QCHOL   227
                      LAFT=LINES-KOUNT                                           QCHOL   228
                      IF(LAFT.LT.2) KOUNT=LINES                                  QCHOL   229
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                      CALL TITLES(2)                                                    QCHOL    230
230                   WRITE(ITAPEW,10) I,INDEX,NAME                                     QCHOL    231
                      KOUNT=KOUNT+2                                                     QCHOL    232
                 1000 IF (NIX.EQ.43) WRITE(ITAPEW,20) K,NAME,T,(X(J),J=1,K)             QCHOL    233
                      CALL MESAGE (2, 5, 5HQCHOL)                                       QCHOL    234
                C                                                                       QCHOL    235
235             C FORMAT STATEMENTS                                                     QCHOL    236
                C                                                                       QCHOL    237
                    4 FORMAT(/,10X,10(1H*),6HERROR ,I4,10(1H*))                         QCHOL    238
                  921 FORMAT(10X, 7HD.O.F. ,I5)                                         QCHOL    239
                   10 FORMAT(/,10X,   27HPROBABLE LOSS OF ACCURACY (,I2,               QCHOL    240
240                   1 24H OR MORE DIGITS) AT STEP,I4,    21H IN SPLITTING MATRIX ,2A4) QCHOL    241
                   20 FORMAT(/,10X,   15HFAILURE AT STEP,I4,                          QCHOL    242
                      1 37H IN CHOLESKY FACTORIZATION OF MATRIX ,2A4,                   QCHOL    243
                      2 50H WHICH MAY NOT BE POSITIVE DEFINITE (AS REQUIRED).,/,10X,    QCHOL    244
                      3 56HTHE CRITICAL ROW IS PRINTED BELOW. LARGE ELEMENT BEFORE ,    QCHOL    245
245                   4 44HDIAGONAL MAY INDICATE A BAD PRINCIPAL MINOR.,/,10X,          QCHOL    246
                      5 55HVARIABLE T IS DIAGONAL ELEMENT MINUS SUM OF SQUARES OF ,     QCHOL    247
                      6 58HEARLIER ELEMENTS. IT SHOULD BE POSITIVE AND NOT TOO SMALL.,  QCHOL    248
                      7 //,10X, 3HT= ,1PE14.6,                                         QCHOL    249
                      8 //,10X,   11HROW FOLLOWS,                                      QCHOL    250
250                   9 //,(10X,1P8E15.6))                                            QCHOL    251
                  2001 FORMAT (10X, 34HLOWER TRIANGLE OF STIFFNESS MATRIX)              QCHOL    252
                  2002 FORMAT (10X, 5(2X, 5A4))                                         QCHOL    253
                  2003 FORMAT (10X, 5(2I5,1P1E12.4))                                    QCHOL    254
                  2005 FORMAT (10X, 36HLOWER TRIANGLE OF FLEXIBILITY MATRIX)            QCHOL    255
255             C                                                                       QCHOL    256
                      RETURN                                                            QCHOL    257
                      END                                                               QCHOL    258
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	QCHOL	39	256

VARIABLES

		SN	TYPE		RELOCATION							
0	A		REAL	ARRAY	F.P.	REFS	50	174	182	183	194		
						DEFINED	39	193	201				
765	DUMMY	*	REAL			REFS	102						
3	H		REAL		PROBSZ	REFS	53						
1015	HEAD		REAL	ARRAY		REFS	48	139	DEFINED	85			
1046	HOLD		REAL	ARRAY		REFS	48	85	DEFINED	82			
1002	I		INTEGER			REFS	169	177	178	179	180	181	183
							184	185	200	201	230	DEFINED	168	176
							184	226					
2	IBANDW		INTEGER		PROBSZ	REFS	53						
7	IDEBUG		INTEGER		PROBSZ	REFS	53						
754	IH		INTEGER			REFS	2*85	139	DEFINED	83	139		
1003	II		INTEGER			REFS	183	185	201	DEFINED	171	185	
1006	INC		INTEGER			REFS	174	179	182	194	DEFINED	177	181
1011	INDEX		INTEGER			REFS	230	DEFINED	199				
2	ITAPEP		INTEGER		COMRWP	REFS	54						

VARIABLES	SN	TYPE		RELOCATION								
7		ITAPET	INTEGER		CTABLE	REFS	58					
1		ITAPEW	INTEGER		COMRWP	REFS	54	138	I/O REFS	136	137	139	143
						219	220	230	232				
771		J	INTEGER			REFS	117	118	122	124	144	193	204
						232	DEFINED	113	117	191	203	232	
772		JCOLS	INTEGER			REFS	118	124	144	DEFINED	114		
774		JCU	INTEGER			REFS	143	DEFINED	126				
755		JH	INTEGER			REFS	85	139	DEFINED	84	139		
1013		JND	* INTEGER			DEFINED	224						
763		K	INTEGER			REFS	101	105	114	121	128	151	2*152
						154	157	158	191	199	207	220	224
						2*232	DEFINED	100					
7		KBPAGE	INTEGER		CLIST	REFS	56						
0		KEE	INTEGER		F.P.	REFS	89	106	DEFINED	39			
0		KEY	INTEGER		F.P.	REFS	153	187	DEFINED	39	92	156	
1010		KJ	INTEGER			REFS	192	193	DEFINED	190	192		
4		KLABEL	INTEGER		CLIST	REFS	56						
0		KLISTM	INTEGER		F.P.	REFS	90	111	DEFINED	39			
773		KOL	INTEGER			REFS	120	121	122	123	125	126	3*143
						DEFINED	115	120	143				
756		KOLUMN	INTEGER			REFS	125	139	DEFINED	87	88		
0		KORE	INTEGER		F.P.	REFS	155	DEFINED	39				
0		KOUNT	INTEGER		CLIST	REFS	56	135	140	142	216	221	227
						231	DEFINED	90	140	142	217	221	228
						231							
11		KOUNTH	INTEGER		CLIST	REFS	56	135					
12		KOUNTI	INTEGER		CLIST	REFS	56						
766		KOUNTO	INTEGER			REFS	102	103	104	105			
1		KPAGE	INTEGER		CLIST	REFS	56						
764		KP1	INTEGER			REFS	158	203	DEFINED	101			
0		KREPOR	INTEGER		REPORT	REFS	60	88					
0		KTABLE	INTEGER		CTABLE	REFS	58	DEFINED	80	128			
5		KTABLO	INTEGER		CTABLE	REFS	58						
5		KTPAGE	INTEGER		CLIST	REFS	56						
0		KTYPE	INTEGER		F.P.	REFS	129	132	136	137	DEFINED	39	
4		K1	INTEGER		PROBSZ	REFS	53						
0		L	INTEGER	ARRAY	F.P.	REFS	50	154	158	169	177	181	185
						DEFINED	39	152					
1012		LAFT	INTEGER			REFS	217	228	DEFINED	216	227		
762		LAG	INTEGER			REFS	161	162	167	168	DEFINED	95	163
						167	175						
1004		LARK	INTEGER			REFS	174	182	194	DEFINED	172		
776		LAST	INTEGER			REFS	180	213	DEFINED	157			
1001		LATE	INTEGER			REFS	168	DEFINED	162	166			
1053		LCOL	INTEGER	ARRAY		REFS	49	143	DEFINED	122			
770		LD	INTEGER			REFS	105	151	152	160	161	163	166
						175	176	DEFINED	159				
761		LDLD	INTEGER			REFS	164	169	170	171	172		
						DEFINED	94	164	169	170			
1000		LD1	INTEGER			REFS	172	174	182	194	DEFINED	160	
1005		LEAST	INTEGER			REFS	174	182	194	DEFINED	179		
775		LEST	INTEGER			REFS	155	202	DEFINED	154			
2		LINES	INTEGER		CLIST	REFS	56	90	216	217	227	228	
10		LINESG	INTEGER		CLIST	REFS	56						
3		LINEST	INTEGER		CLIST	REFS	56						
767		LOC	INTEGER			REFS	104	105	116	119	123		
						DEFINED	103	112	116				

VARIABLES	SN	TYPE	RELOCATION								
760	LOST	INTEGER		REFS	154	190	DEFINED	93	202		
777	LOW	INTEGER		REFS	159	179	191	DEFINED	158		
1060	LROW	INTEGER	ARRAY	REFS	49	143	DEFINED	121			
0	M	INTEGER	F.P.	REFS	91	100	203	205	DEFINED	39	
0	MI	INTEGER	F.P.	REFS	102	104	DEFINED	39			
6	MILSUM	INTEGER	PROBSZ	REFS	53						
0	ML	INTEGER	F.P.	REFS	205	DEFINED	39				
0	MO	INTEGER	F.P.	REFS	207	DEFINED	39				
757	MP2	INTEGER		REFS	103	DEFINED	91				
5	M1	INTEGER	PROBSZ	REFS	53						
0	M2	INTEGER	PROBSZ	REFS	53						
1	N	INTEGER	PROBSZ	REFS	53						
0	NAME	INTEGER	ARRAY F.P.	REFS	50	230	232	DEFINED	39		
3	NCOLS	INTEGER	CTABLE	REFS	58	DEFINED	79				
4	NCOLST	INTEGER	CTABLE	REFS	58						
0	NIX	INTEGER	F.P.	REFS	219	232	DEFINED	39	215	223	
0	NO	INTEGER	CONSTS	REFS	55	111					
6	NPAGE	INTEGER	CLIST	REFS	56						
6	NPAGEA	INTEGER	CTABLE	REFS	58						
1	NPASS	INTEGER	CTABLE	REFS	58						
2	NROWS	INTEGER	CTABLE	REFS	58	DEFINED	78				
0	NU	INTEGER	F.P.	REFS	77	95	100	150	159		
				DEFINED	39	213					
1007	ORIG	REAL		REFS	196	197	198	DEFINED	189		
1065	ROW	REAL	ARRAY	REFS	51	143	DEFINED	123			
1014	S	REAL		REFS	62	174	182	183	194	195	
				DEFINED	178						
1014	T	REAL		REFS	62	189	196	197	198	200	232
				DEFINED	195						
0	WORST	REAL	F.P.	REFS	197	225	226	DEFINED	39	198	
0	X	REAL	ARRAY F.P.	REFS	50	104	2*105	119	123	174	178
				182	193	194	201	205	207	232	
				DEFINED	39	183	200	204			
1	YES	INTEGER	CONSTS	REFS	42	55	88	90			

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS		REFERENCES			
ALOG10	REAL	1	LIBRARY	226			
GETROW		4		102	104		
HOTDOT		8		174	182	194	
MESAGE		3		76	233		
PLB		3		138			
PROGNA		2		86			
PTABLE		3		129	132		
PUTROW		4		205	207		
SQRT	REAL	1	LIBRARY	200			
TITLES		1		127	218	229	
UNPACK		5		105			

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES	
ABS	REAL	1	INTRIN		189	
ABSF	REAL	1	SF	66	189	
ALOGCF	REAL	1	SF	67	226	
IABS	INTEGER	1	INTRIN		170	
IABSF	INTEGER	1	SF	68	170	
MAXO	INTEGER	0	INTRIN		159	179
MAXOF	INTEGER	2	SF	69	159	179

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
MINOF	INTEGER	2	SF	70	
SQRTF	REAL	1	SF	71	200

STATEMENT LABELS				DEF LINE	REFERENCES	
623	4	FMT		237	219	
633	10	FMT		239	230	
0	12			85	83	84
646	20	FMT		241	232	
104	52			115	144	
105	55			116	119	125
112	60			120	118	2*119
123	65			126	124	
165	70			141	135	
15	80			81	77	
207	91			150	106	
0	100		INACTIVE	151	150	
46	101			91	89	
207	115			145	111	
0	120		INACTIVE	152	151	
214	130			153	2*150	
0	140		INACTIVE	154	153	
0	150		INACTIVE	156	155	
223	160			157	2*155	
225	170			158	2*153	
0	180		INACTIVE	161		
0	190		INACTIVE	162	161	
240	200			166	161	
243	210			168	165	
0	220			169	168	
254	230			171	161	
266	240			178	186	
0	250		INACTIVE	181	2*180	
311	260			187	180	
0	270		INACTIVE	189	187	
0	280			193	191	
343	290			200	197	
0	300			204	203	
363	310			207	2*187	
367	320			208	100	206
374	920			215	2*151	
630	921	FMT		238	220	
411	930			223	196	
413	980			224	222	
415	990			225	214	
433	1000			232	225	
720	2001	FMT		251	136	
726	2002	FMT		252	139	
731	2003	FMT		253	143	
734	2005	FMT		254	137	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES			
16	12	IH	83 85	14B		NOT INNER		
24	12	JH	84 85	3B	INSTACK			
55	320	K	100 208	315B		EXT REFS	EXITS	NOT INNER
171		KOL	143 143	12B		EXT REFS		
247	220	I	168 169	3B	INSTACK			
323	280	J	191 193	2B	INSTACK			

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
353	300	J	203 204	2B	INSTACK

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
PROBSZ	8	0 M2 (1)	1 N (1)	2 IBANDW (1)
		3 H (1)	4 K1 (1)	5 M1 (1)
		6 MILSUM (1)	7 IDEBUG (1)	
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CONSTS	2	0 NO (1)	1 YES (1)	
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)
		6 NPAGEA (1)	7 ITAPET (1)	
REPORT	1	0 KREPOR (1)		

EQUIV CLASSES	LENGTH	MEMBERS - BIAS NAME(LENGTH)
S	1	0 T (1)

STATISTICS

PROGRAM LENGTH	1200B	640
CM LABELED COMMON LENGTH	41B	33

520000B CM USED

```
      C45700, SUB. HOTDOT (INNER PRODUCT OF TWO VECTORS)                    * HOTDOT      2
      C                                                                       HOTDOT      3
      C*************************************************************************** HOTDOT      4
      C                                                                     * HOTDOT      5
      C***  SUBROUTINE HOTDOT (LAST  ,INC   ,FIX   ,VARY  ,S     ,LOW      * HOTDOT      6
      C                       ,JUMP  ,KENTRY)                             * HOTDOT      7
      C                                                                     * HOTDOT      8
      C***  OBJECTIVE  ******************************************************** HOTDOT      9
      C     ---------                                                       * HOTDOT     10
      C     FORMS THE INNER PRODUCT OF TWO VECTORS.                         * HOTDOT     11
      C                                                                     * HOTDOT     12
      C***  INPUT/OUTPUT  ***************************************************** HOTDOT     13
      C     ------------                                                    * HOTDOT     14
      C     INPUT CONSISTS OF LOCATION OF THE VECTORS AND ASSOCIATED LENGTHS.* HOTDOT     15
      C     OUTPUT IS THE INNER PRODUCT.                                    * HOTDOT     16
      C                                                                     * HOTDOT     17
      C***  SUMMARY OF SYMBOLS  *********************************************** HOTDOT     18
      C     ------------------                                              * HOTDOT     19
      C                                                                     * HOTDOT     20
      C***  ERROR MESSAGES  *************************************************** HOTDOT     21
      C     --------------                                                  * HOTDOT     22
      C     NONE.                                                           * HOTDOT     23
      C                                                                     * HOTDOT     24
      C*************************************************************************** HOTDOT     25
      C                                                                       HOTDOT     26
            SUBROUTINE HOTDOT (LAST,INC,FIX,VARY,S,LOW,JUMP,KENTRY)           HOTDOT     27
      C                                                                       HOTDOT     28
      CIBM  BEGINNING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS HOTDOT     29
      C     DOUBLE PRECISION S                                                HOTDOT     30
      CIBM  ENDING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS    HOTDOT     31
      C                                                                       HOTDOT     32
            DIMENSION FIX(1)                                                  HOTDOT     33
            DIMENSION VARY(1)                                                 HOTDOT     34
      C                                                                       HOTDOT     35
            GO TO (10,20,30), KENTRY                                          HOTDOT     36
      C                                                                       HOTDOT     37
         10 CONTINUE                                                          HOTDOT     38
            INDEX  =  1                                                       HOTDOT     39
            KEY    =  0                                                       HOTDOT     40
            GO TO 99                                                          HOTDOT     41
      C                                                                       HOTDOT     42
         20 CONTINUE                                                          HOTDOT     43
            INDEX  =  1                                                       HOTDOT     44
            KEY    = -1                                                       HOTDOT     45
            GO TO 99                                                          HOTDOT     46
      C                                                                       HOTDOT     47
         30 CONTINUE                                                          HOTDOT     48
            IF (LOW - LAST) 50, 50, 120                                       HOTDOT     49
         50 IJ     =  INDEX + LOW - 1                                       HOTDOT     50
            IF (KEY) 200, 100, 200                                            HOTDOT     51
        100 DO 110 J=LOW,LAST                                                 HOTDOT     52
            S      =  S + VARY(IJ)*FIX(J)                                     HOTDOT     53
        110 IJ     =  IJ + 1                                                  HOTDOT     54
        120 INDEX  =  INDEX + JUMP                                            HOTDOT     55
            LAST   =  LAST + INC                                              HOTDOT     56
            GO TO 99                                                          HOTDOT     57
        200 DO 210 J=LOW,LAST                                                 HOTDOT     58
```

```
                    FIX(J) =  FIX(J) + VARY(IJ)*S                          HOTDOT     59
                210 IJ     =  IJ + 1                                       HOTDOT     60
      60            GO TO 120                                              HOTDOT     61
                C                                                          HOTDOT     62
                 99 CONTINUE                                               HOTDOT     63
                C                                                          HOTDOT     64
                    RETURN                                                 HOTDOT     65
      65            END                                                    HOTDOT     66
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

35 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	HOTDOT	26	64

VARIABLES	SN	TYPE	RELOCATION									
0	FIX	REAL	ARRAY	F.P.	REFS	32	52	58	DEFINED	26	58	
71	IJ	INTEGER			REFS	52	53	58	59	DEFINED	49	53
					59							
0	INC	INTEGER		F.P.	REFS	55	DEFINED	26				
67	INDEX	INTEGER			REFS	49	54	DEFINED	38	43	54	
72	J	INTEGER			REFS	52	2*58	DEFINED	51	57		
0	JUMP	INTEGER		F.P.	REFS	54	DEFINED	26				
0	KENTRY	INTEGER		F.P.	REFS	35	DEFINED	26				
70	KEY	INTEGER			REFS	50	DEFINED	39	44			
0	LAST	INTEGER		F.P.	REFS	48	51	55	57	DEFINED	26	55
0	LOW	INTEGER		F.P.	REFS	48	49	51	57	DEFINED	26	
0	S	REAL		F.P.	REFS	52	58	DEFINED	26	52		
0	VARY	REAL	ARRAY	F.P.	REFS	33	52	58	DEFINED	26		

STATEMENT LABELS			DEF LINE	REFERENCES		
16	10		37	35		
21	20		42	35		
24	30		47	35		
0	50	INACTIVE	49	2*48		
66	99		62	40	45	56
0	100	INACTIVE	51	50		
0	110		53	51		
45	120		54	48	60	
52	200		57	2*50		
0	210		59	57		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
40	110	J	51 53	4B	INSTACK
61	210	J	57 59	3B	INSTACK

```
STATISTICS
  PROGRAM LENGTH                768B      62
        520000B CM USED
```

```
      C45700, SUB. TRAN (TRANSPOSE OF MATRIX)                                  TRAN        2
      C                                                                        TRAN        3
      C***********************************************************************  TRAN        4
      C                                                                      *  TRAN        5
      C***  SUBROUTINE TRAN    ************************************************  TRAN        6
      C                                                                      *  TRAN        7
      C***  COMPUTER VERSION  ************************************************  TRAN        8
      C     ----------------                                                 *  TRAN        9
      C     IBM .... AS IS.                                                  *  TRAN       10
      C                                                                      *  TRAN       11
      C     CDC .... AS IS.                                                  *  TRAN       12
      C                                                                      *  TRAN       13
      C***  OBJECTIVE  ********************************************************  TRAN       14
      C     ---------                                                        *  TRAN       15
      C     OBTAINS THE TRANSPOSE OF A MATRIX THAT MAY BE TOO LARGE TO FIT   *  TRAN       16
      C     IN CORE.                                                         *  TRAN       17
      C                                                                      *  TRAN       18
      C***  INPUT/OUTPUT  *****************************************************  TRAN       19
      C     ------------                                                     *  TRAN       20
      C     INPUT CONSISTS OF MATRIX TO BE TRANSPOSED. OUTPUT CONSISTS OF    *  TRAN       21
      C     THE TRANSPOSE ON A DIFFERENT TAPE DRIVE.                         *  TRAN       22
      C                                                                      *  TRAN       23
      C***  SUMMARY OF SYMBOLS  ***********************************************  TRAN       24
      C     ------------------                                               *  TRAN       25
      C                                                                      *  TRAN       26
      C***  ERROR MESSAGES  ***************************************************  TRAN       27
      C     --------------                                                   *  TRAN       28
      C     NONE.                                                            *  TRAN       29
      C                                                                      *  TRAN       30
      C***********************************************************************  TRAN       31
      C                                                                        TRAN       32
            SUBROUTINE TRAN (LSIZE,BUFFER,IBUFF,MATRIX,MANS,MTEMP1,MTEMP2      TRAN       33
           1               ,JUNITF,NAMET)                                      TRAN       34
      C                                                                        TRAN       35
      C                                                                        TRAN       36
            DIMENSION BUFFER(LSIZE)                                          TRAN       37
            DIMENSION IPOS(20)                                               TRAN       38
            DIMENSION IBUFF(LSIZE)                                           TRAN       39
            DIMENSION KFMIG(6)                                               TRAN       40
            DIMENSION NAME (2)          ,NAME1(2)           ,NAMET(2)        TRAN       41
      C                                                                        TRAN       42
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE  TRAN       43
           1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                        TRAN       44
            COMMON /FILE  / IPOS                                             TRAN       45
      C                                                                        TRAN       46
      C                                                                        TRAN       47
      C                                                                        TRAN       48
      C INITIAL CONDITIONS                                                     TRAN       49
            CALL PROGNA (4H(TRA,4HN   ))                                     TRAN       50
            CALL MESAGE (1,25,25HTRAN - TRANSPOSE A MATRIX)                  TRAN       51
            CALL TIMEB (11,11HFROM TRAN  )                                   TRAN       52
            ISIZE=LSIZE                                                      TRAN       53
            NFMAT  =  IPOS(MATRIX)                                           TRAN       54
            CALL GEDLAB (8HTRAN  01,MATRIX,NAME  ,NFMAT ,IROW,ICOL)          TRAN       55
            IF (MATRIX .NE. JUNITF) GO TO 1                                  TRAN       56
            CALL GETROW (MATRIX,1,NIGEO,1)                                   TRAN       57
            CALL GETROW (MATRIX,1,NSGEO,1)                                   TRAN       58
```

```
                  CALL GETROW (MATRIX,1,BUFFER,NSGEO)                          TRAN      59
                1 CONTINUE                                                     TRAN      60
60                CALL DVALUE (BUFFER,0.0,LSIZE)                               TRAN      61
                  ASSIGN 24 TO IREAD                                           TRAN      62
                  ASSIGN 70 TO IWRITE                                          TRAN      63
                  JROW=1                                                       TRAN      64
                  ISTART=IROW+1                                                TRAN      65
65                NROW=0                                                       TRAN      66
                  IO=MTEMP1+MTEMP2                                             TRAN      67
                  MOUT=MTEMP1                                                  TRAN      68
                  LOCEMP=ISIZE-IROW                                            TRAN      69
                  INDEX=ISTART                                                 TRAN      70
70          C                                                                  TRAN      71
            C                                                                  TRAN      72
            C BEGIN READING ROWS OF THE MATRIX. NOTE THAT WHEN THE I/O UNITS   TRAN      73
            C MATRIX AND JUNITF ARE THE SAME, ADDITIONAL INFORMATION MUST BE READ. TRAN   74
            C                                                                  TRAN      75
75              2 IF (MATRIX .NE. JUNITF) GO TO 10                             TRAN      76
                  KFMIGC = 0                                                   TRAN      77
                  CALL GETROW (MATRIX,1,KFMIG,6)                               TRAN      78
                  KFMIGX = 0                                                   TRAN      79
                  DO 7 KA=1,6                                                  TRAN      80
80                7 KFMIGX = KFMIGX + (KFMIG(KA) - 1)                          TRAN      81
                 10 CONTINUE                                                   TRAN      82
                  IF (MATRIX .NE. JUNITF) GO TO 11                             TRAN      83
                  KFMIGC = KFMIGC + 1                                          TRAN      84
                  IF (KFMIGC .GT. KFMIGX) GO TO 2                              TRAN      85
85               11 CONTINUE                                                   TRAN      86
            C                                                                  TRAN      87
            C                                                                  TRAN      88
                  CALL GETROW(MATRIX,-1,DUMMY,ICOUNT)                          TRAN      89
                  IF (LOCEMP-ICOUNT-3) 20,12,12                                TRAN      90
90               12 INX=INDEX+2                                                TRAN      91
                  CALL GETROW(MATRIX,0,BUFFER(INX),ICOUNT)                     TRAN      92
                  ICT2=ICOUNT+2                                                TRAN      93
                  LOCEMP=LOCEMP-ICT2                                           TRAN      94
                  IBUFF(INDEX+1)=-INX                                          TRAN      95
95                IBUFF(INDEX)=INDEX+ICT2                                      TRAN      96
                  INDEX=IBUFF(INDEX)                                           TRAN      97
                  NROW=NROW+1                                                  TRAN      98
                  IF (NROW-IROW) 10,20,20                                      TRAN      99
                 20 KROW=NROW                                                  TRAN     100
100         C          HAVE READ IN ALL OR PART OF MATRIX, NOW TRANSPOSE IT    TRAN     101
                  IF (KROW-IROW) 4,6, 6                                        TRAN     102
                4 NFMOUT =  IPOS(MOUT)                                         TRAN     103
                  CALL PUDLAB (8HTRAN  01,MOUT  ,NAME  ,NFMOUT,ICOL,IROW)      TRAN     104
                  GO TO 8                                                      TRAN     105
105               6 ASSIGN 80 TO IWRITE                                        TRAN     106
                  NFMANS =  IPOS(MANS)                                         TRAN     107
                  CALL PUDLAB (8HTRAN  02,MANS  ,NAMET ,NFMANS,ICOL,IROW)      TRAN     108
                8     CONTINUE                                                 TRAN     109
                  NCOL=0                                                       TRAN     110
110              22 NCOL=NCOL+1                                                TRAN     111
                  GO TO IREAD,(24,26)                                          TRAN     112
                 24 DO 25 J=1,IROW                                             TRAN     113
                 25 BUFFER(J)=0.                                               TRAN     114
                  GO TO 30                                                     TRAN     115
```

```
115            26 CALL GETROW(MIN,1,BUFFER,IROW)                                  TRAN      116
               30 INDEX=ISTART                                                    TRAN      117
                  DO 65 NROW=JROW,KROW                                            TRAN      118
                  INX=INDEX+2                                                     TRAN      119
                  IPT=IBUFF(INDEX+1)                                              TRAN      120
120               IF (IPT) 55, 35,35                                              TRAN      121
               35     CONTINUE                                                    TRAN      122
               C      IPT IS POINTING TO DATA                                     TRAN      123
                  BUFFER(NROW)=BUFFER(IPT)                                        TRAN      124
                  IPT=IPT+1                                                       TRAN      125
125               JPT=IBUFF(INX)                                                  TRAN      126
                  IF (JPT) 40, 50,50                                              TRAN      127
               40     CONTINUE                                                    TRAN      128
               C      JPT IS POINTING TO A COUNT OTHER THAN THE FIRST             TRAN      129
                  JPT=-JPT                                                        TRAN      130
130            42 IF (IPT.LE.(JPT+IBUFF(JPT))) GO TO 45                           TRAN      131
               43 IBUFF(INDEX+1)=-IPT                                             TRAN      132
                  IBUFF(INX)=-IPT                                                 TRAN      133
                  GO TO 65                                                        TRAN      134
               45 IBUFF(INDEX+1)=IPT                                              TRAN      135
135               GO TO 65                                                        TRAN      136
               50   CONTINUE                                                     TRAN      137
               C      JPT IS FIRST COUNT                                          TRAN      138
                  JPT=INX                                                         TRAN      139
                  GO TO 42                                                        TRAN      140
140            55     CONTINUE                                                    TRAN      141
               C      IPT IS POINTING TO A COUNT                                  TRAN      142
                  IPT=-IPT                                                        TRAN      143
                  IF (IBUFF(IPT)) 58, 62,62                                       TRAN      144
               58 BUFFER(NROW)=0                                                  TRAN      145
145               IBUFF(IPT)=IBUFF(IPT)+1                                         TRAN      146
                  IF (IBUFF(IPT)) 65,60, 60                                       TRAN      147
               60 IPT=IPT+1                                                       TRAN      148
                  GO TO 43                                                        TRAN      149
               62 IF (IPT.NE.INX) IBUFF(INX)=-IPT                                 TRAN      150
150               IPT=IPT+1                                                       TRAN      151
                  GO TO 35                                                        TRAN      152
               65 INDEX=IBUFF(INDEX)                                              TRAN      153
               C      LOOP ENDING AT 65 GENERATES ALL OR PART OF A ROW OF ANSWER   TRAN      154
                  GO TO IWRITE,(70,80)                                            TRAN      155
155            70 CALL PUTROW(MOUT,1,BUFFER,IROW)                                 TRAN      156
                  IF (NCOL.LT.ICOL) GO TO 22                                      TRAN      157
               C      WRITING AN END OF FILE AND USING FILTAP MAY BE INEFFICIENT  TRAN      158
                  IF(JROW.GT.1) CALL DCLOSE(MIN)                                  TRAN      159
                  MIN=MOUT                                                        TRAN      160
160               ASSIGN 26 TO IREAD                                              TRAN      161
                  MOUT=IO-MIN                                                     TRAN      162
                  NFMIN = IPOS(MIN)                                               TRAN      163
                  CALL GEDLAB (8HTRAN  02,MIN   ,NAME1 ,NFMIN ,J   ,L   )        TRAN      164
                  JROW=KROW+1                                                     TRAN      165
165               NROW=KROW                                                       TRAN      166
                  INDEX=ISTART                                                    TRAN      167
                  LOCEMP=ISIZE-IROW                                               TRAN      168
                  GO TO 12                                                        TRAN      169
               80     CONTINUE                                                    TRAN      170
170               CALL PUTROW(MANS,1,BUFFER,IROW)                                 TRAN      171
                  IF (NCOL.LT.ICOL) GO TO 22                                      TRAN      172
```

```
EXTERNALS           TYPE   ARGS       REFERENCES
      GETROW                 4            36

STATEMENT LABELS              DEF LINE   REFERENCES
    0  100          INACTIVE      35         34
    0  110                        36         35
   20  120                        37        2*34

LOOPS  LABEL    INDEX      FROM-TO    LENGTH    PROPERTIES
   11  110      I            35 36       7B              EXT REFS

STATISTICS
  PROGRAM LENGTH                 358       29
          520000B CM USED
```

```
      C45700. SUB. QPASS (DUMMY READ LOWER TRIANGLE OF DECOMPOSITION OF STIFF) QPASS       2
      C                                                                        QPASS       3
      C*************************************************************************QPASS       4
      C                                                                       * QPASS       5
      C***  SUBROUTINE QPASS  (NU    ,ML    ,T) ***************************** QPASS       6
      C                                                                       * QPASS       7
      C***  OBJECTIVE  ********************************************************* QPASS       8
      C     ---------                                                         * QPASS       9
      C     DUMMY READS OVER THE REQUIRED NUMBER OF ROWS OF THE LOWER         * QPASS      10
      C     TRIANGLE DECOMPOSITION OF THE STIFFNESS MATRIX TO AID IN ZONING   * QPASS      11
      C     FOR THE FORWARD SOLUTION.                                         * QPASS      12
      C                                                                       * QPASS      13
      C***  INPUT/OUTPUT  ******************************************************* QPASS      14
      C     ------------                                                      * QPASS      15
      C     THIS SUBROUTINE USES THE STARTING POINT NU FOR THE ZONING OF THE  * QPASS      16
      C     FORWARD SOLUTION, AND A SCRATCH ARRAY T INTO WHICH A ROW AT A     * QPASS      17
      C     TIME OF THE LOWER TRIANGLE, RESIDING ON ML, IS TO BE DUMMY READ.  * QPASS      18
      C                                                                       * QPASS      19
      C***  SUMMARY OF SYMBOLS  ************************************************ QPASS      20
      C     ------------------                                                * QPASS      21
      C                                                                       * QPASS      22
      C***  ERROR MESSAGES  ****************************************************** QPASS      23
      C     --------------                                                    * QPASS      24
      C     NONE.                                                               QPASS      25
      C                                                                       * QPASS      26
      C*************************************************************************QPASS      27
      C                                                                         QPASS      28
            SUBROUTINE QPASS(NU,ML,T)                                           QPASS      29
      C                                                                         QPASS      30
      C                                                                         QPASS      31
            DIMENSION T(1)                                                      QPASS      32
      C                                                                         QPASS      33
            NEW = NU - 1                                                        QPASS      34
            IF (NEW) 120,120,100                                                QPASS      35
        100 DO 110  I = 1,NEW                                                   QPASS      36
        110 CALL GETROW(ML,0,T,N)                                               QPASS      37
        120 RETURN                                                              QPASS      38
            END                                                                 QPASS      39
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	QPASS	28	37

VARIABLES		SN	TYPE		RELOCATION						
30	I	*	INTEGER			DEFINED	35				
0	ML		INTEGER		F.P.	REFS	36	DEFINED	28		
31	N	*	INTEGER			REFS	36				
27	NEW		INTEGER			REFS	34	35	DEFINED	33	
0	NU		INTEGER		F.P	REFS	33	DEFINED	28		
0	T		REAL	ARRAY	F.P	REFS	31	36	DEFINED	28	

STATEMENT LABELS			DEF LINE	REFERENCES	
0	200	INACTIVE	90	89	
215	220		92	62	2*89
0	230	INACTIVE	94		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
20	100	I	48 51	21B		EXT REFS NOT INNER
33	100	J	50 51	2B	INSTACK	
42	140	K	52 59	17B		NOT INNER
46	130	I	54 58	10B	OPT	EXITS
65	220	I	62 92	133B		EXT REFS NOT INNER
102	146	J	65 66	2B	INSTACK	
142	180	K	75 84	30B		EXT REFS
200	190	K	85 86	2B	INSTACK	

STATISTICS

PROGRAM LENGTH	404B	260

520000B CM USED

VARIABLES	SN	TYPE	RELOCATION									
307	JOLT	INTEGER			REFS	88	DEFINED	47	91			
312	K	INTEGER			REFS	53	55	56	76	77	83	2*86
					DEFINED	52	75	85				
316	KOUNT	INTEGER			REFS	67	68	69	70			
0	L	INTEGER	ARRAY	F.P.	REFS	36	53	77	DEFINED	29	56	
306	LAST	INTEGER			REFS	63	81	89	93	DEFINED	46	
305	LATE	INTEGER			REFS	46	74	78	DEFINED	45		
320	LEAD	INTEGER			REFS	70	74					
323	LEAST	INTEGER			REFS	72	79	DEFINED	78			
326	LK	INTEGER			REFS	78	DEFINED	77				
317	LOC	INTEGER			REFS	69	70	DEFINED	68			
325	LOW	INTEGER			REFS	78	DEFINED	74				
0	M	INTEGER		F.P.	REFS	43	53	62	DEFINED	29		
304	MADZ	INTEGER			REFS	46	48	54	DEFINED	44		
0	MI	INTEGER		F.P.	REFS	49	64	DEFINED	29			
0	MIDZ	INTEGER		F.P.	REFS	36	44	71	72	79		
					DEFINED	29						
0	ML	INTEGER		F.P.	REFS	67	69	DEFINED	29			
0	MO	INTEGER		F.P.	REFS	90	DEFINED	29				
303	MP2	INTEGER			REFS	68	DEFINED	43				
0	MZ	INTEGER		F.P.	REFS	60	DEFINED	29				
0	N	INTEGER		F.P.	REFS	49	50	52	64	65	75	85
					87	DEFINED	29					
0	NU	INTEGER		F.P.	REFS	45	62	72	79	DEFINED	29	93
327	R	REAL			REFS	82	83	DEFINED	80	82		
322	S	REAL			REFS	72	79	80	DEFINED	76		
0	T	REAL	ARRAY	F.P.	REFS	36	49	51	64	66	69	2*70
					72	73	79	87	DEFINED	29	86	
324	X	REAL			REFS	82	DEFINED	73				
0	Z	REAL	ARRAY	F.P.	REFS	36	55	72	76	79	86	
					DEFINED	29	51	66	83			

EXTERNALS	TYPE	ARGS	REFERENCES			
GETROW		4	49	64	67	69
HOTDOT		8	72	79		
PUTROW		4	87			
UNPACK		5	70			

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES	
MAXO	INTEGER	0	INTRIN		74	78
MAXOF	INTEGER	2	SF	40	74	78
MINO	INTEGER	0	INTRIN		71	
MINOF	INTEGER	2	SF	41	71	

STATEMENT LABELS			DEF LINE	REFERENCES	
0	100		51	48	50
0	110	INACTIVE	54	53	
0	120	INACTIVE	56	2*55	
53	130		58	54	55
56	140		59	52	2*53 57
0	143	INACTIVE	64	63	
0	146		66	65	
105	150		67	2*63	
0	160	INACTIVE	82	2*81	
164	170		83	81	
0	180		84	75	
0	190		86	85	

```
                130 CONTINUE                                                    QFOR       59
                140 CONTINUE                                                    QFOR       60
     60             IT = MZ                                                     QFOR       61
                    IN = 1                                                      QFOR       62
                    DO 220  I = NU,M                                            QFOR       63
                    IF (I - LAST) 150,150,143                                   QFOR       64
                143 CALL GETROW (MI,1,T,N)                                      QFOR       65
     65             DO 146  J = 1,N                                             QFOR       66
                146 Z(IN,J) = T(J)                                              QFOR       67
                150 CALL GETROW (ML,-1,DUMMY,KOUNT)                             QFOR       68
                    LOC = MP2 - KOUNT                                           QFOR       69
                    CALL GETROW (ML,0,T(LOC),KOUNT)                             QFOR       70
     70             CALL UNPACK(T(LOC),KOUNT,T,I,LEAD)                          QFOR       71
                    IN1    =  MINOF(IN,MIDZ) - 1                                QFOR       72
                    CALL HOTDOT (IN1,0,T(NU),Z,S,LEAST,MIDZ,1)                  QFOR       73
                    X = T(I)                                                    QFOR       74
                    LOW    =  MAXOF(0,LEAD-LATE) + 1                            QFOR       75
     75             DO 180  K = 1,N                                             QFOR       76
                    S = -Z(IN,K)                                                QFOR       77
                    LK = L(K)                                                   QFOR       78
                    LEAST  =  MAXOF(LOW,LK-LATE)                                QFOR       79
                    CALL HOTDOT (IN1,0,T(NU),Z,S,LEAST,MIDZ,3)                  QFOR       80
     80             R      = -S                                                 QFOR       81
                    IF (I - LAST) 160,160,170                                   QFOR       82
                160 R = R / X                                                   QFOR       83
                170 Z(IN,K) = R                                                 QFOR       84
                180 CONTINUE                                                    QFOR       85
     85             DO 190  K = 1,N                                             QFOR       86
                190 T(K) = Z(IN,K)                                              QFOR       87
                    CALL PUTROW (IT,1,T,N)                                      QFOR       88
                    IN = IN + JOLT                                              QFOR       89
                    IF (I - LAST) 220,200,220                                   QFOR       90
     90         200 IT = MO                                                     QFOR       91
                    JOLT = 0                                                    QFOR       92
                220 CONTINUE                                                    QFOR       93
                    NU = LAST + 1                                               QFOR       94
                230 RETURN                                                      QFOR       95
     95             END                                                         QFOR       96
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

3	QFOR	29 94

VARIABLES

		SN	TYPE	RELOCATION							
315	DUMMY	*	REAL	REFS	67						
310	I		INTEGER	REFS	51	55	56	63	70	73	81
				89	DEFINED	48	54	62			
314	IN		INTEGER	REFS	66	71	76	83	86	88	
				DEFINED	61	88					
321	IN1		INTEGER	REFS	72	79	DEFINED	71			
313	IT		INTEGER	REFS	87	DEFINED	60	90			
311	J		INTEGER	REFS	2*51	2*66	DEFINED	50	65		

```
      C45700, SUB. QFOR  (COMPUTE THE FORWARD SOLUTION OF TRIANGULAR MATRIX)   QFOR      2
      C                                                                        QFOR      3
      C*************************************************************************QFOR      4
      C                                                                       * QFOR      5
      C***  SUBROUTINE QFOR   (T     ,Z     ,L     ,M     ,N     ,NU        * QFOR      6
      C                       ,MIDZ  ,ML    ,MZ    ,MI    ,MO)              * QFOR      7
      C                                                                       * QFOR      8
      C***  OBJECTIVE  ********************************************************QFOR      9
      C     ---------                                                         * QFOR     10
      C     COMPUTES THE FORWARD SOLUTION OF L TRANSPOSE TIMES X = L INVERSE * QFOR     11
      C     TIMES Y = Z.  IT IS CALLED BY QFSOL EVERY TIME THAT THE AVAILABLE* QFOR     12
      C     CORE MUST BE ZONED.                                               * QFOR     13
      C                                                                       * QFOR     14
      C***  INPUT/OUTPUT  *****************************************************QFOR     15
      C     ------------                                                      * QFOR     16
      C     THIS SUBROUTINE USES THE LOWER TRIANGLE DECOMPOSITION OF THE      * QFOR     17
      C     TOTAL STIFFNESS MATRIX, RESIDING ON ML, AND THE APPLIED LOADS ON  * QFOR     18
      C     MY, TO PRODUCE THE INTERMEDIATE Z MATRIX ON MZ.                   * QFOR     19
      C                                                                       * QFOR     20
      C***  SUMMARY OF SYMBOLS  ***********************************************QFOR     21
      C     ------------------                                                * QFOR     22
      C                                                                       * QFOR     23
      C***  ERROR MESSAGES  ***************************************************QFOR     24
      C     --------------                                                    * QFOR     25
      C     NONE.                                                             QFOR     26
      C                                                                       * QFOR     27
      C*************************************************************************QFOR     28
      C                                                                        QFOR     29
            SUBROUTINE QFOR (T,Z,L,M,N,NU,MIDZ,ML,MZ,MI,MO)                    QFOR     30
      C                                                                        QFOR     31
      C                                                                        QFOR     32
      CIBM  BEGINNING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS QFOR     33
      C     DOUBLE PRECISION S                                                 QFOR     34
      CIBM  ENDING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS    QFOR     35
      C                                                                        QFOR     36
            DIMENSION T(1),Z(MIDZ,1),L(1)                                      QFOR     37
      C                                                                        QFOR     38
      C                                                                        QFOR     39
      C FUNCTION DEFINITION                                                    QFOR     40
            MAXOF(I,J)    =  MAXO(I,J)                                         QFOR     41
            MINOF(I,J)    =  MINO(I,J)                                         QFOR     42
      C                                                                        QFOR     43
            MP2 = M + 2                                                        QFOR     44
            MADZ = MIDZ - 1                                                    QFOR     45
            LATE = NU - 1                                                      QFOR     46
            LAST = MADZ + LATE                                                 QFOR     47
            JOLT = 1                                                           QFOR     48
            DO 100  I =1,MADZ                                                  QFOR     49
            CALL GETROW (MI,1,T,N)                                             QFOR     50
            DO 100  J = 1,N                                                    QFOR     51
        100 Z(I,J) = T(J)                                                      QFOR     52
            DO 140  K = 1,N                                                    QFOR     53
            IF (L(K) - M) 140,140,110                                          QFOR     54
        110 DO 130  I = 1,MADZ                                                 QFOR     55
            IF (Z(I,K)) 120,130,120                                            QFOR     56
        120 L(K) = I                                                           QFOR     57
            GO TO 110                                                          QFOR     58
```

STATEMENT LABELS			DEF LINE	REFERENCES			
365	4	FMT	132	112	119		
371	5	FMT	133	97			
0	40	INACTIVE	69	68			
0	50	INACTIVE	70	69			
0	60	INACTIVE	71	70			
0	70	INACTIVE	72	71			
0	100	INACTIVE	76	2*75			
0	110		81	80			
73	120		86	106			
0	130	INACTIVE	92				
0	140	INACTIVE	94	2*93			
147	160		107	93			
150	920		108	75			
163	940		115	2*68	2*69	2*70	2*71
176	1000		121	107	114		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
57	110	I	80 81	2B	INSTACK

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
FILE	1	0 IPOS (1)		
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CONSTS	2	0 NO (1)	1 YES (1)	
CIDIV	1	0 IDIV (1)		

STATISTICS

PROGRAM LENGTH	477B	319
CM LABELED COMMON LENGTH	22B	18

52000B CM USED

VARIABLES	SN	TYPE		RELOCATION							
					DEFINED	74	83	92			
2	LINES	INTEGER		CLIST	REFS	45	94	95	109	110	116	117
10	LINESG	INTEGER		CLIST	REFS	45						
3	LINEST	INTEGER		CLIST	REFS	45						
423	LOVE	INTEGER			REFS	86	DEFINED	82				
406	M	INTEGER			REFS	65	68	69	70	72	83	85
					89	91						
433	MATNAM	INTEGER	ARRAY		REFS	39	65	104				
435	MATNAN	INTEGER	ARRAY		REFS	39	85	DEFINED	62			
437	MATNAP	INTEGER	ARRAY		REFS	39	89	102	DEFINED	63		
407	MC	INTEGER			REFS	65	69	102	104			
417	MI	INTEGER			REFS	91	100	101	102	DEFINED	77	99
0	ML	INTEGER		F.P.	REFS	64	65	91	103	104	105	122
					DEFINED	34						
420	MO	INTEGER			REFS	88	89	91	99	DEFINED	78	100
411	MR	INTEGER			REFS	67	70	91	DEFINED	87		
0	MY	INTEGER		F.P.	REFS	66	67	77	123	DEFINED	34	
0	MZ	INTEGER		F.P.	REFS	84	85	91	124	DEFINED	34	
0	M1	INTEGER		F.P.	REFS	76	78	125	DEFINED	34		
0	M2	INTEGER		F.P.	REFS	76	126	DEFINED	34			
412	N	INTEGER			REFS	67	71	72	73	74	75	82
					85	89	91					
441	NAME1	INTEGER	ARRAY		REFS	40	67					
431	NC	INTEGER			REFS	102	104					
430	NFILMI	INTEGER			REFS	102	DEFINED	101				
405	NFILML	INTEGER			REFS	65	104	DEFINED	64	103		
426	NFILMO	INTEGER			REFS	89	DEFINED	88				
410	NFILMY	INTEGER			REFS	67	DEFINED	66				
424	NFILMZ	INTEGER			REFS	85	DEFINED	84				
0	NO	INTEGER		CONSTS	REFS	47						
6	NPAGE	INTEGER		CLIST	REFS	45						
421	NU	INTEGER			REFS	91	105	DEFINED	79			
0	T	REAL	ARRAY	F.P.	REFS	41	3*91	105	DEFINED	34	81	
1	YES	INTEGER		CONSTS	REFS	36	47					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES				
DCLOSE		1	122	123	124	125	126
GEDLAB		6	65	67	102	104	
MESAGE		3	59	128			
PROGNA		2	58				
PUDLAB		6	85	89			
QFOR		11	91				
QPASS		3	105				
TIMEB		2	60	127			
TITLES		1	96	111	118		

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
IABS	INTEGER	1	INTRIN		68
IABSF	INTEGER	1	SF	52	68
MAXO	INTEGER	0	INTRIN		72
MAXOF	INTEGER	2	SF	53	72
MINO	INTEGER	0	INTRIN		86
MINOF	INTEGER	2	SF	54	86

```
                940 IND=37                                                    QFSOL   116
                    LAFT=LINES-KOUNT                                          QFSOL   117
                    IF(LAFT.LT.2) KOUNT=LINES                                 QFSOL   118
                    CALL TITLES(2)                                            QFSOL   119
                    WRITE(ITAPEW,4) IND                                       QFSOL   120
                    KOUNT=KOUNT+2                                             QFSOL   121
               1000 CONTINUE                                                  QFSOL   122
                    CALL DCLOSE (ML)                                          QFSOL   123
                    CALL DCLOSE (MY)                                          QFSOL   124
                    CALL DCLOSE (MZ)                                          QFSOL   125
                    CALL DCLOSE (M1)                                          QFSOL   126
                    CALL DCLOSE (M2)                                          QFSOL   127
                    CALL TIMEB (10,10HFROM QFSOL)                             QFSOL   128
                    CALL MESAGE (2, 5, 5HQFSOL)                               QFSOL   129
              C                                                               QFSOL   130
              C FORMAT STATEMENTS                                             QFSOL   131
              C                                                               QFSOL   132
                  4 FORMAT(/,10X,10(1H*),5HERROR,I4,10(1H*))                  QFSOL   133
                  5 FORMAT(/,10X,   36HTOTAL MATRIX EXCEEDS STORAGE IN CORE)  QFSOL   134
              C                                                               QFSOL   135
                    RETURN                                                    QFSOL   136
                    END                                                       QFSOL   137
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	QFSOL	34	135

VARIABLES	SN	TYPE		RELOCATION								
351	BLANK	REAL			REFS	81	DEFINED	61				
422	I	INTEGER			REFS	81	DEFINED	80				
0	IDIV	INTEGER		CIDIV	REFS	48	73					
432	IND	INTEGER			REFS	112	119	DEFINED	108	115		
416	IO	INTEGER			REFS	100	DEFINED	76				
0	IPOS	INTEGER	ARRAY	FILE	REFS	38	43	64	66	84	88	101
					103							
2	ITAPEP	INTEGER		COMRWP	REFS	44						
0	ITAPER	INTEGER		COMRWP	REFS	44						
1	ITAPEW	INTEGER		COMRWP	REFS	44	I/O REFS	97	112	119		
7	KBPAGE	INTEGER		CLIST	REFS	45						
4	KLABEL	INTEGER		CLIST	REFS	45						
0	KORE	INTEGER		F.P.	REFS	41	73	80	DEFINED	34		
0	KOUNT	INTEGER		CLIST	REFS	45	94	98	109	113	116	120
					DEFINED	95	98	110	113	117	120	
11	KOUNTH	INTEGER		CLIST	REFS	45						
12	KOUNTI	INTEGER		CLIST	REFS	45						
1	KPAGE	INTEGER		CLIST	REFS	45						
425	KR	INTEGER			REFS	87	92	DEFINED	86			
5	KTPAGE	INTEGER		CLIST	REFS	45						
427	LAFT	INTEGER			REFS	95	110	117	DEFINED	94	109	116
413	LARGE	INTEGER			REFS	74	91	DEFINED	72			
414	LEAVE	INTEGER			REFS	74	80	91	DEFINED	73		
415	LEFT	INTEGER			REFS	75	82	86	92	93		

```
                      CALL PROGNA (4H(QFS,4HOL ))                                  QFSOL      59
                      CALL MESAGE (1,32,32HQFSOL - MANAGES FORWARD SOLUTION)       QFSOL      60
60                    CALL TIMEB (11,11HFROM QFSOL )                               QFSOL      61
                      DATA BLANK /4H    /                                          QFSOL      62
                      DATA MATNAN/4HZ-MA,4HTRIX/                                   QFSOL      63
                      DATA MATNAP/4HSCRA,4HTCHI/                                   QFSOL      64
                      NFILML =  IPOS(ML)                                           QFSOL      65
65                    CALL GEDLAB (8HQFSOL 01,ML,MATNAM,NFILML,M ,MC)              QFSOL      66
                      NFILMY =  IPOS(MY)                                           QFSOL      67
                      CALL GEDLAB (8HQFSOL 02,MY,NAME1 ,NFILMY,MR,N )              QFSOL      68
                      IF (IABSF(M-8192) - 8192) 40, 940, 940                       QFSOL      69
                   40 IF (M - MC) 940,50,940                                       QFSOL      70
70                 50 IF (M - MR) 940,60,940                                       QFSOL      71
                   60 IF (N) 940,940,70                                            QFSOL      72
                   70 LARGE  =  MAXOF(M,N) + 2                                     QFSOL      73
                      LEAVE = KORE - N/IDIV                                        QFSOL      74
                      LEFT = LEAVE - LARGE - N                                     QFSOL      75
75                    IF (LEFT - N) 920,100,100                                    QFSOL      76
                  100 IO = M1 + M2                                                 QFSOL      77
                      MI = MY                                                      QFSOL      78
                      MO = M1                                                      QFSOL      79
                      NU = 1                                                       QFSOL      80
80                    DO 110  I = LEAVE,KORE                                       QFSOL      81
                  110 T(I) = BLANK                                                 QFSOL      82
                      LOVE = LEFT / N                                              QFSOL      83
                      LEFT = M                                                     QFSOL      84
                      NFILMZ =  IPOS(MZ)                                           QFSOL      85
85                    CALL PUDLAB (8HQFSOL 01,MZ,MATNAN,NFILMZ,M ,N )              QFSOL      86
                  120 KR     =  MINOF(LEFT,LOVE)                                   QFSOL      87
                      MR = KR + 1                                                  QFSOL      88
                      NFILMO =  IPOS(MO)                                           QFSOL      89
                      CALL PUDLAB (8HQFSOL 02,MO,MATNAP,NFILMO,M ,N )              QFSOL      90
90              C     ACTUAL COMPUTATION OF THE FORWARD SOLUTION                   QFSOL      91
                      CALL QFOR (T,T(LARGE),T(LEAVE),M,N,NU,MR,ML,MZ,MI,MO)        QFSOL      92
                  130 LEFT = LEFT - KR                                             QFSOL      93
                      IF (LEFT) 140,160,140                                        QFSOL      94
                  140 LAFT=LINES-KOUNT                                             QFSOL      95
95                    IF(LAFT.LT.2) KOUNT=LINES                                    QFSOL      96
                      CALL TITLES(2)                                               QFSOL      97
                      WRITE(ITAPEW,5)                                              QFSOL      98
                      KOUNT=KOUNT+2                                                QFSOL      99
                      MI = MO                                                      QFSOL     100
100                   MO = IO - MI                                                 QFSOL     101
                      NFILMI =  IPOS(MI)                                           QFSOL     102
                      CALL GEDLAB (8HQFSOL 03,MI,MATNAP,NFILMI,MC,NC)              QFSOL     103
                      NFILML =  IPOS(ML)                                           QFSOL     104
                      CALL GEDLAB (8HQFSOL 04,ML,MATNAM,NFILML,MC,NC)              QFSOL     105
105                   CALL QPASS (NU,ML,T)                                         QFSOL     106
                      GO TO 120                                                    QFSOL     107
                  160 GO TO 1000                                                   QFSOL     108
                  920 IND=53                                                       QFSOL     109
                      LAFT=LINES-KOUNT                                             QFSOL     110
110                   IF(LAFT.LT.2) KOUNT=LINES                                    QFSOL     111
                      CALL TITLES(2)                                               QFSOL     112
                      WRITE(ITAPEW,4) IND                                          QFSOL     113
                      KOUNT=KOUNT+2                                                QFSOL     114
                      GO TO 1000                                                   QFSOL     115
```

```
      C45700, SUB. QFSOL (MANAGES ZONING FOR FORWARD SOLUTION OF TRIANG. M.)   QFSOL     2
      C                                                                        QFSOL     3
      C*************************************************************************QFSOL     4
      C                                                                       * QFSOL     5
      C***  SUBROUTINE QFSOL  (ML    ,MY    ,MZ    ,M1    ,M2) **************** QFSOL     6
      C                                                                       * QFSOL     7
      C***  COMPUTER VERSION  ************************************************* QFSOL     8
      C     ----------------                                                  * QFSOL     9
      C     IBM .... AS IS.                                                   * QFSOL    10
      C                                                                       * QFSOL    11
      C     CDC .... AS IS.                                                   * QFSOL    12
      C                                                                       * QFSOL    13
      C***  OBJECTIVE  ********************************************************* QFSOL    14
      C     ---------                                                         * QFSOL    15
      C     SETS UP AND MANAGES THE ZONING FOR THE FORWARD SOLUTION OF L      * QFSOL    16
      C     TRANSPOSE TIMES X = L INVERSE TIMES Y = Z USING L, AND Y, GETTING* QFSOL    17
      C     Z.                                                                * QFSOL    18
      C                                                                       * QFSOL    19
      C***  INPUT/OUTPUT  ******************************************************* QFSOL    20
      C     ------------                                                      * QFSOL    21
      C     THIS SUBROUTINE USES THE LOWER TRIANGLE DECOMPOSITION OF THE      * QFSOL    22
      C     STIFFNESS MATRIX, RESIDING ON ML, AND THE APPLIED LOADS ON MY,    * QFSOL    23
      C     TO PRODUCE THE Z MATRIX ON MZ.                                    * QFSOL    24
      C                                                                       * QFSOL    25
      C***  SUMMARY OF SYMBOLS  ************************************************ QFSOL    26
      C     ------------------                                                * QFSOL    27
      C                                                                       * QFSOL    28
      C***  ERROR MESSAGES  ***************************************************** QFSOL    29
      C     --------------                                                    * QFSOL    30
      C     **** ERROR --- ****.                                              * QFSOL    31
      C                                                                       * QFSOL    32
      C*************************************************************************QFSOL    33
      C                                                                        QFSOL    34
            SUBROUTINE QFSOL (KORE,T,ML,MY,MZ,M1,M2)                           QFSOL    35
      C                                                                        QFSOL    36
            INTEGER YES                                                        QFSOL    37
      C                                                                        QFSOL    38
            DIMENSION IPOS(1)                                                  QFSOL    39
            DIMENSION MATNAM(2)          ,MATNAN(2)          ,MATNAP(2)        QFSOL    40
            DIMENSION NAME1(2)                                                 QFSOL    41
            DIMENSION T(KORE)                                                  QFSOL    42
      C                                                                        QFSOL    43
            COMMON /FILE  / IPOS                                               QFSOL    44
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                               QFSOL    45
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE    QFSOL    46
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                        QFSOL    47
            COMMON /CONSTS/ NO    ,YES                                         QFSOL    48
            COMMON /CIDIV / IDIV                                               QFSOL    49
      C                                                                        QFSOL    50
      C                                                                        QFSOL    51
      C FUNCTION DEFINITION                                                    QFSOL    52
            IABSF(I)     =  IABS(I)                                            QFSOL    53
            MAXOF(I,J)   =  MAXO(I,J)                                          QFSOL    54
            MINOF(I,J)   =  MINO(I,J)                                          QFSOL    55
      C                                                                        QFSOL    56
      C DATA INITIALIZATION                                                    QFSOL    57
      C                                                                        QFSOL    58
```

STATEMENT LABELS			DEF LINE	REFERENCES			
0	25		113	112			
163	26		115	111	160		
166	30		116	114			
175	35		121	2*120	151		
0	40	INACTIVE	127	126			
204	42		130	139			
207	43		131	148			
213	45		134	130			
216	50		136	2*126			
220	55		140	120			
0	58	INACTIVE	144	143			
0	60	INACTIVE	147	2*146			
226	62		149	2*143			
233	65		152	117	133	135	146
241	70		155	62	154		
270	80		169	105	154		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
66	7	KA	79 80	3B	INSTACK
160	25	J	112 113	2B	INSTACK
171	65	NROW	117 152	46B	

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
FILE	20	0 IPOS (20)		

STATISTICS

PROGRAM LENGTH	626B	406
CM LABELED COMMON LENGTH	37B	31

520000B CM USED

VARIABLES	SN	TYPE	RELOCATION								
12	KOUNTI	INTEGER	CLIST	REFS	42						
1	KPAGE	INTEGER	CLIST	REFS	42						
536	KROW	INTEGER		REFS	101	117	164	165	DEFINED	99	
5	KTPAGE	INTEGER	CLIST	REFS	42						
547	L *	INTEGER		REFS	163						
2	LINES	INTEGER	CLIST	REFS	42						
10	LINESG	INTEGER	CLIST	REFS	42						
3	LINEST	INTEGER	CLIST	REFS	42						
525	LOCEMP	INTEGER		REFS	89	93	DEFINED	68	93	167	
0	LSIZE	INTEGER	F.P	REFS	36	38	52	60	DEFINED	32	
0	MANS	INTEGER	F P.	REFS	106	107	170	172	174		
				DEFINED	32						
0	MATRIX	INTEGER	F P.	REFS	53	54	55	56	57	58	75
				77	82	88	91	173	DEFINED	32	
543	MIN	INTEGER		REFS	115	158	161	162	163		
				DEFINED	159						
524	MOUT	INTEGER		REFS	102	103	155	159	DEFINED	67	161
0	MTEMP1	INTEGER	F.P.	REFS	66	67	175	DEFINED	32		
0	MTEMP2	INTEGER	F.P.	REFS	66	176	DEFINED	32			
556	NAME	INTEGER ARRAY		REFS	40	54	103				
0	NAMET	INTEGER ARRAY	F.P.	REFS	40	107	DEFINED	32			
560	NAME1	INTEGER ARRAY		REFS	40	163					
541	NCOL	INTEGER		REFS	110	156	171	DEFINED	109	110	
540	NFMANS	INTEGER		REFS	107	DEFINED	106				
511	NFMAT	INTEGER		REFS	54	DEFINED	53				
546	NFMIN	INTEGER		REFS	163	DEFINED	162				
537	NFMOUT	INTEGER		REFS	103	DEFINED	102				
514	NIGEO *	INTEGER		REFS	56						
6	NPAGE	INTEGER	CLIST	REFS	42						
522	NROW	INTEGER		REFS	97	98	99	123	144		
				DEFINED	65	97	117	165			
515	NSGEO	INTEGER		REFS	57	58					

EXTERNALS	TYPE	ARGS	REFERENCES					
DCLOSE		1	158	173	174	175	176	
DVALUE		3	60					
GEDLAB		6	54	163				
GETROW		4	56	57	58	77	88	91	115
MESAGE		3	50	178				
PROGNA		2	49					
PUDLAB		6	103	107				
PUTROW		4	155	170	172			
TIMEB		2	51	177				

STATEMENT LABELS			DEF LINE	REFERENCES	
36	1		59	55	
54	2		75	84	
0	4	INACTIVE	102	101	
141	6		105	2*101	
0	7		80	79	
150	8		108	104	
72	10		81	75	98
100	11		85	82	
107	12		90	2*89	168
131	20		99	89	2*98
151	22		110	156	171
154	24		112	61	111

```
                CALL PUTROW(MANS,0,0,0)                                  TRAN    173
                CALL DCLOSE (MATRIX)                                     TRAN    174
                CALL DCLOSE (MANS)                                       TRAN    175
175             CALL DCLOSE (MTEMP1)                                     TRAN    176
                CALL DCLOSE (MTEMP2)                                     TRAN    177
                CALL TIMEB (9,9HFROM TRAN)                               TRAN    178
                CALL MESAGE (2, 4, 4HTRAN)                               TRAN    179
              C                                                          TRAN    180
180             RETURN                                                   TRAN    181
                END                                                      TRAN    182
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 TRAN 32 180

VARIABLES SN TYPE RELOCATION

0	BUFFER	REAL	ARRAY	F.P.	REFS	36	58	60	91	115	123	155
					170	DEFINED	32	113	123	144		
532	DUMMY *	REAL			REFS	88						
0	IBUFF	INTEGER	ARRAY	F.P.	REFS	38	96	119	125	130	143	145
					146	152	DEFINED	32	94	95	131	132
					134	145	149					
513	ICOL	INTEGER			REFS	54	103	107	156	171		
533	ICOUNT	INTEGER			REFS	88	89	91	92			
535	ICT2	INTEGER			REFS	93	95	DEFINED	92			
526	INDEX	INTEGER			REFS	90	94	2*95	96	118	119	131
					134	152	DEFINED	69	96	116	152	166
534	INX	INTEGER			REFS	91	94	125	132	138	2*149	
					DEFINED	90	118					
523	IO	INTEGER			REFS	161	DEFINED	66				
0	IPOS	INTEGER	ARRAY	FILE	REFS	37	44	53	102	106	162	
544	IPT	INTEGER			REFS	120	123	124	130	131	132	134
					142	143	2*145	146	147	2*149	150	
					DEFINED	119	124	142	147	150		
516	IREAD	INTEGER			REFS	111	DEFINED	61	160			
512	IROW	INTEGER			REFS	54	64	68	98	101	103	107
					112	115	155	167	170			
510	ISIZE	INTEGER			REFS	68	167	DEFINED	52			
521	ISTART	INTEGER			REFS	69	116	166	DEFINED	64		
517	IWRITE	INTEGER			REFS	154	DEFINED	62	105			
542	J	INTEGER			REFS	113	163	DEFINED	112			
545	JPT	INTEGER			REFS	126	129	2*130	DEFINED	125	129	138
520	JROW	INTEGER			REFS	117	158	DEFINED	63	164		
0	JUNITF	INTEGER		F.P.	REFS	55	75	82	DEFINED	32		
531	KA	INTEGER			REFS	80	DEFINED	79				
7	KBPAGE	INTEGER		CLIST	REFS	42						
550	KFMIG	INTEGER	ARRAY		REFS	39	77	80				
527	KFMIGC	INTEGER			REFS	83	84	DEFINED	76	83		
530	KFMIGX	INTEGER			REFS	80	84	DEFINED	78	80		
4	KLABEL	INTEGER		CLIST	REFS	42						
0	KOUNT	INTEGER		CLIST	REFS	42						
11	KOUNTU	INTEGER		CLIST	REFS	42						

```
C45700. SUB. REVERS (REVERSE THE ORDER OF A MATRIX ON TAPE)                    REVERS     2
C                                                                              REVERS     3
C*****************************************************************************REVERS     4
C                                                                             * REVERS     5
C***  SUBROUTINE REVERS (MAT1  ,MAT2) *********************************** * REVERS     6
C                                                                             * REVERS     7
C***  COMPUTER VERSION  ************************************************** * REVERS     8
C     ----------------                                                        * REVERS     9
C     IBM .... AS IS.                                                         * REVERS    10
C                                                                             * REVERS    11
C     CDC .... AS IS.                                                         * REVERS    12
C                                                                             * REVERS    13
C***  OBJECTIVE  ********************************************************** * REVERS    14
C     ---------                                                               * REVERS    15
C     USED TO REVERSE THE ORDER OF A MATRIX ON A TAPE WHEN THE MATRIX  * REVERS    16
C     WILL NOT FIT IN CORE.  THE SUBROUTINE READS THE MATRIX INTO THE  * REVERS    17
C     ARRAY BUFFER.  WHEN THE ARRAY IS FULL, THE SUBROUTINE KEEPS      * REVERS    18
C     READING THE MATRIX IN, PUTTING THE NEW ROWS INTO BUFFER ON TOP   * REVERS    19
C     OF THE OLD ROWS UNTIL ALL THE MATRIX IS READ IN.  AT THIS TIME   * REVERS    20
C     THE ARRAY WILL CONTAIN THE END OF THE MATRIX WHICH IS THEN       * REVERS    21
C     WRITTEN OUT IN REVERSE ORDER ONTO TAPE MAT2.  THE FIRST MATRIX   * REVERS    22
C     IS THEN AGAIN READ IN UNTIL THE LAST ROW READ ONTO MAT2 IS       * REVERS    23
C     REACHED.  THEN THE PORTION OF THE MATRIX IN BUFFER IS READ OUT   * REVERS    24
C     BACKWARDS ONTO MAT2.  THIS CONTINUES UNTIL ALL THE MATRIX ON MAT1* REVERS    25
C     HAS BEEN REVERSED AND PUT ON MAT2.                               * REVERS    26
C                                                                             * REVERS    27
C***  INPUT/OUTPUT  ****************************************************** * REVERS    28
C     ------------                                                            * REVERS    29
C     THE SUBROUTINE USES A MATRIX ON TAPE MAT1 AS INPUT, AND PUTS OUT * REVERS    30
C     THE SAME MATRIX IN REVERSE ORDER ON MAT2.                        * REVERS    31
C                                                                             * REVERS    32
C***  SUMMARY OF SYMBOLS  ************************************************ * REVERS    33
C     ------------------                                                      * REVERS    34
C                                                                             * REVERS    35
C***  ERROR MESSAGES  **************************************************** * REVERS    36
C     --------------                                                          * REVERS    37
C     NONE.                                                                   REVERS    38
C                                                                             * REVERS    39
C*****************************************************************************REVERS    40
C                                                                              REVERS    41
      SUBROUTINE REVERS (ISIZE,BUFFER,IBUFF,MAT1,MAT2,NAME)                    REVERS    42
C                                                                              REVERS    43
      INTEGER YES                                                              REVERS    44
C                                                                              REVERS    45
      DIMENSION IBUFF(ISIZE)       ,IPOS(20)                                   REVERS    46
      DIMENSION BUF(300)           ,BUFFER(ISIZE)                              REVERS    47
      DIMENSION MATNAM(2)                                                      REVERS    48
      DIMENSION NAME(2)                                                        REVERS    49
C                                                                              REVERS    50
      COMMON /CLUE/IANAL,MAXAN,JCORN,KLU,INVER,KLUT1,MAXAN1,                   REVERS    51
     1        NOWARP,NOBEAM,MCROW,JDEFL                                        REVERS    52
      COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                                     REVERS    53
      COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE          REVERS    54
     1               ,KBPAGE,LINESG,KOUNTM,KOUNTI                            REVERS    55
      COMMON /CONSTS/ NO    ,YES                                               REVERS    56
      COMMON /FILE  / IPOS                                                     REVERS    57
C                                                                              REVERS    58
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                C DATA INITIALIZATION                                                  REVERS     59
                C                                                                      REVERS     60
60                    CALL FROGNA (4H(REV,4HERS))                                      REVERS     61
                      CALL MESAGE (1,32,32HREVERS - REVERSE ORDER OF MATRIX)           REVERS     62
                      CALL TIMEB (11,11HFROM REVERS)                                   REVERS     63
                      DATA NAMD/4HDEFL/                                                REVERS     64
                     1 NFMAT1 =  IPOS(MAT1)                                            REVERS     65
65                    CALL GEDLAB (8HREVERSO1,MAT1,MATNAM,NFMAT1,IROW,ICOL)            REVERS     66
                      NFMAT2 =  IPOS(MAT2)                                             REVERS     67
                      CALL PUDLAB (6HREVERS,MAT2,NAME,NFMAT2,IROW,ICOL)                REVERS     68
                      ICOUNT = 0                                                       REVERS     69
                      LROW=IROW                                                        REVERS     70
70              COMMENT***THE CODE TO READ IN THE FIRST CORE LOAD IN EACH PASS***       REVERS     71
                   20 JROW1=1                                                          REVERS     72
                      JPT1=1                                                           REVERS     73
                      KROW2=0                                                          REVERS     74
                      LOCEMP=ISIZE                                                     REVERS     75
75                    NROW=0                                                           REVERS     76
                      NPT=0                                                            REVERS     77
                      INDEX=1                                                          REVERS     78
                   22 CALL GETROW (MAT1,-1,DUMMY,ICT)                                  REVERS     79
                      IF ((ICT+3).GT.LOCEMP) GO TO 28                                  REVERS     80
80                    CALL GETROW (MAT1,0,BUFFER(INDEX+2),ICT)                         REVERS     81
                      ICT2=ICT+2                                                       REVERS     82
                      IBUFF(INDEX+1)=NPT                                               REVERS     83
                      NPT=INDEX                                                        REVERS     84
                      IBUFF(INDEX)=INDEX+ICT2                                          REVERS     85
85                    INDEX=IBUFF(INDEX)                                               REVERS     86
                      LOCEMP=LOCEMP-ICT2                                               REVERS     87
                      NROW=NROW+1                                                      REVERS     88
                      IF (NROW-LROW) 22,50,050                                         REVERS     89
                   28     CONTINUE                                                     REVERS     90
90              COMMENT***THE CODE TO GET THE NEEDED LAST ROWS INTO CORE***            REVERS     91
                      KROW1=NROW                                                       REVERS     92
                      KPT1=NPT                                                         REVERS     93
                      LOCEMP=ISIZE                                                     REVERS     94
                      INDEX=1                                                          REVERS     95
95                    JROW2=NROW+1                                                     REVERS     96
                      JPT2=1                                                           REVERS     97
                      NPT=0                                                            REVERS     98
                      ASSIGN 34 TO ISW                                                 REVERS     99
                C          READY TO READ IN MORE ROWS OVER THOSE WE ALREADY HAVE       REVERS    100
100                   GO TO 32                                                         REVERS    101
                   30 CALL GETROW (MAT1,-1,DUMMY,ICT)                                  REVERS    102
                      IF ((ICT+3).GT.LOCEMP) GO TO 48                                  REVERS    103
                   32 JNDEX=INDEX+ICT+3                                                REVERS    104
                      GO TO ISW,(34,40)                                                REVERS    105
105             C       KEEP TRACK OF HOW MANY ROWS FROM PREVIOUS PASS WE WILL CLOBBER  REVERS    106
                C       UNLESS WE HAVE ALREADY CLOBBERED THEM ALL                      REVERS    107
                   34 JROW1=JROW1+1                                                    REVERS    108
                      IF (JROW1.GT.KROW1) GO TO 45                                     REVERS    109
                      JPT1=IBUFF(JPT1)                                                 REVERS    110
110                   IF (JPT1-JNDEX) 34,40,40                                         REVERS    111
                   40 CALL GETROW (MAT1,0,BUFFER(INDEX+2),ICT)                         REVERS    112
                      IBUFF(INDEX+1)=NPT                                               REVERS    113
                      NPT=INDEX                                                        REVERS    114
                      INDEX=INDEX+ICT+2                                                REVERS    115
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115                IBUFF(INDEX)=JNDEX                                    REVERS   116
                   INDEX=JNDEX                                           REVERS   117
                   LOCEMP=LOCEMP-ICT-2                                   REVERS   118
                   NROW=NROW+1                                           REVERS   119
                   IF (NROW-LROW) 30,52,052                              REVERS   120
120             45 ASSIGN 40 TO ISW                                      REVERS   121
                   KROW1=0                                               REVERS   122
               C       SIGNAL COMPLETE DESTRUCTION OF PREVIOUS PASS      REVERS   123
                   GO TO 40                                              REVERS   124
                48 JROW1=JROW2                                           REVERS   125
125                JPT1=JPT2                                             REVERS   126
               C       REINITIALIZE FOR ANOTHER PASS                     REVERS   127
                   GO TO 28                                              REVERS   128
                50 KROW1=LROW                                            REVERS   129
                   KPT1=NPT                                              REVERS   130
130                GO TO 55                                              REVERS   131
                52 KROW2=LROW                                            REVERS   132
                   KPT2=NPT                                              REVERS   133
                55     CONTINUE                                          REVERS   134
               C       LAST UNWRITTEN ROWS OF MATRIX ARE IN CORE         REVERS   135
135            C       KROW1=0 MEANS  FIRST PART IS NULL                 REVERS   136
               C       KROW2=0 MEANS SECOND PART IS NULL                 REVERS   137
                   IF (KROW2.EQ.0) GO TO 72                              REVERS   138
                   KPT=KPT2                                              REVERS   139
                   NROW=KROW2                                            REVERS   140
140                JROW=JROW2                                            REVERS   141
                62 NPT=KPT                                               REVERS   142
                64 IF (NROW-JROW) 70,66,66                               REVERS   143
                66 ICT=IBUFF(NPT)-NPT-2                                  REVERS   144
                   CALL PUTROW (MAT2,0,BUFFER(NPT+2),ICT)                REVERS   145
145                ICOUNT = ICOUNT+1                                     REVERS   146
                   IF (MATNAM(1).NE.NAMD) GO TO 91                       REVERS   147
                   IF (JDEFL.EQ.0) GO TO 91                              REVERS   148
                   CALL UNPACK (BUFFER(NPT+2),ICT,BUF,ICOL,LD)           REVERS   149
                   LAFT=LINES-KOUNT                                      REVERS   150
150                IF(LAFT.LT.3) KOUNT=LINES                             REVERS   151
                   CALL TITLES(2)                                        REVERS   152
                   WRITE(ITAPEW,95) ICOUNT                               REVERS   153
                   KOUNT=KOUNT+3                                         REVERS   154
               C                                                         REVERS   155
155                LAST=0                                                REVERS   156
               100 CONTINUE                                              REVERS   157
                   NEXT=LAST+1                                           REVERS   158
                   LAST=LAST+8                                           REVERS   159
                   IF(LAST.GT.ICOL) LAST=ICOL                            REVERS   160
160                CALL TITLES(2)                                        REVERS   161
                   WRITE(ITAPEW,96) (BUF(II),II=NEXT.LAST)               REVERS   162
                   KOUNT=KOUNT+1                                         REVERS   163
                   IF(LAST.LT.ICOL) GO TO 100                            REVERS   164
                91 NROW=NROW-1                                           REVERS   165
165                NPT=IBUFF(NPT+1)                                      REVERS   166
               C       FETCH POINTER TO PREVIOUS ROW                     REVERS   167
                   GO TO 64                                              REVERS   168
                70 LROW=JROW-1                                           REVERS   169
               C       REGISTER ROWS WHICH HAVE JUST BEEN PUT OUT        REVERS   170
170                IF (JROW.EQ.JROW1) GO TO 75                           REVERS   171
               C       OTHERWISE WE JUST WROTE OUT SECOND PART,NOW TRY FIRST REVERS   172
```

```
                  72 IF (KROW1.EQ.0) GO TO 75                                    REVERS   173
                     KPT=KPT1                                                    REVERS   174
                     NROW=KROW1                                                  REVERS   175
     175             JROW=JROW1                                                  REVERS   176
                     GO TO 62                                                    REVERS   177
                  75 IF (LROW.GT.0) GO TO 80                                     REVERS   178
                     GO TO 1000                                                  REVERS   179
                  80 NFMAT1 =  IPOS(MAT1)                                        REVERS   180
     180             CALL GEDLAB (8HREVERS02,MAT1,MATNAM,NFMAT1,IROW,ICOL)       REVERS   181
                C        REPOSITION FOR ANOTHER PASS                            REVERS   182
                     GO TO 2                                                     REVERS   183
                1000 CONTINUE                                                    REVERS   184
                     CALL DCLOSE (MAT1)                                          REVERS   185
     185             CALL DCLOSE (MAT2)                                          REVERS   186
                     CALL TIMEB (11,11HFROM REVERS)                              REVERS   187
                     CALL MESAGE (2, 6, 6HREVERS)                                REVERS   188
                C                                                                REVERS   189
                C FORMAT STATEMENTS                                              REVERS   190
     190        C                                                                REVERS   191
                  95 FORMAT(/,10X,    8HICOUNT= ,I5,/)                           REVERS   192
                  96 FORMAT(10X,1P8E15.6)                                        REVERS   193
                C                                                                REVERS   194
                     RETURN                                                      REVERS   195
     195             END                                                         REVERS   196
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

3	REVERS	41 194

VARIABLES

		SN	TYPE		RELOCATION								
472	BUF		REAL	ARRAY		REFS	46	148	161				
0	BUFFER		REAL	ARRAY	F.P.	REFS	46	80	111	144	148		
						DEFINED	41						
451	DUMMY		REAL			REFS	78	101					
0	IANAL		INTEGER		CLUE	REFS	50						
0	IBUFF		INTEGER	ARRAY	F.P.	REFS	45	85	109	143	165		
						DEFINED	41	82	84	112	115		
436	ICOL		INTEGER			REFS	65	67	148	2*159	163	180	
440	ICOUNT		INTEGER			REFS	145	152	DEFINED	68	145		
452	ICT		INTEGER			REFS	78	79	80	81	101	102	103
							111	114	117	144	148	DEFINED	143
453	ICT2		INTEGER			REFS	84	86	DEFINED	81			
471	II		INTEGER			REFS	161	DEFINED	161				
450	INDEX		INTEGER			REFS	80	82	83	2*84	85	103	111
							112	113	114	115	DEFINED	77	85	94
							116						
4	INVER		INTEGER		CLUE	REFS	50						
0	IPOS		INTEGER	ARRAY	FILE	REFS	45	56	64	66	179		
435	IROW		INTEGER			REFS	65	67	69	180			
0	ISIZE		INTEGER		F.P.	REFS	45	46	74	93	DEFINED	41	
460	ISW		INTEGER			REFS	104	DEFINED	98	120			
2	ITAPEP		INTEGER		COMRWP	REFS	52						

VARIABLES	SN	TYPE	RELOCATION								
0 ITAPER		INTEGER	COMRWP	REFS	52						
1 ITAPEW		INTEGER	COMRWP	REFS	52	I/O REFS	152	161			
2 JCORN		INTEGER	CLUE	REFS	50						
12 JDEFL		INTEGER	CLUE	REFS	50	147					
461 JNDEX		INTEGER		REFS	110	115	116	DEFINED	103	114	
443 JPT1		INTEGER		REFS	109	110	DEFINED	72	109	125	
457 JPT2		INTEGER		REFS	125	DEFINED	96				
464 JROW		INTEGER		REFS	142	168	170	DEFINED	140	175	
442 JROW1		INTEGER		REFS	107	108	170	175	DEFINED	71	107
				124							
456 JROW2		INTEGER		REFS	124	140	DEFINED	95			
7 KBPAGE		INTEGER	CLIST	REFS	53						
4 KLABEL		INTEGER	CLIST	REFS	53						
3 KLU		INTEGER	CLUE	REFS	50						
5 KLUT1		INTEGER	CLUE	REFS	50						
0 KOUNT		INTEGER	CLIST	REFS	53	149	153	162	DEFINED	150	153
				162							
11 KOUNTH		INTEGER	CLIST	REFS	53						
12 KOUNTI		INTEGER	CLIST	REFS	53						
1 KPAGE		INTEGER	CLIST	REFS	53						
463 KPT		INTEGER		REFS	141	DEFINED	138	173			
455 KPT1		INTEGER		REFS	173	DEFINED	92	129			
462 KPT2		INTEGER		REFS	138	DEFINED	132				
454 KROW1		INTEGER		REFS	108	172	174	DEFINED	91	121	128
444 KROW2		INTEGER		REFS	137	139	DEFINED	73	131		
5 KTPAGE		INTEGER	CLIST	REFS	53						
466 LAFT		INTEGER		REFS	150	DEFINED	149				
467 LAST		INTEGER		REFS	157	158	159	161	163		
				DEFINED	155	158	159				
465 LD	*	INTEGER		REFS	148						
2 LINES		INTEGER	CLIST	REFS	53	149	150				
10 LINESG		INTEGER	CLIST	REFS	53						
3 LINEST		INTEGER	CLIST	REFS	53						
445 LOCEMP		INTEGER		REFS	79	86	102	117	DEFINED	74	86
				93	117						
441 LROW		INTEGER		REFS	88	119	128	131	177		
				DEFINED	69	168					
1146 MATNAM		INTEGER	ARRAY	REFS	47	65	146	180			
0 MAT1		INTEGER	F.P.	REFS	64	65	78	80	101	111	179
				180	184	DEFINED	41				
0 MAT2		INTEGER	F.P.	REFS	66	67	144	185	DEFINED	41	
1 MAXAN		INTEGER	CLUE	REFS	50						
6 MAXAN1		INTEGER	CLUE	REFS	50						
11 MCROW		INTEGER	CLUE	REFS	50						
407 NAMD		INTEGER		REFS	146	DEFINED	63				
0 NAME		INTEGER	ARRAY F.P.	REFS	48	67	DEFINED	41			
470 NEXT		INTEGER		REFS	161	DEFINED	157				
434 NFMAT1		INTEGER		REFS	65	180	DEFINED	64	179		
437 NFMAT2		INTEGER		REFS	67	DEFINED	66				
0 NO		INTEGER	CONSTS	REFS	55						
10 NOBEAM		INTEGER	CLUE	REFS	50						
7 NOWARP		INTEGER	CLUE	REFS	50						
6 NPAGE		INTEGER	CLIST	REFS	53						
447 NPT		INTEGER		REFS	82	92	112	129	132	2*143	144
				148	165	DEFINED	76	83	97	113	141
				165							
446 NROW		INTEGER		REFS	87	88	91	95	118	119	142

VARIABLES	SN	TYPE	RELOCATION						
				164	DEFINED	75	87	118	139	164	174
1	YES	INTEGER	CONSTS	REFS	43	55					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES			
DCLOSE		1	184	185		
GEDLAB		6	65	180		
GETROW		4	78	80	101	111
MESAGE		3	61	187		
PROGNA		2	60			
PUDLAB		6	67			
PUTROW		4	144			
TIMEB		2	62	186		
TITLES		1	151	160		
UNPACK		5	148			

STATEMENT LABELS			DEF LINE	REFERENCES			
0	1	INACTIVE	64				
30	20		71	182			
36	22		78	88			
66	28		89	79	127		
77	30		101	119			
106	32		103	100			
112	34		107	98	104	110	
121	40		111	104	2*110	120	123
141	45		120	108			
144	48		124	102			
147	50		128	2*88			
152	52		131	2*119			
155	55		133	130			
162	62		141	176			
164	64		142	167			
0	66	INACTIVE	143	2*142			
251	70		168	142			
255	72		172	137			
262	75		177	170	172		
264	80		179	177			
245	91		164	146	147		
420	95	FMT	191	152			
423	96	FMT	192	161			
223	100		156	163			
272	1000		183	178			

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CLUE	11	0 IANAL (1)	1 MAXAN (1)	2 JCORN (1)
		3 KLU (1)	4 INVER (1)	5 KLUT1 (1)
		6 MAXAN1 (1)	7 NOWARP (1)	8 NOBEAM (1)
		9 MCROW (1)	10 JDEFL (1)	
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CONSTS	2	0 NO (1)	1 YES (1)	
FILE	20	0 IPOS (20)		

STATISTICS

PROGRAM LENGTH	11778	639
CM LABELED COMMON LENGTH	578	47

520008 CM USED

```
      C45700, SUB. QBSOL (SOLVE THE EQUATION FOR THE NODAL DEFLECTIONS)        QBSOL    2
      C                                                                        QBSOL    3
      C*************************************************************************QBSOL    4
      C                                                                       *QBSOL    5
      C***  SUBROUTINE QBSOL  (MB    ,MZ    ,MX    ,M1    ,M2) **************QBSOL    6
      C                                                                       *QBSOL    7
      C***  OBJECTIVE  ********************************************************QBSOL    8
      C     ---------                                                         *QBSOL    9
      C     SOLVES THE EQUATION L TRANSPOSE TIMES X = Z TO OBTAIN X WHICH IS  *QBSOL   10
      C     THE MATRIX OF NODAL DEFLECTIONS.  IN GENERAL OBSOL ONLY MANAGES   *QBSOL   11
      C     THE SOLUTION; THE ACTUAL COMPUTATIONS ARE DONE IN QBAC. IF JDEFL  *QBSOL   12
      C     IS NON ZERO, THE DEFLECTIONS ARE PRINTED OUT.                     *QBSOL   13
      C                                                                       *QBSOL   14
      C***  INPUT/OUTPUT  *****************************************************QBSOL   15
      C     ------------                                                      *QBSOL   16
      C     THIS SUBROUTINE USES THE Z MATRIX ON MZ AND THE LOWER TRIANGLE    *QBSOL   17
      C     MATRIX ON MB TO PRODUCE THE DEFLECTIONS ON MX.                    *QBSOL   18
      C                                                                       *QBSOL   19
      C***  SUMMARY OF SYMBOLS  ***********************************************QBSOL   20
      C     ------------------                                                *QBSOL   21
      C                                                                       *QBSOL   22
      C***  ERROR MESSAGES  ***************************************************QBSOL   23
      C     --------------                                                    *QBSOL   24
      C     **** ERROR --- ****.                                              *QBSOL   25
      C                                                                       *QBSOL   26
      C*************************************************************************QBSOL   27
      C                                                                        QBSOL   28
            SUBROUTINE QBSOL (KORE,T,NAME1,MB,MZ,MX,M1,M2)                     QBSOL   29
      C                                                                        QBSOL   30
            INTEGER YES                                                        QBSOL   31
      C                                                                        QBSOL   32
            DIMENSION MATNAM(2)                                                QBSOL   33
            DIMENSION NAME1(2)                                                 QBSOL   34
            DIMENSION IPOS(20)                                                 QBSOL   35
            DIMENSION T(KORE)                                                  QBSOL   36
      C                                                                        QBSOL   37
            COMMON /CLUE/IANAL,MAXAN,JCORN,KLU,INVER,KLUT1,MAXAN1,             QBSOL   38
           1        NOWARP,NOBEAM,MCROW,JDEFL                                  QBSOL   39
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                               QBSOL   40
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE    QBSOL   41
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                        QBSOL   42
            COMMON /CONSTS/ NO    ,YES                                         QBSOL   43
            COMMON /FILE  / IPOS                                               QBSOL   44
            COMMON /CIDIV / IDIV                                               QBSOL   45
      C                                                                        QBSOL   46
      C                                                                        QBSOL   47
      C                                                                        QBSOL   48
      C FUNCTION DEFINITION                                                    QBSOL   49
            IABSF(I)     =  IABS(I)                                            QBSOL   50
            MAXOF(I,J)   =  MAXO(I,J)                                          QBSOL   51
      C                                                                        QBSOL   52
      C DATA INITIALIZATION                                                    QBSOL   53
      C                                                                        QBSOL   54
            CALL PROGNA (4H(QBS,4HOL ))                                        QBSOL   55
            CALL MESAGE (1,33,33HQBSOL - MANAGES BACKWARD SOLUTION)            QBSOL   56
            CALL TIMEB (11,11HFROM QBSOL )                                     QBSOL   57
            DATA NAME/4HDEFL/                                                  QBSOL   58
```

```
                30 NIX = 0                                                    QBSOL     59
                   IF(NAME1(1).NE.NAME) GO TO 31                              QBSOL     60
60                 IF (JDEFL.EQ.0) GO TO 31                                   QBSOL     61
                   KOUNT=LINES                                                QBSOL     62
                   CALL TITLES(2)                                             QBSOL     63
                   KOUNT=KOUNT+2                                              QBSOL     64
                   WRITE(ITAPEW,6)                                            QBSOL     65
65              31 NFILMB =  IPOS(MB)                                         QBSOL     66
                   CALL GEDLAB (8HQBSOL 01,MB,MATNAM,NFILMB,M ,MC)            QBSOL     67
                   NFILMZ =  IPOS(MZ)                                         QBSOL     68
                   CALL GEDLAB (8HQBSOL 02,MZ,MATNAM,NFILMZ,MR,N )            QBSOL     69
                   IF (IABSF(M-8192) - 8192) 40, 940, 940                     QBSOL     70
70              40 IF (M - MC) 940,50,940                                     QBSOL     71
                50 IF (M - MR) 940,60,940                                     QBSOL     72
                60 IF (N) 940,940,70                                          QBSOL     73
                70 LL = KORE - M/IDIV                                         QBSOL     74
                   LA      =  MAXOF(M,N) + 2                                  QBSOL     75
75                 LEFT = LL - LA                                             QBSOL     76
                   IF (LEFT - LA) 920,920,100                                 QBSOL     77
               100 IO = M1 + M2                                               QBSOL     78
                   MI = MZ                                                    QBSOL     79
                   MO = M1                                                    QBSOL     80
80                 MU = M                                                     QBSOL     81
                   NFILMX = IPOS(MX)                                          QBSOL     82
                   CALL PUDLAB (8HQBSOL 01,MX,NAME1 ,NFILMX, M,N )            QBSOL     83
               110 NFILMO =  IPOS(MO)                                         QBSOL     84
                   CALL PUDLAB (8HQBSOL 02,MO,MATNAM,NFILMO, M,N )            QBSOL     85
85              C  ACTUAL COMPUTATION OF THE BACKWARD SOLUTION                QBSOL     86
                   CALL QBAC (T,T(LA),T(LA),T(LL),M,N,MU,LEFT,MB,MX,MI,MO)    QBSOL     87
               120 IF (MU) 130,150,130                                        QBSOL     88
               130 CONTINUE                                                   QBSOL     89
                   CALL TITLES(2)                                             QBSOL     90
90                 WRITE(ITAPEW,5)                                            QBSOL     91
                   KOUNT=KOUNT+1                                              QBSOL     92
                   MI = MO                                                    QBSOL     93
                   MO = IO - MI                                               QBSOL     94
                   NFILMI =  IPOS(MI)                                         QBSOL     95
95                 CALL GEDLAB (8HQBSOL 03,MI,MATNAM,NFILMI,MC,NC)            QBSOL     96
                   GO TO 110                                                  QBSOL     97
               150 GO TO 1000                                                 QBSOL     98
               920 IND=54                                                     QBSOL     99
                   CALL TITLES(2)                                             QBSOL    100
100                KOUNT=KOUNT+1                                              QBSOL    101
                   WRITE(ITAPEW,4) IND                                        QBSOL    102
                   GO TO 1000                                                 QBSOL    103
               940 IND=38                                                     QBSOL    104
                   CALL TITLES(2)                                             QBSOL    105
105                KOUNT=KOUNT+1                                              QBSOL    106
                   WRITE(ITAPEW,4) IND                                        QBSOL    107
              1000 CONTINUE                                                   QBSOL    108
                   CALL DCLOSE (MB)                                           QBSOL    109
                   CALL DCLOSE (MZ)                                           QBSOL    110
110                CALL DCLOSE (MX)                                           QBSOL    111
                   CALL DCLOSE (M1)                                           QBSOL    112
                   CALL DCLOSE (M2)                                           QBSOL    113
                   CALL TIMEB (10,10HFROM QBSOL)                              QBSOL    114
                   CALL MESAGE (-2,5,5HQBSOL)                                 QBSOL    115
```

```
                C                                                               QBSOL     116
                C FORMAT STATEMENTS                                             QBSOL     117
                C                                                               QBSOL     118
                    4 FORMAT(10X,10(1H*),6HERROR ,I4,10(1H*))                   QBSOL     119
                    5 FORMAT(10X,36HTOTAL MATRIX EXCEEDS STORAGE IN CORE)       QBSOL     120
120             6 FORMAT(40X,52HN  O  D  A  L       D  E  F  L  E  C  T  I  O  N  S QBSOL     121
                 1          ,/)                                                 QBSOL     122
                C                                                               QBSOL     123
                  RETURN                                                        QBSOL     124
                  END                                                           QBSOL     125
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 QBSOL 28 123

VARIABLES	SN	TYPE		RELOCATION								
0	IANAL	INTEGER		CLUE	REFS	37						
0	IDIV	INTEGER		CIDIV	REFS	44	73					
376	IND	INTEGER			REFS	101	106	DEFINED	98	103		
4	INVER	INTEGER		CLUE	REFS	37						
366	IO	INTEGER			REFS	93	DEFINED	77				
0	IPOS	INTEGER	ARRAY	FILE	REFS	34	43	65	67	81	83	94
2	ITAPEP	INTEGER		COMRWP	REFS	39						
0	ITAPER	INTEGER		COMRWP	REFS	39						
1	ITAPEW	INTEGER		COMRWP	REFS	39	I/O REFS	64	90	101	106	
2	JCORN	INTEGER		CLUE	REFS	37						
12	JDEFL	INTEGER		CLUE	REFS	37	60					
7	KBPAGE	INTEGER		CLIST	REFS	40						
4	KLABEL	INTEGER		CLIST	REFS	40						
3	KLU	INTEGER		CLUE	REFS	37						
5	KLUT1	INTEGER		CLUE	REFS	37						
0	KORE	INTEGER		F.P.	REFS	35	73	DEFINED	28			
0	KOUNT	INTEGER		CLIST	REFS	40	63	91	100	105		
					DEFINED	61	63	91	100	105		
11	KOUNTH	INTEGER		CLIST	REFS	40						
12	KOUNTI	INTEGER		CLIST	REFS	40						
1	KPAGE	INTEGER		CLIST	REFS	40						
5	KTPAGE	INTEGER		CLIST	REFS	40						
364	LA	INTEGER			REFS	75	76	2*86	DEFINED	74		
365	LEFT	INTEGER			REFS	76	86	DEFINED	75			
2	LINES	INTEGER		CLIST	REFS	40	61					
10	LINESG	INTEGER		CLIST	REFS	40						
3	LINEST	INTEGER		CLIST	REFS	40						
363	LL	INTEGER			REFS	75	86	DEFINED	73			
356	M	INTEGER			REFS	66	69	70	71	73	74	80
						82	84	86				
377	MATNAM	INTEGER	ARRAY		REFS	32	66	68	84	95		
1	MAXAN	INTEGER		CLUE	REFS	37						
6	MAXAN1	INTEGER		CLUE	REFS	37						
0	MB	INTEGER		F.P.	REFS	65	66	86	108	DEFINED	28	
357	MC	INTEGER			REFS	66	70	95				
11	MCROW	INTEGER		CLUE	REFS	37						

VARIABLES	SN	TYPE	RELOCATION								
367	MI	INTEGER			REFS	86	93	94	95	DEFINED	78	92
370	MO	INTEGER			REFS	83	84	86	92	DEFINED	79	93
361	MR	INTEGER			REFS	68	71					
371	MU	INTEGER			REFS	86	87	DEFINED	80			
0	MX	INTEGER		F.P.	REFS	81	82	86	110	DEFINED	28	
0	MZ	INTEGER		F.P.	REFS	67	68	78	109	DEFINED	28	
0	M1	INTEGER		F.P.	REFS	77	79	111	DEFINED	28		
0	M2	INTEGER		F.P.	REFS	77	112	DEFINED	28			
362	N	INTEGER			REFS	68	72	74	82	84	86	
305	NAME	INTEGER			REFS	59	DEFINED	57				
0	NAME1	INTEGER	ARRAY	F.P.	REFS	33	59	82	DEFINED	28		
375	NC *	INTEGER			REFS	95						
355	NFILMB	INTEGER			REFS	66	DEFINED	65				
374	NFILMI	INTEGER			REFS	95	DEFINED	94				
373	NFILMO	INTEGER			REFS	84	DEFINED	83				
372	NFILMX	INTEGER			REFS	82	DEFINED	81				
360	NFILMZ	INTEGER			REFS	68	DEFINED	67				
354	NIX *	INTEGER			DEFINED	58						
0	NO	INTEGER		CONSTS	REFS	42						
10	NOBEAM	INTEGER		CLUE	REFS	37						
7	NOWARP	INTEGER		CLUE	REFS	37						
6	NPAGE	INTEGER		CLIST	REFS	40						
0	T	REAL	ARRAY	F.P.	REFS	35	4*86	DEFINED	28			
1	YES	INTEGER		CONSTS	REFS	30	42					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES				
DCLOSF		1	108	109	110	111	112
GEDLAB		6	66	68	95		
MESAGE		3	55	114			
PROGNA		2	54				
PUDLAB		6	82	84			
QBAC		12	86				
TIMEB		2	56	113			
TITLES		1	62	89	99	104	

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
IABS	INTEGER	1	INTRIN		69
IABSF	INTEGER	1	SF	49	69
MAXO	INTEGER	0	INTRIN		74
MAXOF	INTEGER	2	SF	50	74

STATEMENT LABELS			DEF LINE	REFERENCES	
324	4	FMT	118	101	106
330	5	FMT	119	90	
336	6	FMT	120	64	
0	30	INACTIVE	58		
25	31		65	59	60
0	40	INACTIVE	70	69	
0	50	INACTIVE	71	70	
0	60	INACTIVE	72	71	
0	70	INACTIVE	73	72	
0	100	INACTIVE	77	76	
73	110		83	96	
0	120	INACTIVE	87		
0	130	INACTIVE	88	2*87	
126	150		97	87	

STATEMENT LABELS

		DEF LINE	REFERENCES			
127	920	98	2*76			
136	940	103	2*69	2*70	2*71	2*72
144	1000	107	97	102		

COMMON BLOCKS

	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CLUE	11	0 IANAL (1)	1 MAXAN (1)	2 JCORN (1)
		3 KLU (1)	4 INVER (1)	5 KLUT1 (1)
		6 MAXAN1 (1)	7 NOWARP (1)	8 NOBEAM (1)
		9 MCROW (1)	10 JDEFL (1)	
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CONSTS	2	0 NO (1)	1 YES (1)	
FILE	20	0 IPOS (20)		
CIDIV	1	0 IDIV (1)		

STATISTICS

PROGRAM LENGTH	4338	283
CM LABELED COMMON LENGTH	60B	48

52000B CM USED

```
      C45700, SUB. QBAC  (COMPUTE THE BACKWARD SOL. OF EQ. FOR NODAL DEFL'S)   QBAC      2
      C                                                                        QBAC      3
      C*************************************************************************QBAC      4
      C                                                                       * QBAC      5
      C                                                                       * QBAC      6
      C***  SUBROUTINE QBAC   (T     ,B     ,X     ,L     ,M     ,N         * QBAC      7
      C                       ,MU    ,KORE  ,MB    ,MX    ,MI    ,MO)       * QBAC      8
      C***  OBJECTIVE  ********************************************************QBAC      9
      C     ---------                                                         * QBAC     10
      C     CALLED BY QBSOL TO COMPUTE THE BACKWARD SOLUTION OF THE EQUATION  * QBAC     11
      C     L TRANSPOSE TIMES X = Z, THUS OBTAINING THE MATRIX OF NODAL       * QBAC     12
      C     DEFLECTIONS X.                                                    * QBAC     13
      C                                                                       * QBAC     14
      C***  INPUT/OUTPUT  *****************************************************QBAC     15
      C     ------------                                                      * QBAC     16
      C     THIS SUBROUTINE USES THE INTERMEDIATE Z MATRIX IN REVERSE ORDER,  * QBAC     17
      C     RESIDING ON MZ, AND THE LOWER TRIANGULAR MATRIX IN REVERSE ORDER  * QBAC     18
      C     ON MB, TO PRODUCE THE DEFLECTIONS ON MX, ALSO IN REVERSE ORDER.   * QBAC     19
      C                                                                       * QBAC     20
      C***  SUMMARY OF SYMBOLS  ***********************************************QBAC     21
      C     ------------------                                                * QBAC     22
      C                                                                       * QBAC     23
      C***  ERROR MESSAGES  ***************************************************QBAC     24
      C     --------------                                                    * QBAC     25
      C     NONE.                                                             QBAC     26
      C                                                                       * QBAC     27
      C*************************************************************************QBAC     28
      C                                                                        QBAC     29
            SUBROUTINE QBAC (T,B,X,L,M,N,MU,KORE,MB,MX,MI,MO)                  QBAC     30
      C                                                                        QBAC     31
      C                                                                        QBAC     32
      CIBM  BEGINNING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS QBAC     33
      C     DOUBLE PRECISION S                                                 QBAC     34
      CIBM  ENDING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS    QBAC     35
      C                                                                        QBAC     36
            DIMENSION B(1),X(N,1),T(1),L(1)                                    QBAC     37
      C                                                                        QBAC     38
            IT = MX                                                            QBAC     39
            LOW = MU + 1                                                       QBAC     40
            MP2 = M + 2                                                        QBAC     41
            KEY = 0                                                            QBAC     42
            MUI = 0                                                            QBAC     43
            LX = 0                                                             QBAC     44
            LB = KORE                                                          QBAC     45
         90 I = MU - MUI                                                       QBAC     46
            IF (I) 100,250,100                                                 QBAC     47
        100 IF (KEY) 150,110,150                                               QBAC     48
        110 LLB = LB + 1 - I                                                   QBAC     49
            LX = LX + N                                                        QBAC     50
            IF (LX - LLB) 130,120,120                                          QBAC     51
        120 KEY = 1                                                            QBAC     52
            IT = MO                                                            QBAC     53
            GO TO 150                                                          QBAC     54
        130 CALL GETROW (MB,-1,DUMMY,KOUNT)                                    QBAC     55
            LOC = MP2 - KOUNT                                                  QBAC     56
            CALL GETROW (MB,0,T(LOC),KOUNT)                                    QBAC     57
            CALL UNPACK(T(LOC),KOUNT,T,1,LEAD)                                 QBAC     58
```

```
                      L(I) = I - LEAD                                    QBAC       59
                      LLB = LB + 1 - L(I)                                QBAC       60
     60               J = LEAD                                           QBAC       61
                      DO 140  JI = LLB,LB                                QBAC       62
                      J = J + 1                                          QBAC       63
                  140 B(JI) = T(J)                                       QBAC       64
                  150 CALL GETROW (MI,1,T,N)                             QBAC       65
     65               K = MU                                             QBAC       66
                      INC = L(MU)                                        QBAC       67
                      KK = KORE - L(MU)                                  QBAC       68
                      KI = KORE - MUI                                    QBAC       69
                      MUI = MUI + 1                                      QBAC       70
     70           C   ENTRY POINT IN HOTDOT                              QBAC       71
                      CALL HOTDOT (N,O,T,X,S,1,N,2)                      QBAC       72
                  160 IF (K - LOW) 210,170,170                           QBAC       73
                  170 IF (KI - KK) 180,180,190                           QBAC       74
                  180 S = 0.                                             QBAC       75
     75               GO TO 200                                          QBAC       76
                  190 S = -B(KI)                                         QBAC       77
                  200 CALL HOTDOT (N,O,T,X,S,1,N,3)                      QBAC       78
                      KI = KI - INC + 1                                  QBAC       79
                      K = K - 1                                          QBAC       80
     80               INC = L(K)                                         QBAC       81
                      KK = KK - INC                                      QBAC       82
                      GO TO 160                                          QBAC       83
                  210 IF (KEY) 240,220,240                               QBAC       84
                  220 R = B(LB)                                          QBAC       85
     85               LOW = I                                            QBAC       86
                      DO 230  J = 1,N                                    QBAC       87
                      T(J) = T(J) / R                                    QBAC       88
                  230 X(J,MUI) = T(J)                                    QBAC       89
                  240 CALL PUTROW (IT,1,T,N)                             QBAC       90
     90               LB = LLB - 1                                       QBAC       91
                      GO TO 90                                           QBAC       92
                  250 MU = LOW - 1                                       QBAC       93
                      RETURN                                             QBAC       94
                      END                                                QBAC       95
```

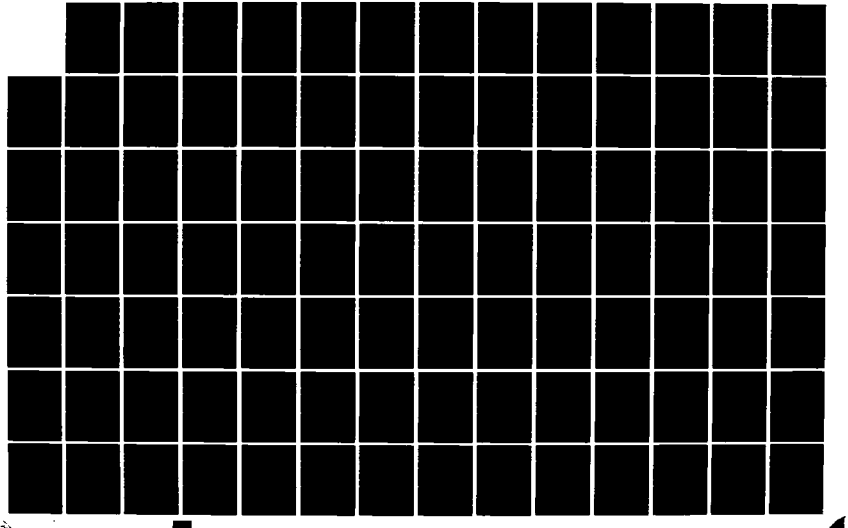
SYMBOLIC REFERENCE MAP (R=3)

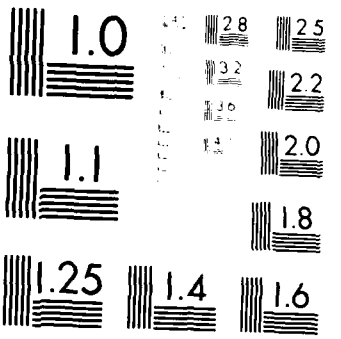
ENTRY POINTS		DEF LINE	REFERENCES
3	QBAC	29	93

VARIABLES		SN	TYPE	RELOCATION								
0	B		REAL	ARRAY	F.P.	REFS	36	76	84	DEFINED	29	63
272	DUMMY	*	REAL			REFS	54					
270	I		INTEGER			REFS	46	48	57	2*58	59	85
						DEFINED	45					
301	INC		INTEGER			REFS	78	81	DEFINED	66	80	
261	IT		INTEGER			REFS	89	DEFINED	38	52		
276	J		INTEGER			REFS	62	63	2*87	2*88	DEFINED	60	62
						86						
277	JI		INTEGER			REFS	63	DEFINED	61			

AD-A152 270 ESP (EXTERNAL-STORES PROGRAM) - A PILOT COMPUTER PROGRAM FOR DETERMINING.. (U) GRUMMAN AEROSPACE CORP BETHPAGE NY J B SMEDFJELD FEB 85 ADCR-85-1-VOL-3-PT-1 4/8

UNCLASSIFIED N00019-81-C-0395 F/G 9/2 NL





MICROCOPY RESOLUTION TEST CHART

VARIABLES	SN	TYPE	RELOCATION									
300	K	INTEGER			REFS	72	79	80	DEFINED	65	79	
264	KEY	INTEGER			REFS	47	83	DEFINED	41	51		
303	KI	INTEGER			REFS	73	76	78	DEFINED	68	78	
302	KK	INTEGER			REFS	73	81	DEFINED	67	81		
0	KORE	INTEGER		F.P.	REFS	44	67	68	DEFINED	29		
273	KOUNT	INTEGER			REFS	54	55	56	57			
0	L	INTEGER	ARRAY	F.P.	REFS	36	59	66	67	80		
					DEFINED	29	58					
267	LB	INTEGER			REFS	48	59	61	84	DEFINED	44	90
275	LEAD	INTEGER			REFS	57	58	60				
271	LLB	INTEGER			REFS	50	61	90	DEFINED	48	59	
274	LOC	INTEGER			REFS	56	57	DEFINED	55			
262	LOW	INTEGER			REFS	72	92	DEFINED	39	85		
266	LX	INTEGER			REFS	49	50	DEFINED	43	49		
0	M	INTEGER		F.P.	REFS	40	DEFINED	29				
0	MB	INTEGER		F.P.	REFS	54	56	DEFINED	29			
0	MI	INTEGER		F.P.	REFS	64	DEFINED	29				
0	MO	INTEGER		F.P.	REFS	52	DEFINED	29				
263	MP2	INTEGER			REFS	55	DEFINED	40				
0	MU	INTEGER		F.P.	REFS	39	45	65	66	67		
					DEFINED	29	92					
265	MUI	INTEGER			REFS	45	68	69	88	DEFINED	42	69
0	MX	INTEGER		F.P.	REFS	38	DEFINED	29				
0	N	INTEGER		F.P.	REFS	36	49	64	2*71	2*77	86	89
					DEFINED	29						
305	R	REAL			REFS	87	DEFINED	84				
304	S	REAL			REFS	71	77	DEFINED	74	76		
0	T	REAL	ARRAY	F.P.	REFS	36	56	2*57	63	64	71	77
					87	88	89	DEFINED	29	87		
0	X	REAL	ARRAY	F.P.	REFS	36	71	77	DEFINED	29	88	

EXTERNALS	TYPE	ARGS	REFERENCES		
GETROW		4	54	56	64
HOTDOT		8	71	77	
PUTROW		4	89		
UNPACK		5	57		

STATEMENT LABELS			DEF LINE	REFERENCES	
20	90		45	91	
0	100	INACTIVE	47	2*46	
0	110	INACTIVE	48	47	
0	120	INACTIVE	51	2*50	
34	130		54	50	
0	140		63	61	
72	150		64	2*47	53
117	160		72	82	
0	170	INACTIVE	73	2*72	
0	180	INACTIVE	74	2*73	
125	190		76	73	
130	200		77	75	
145	210		83	72	
0	220	INACTIVE	84	83	
0	230		88	86	
165	240		89	2*83	
174	250		92	46	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
66	140	JI	61 63	2B	INSTACK
161	230	J	86 88	3B	INSTACK

STATISTICS

PROGRAM LENGTH 306B 198

520000B CM USED

```
      SUBROUTINE UNFIL(JUMP)                                            UNFIL      2
C                                                                       UNFIL      3
C                                                                       UNFIL      4
      COMMON/KLUES/ KLUSE,KLUNAL,IRED,KLUMD,KLUBAL,MSADD,NPASS,IDNOPT,  UNFIL      5
     1              VDES,EPS1,DWMAX,NBAR,NFIX,D,DEL,EPS2,NCYC,NNN,IBAND, UNFIL      6
     2              IFIN,KLUB,KLUQ,MORBAL,DBAL                          UNFIL      7
      COMMON/SIZES/ NSTMEM,NSTDOF,NDYDOF,NNOPT,NDESNO,NDESYS            UNFIL      8
      COMMON/PLACES/ IUIN1,IUIN2,IUOUT1,IUOUT2,IUGO1,IUGO2,IUGO3,IUGO4, UNFIL      9
     1               IUSCR,IFSCR,IFS1,IFS2,IFS3,IFS4,IUCD,IUPR,         UNFIL     10
     2               IUA,IFA,IUY,IFY,IUMEMN,IFMEMN,IUSTFN,IFSTFN,       UNFIL     11
     3               IUKS,IFKS,IUB,IFB,IUDESO,IFDESO,                   UNFIL     12
     4               IUMDBI,IFMDBI,IUADDI,IFADDI,IUBALI,IFBALI,         UNFIL     13
     5               IUDESI,IFDESI,IUWTI,IFWTI,                         UNFIL     14
     6               IUMEMO,IFMEMO,IUBT,IFBT,                           UNFIL     15
     7               IUDESN,IFDESN,IUMD,IFMD,                           UNFIL     16
     8               IUMEMF,IFMEMF,                                     UNFIL     17
     9               IUSTFO,IFSTFO,IUMDB,IFMDB,IUADD,IFADD,IUBAL,IFBAL, UNFIL     18
     A               IUDESF,IFDESF,IUWT,IFWT,                           UNFIL     19
     B               IUDUM1,IFDUM1,IUDUM2,IFDUM2,IUDUM3,IFDUM3,         UNFIL     20
     C               IUL,IFL,IUYT,IFYT,IUZ,IFZ,IUZR,IFZR,IULR,IFLR,     UNFIL     21
     D               IUBR,IFBR,                                         UNFIL     22
     E               IUPHTF,IFPHTF,IUMODM,IFMODM,                       UNFIL     23
     F               IUMODK,IFMODK,IUPHT,IFPHT,IUQT,IFQT,IUQ,IFQ,       UNFIL     24
     G               IUPH,IFPH,IUINCM,IFINCM,IUINCK,IFINCK              UNFIL     25
      COMMON /CLIST / KOUNT,KPAGE,LINES,LINEST,KLABEL,KTPAGE,NPAGE      UNFIL     26
     1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                       UNFIL     27
      COMMON /CSETUP/ IOINC                                             UNFIL     28
      COMMON /KLUFF/ KFREE                                              UNFIL     29
      COMMON /PLAYFF/ IUMDFF,IFMDFF,IUDLTI,IFDLTI,IUSLTI,IFSLTI         UNFIL     30
     1               ,IUMPLI,IFMPLI,IUTPGT,IFTPGT,IUPATF,IFPATF         UNFIL     31
     2               ,IUMPL,IFMPL,IUSLT,IFSLT,IUDLT,IFDLT               UNFIL     32
     3               ,IUQA,IFQA,IUQAT,IFQAT,IUPHA,IFPHA,IUPHAT,IFPHAT   UNFIL     33
      COMMON /LOCSTR/ IUSTRI,IFSTRI,IUMREF,IFMREF                       UNFIL     34
     1               ,IUMOD,IFMOD                                       UNFIL     35
      COMMON/ INVERT / INVERT,IUA2,IFLEX,AORD(30),IPERM(30),NSTOR(30,2) UNFIL     36
     A,IPREV,NDOFT                                                      UNFIL     37
C                                                                       UNFIL     38
C                                                                       UNFIL     39
      CALL PROGNA(4H(UNF,4HIL ))                                        UNFIL     40
      CALL MESAGE(1,5,5HUNFIL)                                          UNFIL     41
C                                                                       UNFIL     42
      IUMREF = 12 - IOINC                                               UNFIL     43
      IFMREF=1                                                          UNFIL     44
      IUMOD=IUMREF                                                      UNFIL     45
      IFMOD=IFMREF+1                                                    UNFIL     46
C                                                                       UNFIL     47
C                                                                       UNFIL     48
      IF(JUMP.EQ.0) GO TO 10                                            UNFIL     49
      IF(JUMP.EQ.-1) GO TO 33                                           UNFIL     50
      IF(JUMP.EQ.1) GO TO 1040                                          UNFIL     51
      IF(JUMP.EQ.2) GO TO 1060                                          UNFIL     52
      IF(JUMP.EQ.25) GO TO 1080                                         UNFIL     53
      IF(JUMP.EQ.3) GO TO 1100                                          UNFIL     54
      IF(JUMP.EQ.35) GO TO 1125                                         UNFIL     55
      IF(JUMP.EQ.4) GO TO 1150                                          UNFIL     56
      IF(JUMP.EQ.5) GO TO 1200                                          UNFIL     57
      IF(JUMP.EQ.6) GO TO 1300                                          UNFIL     58
```

```
      C                                                                 UNFIL      59
          10 CONTINUE                                                   UNFIL      60
60           IF(NPASS.EQ.1) GO TO 500                                   UNFIL      61
      C                                                                 UNFIL      62
             IUGO1=1                                                    UNFIL      63
             IUGO2=2                                                    UNFIL      64
             IUGO3=3                                                    UNFIL      65
65           IUGO4=4                                                    UNFIL      66
             IUIN1  =  8 - IOINC                                        UNFIL      67
             IUOUT1 =  9 - IOINC                                        UNFIL      68
             IUOUT2 = 10 - IOINC                                        UNFIL      69
             IUIN2  = 11 - IOINC                                        UNFIL      70
70           IFS1=1                                                     UNFIL      71
             IFS2=1                                                     UNFIL      72
             IFS3=1                                                     UNFIL      73
             IFS4=1                                                     UNFIL      74
      C                                                                 UNFIL      75
75           IUA=IUIN1                                                  UNFIL      76
             IUA2 = IUA                                                 UNFIL      77
             IUY=IUIN1                                                  UNFIL      78
             IUMEMN=IUIN1                                               UNFIL      79
             IUSTFN=IUIN1                                               UNFIL      80
80           IUMEMF=IUOUT1                                              UNFIL      81
      CIBM                                                              UNFIL      82
      C      CALL DINIT(13,8HFT13F001)                                  UNFIL      83
      CIBM                                                              UNFIL      84
             IUSCR = 13                                                 UNFIL      85
85           IUKS=IUIN1                                                 UNFIL      86
             IUSLTI=IUIN1                                               UNFIL      87
             IUDLTI=IUIN1                                               UNFIL      88
      C                                                                 UNFIL      89
             IF(IRED.EQ.0) GO TO 20                                     UNFIL      90
90    C                                                                 UNFIL      91
             IFSTFN=1                                                   UNFIL      92
             IFMEMN=2                                                   UNFIL      93
             IFY=3                                                      UNFIL      94
             IFA=4                                                      UNFIL      95
95           NEXT=5                                                     UNFIL      96
             IF(KFREE.EQ.1) GO TO 15                                    UNFIL      97
             IFSLTI=NEXT                                                UNFIL      98
             NEXT=NEXT+1                                                UNFIL      99
             IFDLTI=NEXT                                                UNFIL     100
100          NEXT=NEXT+1                                                UNFIL     101
          15 IFSCR = 1                                                  UNFIL     102
             IUIN1 = 13                                                 UNFIL     103
      C                                                                 UNFIL     104
             GO TO 30                                                   UNFIL     105
105   C                                                                 UNFIL     106
          20 CONTINUE                                                   UNFIL     107
             IFSTFN=1                                                   UNFIL     108
             IFMEMN=2                                                   UNFIL     109
             IFKS=3                                                     UNFIL     110
110          NEXT=4                                                     UNFIL     111
             IF(KFREE.EQ.1) GO TO 25                                    UNFIL     112
             IFSLTI=NEXT                                                UNFIL     113
             IFDLTI=IFSLTI                                              UNFIL     114
             NEXT=NEXT+1                                                UNFIL     115
```

```
115            25 IFSCR=NEXT                                                    UNFIL  116
          C                                                                     UNFIL  117
               30 CONTINUE                                                      UNFIL  118
                  GO TO 9999                                                    UNFIL  119
          C                                                                     UNFIL  120
120       C                                                                     UNFIL  121
               33 CONTINUE                                                      UNFIL  122
                  IF(KLUSE.EQ.2) GO TO 35                                       UNFIL  123
          C                                                                     UNFIL  124
                  IF(KLUMD.EQ.1.AND.NNOPT.EQ.0) GO TO 400                       UNFIL  125
125               IUSTFO=IUGO1                                                  UNFIL  126
                  IFSTFO=1                                                      UNFIL  127
                  IFS1=2                                                        UNFIL  128
                  IUDUM3=IUSTFN+IUSTFO                                          UNFIL  129
                  IFDUM3=IFSTFN+IFSTFO                                          UNFIL  130
130               GO TO 400                                                     UNFIL  131
          C                                                                     UNFIL  132
               35 CONTINUE                                                      UNFIL  133
                  IUSTFO=IUOUT2                                                 UNFIL  134
                  IFSTFO=1                                                      UNFIL  135
135               NEXT=2                                                        UNFIL  136
                  IUDUM3=IUSTFN+IUSTFO                                          UNFIL  137
                  IFDUM3=IFSTFN+IFSTFO                                          UNFIL  138
                  IUMEMO=IUGO1                                                  UNFIL  139
                  IFMEMO=1                                                      UNFIL  140
140               IFS1=2                                                        UNFIL  141
                  IUDUM1=IUMEMN+IUMEMO                                          UNFIL  142
                  IFDUM1=IFMEMN+IFMEMO                                          UNFIL  143
                  IUMEMF=IUOUT1                                                 UNFIL  144
                  IFMEMF=1                                                      UNFIL  145
145               IUDESN=IUGO2                                                  UNFIL  146
                  IFDESN=1                                                      UNFIL  147
                  IFS2=2                                                        UNFIL  148
                  IUDESO=IUIN1                                                  UNFIL  149
                  IFDESO = 2                                                    UNFIL  150
150               IUDUM2=IUDESN+IUDESO                                          UNFIL  151
                  IFDUM2=IFDESN+IFDESO                                          UNFIL  152
                  IF(KLUMD.EQ.0) GO TO 100                                      UNFIL  153
                  IUMDB=IUOUT2                                                  UNFIL  154
                  IFMDB=2                                                       UNFIL  155
155               NEXT=3                                                        UNFIL  156
                  GO TO 115                                                     UNFIL  157
          C                                                                     UNFIL  158
             100  IF(MSADD.EQ.0) GO TO 115                                      UNFIL  159
                  IUADD=IUOUT2                                                  UNFIL  160
160               IFADD=2                                                       UNFIL  161
                  NEXT=3                                                        UNFIL  162
          C                                                                     UNFIL  163
             115  IF(KFREE.EQ.1) GO TO 120                                     UNFIL  164
                  IUMPL=IUOUT2                                                  UNFIL  165
165               IFMPL=NEXT                                                    UNFIL  166
                  NEXT=NEXT+1                                                   UNFIL  167
                  IUSLT=IUOUT2                                                  UNFIL  168
                  IFSLT=NEXT                                                    UNFIL  169
                  NEXT=NEXT+1                                                   UNFIL  170
170               IUDLT=IUOUT2                                                  UNFIL  171
                  IFDLT=IFSLT                                                   UNFIL  172
```

```
                      IF(IRED.EQ.0) GO TO 120                          UNFIL   173
                      IFDLT=NEXT                                       UNFIL   174
                      NEXT=NEXT+1                                      UNFIL   175
175           C                                                        UNFIL   176
                120   IF(KLUBAL.EQ.0) GO TO 140                        UNFIL   177
                      IUBAL=IUOUT2                                     UNFIL   178
                      IFBAL=NEXT                                       UNFIL   179
                      NEXT=NEXT+1                                      UNFIL   180
180           C                                                        UNFIL   181
                140   IUDESF=IUOUT2                                    UNFIL   182
                      IFDESF=NEXT                                      UNFIL   183
                      NEXT=NEXT+1                                      UNFIL   184
                      IUWT=IUOUT2                                      UNFIL   185
185                   IFWT=NEXT                                        UNFIL   186
                      NEXT=NEXT+1                                      UNFIL   187
              C                                                        UNFIL   188
                400   CONTINUE                                         UNFIL   189
              C                                                        UNFIL   190
190                   GO TO 1000                                       UNFIL   191
              C                                                        UNFIL   192
              C                                                        UNFIL   193
                500   CONTINUE                                         UNFIL   194
              C                                                        UNFIL   195
195                   IUGO1=1                                          UNFIL   196
                      IUGO2=2                                          UNFIL   197
                      IUGO3=3                                          UNFIL   198
                      IUGO4=4                                          UNFIL   199
                      IUIN1=8  -IOINC                                  UNFIL   200
200                   IUOUT1=9 -IOINC                                  UNFIL   201
                      IUOUT2=10-IOINC                                  UNFIL   202
                      IUIN2=11 -IOINC                                  UNFIL   203
                      IFS1=1                                           UNFIL   204
                      IFS2=1                                           UNFIL   205
205                   IFS3=1                                           UNFIL   206
                      IFS4=1                                           UNFIL   207
              C                                                        UNFIL   208
                      IUA=IUIN1                                        UNFIL   209
                      IUY=IUIN1                                        UNFIL   210
210                   IUMEMN=IUIN1                                     UNFIL   211
                      IUSCR=IUIN1                                      UNFIL   212
                      IUKS=IUIN1                                       UNFIL   213
              C                                                        UNFIL   214
                      IUSTFN=IUIN2                                     UNFIL   215
215                   IFSTFN=1                                         UNFIL   216
                      NEXT=2                                           UNFIL   217
                      IF(KLUMD.EQ.0) GO TO 505                         UNFIL   218
                      IUMDBI=IUIN2                                     UNFIL   219
                      IFMDBI=2                                         UNFIL   220
220                   NEXT=3                                           UNFIL   221
                      GO TO 507                                        UNFIL   222
              C                                                        UNFIL   223
                505   IF(MSADD.EQ.0) GO TO 507                         UNFIL   224
                      IUADDI=IUIN2                                     UNFIL   225
225                   IFADDI=2                                         UNFIL   226
                      NEXT=3                                           UNFIL   227
              C                                                        UNFIL   228
                507   IF(KFREE.EQ.1) GO TO 510                         UNFIL   229
```

```
                IUMPLI=IUIN2                                        UNFIL   230
230             IFMPLI=NEXT                                         UNFIL   231
                NEXT=NEXT+1                                         UNFIL   232
                IUSLTI=IUIN2                                        UNFIL   233
                IFSLTI=NEXT                                         UNFIL   234
                NEXT=NEXT+1                                         UNFIL   235
235             IUDLTI=IUIN2                                        UNFIL   236
                IFDLTI=IFSLTI                                       UNFIL   237
                IF(IRED.EQ.0) GO TO 510                             UNFIL   238
                IFDLTI=NEXT                                         UNFIL   239
                NEXT=NEXT+1                                         UNFIL   240
240         C                                                       UNFIL   241
              510 IF(KLUBAL.EQ.0) GO TO 515                         UNFIL   242
                IUBALI=IUIN2                                        UNFIL   243
                IFBALI=NEXT                                         UNFIL   244
                NEXT=NEXT+1                                         UNFIL   245
245         C                                                       UNFIL   246
              515 IUDESI=IUIN2                                      UNFIL   247
                IFDESI=NEXT                                         UNFIL   248
                NEXT=NEXT+1                                         UNFIL   249
                IUWTI=IUIN2                                         UNFIL   250
250             IFWTI=NEXT                                          UNFIL   251
                NEXT=NEXT+1                                         UNFIL   252
            C                                                       UNFIL   253
                IF(IRED.EQ.0) GO TO 520                             UNFIL   254
            C                                                       UNFIL   255
255             IFMEMN=2                                            UNFIL   256
                IFY=3                                               UNFIL   257
                IFA=4                                               UNFIL   258
                IFSCR=5                                             UNFIL   259
            C                                                       UNFIL   260
260             GO TO 530                                           UNFIL   261
            C                                                       UNFIL   262
              520 CONTINUE                                          UNFIL   263
                IFMEMN=2                                            UNFIL   264
                IFKS=3                                              UNFIL   265
265             IFSCR=4                                             UNFIL   266
            C                                                       UNFIL   267
              530 CONTINUE                                          UNFIL   268
            C                                                       UNFIL   269
            C                                                       UNFIL   270
270           550 CONTINUE                                          UNFIL   271
                IUSTFO=IUOUT2                                       UNFIL   272
                IFSTFO=1                                            UNFIL   273
                NEXT=2                                              UNFIL   274
                IUDUM3=IUSTFN+IUSTFO                                UNFIL   275
275             IFDUM3=IFSTFN+IFSTFO                                UNFIL   276
                IUMEMF=IUOUT1                                       UNFIL   277
                IFMEMF=1                                            UNFIL   278
                IUDESN=IUG02                                        UNFIL   279
                IFDESN=1                                            UNFIL   280
280             IFS2=2                                              UNFIL   281
                IUDESO=IUIN1                                        UNFIL   282
                IFDESO=IFSCR                                        UNFIL   283
                IUDUM2=IUDESN+IUDESO                                UNFIL   284
                IFDUM2=IFDESN+IFDESO                                UNFIL   285
285             IF(KLUMD.EQ.0) GO TO 600                            UNFIL   286
```

```
                IUMDB=IUOUT2                                                    UNFIL     287
                IFMDB=2                                                         UNFIL     288
                NEXT=3                                                          UNFIL     289
                GO TO 615                                                       UNFIL     290
290           C                                                                 UNFIL     291
              600 IF(MSADD.EQ.0) GO TO 615                                      UNFIL     292
                IUADD=IUOUT2                                                    UNFIL     293
                IFADD=2                                                         UNFIL     294
                NEXT=3                                                          UNFIL     295
295           C                                                                 UNFIL     296
              615 IF(KFREE.EQ.1) GO TO 620                                      UNFIL     297
                IUMPL=IUOUT2                                                    UNFIL     298
                IFMPL=NEXT                                                      UNFIL     299
                NEXT=NEXT+1                                                     UNFIL     300
300             IUSLT=IUOUT2                                                    UNFIL     301
                IFSLT=NEXT                                                      UNFIL     302
                NEXT=NEXT+1                                                     UNFIL     303
                IUDLT=IUOUT2                                                    UNFIL     304
                IFDLT=IFSLT                                                     UNFIL     305
305             IF(IRED.EQ.0) GO TO 620                                         UNFIL     306
                IFDLT=NEXT                                                      UNFIL     307
                NEXT=NEXT+1                                                     UNFIL     308
              C                                                                 UNFIL     309
              620 IF(KLUBAL.EQ.0) GO TO 640                                     UNFIL     310
310             IUBAL=IUOUT2                                                    UNFIL     311
                IFBAL=NEXT                                                      UNFIL     312
                NEXT=NEXT+1                                                     UNFIL     313
              640 IUDESF=IUOUT2                                                 UNFIL     314
                IFDESF=NEXT                                                     UNFIL     315
315             NEXT=NEXT+1                                                     UNFIL     316
                IUWT=IUOUT2                                                     UNFIL     317
                IFWT=NEXT                                                       UNFIL     318
                NEXT=NEXT+1                                                     UNFIL     319
              C                                                                 UNFIL     320
320           1000 CONTINUE                                                     UNFIL     321
                IUL=IUGO2                                                       UNFIL     322
                IFL=IFS2                                                        UNFIL     323
                IUYT=IUGO1                                                      UNFIL     324
                IFYT=IFS1                                                       UNFIL     325
325             IUZ=IUIN1                                                       UNFIL     326
                IFZ=IFSCR                                                       UNFIL     327
                IUZR=IUGO1                                                      UNFIL     328
                IFZR=IFS1                                                       UNFIL     329
                IULR=IUIN1                                                      UNFIL     330
330             IFLR=IFSCR                                                      UNFIL     331
                IUBR=IUGO2                                                      UNFIL     332
                IFBR=IFS2                                                       UNFIL     333
                IUB=IUIN1                                                       UNFIL     334
                IFB=IFSCR                                                       UNFIL     335
335             IUBT=IUGO1                                                      UNFIL     336
                IFBT=IFS1                                                       UNFIL     337
              C                                                                 UNFIL     338
                IUMD=IUGO2                                                      UNFIL     339
                IFMD=IFS2                                                       UNFIL     340
340             IF(KFREE.EQ.1) GO TO 9999                                       UNFIL     341
                IUTPGT=IUGO2                                                    UNFIL     342
                IFTPGT=IFMD+1                                                   UNFIL     343
```

```
      400               IFQAT=2                                          UNFIL   401
                        IUPHA=IUG04                                      UNFIL   402
                        IFPHA=2                                          UNFIL   403
                        IUPHAT=IUG03                                     UNFIL   404
                        IFPHAT=2                                         UNFIL   405
      405               IFS3=3                                           UNFIL   406
                        IFS4=3                                           UNFIL   407
                        GO TO 9999                                       UNFIL   408
                  C                                                      UNFIL   409
                   1150 CONTINUE                                         UNFIL   410
      410               IFSCR=IFB+1                                      UNFIL   411
                        GO TO 9999                                       UNFIL   412
                  C                                                      UNFIL   413
                   1200 CONTINUE                                         UNFIL   414
                        IFS1=IFS1+1                                      UNFIL   415
      415               GO TO 9999                                       UNFIL   416
                  C                                                      UNFIL   417
                   1300 CONTINUE                                         UNFIL   418
                        IFS1 = IFMODM                                    UNFIL   419
                  C                                                      UNFIL   420
      420         C                                                      UNFIL   421
                   9999 CONTINUE                                         UNFIL   422
                  C                                                      UNFIL   423
                        CALL MESAGE(2,5,5HUNFIL)                         UNFIL   424
                  C                                                      UNFIL   425
      425               RETURN                                           UNFIL   426
                        END                                              UNFIL   427
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	UNFIL	1	425

VARIABLES

	SN	TYPE	RELOCATION						
3	AORD	REAL	ARRAY	INVERT	REFS	35			
15	D	REAL		KLUES	REFS	4			
27	DBAL	REAL		KLUES	REFS	4			
16	DEL	REAL		KLUES	REFS	4			
12	DWMAX	REAL		KLUES	REFS	4			
11	EPS1	REAL		KLUES	REFS	4			
17	EPS2	REAL		KLUES	REFS	4			
22	IBAND	INTEGER		KLUES	REFS	4			
7	IDNOPT	INTEGER		KLUES	REFS	4			
21	IFA	INTEGER		PLACES	REFS	8	DEFINED	94	257
67	IFADD	INTEGER		PLACES	REFS	8	DEFINED	160	293
41	IFADDI	INTEGER		PLACES	REFS	8	DEFINED	225	
33	IFB	INTEGER		PLACES	REFS	8	410	DEFINED	334
71	IFBAL	INTEGER		PLACES	REFS	8	DEFINED	178	311
43	IFBALI	INTEGER		PLACES	REFS	8	DEFINED	243	
117	IFBR	INTEGER		PLACES	REFS	8	DEFINED	332	
53	IFBT	INTEGER		PLACES	REFS	8	DEFINED	336	
73	IFDESF	INTEGER		PLACES	REFS	8	DEFINED	182	314
45	IFDESI	INTEGER		PLACES	REFS	8	DEFINED	247	

```
                IUMOFF=IUGO2                                                    UNFIL  344
                IFMOFF=IFTPGT+1                                                 UNFIL  345
345           C                                                                 UNFIL  346
                GO TO 9999                                                      UNFIL  347
              C                                                                 UNFIL  348
               1040 CONTINUE                                                    UNFIL  349
                IFSCR=IFSCR+1                                                   UNFIL  350
350             IFS1=IFS1+1                                                     UNFIL  351
                GO TO 9999                                                      UNFIL  352
              C                                                                 UNFIL  353
               1060 CONTINUE                                                    UNFIL  354
                IF (NCYC .GT. 0) GOTO 9999                                      UNFIL  355
355             IFS1=IFS1-1                                                     UNFIL  356
                GO TO 9999                                                      UNFIL  357
              C                                                                 UNFIL  358
               1080 CONTINUE                                                    UNFIL  359
                IUPHTF=IUGO4                                                    UNFIL  360
360             IFPHTF=1                                                        UNFIL  361
                IUPATF=IUGO4                                                    UNFIL  362
                IFPATF=2                                                        UNFIL  363
                IUMODM=IUGO1                                                    UNFIL  364
                IFMODM=IFS1                                                     UNFIL  365
365             IUMODK=IUGO1                                                    UNFIL  366
                IFMODK=IFMODM+1                                                 UNFIL  367
                GO TO 9999                                                      UNFIL  368
              C                                                                 UNFIL  369
               1100 CONTINUE                                                    UNFIL  370
370           C                                                                 UNFIL  371
              C                                                                 UNFIL  372
                IUMODM=IUGO1                                                    UNFIL  373
                IFMODM=IFS1                                                     UNFIL  374
                IUMODK=IUGO1                                                    UNFIL  375
375             IFMODK=IFMODM+1                                                 UNFIL  376
                IFS1=IFMODK+1                                                   UNFIL  377
                IUINCM=IUGO1                                                    UNFIL  378
                IFINCM=IFMODK+1                                                 UNFIL  379
                IUINCK=IUGO1                                                    UNFIL  380
380             IFINCK=IFINCM+1                                                 UNFIL  381
              C                                                                 UNFIL  382
                IUPHTF=IUGO4                                                    UNFIL  383
                IFPHTF=1                                                        UNFIL  384
                IFS4=2                                                          UNFIL  385
385             IUPHT=IUGO3                                                     UNFIL  386
                IFPHT=1                                                         UNFIL  387
                IFS3=2                                                          UNFIL  388
                IUQT=IUGO4                                                      UNFIL  389
                IFQT=1                                                          UNFIL  390
390             IUQ=IUGO3                                                       UNFIL  391
                IFQ=1                                                           UNFIL  392
                IUPH=IUGO4                                                      UNFIL  393
                IFPH=1                                                          UNFIL  394
                GO TO 9999                                                      UNFIL  395
395            1125 CONTINUE                                                    UNFIL  396
              C                                                                 UNFIL  397
                IUQA=IUGO3                                                      UNFIL  398
                IFQA=2                                                          UNFIL  399
                IUQAT=IUGO1                                                     UNFIL  400
```

VARIABLES	SN	TYPE	RELOCATION								
55	IFDESN	INTEGER	PLACES	REFS	8	151	284	DEFINED	146	279	
35	IFDESO	INTEGER	PLACES	REFS	8	151	284	DEFINED	149	282	
21	IFDLT	INTEGER	PLAYFF	REFS	29	DEFINED	171	173	304	306	
3	IFDLTI	INTEGER	PLAYFF	REFS	29	DEFINED	99	113	236	238	
77	IFDUM1	INTEGER	PLACES	REFS	8	DEFINED	142				
101	IFDUM2	INTEGER	PLACES	REFS	8	DEFINED	151	284			
103	IFDUM3	INTEGER	PLACES	REFS	8	DEFINED	129	137	275		
23	IFIN	INTEGER	KLUES	REFS	4						
141	IFINCK	INTEGER	PLACES	REFS	8	DEFINED	380				
137	IFINCM	INTEGER	PLACES	REFS	8	380	DEFINED	378			
31	IFKS	INTEGER	PLACES	REFS	8	DEFINED	109	264			
105	IFL	INTEGER	PLACES	REFS	8	DEFINED	322				
2	IFLEX	INTEGER	INVERT	REFS	35						
115	IFLR	INTEGER	PLACES	REFS	8	DEFINED	330				
57	IFMD	INTEGER	PLACES	REFS	8	342	DEFINED	339			
65	IFMDB	INTEGER	PLACES	REFS	8	DEFINED	154	287			
37	IFMDBI	INTEGER	PLACES	REFS	8	DEFINED	219				
1	IFMDFF	INTEGER	PLAYFF	REFS	29	DEFINED	344				
61	IFMEMF	INTEGER	PLACES	REFS	8	DEFINED	144	277			
25	IFMEMN	INTEGER	PLACES	REFS	8	142	DEFINED	92	108	255	263
51	IFMEMO	INTEGER	PLACES	REFS	8	142	DEFINED	139			
5	IFMOD	INTEGER	LOCSTR	REFS	33	DEFINED	45				
125	IFMODK	INTEGER	PLACES	REFS	8	376	378	DEFINED	366	375	
123	IFMODM	INTEGER	PLACES	REFS	8	366	375	418	DEFINED	364	373
15	IFMPL	INTEGER	PLAYFF	REFS	29	DEFINED	165	298			
7	IFMPLI	INTEGER	PLAYFF	REFS	29	DEFINED	230				
3	IFMREF	INTEGER	LOCSTR	REFS	33	45	DEFINED	43			
13	IFPATF	INTEGER	PLAYFF	REFS	29	DEFINED	362				
135	IFPH	INTEGER	PLACES	REFS	8	DEFINED	393				
27	IFPHA	INTEGER	PLAYFF	REFS	29	DEFINED	402				
31	IFPHAT	INTEGER	PLAYFF	REFS	29	DEFINED	404				
127	IFPHT	INTEGER	PLACES	REFS	8	DEFINED	386				
121	IFPHTF	INTEGER	PLACES	REFS	8	DEFINED	360	383			
133	IFQ	INTEGER	PLACES	REFS	8	DEFINED	391				
23	IFQA	INTEGER	PLAYFF	REFS	29	DEFINED	398				
25	IFQAT	INTEGER	PLAYFF	REFS	29	DEFINED	400				
131	IFQT	INTEGER	PLACES	REFS	8	DEFINED	389				
11	IFSCR	INTEGER	PLACES	REFS	8	282	326	330	334	349	
				DEFINED	101	115	258	265	349	410	
17	IFSLT	INTEGER	PLAYFF	REFS	29	171	304	DEFINED	168	301	
5	IFSLTI	INTEGER	PLAYFF	REFS	29	113	236	DEFINED	97	112	233
27	IFSTFN	INTEGER	PLACES	REFS	8	129	137	275	DEFINED	91	107
				215							
63	IFSTFO	INTEGER	PLACES	REFS	8	129	137	275	DEFINED	126	134
				272							
1	IFSTRI	INTEGER	LOCSTR	REFS	33						
12	IFS1	INTEGER	PLACES	REFS	8	324	328	336	350	355	364
				373	414	DEFINED	70	127	140	203	350
				355	376	414	418				
13	IFS2	INTEGER	PLACES	REFS	8	322	332	339	DEFINED	71	147
				204	280						
14	IFS3	INTEGER	PLACES	REFS	8	DEFINED	72	205	387	405	
15	IFS4	INTEGER	PLACES	REFS	8	DEFINED	73	206	384	406	
11	IFTPGT	INTEGER	PLAYFF	REFS	29	344	DEFINED	342			
75	IFWT	INTEGER	PLACES	REFS	8	DEFINED	185	317			
47	IFWTI	INTEGER	PLACES	REFS	8	DEFINED	250				
23	IFY	INTEGER	PLACES	REFS	8	DEFINED	93	256			

VARIABLES	SN	TYPE		RELOCATION								
107	IFYT	INTEGER		PLACES	REFS	8	DEFINED	324				
111	IFZ	INTEGER		PLACES	REFS	8	DEFINED	326				
113	IFZR	INTEGER		PLACES	REFS	8	DEFINED	328				
0	INVERT	INTEGER		INVERT	REFS	35						
0	IOINC	INTEGER		CSETUP	REFS	27	42	66	67	68	69	199
						200	201	202				
41	IPERM	INTEGER	ARRAY	INVERT	REFS	35						
173	IPREV	INTEGER		INVERT	REFS	35						
2	IRED	INTEGER		KLUES	REFS	4	89	172	237	253	305	
20	IUA	INTEGER		PLACES	REFS	8	76	DEFINED	75	208		
66	IUADD	INTEGER		PLACES	REFS	8	DEFINED	159	292			
40	IUADDI	INTEGER		PLACES	REFS	8	DEFINED	224				
1	IUA2	INTEGER		INVERT	REFS	35	DEFINED	76				
32	IUB	INTEGER		PLACES	REFS	8	DEFINED	333				
70	IUBAL	INTEGER		PLACES	REFS	8	DEFINED	177	310			
42	IUBALI	INTEGER		PLACES	REFS	8	DEFINED	242				
116	IUBR	INTEGER		PLACES	REFS	8	DEFINED	331				
52	IUBT	INTEGER		PLACES	REFS	8	DEFINED	335				
16	IUCD	INTEGER		PLACES	REFS	8						
72	IUDESF	INTEGER		PLACES	REFS	8	DEFINED	181	313			
44	IUDESI	INTEGER		PLACES	REFS	8	DEFINED	246				
54	IUDESN	INTEGER		PLACES	REFS	8	150	283	DEFINED	145	278	
34	IUDESO	INTEGER		PLACES	REFS	8	150	283	DEFINED	148	281	
20	IUDLT	INTEGER		PLAYFF	REFS	29	DEFINED	170	303			
2	IUDLTI	INTEGER		PLAYFF	REFS	29	DEFINED	87	235			
76	IUDUM1	INTEGER		PLACES	REFS	8	DEFINED	141				
100	IUDUM2	INTEGER		PLACES	REFS	8	DEFINED	150	283			
102	IUDUM3	INTEGER		PLACES	REFS	8	DEFINED	128	136	274		
4	IUGO1	INTEGER		PLACES	REFS	8	125	138	323	327	335	363
						365	372	374	377	379	DEFINED	62	195
5	IUGO2	INTEGER		PLACES	REFS	8	145	278	321	331	338	341
						343	DEFINED	63	196			
6	IUGO3	INTEGER		PLACES	REFS	8	385	390	397	403		
					DEFINED	64	197					
7	IUGO4	INTEGER		PLACES	REFS	8	359	361	382	388	392	399
						401	DEFINED	65	198			
140	IUINCK	INTEGER		PLACES	REFS	8	DEFINED	379				
136	IUINCM	INTEGER		PLACES	REFS	8	DEFINED	377				
0	IUIN1	INTEGER		PLACES	REFS	8	75	77	78	79	85	86
						87	148	208	209	210	211	212	281
						325	329	333	DEFINED	66	102	199	
1	IUIN2	INTEGER		PLACES	REFS	8	214	218	224	229	232	235
						242	246	249	DEFINED	69	202	
30	IUKS	INTEGER		PLACES	REFS	8	DEFINED	85	212			
104	IUL	INTEGER		PLACES	REFS	8	DEFINED	321				
114	IULR	INTEGER		PLACES	REFS	8	DEFINED	329				
56	IUMD	INTEGER		PLACES	REFS	8	DEFINED	338				
64	IUMDB	INTEGER		PLACES	REFS	8	DEFINED	153	286			
36	IUMDBI	INTEGER		PLACES	REFS	8	DEFINED	218				
0	IUMDFF	INTEGER		PLAYFF	REFS	29	DEFINED	343				
60	IUMEMF	INTEGER		PLACES	REFS	8	DEFINED	80	143	276		
24	IUMEMN	INTEGER		PLACES	REFS	8	141	DEFINED	78	210		
50	IUMEMO	INTEGER		PLACES	REFS	8	141	DEFINED	138			
4	IUMOD	INTEGER		LOCSTR	REFS	33	DEFINED	44				
124	IUMODK	INTEGER		PLACES	REFS	8	DEFINED	365	374			
122	IUMODM	INTEGER		PLACES	REFS	8	DEFINED	363	372			

VARIABLES	SN	TYPE	RELOCATION								
				82	86	93	DEFINED	29			
124	INDEX	INTEGER		REFS	57	77	78	93	DEFINED	45	57
				93							
137	INDEX2	INTEGER		REFS	84	91	DEFINED	78			
127	INO	INTEGER		REFS	56	72	DEFINED	55	71		
126	INX	INTEGER		REFS	50	51	53	61	65	67	70
				71	DEFINED	47	53	61	67		
132	IST	INTEGER		REFS	72	DEFINED	70				
133	IX	INTEGER		REFS	73	DEFINED	72				
141	JEND	INTEGER		REFS	87	90	DEFINED	86			
136	JNX	INTEGER		REFS	81	82	83	84	85	2*86	91
				DEFINED	77	83	90				
0	JROW	INTEGER	F.P.	REFS	44	DEFINED	29				
140	JST	INTEGER		REFS	87	DEFINED	85				
135	J2CT	INTEGER		REFS	82	2*88	89	DEFINED	76	82	89
130	K	INTEGER		REFS	88	DEFINED	56	87			
0	KROW	INTEGER	F.P	REFS	59	94	DEFINED	29			
125	LOCSUM	INTEGER		REFS	51	52	55	66	68	70	
				DEFINED	46	51	68				
131	NACT	INTEGER		REFS	66	67	68	71	DEFINED	65	
123	NROW	INTEGER		REFS	52	55	58	59	66	70	92
				94	DEFINED	44	58	92			

STATEMENT LABELS			DEF LINE	REFERENCES		
14	15		48	54	62	69
0	20	INACTIVE	50			
23	25		55	52		
0	30		60	56		
40	35		65	50		
45	36		67	66	96	
51	40		70	2*66		
0	46	INACTIVE	76	2*74		
64	50		79	2*84	2*91	
0	52	INACTIVE	82	2*81		
73	54		85	81		
0	58		89	87		
113	60		92	74	84	91
0	65		95	72		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
27	30	K	56 60	7B		
56	65	IX	72 95	44B		NOT INNER
103	58	K	87 89	3B	INSTACK	

STATISTICS

PROGRAM LENGTH 155B 109

52000B CM USED

```
                      NROW=NROW+1                                                ENMMPY     59
                      IF (NROW.GT.KROW) RETURN                                   ENMMPY     60
60                 30 CONTINUE                                                   ENMMPY     61
                      INX=INX+1                                                  ENMMPY     62
                      GO TO 15                                                   ENMMPY     63
                C**35 NA=IBUFF(INX)                                              ENMMPY     64
                C     NACT = NUMBER OF NON-ZERO ELEMENTS IN THIS STRING          ENMMPY     65
65                 35 NACT=IBUFF(INX)                                            ENMMPY     66
                      IF (LOCSUM+NACT-NROW) 36,40,40                             ENMMPY     67
                   36 INX=INX+NACT+1                                             ENMMPY     68
                      LOCSUM=LOCSUM+NACT                                         ENMMPY     69
                      GO TO 15                                                   ENMMPY     70
70                 40 IST=INX+NROW-LOCSUM                                        ENMMPY     71
                      INO=INX+NACT                                               ENMMPY     72
                      DO 65 IX=IST,INO                                           ENMMPY     73
                      A=BUFFER(IX)                                               ENMMPY     74
                      IF (A) 46,60,46                                            ENMMPY     75
75              C         MULTIPLY THIS ELEMENT BY A ROW OF MATRIX B TO GET PARTIALS ENMMPY     76
                   46 J2CT = 1                                                   ENMMPY     77
                      JNX=INDEX+1                                                ENMMPY     78
                      INDEX2=IBUFF(INDEX)-1                                      ENMMPY     79
                   50     CONTINUE                                               ENMMPY     80
80              C      BEGIN LOOP ON A ROW OF B, END AT 60                       ENMMPY     81
                      IF (IBUFF(JNX)) 52,52,54                                   ENMMPY     82
                   52 J2CT=J2CT-IBUFF(JNX)                                       ENMMPY     83
                      JNX=JNX+1                                                  ENMMPY     84
                      IF (JNX-INDEX2) 50,50,60                                   ENMMPY     85
85                 54 JST=JNX+1                                                  ENMMPY     86
                      JEND=JNX+IBUFF(JNX)                                        ENMMPY     87
                      DO 58 K=JST,JEND                                           ENMMPY     88
                      DBUFF(J2CT)=DBUFF(J2CT)+A*BUFFER(K)                        ENMMPY     89
                   58 J2CT=J2CT+1                                                ENMMPY     90
90                    JNX=JEND+1                                                 ENMMPY     91
                      IF (JNX-INDEX2) 50,50,60                                   ENMMPY     92
                   60 NROW=NROW+1                                                ENMMPY     93
                      INDEX=IBUFF(INDEX)                                         ENMMPY     94
                      IF (NROW.GT.KROW) RETURN                                   ENMMPY     95
95                 65 CONTINUE                                                   ENMMPY     96
                      GO TO 36                                                   ENMMPY     97
                      END                                                        ENMMPY     98
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	ENMMPY	29	59 94

VARIABLES

	SN	TYPE		RELOCATION							
134	A	REAL			REFS	74	88	DEFINED	73		
0	BUFFER	REAL	ARRAY	F.P.	REFS	36	73	88	DEFINED	29	
0	DBUFF	REAL	ARRAY	F.P.	REFS	37	88	DEFINED	29	88	
0	IAST	INTEGER		F.P.	REFS	47	DEFINED	29			
0	IBST	INTEGER		F.P.	REFS	45	DEFINED	29			
0	IBUFF	INTEGER	ARRAY	F.P.	REFS	38	50	51	57	65	78	81

```
      C45700. SUB. ENMMPY (MULTIPLY TOGETHER TWO MATRICES IN CORE)                ENMMPY      2
      C                                                                           ENMMPY      3
      C*************************************************************************** ENMMPY      4
      C                                                                         *  ENMMPY      5
      C***  SUBROUTINE ENMMPY (BUFFER,IBUFF ,DBUFF ) ************************** ENMMPY      6
      C                                                                         *  ENMMPY      7
      C***  OBJECTIVE  ********************************************************** ENMMPY      8
      C     ---------                                                           *  ENMMPY      9
      C     MULTIPLIES TOGETHER TWO MATRICES STORED IN CORE TO PRODUCE THE      *  ENMMPY     10
      C     PARTIAL PRODUCT OF TWO LARGER MATRICES THAT DO NOT FIT IN CORE.     *  ENMMPY     11
      C     THE MULTIPLICATION IS CARRIED OUT IN PACKED FORM.  THAT IS,         *  ENMMPY     12
      C     STRING OF ZEROES ARE NOT MULTIPLIED EXPLICITLY.  THE STORAGE FOR    *  ENMMPY     13
      C     THIS SUBROUTINE IS CONTROLLED BY MULT.                              *  ENMMPY     14
      C                                                                         *  ENMMPY     15
      C***  INPUT/OUTPUT  ******************************************************* ENMMPY     16
      C     ------------                                                        *  ENMMPY     17
      C     THIS SUBROUTINE RECEIVES TWO MATRICES FROM THE CALLING ROUTINE      *  ENMMPY     18
      C     MULT AND RETURNS WITH THE PRODUCT MATRIX.                           *  ENMMPY     19
      C                                                                         *  ENMMPY     20
      C***  SUMMARY OF SYMBOLS  ************************************************ ENMMPY     21
      C     ------------------                                                  *  ENMMPY     22
      C                                                                         *  ENMMPY     23
      C***  ERROR MESSAGES  ***************************************************** ENMMPY     24
      C     --------------                                                      *  ENMMPY     25
      C     NONE.                                                                  ENMMPY     26
      C                                                                         *  ENMMPY     27
      C*************************************************************************** ENMMPY     28
      C                                                                           ENMMPY     29
            SUBROUTINE ENMMPY (BUFFER,IBUFF,DBUFF,IAST,IBST,JROW,KROW)            ENMMPY     30
      C                                                                           ENMMPY     31
      C                                                                           ENMMPY     32
      CIBM  BEGINNING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS    ENMMPY     33
      C     DOUBLE PRECISION DBUFF, A                                             ENMMPY     34
      CIBM  ENDING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS       ENMMPY     35
      C                                                                           ENMMPY     36
            DIMENSION BUFFER(1)                                                   ENMMPY     37
            DIMENSION DBUFF(1)                                                    ENMMPY     38
            DIMENSION IBUFF(1)                                                    ENMMPY     39
      C                                                                           ENMMPY     40
      C     IAST = START OF MATRIX A                                              ENMMPY     41
      C     IBST = START OF MATRIX B                                              ENMMPY     42
      C     JROW = FIRST ROW OF B IN CORE                                         ENMMPY     43
      C     KROW = LAST ROW OF B IN CORE                                          ENMMPY     44
            NROW=JROW                                                             ENMMPY     45
            INDEX=IBST                                                            ENMMPY     46
            LOCSUM=0                                                              ENMMPY     47
            INX=IAST                                                              ENMMPY     48
         15     CONTINUE                                                          ENMMPY     49
      C     MULTIPLY IN PACKED FORM                                               ENMMPY     50
         20 IF (IBUFF(INX).GT.0) GO TO 35                                         ENMMPY     51
            LOCSUM=LOCSUM-IBUFF(INX)                                              ENMMPY     52
            IF (LOCSUM.GE.NROW) GO TO 25                                          ENMMPY     53
            INX=INX+1                                                             ENMMPY     54
            GO TO 15                                                              ENMMPY     55
         25 INO=LOCSUM+1-NROW                                                     ENMMPY     56
            DO 30 K=1,INO                                                         ENMMPY     57
            INDEX=IBUFF(INDEX)                                                    ENMMPY     58
```

STATEMENT LABELS			DEF LINE	REFERENCES
244	100		177	175
240	101		176	173
123	200		131	126
260	205		184	191
302	210		192	178
570	250	FMT	212	181
305	777		195	82
576	778	FMT	214	197
314	1000		199	194

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
132	17	J2CT	137 138	2B	INSTACK
226	74	M	171 172	2B	INSTACK

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CONSTS	2	0 NO (1)	1 YES (1)	
FILE	20	0 IPOS (20)		

STATISTICS

PROGRAM LENGTH	716B	462
CM LABELED COMMON LENGTH	44B	36

52000B CM USED

VARIABLES	SN	TYPE		RELOCATION								
0	MATNAM	INTEGER	ARRAY	F.P.	REFS	63	121	125	129	161	173	
					DEFINED	41						
0	MAT1	INTEGER		F.P.	REFS	77	78	144	162	163	200	
					DEFINED	41						
0	MAT2	INTEGER		F.P.	REFS	79	80	100	104	201		
					DEFINED	41						
645	MIN	INTEGER			REFS	140	158	160	161	DEFINED	157	
631	MOUT	INTEGER			REFS	120	121	149	151	157		
					DEFINED	93	158					
0	MTEMP1	INTEGER		F.P.	REFS	92	93	203	DEFINED	41		
0	MTEMP2	INTEGER		F.P.	REFS	92	204	DEFINED	41			
657	NAME	INTEGER	ARRAY		REFS	64	78	163				
661	NAME1	INTEGER	ARRAY		REFS	64	80					
654	NEXT	INTEGER			REFS	189	DEFINED	185				
643	NFANS	INTEGER			REFS	125	DEFINED	124				
613	NFMAT1	INTEGER			REFS	78	163	DEFINED	77	162		
616	NFMAT2	INTEGER			REFS	80	DEFINED	79				
650	NFMIN	INTEGER			REFS	161	DEFINED	160				
642	NFMOUT	INTEGER			REFS	121	DEFINED	120				
0	NO	INTEGER		CONSTS	REFS	69						
6	NPAGE	INTEGER		CLIST	REFS	67						
627	NROW	INTEGER			REFS	108	109	110	DEFINED	91	108	165
1	YES	INTEGER		CONSTS	REFS	44	69					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES					
DCLOSE		1	151	200	201	202	203	204
ENMMPY		7	145					
GEDLAB		6	78	80	161	163		
GETROW		4	100	104	169	144		
MESAGE		3	74	206				
PROGNA		2	73					
PUDLAB		6	121	125				
PUTROW		4	149	174	176			
TIMEB		2	75	205				
TITLES		1	128	154	180	188	196	

STATEMENT LABELS			DEF LINE	REFERENCES		
0	1	INACTIVE	84			
123	2		133	122	150	193
0	4	INACTIVE	120	119		
103	6		123	2*119		
562	7	FMT	211	155		
45	10		100	109		
54	12		103	102	168	
71	15		110	2*102	2*109	
126	16		137	95	134	
0	17		138	137		
135	18		140	134	159	
140	20		143	139		
0	25	INACTIVE	144			
155	71		149	97	148	
221	73		169	123	148	
0	74		172	171		
573	80	FMT	213	189		
553	81	FMT	210	129		
0	99	INACTIVE	216			

VARIABLES	SN	TYPE		RELOCATION								
0	BUFFER	REAL	ARRAY	F.P.	REFS	60	104	140	144	145	149	174
						176	189	DEFINED	41	172		
0	DBUFF	REAL	ARRAY	F.P.	REFS	61	145	172	DEFINED	41	138	
636	DUMMY	* REAL			REFS	100						
641	I	INTEGER			REFS	133	150	181	193	DEFINED	116	133
623	IAST	INTEGER			REFS	87	145	DEFINED	86			
625	IBST	INTEGER			REFS	145	DEFINED	89				
0	IBUFF	INTEGER	ARRAY	F.P.	REFS	62	107	145	DEFINED	41	106	
637	ICOUNT	INTEGER			REFS	100	102	104	105	106		
646	ICT	INTEGER			REFS	144	161					
656	IND	INTEGER			REFS	197	DEFINED	195				
634	INDEX	INTEGER			REFS	104	2*106	107	DEFINED	98	107	166
651	INO	* INTEGER			REFS	161						
630	IO	INTEGER			REFS	158	DEFINED	92				
0	IPOS	INTEGER	ARRAY	FILE	REFS	62	70	77	79	120	124	160
						162						
0	IPRINT	INTEGER		F.P.	REFS	126	178	DEFINED	41			
632	IREAD	INTEGER			REFS	134	DEFINED	95	159			
614	IR1	INTEGER			REFS	78	121	125	129	150	163	193
617	IR2	INTEGER			REFS	80	82	109	119			
621	ISIZE	INTEGER			REFS	99	167	DEFINED	83			
624	ISTART	INTEGER			REFS	89	98	99	166	167		
					DEFINED	87						
2	ITAPEP	INTEGER		COMRWP	REFS	66						
0	ITAPER	INTEGER		COMRWP	REFS	66						
1	ITAPEW	INTEGER		COMRWP	REFS	66	I/O REFS	129	155	181	189	197
633	IWRITE	INTEGER			REFS	148	DEFINED	97	123			
655	J	INTEGER			REFS	189	DEFINED	189				
615	JC1	INTEGER			REFS	78	82	87	163			
620	JC2	INTEGER			REFS	80	2*84	121	125	129	137	171
						174	176	2*187	191			
622	JC2X2	INTEGER			REFS	86	140	144	149	DEFINED	84	
626	JROW	INTEGER			REFS	145	DEFINED	90	164			
644	J2CT	INTEGER			REFS	138	DEFINED	137				
7	KBPAGE	INTEGER		CLIST	REFS	67						
4	KLABEL	INTEGER		CLIST	REFS	67						
0	KOUNT	INTEGER		CLIST	REFS	67	130	152	156	179	182	190
						198	DEFINED	127	130	153	156	179	182
						190	198					
11	KOUNTH	INTEGER		CLIST	REFS	67						
12	KOUNTI	INTEGER		CLIST	REFS	67						
1	KPAGE	INTEGER		CLIST	REFS	67						
640	KROW	INTEGER			REFS	119	145	164	165	DEFINED	110	
5	KTPAGE	INTEGER		CLIST	REFS	67						
647	LAFT	INTEGER			REFS	153	DEFINED	152				
653	LAST	INTEGER			REFS	185	186	187	189	191		
					DEFINED	183	186	187				
2	LINES	INTEGER		CLIST	REFS	67	127	152	153	2*179		
10	LINESG	INTEGER		CLIST	REFS	67						
3	LINEST	INTEGER		CLIST	REFS	67						
635	LOCEMP	INTEGER			REFS	102	105	DEFINED	99	105	167	
0	LSIZE	INTEGER		F.P.	REFS	83	DEFINED	41				
652	M	INTEGER			REFS	2*172	DEFINED	171				
0	MATANS	INTEGER		F.P.	REFS	124	125	174	176	202		
					DEFINED	41						
525	MATN	INTEGER			REFS	173	DEFINED	76				

```
                74 BUFFER(M)=DBUFF(M)                                          MULT      173
                   IF(MATNAM(1).EQ.MATN) GO TO 101                             MULT      174
                   CALL PUTROW (MATANS,1,BUFFER,JC2)                           MULT      175
175                GO TO 100                                                   MULT      176
               101 CALL PUTROW (MATANS,2,BUFFER,JC2)                           MULT      177
               100 CONTINUE                                                    MULT      178
                   IF(IPRINT.NE.1) GO TO 210                                   MULT      179
                   IF((LINES-KOUNT).LT.2) KOUNT=LINES                          MULT      180
180                CALL TITLES(2)                                              MULT      181
                   WRITE(ITAPEW,250) I                                         MULT      182
                   KOUNT=KOUNT+2                                               MULT      183
                   LAST=0                                                      MULT      184
               205 CONTINUE                                                    MULT      185
185                NEXT=LAST+1                                                 MULT      186
                   LAST=LAST+8                                                 MULT      187
                   IF(LAST.GT.JC2) LAST=JC2                                    MULT      188
                   CALL TITLES(2)                                              MULT      189
                   WRITE(ITAPEW,80) (BUFFER(J),J=NEXT,LAST)                    MULT      190
190                KOUNT=KOUNT+1                                               MULT      191
                   IF(LAST.LT.JC2) GO TO 205                                   MULT      192
               210 CONTINUE                                                    MULT      193
                   IF(I.LT.IR1) GO TO 2                                        MULT      194
                   GO TO 1000                                                  MULT      195
195            777 IND=31                                                      MULT      196
                   CALL TITLES(2)                                              MULT      197
                   WRITE(ITAPEW,778) IND                                       MULT      198
                   KOUNT=KOUNT+1                                               MULT      199
              1000 CONTINUE                                                    MULT      200
200                CALL DCLOSE (MAT1)                                          MULT      201
                   CALL DCLOSE (MAT2)                                          MULT      202
                   CALL DCLOSE (MATANS)                                        MULT      203
                   CALL DCLOSE (MTEMP1)                                        MULT      204
                   CALL DCLOSE (MTEMP2)                                        MULT      205
205                CALL TIMEB (9,9HFROM MULT)                                  MULT      206
                   CALL MESAGE (2, 4, 4HMULT)                                  MULT      207
                C                                                              MULT      208
                C FORMAT STATEMENTS                                            MULT      209
                C                                                              MULT      210
210               81 FORMAT(10X, 9HMATRIX ( ,2A4,4H )  ,I4,7H ROWS, ,I4,8H COLUMNS,/)  MULT  211
                   7 FORMAT(/,10X,   41HTOTAL MATRIX EXCEEDS CORE STORAGE..(MULT))  MULT  212
                 250 FORMAT(/,10X,    3HI= ,I5)                                MULT      213
                  80 FORMAT(10X,1P8E15.6)                                      MULT      214
                 778 FORMAT(10X,10(1H*),  16HDIMENSION ERROR ,I4,10(1H*))      MULT      215
215             C                                                              MULT      216
                  99 RETURN                                                    MULT      217
                     END                                                       MULT      218
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS	DEF LINE	REFERENCES
3 MULT	41	216

```
115          C     KROW = LAST ROW OF B IN CORE                                          MULT      116
                   I=0                                                                   MULT      117
             C     IF THIS IS THE LAST TIME THROUGH - WRITE MATRIX LABEL FOR C;           MULT      118
             C     IF NOT - WRITE SCRATCH MATRIX LABEL                                   MULT      119
                   IF (KROW-IR2) 4,6,6                                                   MULT      120
120                4 NFMOUT =  IPOS(MOUT)                                               MULT      121
                   CALL PUDLAB (8HMULT  O1,MOUT,MATNAM,NFMOUT,IR1,JC2)                   MULT      122
                   GO TO 2                                                               MULT      123
                   6 ASSIGN 73 TO IWRITE                                                 MULT      124
                   NFANS  =  IPOS(MATANS)                                                MULT      125
125                CALL PUDLAB (8HMULT  O2,MATANS,MATNAM,NFANS,IR1,JC2)                  MULT      126
                   IF(IPRINT.NE.1) GO TO 200                                             MUL.      127
                   KOUNT=LINES                                                           MULT      128
                   CALL TITLES(2)                                                        MULT      129
                   WRITE(ITAPEW,81) MATNAM,IR1,JC2                                       MULT      130
130                KOUNT=KOUNT+2                                                         MULT      131
                 200 CONTINUE                                                            MULT      132
             C     LOOP ON ROWS                                                          MULT      133
                   2 I=I+1                                                               MULT      134
                   GO TO IREAD,(16,18)                                                   MULT      135
135          C      LI CONTROLS USE OF SCRATCH TAPES OR DISKS                            MULT      136
             C     INITIALIZE C TO ZERO OR PREVIOUS C                                    MULT      137
                  16 DO 17 J2CT=1,JC2                                                    MULT      138
                  17 DBUFF(J2CT)=0.                                                      MULT      139
                   GO TO 20                                                              MULT      140
140                18 CALL GETROW (MIN,1,BUFFER,JC2X2)                                  MULT      141
             C      FIRST JC2X2 LOCATIONS OF BUFFER ARE FOR                              MULT      142
             C      DOUBLE PRECISION ACCUMULATION OF MATANS                              MULT      143
                  20 CONTINUE                                                           MULT      144
                  25 CALL GETROW (MAT1,0,BUFFER(JC2X2+1),ICT)                           MULT      145
145                CALL ENMMPY (BUFFER,IBUFF,DBUFF,IAST,IBST,JROW,KROW)                  MULT      146
             C         THIS ROUTINE MULTIPLIED A ROW OF MAT1 BY A PARTITION OF MAT2      MULT      147
             C         GENERATING A PARTIAL ROW OF ANSWER                                MULT      148
                   GO TO IWRITE,(71,73)                                                  MULT      149
                  71 CALL PUTROW (MOUT,2,BUFFER,JC2X2)                                  MULT      150
150                IF(I.LT.IR1) GO TO 2                                                  MULT      151
                   CALL DCLOSE (MOUT)                                                    MULT      152
                   LAFT=LINES-KOUNT                                                      MULT      153
                   IF(LAFT.LT.2) KOUNT=LINES                                             MULT      154
                   CALL TITLES(2)                                                        MULT      155
155                WRITE(ITAPEW,7)                                                       MULT      156
                   KOUNT=KOUNT+2                                                         MULT      157
                   MIN=MOUT                                                              MULT      158
                   MOUT=IO-MIN                                                           MULT      159
                   ASSIGN 18 TO IREAD                                                    MULT      160
160                NFMIN  =  IPOS(MIN)                                                   MULT      161
                   CALL GEDLAB (8HMULT  O3,MIN ,MATNAM,NFMIN ,ICT,INO)                   MULT      162
                   NFMAT1 =  IPOS(MAT1)                                                  MULT      163
                   CALL GEDLAB (8HMULT  O4,MAT1,NAME  ,NFMAT1,IR1,JC1)                   MULT      164
                   JROW=KROW+1                                                           MULT      165
165                NROW=KROW                                                             MULT      166
                   INDEX=ISTART+1                                                        MULT      167
                   LOCEMP=ISIZE-ISTART                                                   MULT      168
                   GO TO 12                                                              MULT      169
                  73     CONTINUE                                                       MULT      170
170          C     TRUNCATE TO SINGLE PRECISION FOR FINAL ANSWER                         MULT      171
```

```
      CIBM  ENDING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS     MULT       59
      C                                                                         MULT       60
60          DIMENSION BUFFER(1)                                               MULT       61
            DIMENSION DBUFF(1)                                                MULT       62
            DIMENSION IBUFF(1)          ,IPOS(20)                             MULT       63
            DIMENSION MATNAM(2)                                               MULT       64
            DIMENSION NAME(2)           ,NAME1(2)                             MULT       65
65          C                                                                 MULT       66
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              MULT       67
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE   MULT       68
           1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                        MULT       69
            COMMON /CONSTS/ NO    ,YES                                        MULT       70
70          COMMON /FILE  / IPOS                                              MULT       71
      C                                                                         MULT       72
      C DATA INITIALIZATION                                                     MULT       73
            CALL PROGNA (4H(MUL,4HT  ))                                       MULT       74
            CALL MESAGE (1,28,28HMULT - MULTIPLY TWO MATRICES)                MULT       75
75          CALL TIMEB (11,11HFROM MULT  )                                    MULT       76
            DATA MATN/4HCORN/                                                 MULT       77
            NFMAT1 =  IPOS(MAT1)                                              MULT       78
            CALL GEDLAB (8HMULT  01,MAT1,NAME  ,NFMAT1,IR1,JC1)               MULT       79
            NFMAT2 =  IPOS(MAT2)                                              MULT       80
80          CALL GEDLAB (8HMULT  02,MAT2,NAME1 ,NFMAT2,IR2,JC2)               MULT       81
      C         TEST DIMENSIONS FOR CONFORMABILITY                            MULT       82
            IF (JC1.NE.IR2) GO TO 777                                         MULT       83
            ISIZE = LSIZE                                                     MULT       84
           1 JC2X2=JC2+JC2                                                    MULT       85
85    C         ALLOCATE SPACE FOR A DOUBLE PRECISION ROW OF ANSWER           MULT       86
            IAST=JC2X2+1                                                      MULT       87
            ISTART=IAST+JC1                                                   MULT       88
      C         ALLOCATE SPACE FOR A ROW OF MAT1                              MULT       89
            IBST=ISTART+1                                                     MULT       90
90          JROW=1                                                            MULT       91
            NROW=0                                                            MULT       92
            IO=MTEMP1+MTEMP2                                                  MULT       93
            MOUT=MTEMP1                                                       MULT       94
      C     ZERO OUT OR READ C                                                MULT       95
95          ASSIGN 16 TO IREAD                                                MULT       96
      C     GENERATE INTERMEDIATE OR FINAL RESULTS                            MULT       97
            ASSIGN 71 TO IWRITE                                               MULT       98
            INDEX=ISTART+1                                                    MULT       99
            LOCEMP=ISIZE-ISTART                                               MULT      100
100        10 CALL GETROW (MAT2,-1,DUMMY,ICOUNT)                              MULT      101
      C         FIND OUT IF ANOTHER ROW OF MAT2 WILL FIT                      MULT      102
            IF (LOCEMP-ICOUNT) 15,15,12                                       MULT      103
           12     CONTINUE                                                    MULT      104
            CALL GETROW (MAT2,0,BUFFER(INDEX+1),ICOUNT)                       MULT      105
105         LOCEMP=LOCEMP-ICOUNT-1                                            MULT      106
            IBUFF(INDEX)=INDEX+ICOUNT+1                                       MULT      107
            INDEX=IBUFF(INDEX)                                                MULT      108
            NROW=NROW+1                                                       MULT      109
            IF (NROW-IR2) 10,15,15                                            MULT      110
110        15 KROW=NROW                                                       MULT      111
      C      HAVE A PARTITION OF MATRIX MAT2 IN BUFFER                        MULT      112
      C     IAST = START OF MATRIX A                                          MULT      113
      C     IBST = START OF MATRIX B                                          MULT      114
      C     JROW = FIRST ROW OF B IN CORE                                     MULT      115
```

```
      C45700, SUB  MULT (MULTIPLY TOGETHER TWO MATRICES READ FROM TAPE)          MULT        2
      C                                                                          MULT        3
      C*************************************************************************** MULT        4
      C                                                                        *  MULT        5
      C***  SUBROUTINE MULT   (MAT1  ,MAT2  ,MATANS,MTEMP1,MTEMP2,MATNAM      *  MULT        6
      C                       ,IPRINT)                                         *  MULT        7
      C                                                                        *  MULT        8
      C***  COMPUTER VERSION  ************************************************** MULT        9
      C     ----------------                                                   *  MULT       10
      C     IBM .... INCLUDES DOUBLE PRECISION TYPE STATEMENTS.  COLUMN ONE    *  MULT       11
      C               SHOULD BE BLANK.                                         *  MULT       12
      C                                                                        *  MULT       13
      C     CDC .... DOES NOT INCLUDE DOUBLE PRECISION TYPE STATEMENTS.        *  MULT       14
      C               THESE STATEMENTS ARE CONVERTED INTO COMMENTS BY          *  MULT       15
      C               INSERTING THE LETTER C IN COLUMN ONE.                    *  MULT       16
      C                                                                        *  MULT       17
      C***  OBJECTIVE  ********************************************************* MULT       18
      C     ---------                                                          *  MULT       19
      C     MULTIPLIES TOGETHER TWO MATRICES, NEITHER OF WHICH FIT IN CORE     *  MULT       20
      C     STORAGE, TO FORM A NEW MATRIX C = A TIMES B.  ONE ROW OF A IS      *  MULT       21
      C     READ INTO CORE AT A TIME, AND AS MUCH OF THE B MATRIX AS WILL FIT  *  MULT       22
      C     IS READ IN.  THE SUBROUTINE BECOMES RATHER SLOW IF ALL OF THE B    *  MULT       23
      C     MATRIX WILL NOT FIT.  THE SUBROUTINE MULT ONLY CONTROLS THE TAPE   *  MULT       24
      C     MANIPULATION AND STORAGE.  THE ACTUAL MANIPULATION IS CARRIED      *  MULT       25
      C     OUT IN THE CALLED SUBROUTINE MMPY.                                 *  MULT       26
      C                                                                        *  MULT       27
      C***  INPUT/OUTPUT  ****************************************************** MULT       28
      C     ------------                                                       *  MULT       29
      C     THE SUBROUTINE READS IN THE A AND B MATRICES AND OUTPUTS THE       *  MULT       30
      C     ANSWER MATRIX, C.                                                  *  MULT       31
      C                                                                        *  MULT       32
      C***  SUMMARY OF SYMBOLS  ************************************************ MULT       33
      C     ------------------                                                 *  MULT       34
      C                                                                        *  MULT       35
      C***  ERROR MESSAGES  **************************************************** MULT       36
      C     --------------                                                     *  MULT       37
      C     **** DIMENSION ERROR --- ****.                                     *  MULT       38
      C                                                                        *  MULT       39
      C*************************************************************************** MULT       40
      C                                                                          MULT       41
            SUBROUTINE MULT (LSIZE,BUFFER,IBUFF,DBUFF,MAT1,MAT2,MATANS           MULT       42
           1                ,MTEMP1,MTEMP2,MATNAM,IPRINT)                        MULT       43
      C                                                                          MULT       44
            INTEGER YES                                                          MULT       45
      C               MATRIX MULTIPLICATION ROUTINE                              MULT       46
      C               MAT1 * MAT2 = MATANS                                       MULT       47
      C               MTEMP1 AND MTEMP2 ARE SCRATCH TAPES USED ALTERNATELY       MULT       48
      C          1. READ IN AS MUCH OF MAT2 AS WILL FIT IN CORE                  MULT       49
      C          2. READ IN A ROW OF MAT1                                        MULT       50
      C          3. ZERO OUT A ROW OF ANSWER OR READ IN PREVIOUS PARTIALS        MULT       51
      C          4. COMPUTE A ROW OF ANSWER OR NEW PARTIALS                      MULT       52
      C          5. GO TO 2 UNLESS MAT1 IS EXHAUSTED                            MULT       53
      C          6. UNLESS MAT2 IS EXHAUSTED, REWIND MAT1 & PARTIALS & GO TO 1   MULT       54
      C                                                                          MULT       55
      C                                                                          MULT       56
      CIBM  BEGINNING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   MULT       57
      C     DOUBLE PRECISION DBUFF                                               MULT       58
```

```
COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
                                 6 IUMPLI (1)          7 IFMPLI (1)          8 IUTPGT (1)
                                 9 IFTPGT (1)         10 IUPATF (1)         11 IFPATF (1)
                                12 IUMPL  (1)         13 IFMPL  (1)         14 IUSLT  (1)
                                15 IFSLT  (1)         16 IUDLT  (1)         17 IFDLT  (1)
                                18 IUQA   (1)         19 IFQA   (1)         20 IUQAT  (1)
                                21 IFQAT  (1)         22 IUPHA  (1)         23 IFPHA  (1)
                                24 IUPHAT (1)         25 IFPHAT (1)
        LOCSTR         6        0 IUSTRI (1)          1 IFSTRI (1)          2 IUMREF (1)
                                 3 IFMREF (1)          4 IUMOD  (1)          5 IFMOD  (1)
        INVERT       125        0 INVERT (1)          1 IUA2   (1)          2 IFLEX  (1)
                                 3 AORD   (30)        33 IPERM  (30)        63 NSTOR  (60)
                               123 IPREV  (1)         124 NDOFT (1)

STATISTICS
  PROGRAM LENGTH                 511B      329
  CM LABELED COMMON LENGTH       452B      298
        520000B CM USED
```

STATEMENT LABELS	DEF LINE	REFERENCES
453 1200	413	56
455 1300	417	57
457 9999	421	118 340 346 351 354 356 367 394 407
		411 415

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
KLUES	24	0 KLUSE (1)	1 KLUNAL (1)	2 IRED (1)
		3 KLUMD (1)	4 KLUBAL (1)	5 MSADD (1)
		6 NPASS (1)	7 IDNOPT (1)	8 VDES (1)
		9 EPS1 (1)	10 DWMAX (1)	11 NBAR (1)
		12 NFIX (1)	13 D (1)	14 DEL (1)
		15 EPS2 (1)	16 NCYC (1)	17 NNN (1)
		18 IBAND (1)	19 IFIN (1)	20 KLUB (1)
		21 KLUQ (1)	22 MORBAL (1)	23 DBAL (1)
SIZES	6	0 NSTMEM (1)	1 NSTDOF (1)	2 NDYDOF (1)
		3 NNOPT (1)	4 NDESNO (1)	5 NDESYS (1)
PLACES	98	0 IUIN1 (1)	1 IUIN2 (1)	2 IUOUT1 (1)
		3 IUOUT2 (1)	4 IUGO1 (1)	5 IUGO2 (1)
		6 IUGO3 (1)	7 IUGO4 (1)	8 IUSCR (1)
		9 IFSCR (1)	10 IFS1 (1)	11 IFS2 (1)
		12 IFS3 (1)	13 IFS4 (1)	14 IUCD (1)
		15 IUPR (1)	16 IUA (1)	17 IFA (1)
		18 IUY (1)	19 IFY (1)	20 IUMEMN (1)
		21 IFMEMN (1)	22 IUSTFN (1)	23 IFSTFN (1)
		24 IUKS (1)	25 IFKS (1)	26 IUB (1)
		27 IFB (1)	28 IUDESO (1)	29 IFDESO (1)
		30 IUMDBI (1)	31 IFMDBI (1)	32 IUADDI (1)
		33 IFADDI (1)	34 IUBALI (1)	35 IFBALI (1)
		36 IUDESI (1)	37 IFDESI (1)	38 IUWTI (1)
		39 IFWTI (1)	40 IUMEMO (1)	41 IFMEMO (1)
		42 IUBT (1)	43 IFBT (1)	44 IUDESN (1)
		45 IFDESN (1)	46 IUMD (1)	47 IFMD (1)
		48 IUMEMF (1)	49 IFMEMF (1)	50 IUSTFO (1)
		51 IFSTFO (1)	52 IUMDB (1)	53 IFMDB (1)
		54 IUADD (1)	55 IFADD (1)	56 IUBAL (1)
		57 IFBAL (1)	58 IUDESF (1)	59 IFDESF (1)
		60 IUWT (1)	61 IFWT (1)	62 IUDUM1 (1)
		63 IFDUM1 (1)	64 IUDUM2 (1)	65 IFDUM2 (1)
		66 IUDUM3 (1)	67 IFDUM3 (1)	68 IUL (1)
		69 IFL (1)	70 IUYT (1)	71 IFYT (1)
		72 IUZ (1)	73 IFZ (1)	74 IUZR (1)
		75 IFZR (1)	76 IULR (1)	77 IFLR (1)
		78 IUBR (1)	79 IFBR (1)	80 IUPHTF (1)
		81 IFPHTF (1)	82 IUMODM (1)	83 IFMODM (1)
		84 IUMODK (1)	85 IFMODK (1)	86 IUPHT (1)
		87 IFPHT (1)	88 IUQT (1)	89 IFQT (1)
		90 IUQ (1)	91 IFQ (1)	92 IUPH (1)
		93 IFPH (1)	94 IUINCM (1)	95 IFINCM (1)
		96 IUINCK (1)	97 IFINCK (1)	
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CSETUP	1	0 IOINC (1)		
KLUFF	1	0 KFREE (1)		
PLAYFF	26	0 IUMDFF (1)	1 IFMDFF (1)	2 IUDLTI (1)
		3 IFDLTI (1)	4 IUSLTI (1)	5 IFSLTI (1)

VARIABLES	SN	TYPE		RELOCATION								
2	NDYDOF	INTEGER		SIZES	REFS	7						
500	NEXT	INTEGER			REFS	97	98	99	100	112	114	115
						165	166	168	169	173	174	178	179
						182	183	185	186	230	231	233	234
						238	239	243	244	247	248	250	251
						298	299	301	302	306	307	311	312
						314	315	317	318	DEFINED	95	98	100
						110	114	135	155	161	166	169	174
						179	183	186	216	220	226	231	234
						239	244	248	251	273	288	294	299
						302	307	312	315	318			
14	NFIX	INTEGER		KLUES	REFS	4						
21	NNN	INTEGER		KLUES	REFS	4						
3	NNOPT	INTEGER		SIZES	REFS	7	124					
6	NPAGE	INTEGER		CLIST	REFS	25						
6	NPASS	INTEGER		KLUES	REFS	4	60					
1	NSTDOF	INTEGER		SIZES	REFS	7						
0	NSTMEM	INTEGER		SIZES	REFS	7						
77	NSTOR	INTEGER	ARRAY	INVERT	REFS	35						
10	VDES	REAL		KLUES	REFS	4						

EXTERNALS	TYPE	ARGS	REFERENCES	
MESAGE		3	40	423
PROGNA		2	39	

STATEMENT LABELS			DEF LINE	REFERENCES	
33	10		59	48	
71	15		101	96	
74	20		106	89	
104	25		115	111	
106	30		117	104	
107	33		121	49	
123	35		132	122	
153	100		158	152	
160	115		163	156	158
172	120		176	163	172
177	140		181	176	
204	400		188	124	130
205	500		193	60	
232	505		223	217	
237	507		228	221	223
251	510		241	228	237
256	515		246	241	
271	520		262	253	
274	530		267	260	
0	550	INACTIVE	270		
321	600		291	285	
326	615		296	289	291
340	620		309	296	305
345	640		313	309	
352	1000		320	190	
376	1040		348	50	
401	1060		353	51	
405	1080		358	52	
416	1100		369	53	
437	1125		395	54	
450	1150		409	55	

VARIABLES	SN	TYPE	RELOCATION								
6	IUMPLI	INTEGER	PLAYFF	REFS	29	DEFINED	229				
2	IUMREF	INTEGER	LOCSTR	REFS	33	44	DEFINED	42			
2	IUOUT1	INTEGER	PLACES	REFS	8	80	143	276	DEFINED	67	200
3	IUOUT2	INTEGER	PLACES	REFS	8	133	153	159	164	167	170
					177	181	184	271	286	292	297	300
					303	310	313	316	DEFINED	68	201
12	IUPATF	INTEGER	PLAYFF	REFS	29	DEFINED	361				
134	IUPH	INTEGER	PLACES	REFS	8	DEFINED	392				
26	IUPHA	INTEGER	PLAYFF	REFS	29	DEFINED	401				
30	IUPHAT	INTEGER	PLAYFF	REFS	29	DEFINED	403				
126	IUPHT	INTEGER	PLACES	REFS	8	DEFINED	385				
120	IUPHTF	INTEGER	PLACES	REFS	8	DEFINED	359	382			
17	IUPR	INTEGER	PLACES	REFS	8						
132	IUQ	INTEGER	PLACES	REFS	8	DEFINED	390				
22	IUQA	INTEGER	PLAYFF	REFS	29	DEFINED	397				
24	IUQAT	INTEGER	PLAYFF	REFS	29	DEFINED	399				
130	IUQT	INTEGER	PLACES	REFS	8	DEFINED	388				
10	IUSCR	INTEGER	PLACES	REFS	8	DEFINED	84	211			
16	IUSLT	INTEGER	PLAYFF	REFS	29	DEFINED	167	300			
4	IUSLTI	INTEGER	PLAYFF	REFS	29	DEFINED	86	232			
26	IUSTFN	INTEGER	PLACES	REFS	8	128	136	274	DEFINED	79	214
62	IUSTFO	INTEGER	PLACES	REFS	8	128	136	274	DEFINED	125	133
					271						
0	IUSTRI	INTEGER	LOCSTR	REFS	33						
10	IUTPGT	INTEGER	PLAYFF	REFS	29	DEFINED	341				
74	IUWT	INTEGER	PLACES	REFS	8	DEFINED	184	316			
46	IUWTI	INTEGER	PLACES	REFS	8	DEFINED	249				
22	IUY	INTEGER	PLACES	REFS	8	DEFINED	77	209			
106	IUYT	INTEGER	PLACES	REFS	8	DEFINED	323				
110	IUZ	INTEGER	PLACES	REFS	8	DEFINED	325				
112	IUZR	INTEGER	PLACES	REFS	8	DEFINED	327				
0	JUMP	INTEGER	F.P.	REFS	48	49	50	51	52	53	54
					55	56	57	DEFINED	1		
7	KBPAGE	INTEGER	CLIST	REFS	25						
0	KFREE	INTEGER	KLUFF	REFS	28	96	111	163	228	296	340
4	KLABEL	INTEGER	CLIST	REFS	25						
24	KLUB	INTEGER	KLUES	REFS	4						
4	KLUBAL	INTEGER	KLUES	REFS	4	176	241	309			
3	KLUMD	INTEGER	KLUES	REFS	4	124	152	217	285		
1	KLUNAL	INTEGER	KLUES	REFS	4						
25	KLUQ	INTEGER	KLUES	REFS	4						
0	KLUSE	INTEGER	KLUES	REFS	4	122					
0	KOUNT	INTEGER	CLIST	REFS	25						
11	KOUNTH	INTEGER	CLIST	REFS	25						
12	KOUNTI	INTEGER	CLIST	REFS	25						
1	KPAGE	INTEGER	CLIST	REFS	25						
5	KTPAGE	INTEGER	CLIST	REFS	25						
2	LINES	INTEGER	CLIST	REFS	25						
10	LINESG	INTEGER	CLIST	REFS	25						
3	LINEST	INTEGER	CLIST	REFS	25						
26	MORBAL	INTEGER	KLUES	REFS	4						
5	MSADD	INTEGER	KLUES	REFS	4	158	223	291			
13	NBAR	INTEGER	KLUES	REFS	4						
20	NCYC	INTEGER	KLUES	REFS	4	354					
4	NDESNO	INTEGER	SIZES	REFS	7						
5	NDESYS	INTEGER	SIZES	REFS	7						
174	NDOFT	INTEGER	INVERT	REFS	35						

```
      SUBROUTINE VIBIFO (ISCR,IROW,NCYC,INDEX1,KLUSE)                    VIBIFO     2
      DIMENSION NAME(2),NAME3(2,2)                                       VIBIFO     3
      DIMENSION Q(2510),QMASS(40,40),QQ(220)                             VIBIFO     4
      DIMENSION TPLUG(3,220),ELAM(220,3)                                 VIBIFO     5
      DIMENSION ELMTMD(3,220),EMOM(3,40),RMASS(3,3),CHK(43,43),F(43)     VIBIFO     6
      DIMENSION A(25000)                                                 VIBIFO     7
      DIMENSION BUFFER(220)                                              VIBIFO     8
      DIMENSION    TITLE(18,2) ,      TSHV(1)                            VIBIFO     9
      DIMENSION      ITAPES(1)                                           VIBIFO    10
      DIMENSION        IPOS(1)                                           VIBIFO    11
      DIMENSION IFILES(1)                                                VIBIFO    12
      DIMENSION        FREQ(1)                                           VIBIFO    13
      DIMENSION       NAME1(2) ,     NAME2(2)                            VIBIFO    14
C                                                                        VIBIFO    15
C                                                                        VIBIFO    16
C                                                                        VIBIFO    17
      COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE    VIBIFO    18
     1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                        VIBIFO    19
      COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA   VIBIFO    20
     1               ,ITAPET                                             VIBIFO    21
      COMMON /CTSHV / LTSHV, TSHV                                        VIBIFO    22
      COMMON /CTAPES/ ITAPES                                             VIBIFO    23
      COMMON /CTITLE/ LTITLE, TITLE                                      VIBIFO    24
      COMMON /FILE  / IPOS                                               VIBIFO    25
      COMMON /CFILES/ KFILES, IFILES                                     VIBIFO    26
      COMMON /FREAKS/ FREQ                                               VIBIFO    27
      COMMON /CPMASS/ A                                                  VIBIFO    28
      COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                               VIBIFO    29
      COMMON /REPORT/ KREPOR                                             VIBIFO    30
      COMMON/PLACES/ IUIN1,IUIN2,IUOUT1,IUOUT2,IUGO1,IUGO2,IUGO3,IUGO4,  VIBIFO    31
     1               IUSCR,IFSCR,IFS1,IFS2,IFS3,IFS4,IUCD,IUPR,          VIBIFO    32
     2               IUA,IFA,IUY,IFY,IUMEMN,IFMEMN,IUSTFN,IFSTFN,        VIBIFO    33
     3               IUKS,IFKS,IUB,IFB,IUDESO,IFDESO,                    VIBIFO    34
     4               IUMDBI,IFMDBI,IUADDI,IFADDI,IUBALI,IFBALI,          VIBIFO    35
     5               IUDESI,IFDESI,IUWTI,IFWTI,                          VIBIFO    36
     6               IUMEMO,IFMEMO,IUBT,IFBT,                            VIBIFO    37
     7               IUDESN,IFDESN,IUMD,IFMD,                            VIBIFO    38
     8               IUMEMF,IFMEMF,                                      VIBIFO    39
     9               IUSTFO,IFSTFO,IUMDB,IFMDB,IUADD,IFADD,IUBAL,IFBAL,  VIBIFO    40
     A               IUDESF,IFDESF,IUWT,IFWT,                            VIBIFO    41
     B               IUDUM1,IFDUM1,IUDUM2,IFDUM2,IUDUM3,IFDUM3,          VIBIFO    42
     C               IUL,IFL,IUYT,IFYT,IUZ,IFZ,IUZR,IFZR,IULR,IFLR,      VIBIFO    43
     D               IUBR,IFBR,                                          VIBIFO    44
     E               IUPHTF,IFPHTF,IUMODM,IFMODM,                        VIBIFO    45
     F               IUMODK,IFMODK,IUPHT,IFPHT,IUQT,IFQT,IUQ,IFQ,        VIBIFO    46
     G               IUPH,IFPH,IUINCM,IFINCM,IUINCK,IFINCK               VIBIFO    47
      COMMON /PLUG/ EMP(3,3), PHP(3,40)                                  VIBIFO    48
      COMMON /PLAYFF/ IUMDFF,IFMDFF,IUDLTI,IFDLTI,IUSLTI,IFSLTI          VIBIFO    49
     1               ,IUMPLI,IFMPLI,IUTPGT,IFTPGT,IUPATF,IFPATF          VIBIFO    50
     2               ,IUMPL,IFMPL,IUSLT,IFSLT,IUDLT,IFDLT                VIBIFO    51
     3               ,IUQA,IFQA,IUQAT,IFQAT,IUPHA,IFPHA,IUPHAT,IFPHAT    VIBIFO    52
      COMMON /KLUFF/ KFREE                                               VIBIFO    53
      COMMON /VKLUE/ NROOTS,NDOFFF,NZERO,IDFV(220),IDFF(220)             VIBIFO    54
      COMMON /CLUEM/ LKLUE,KLUE(80)                                      VIBIFO    55
      COMMON /VIBIFR/ RIGFRQ(3)                                          VIBIFO    56
C                                                                        VIBIFO    57
      EQUIVALENCE (Q(1),TPLUG(1,1),ELAM(1,1),CHK(1,1))                   VIBIFO    58
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      EQUIVALENCE (Q(1850),ELMTMD(1,1))                                 VIBIFO     59
C                                                                       VIBIFO     60
C                                                                       VIBIFO     61
      DATA NONE   /4HNONE/                                              VIBIFO     62
      DATA NAME3/4HEIGE,4HNNCS,                                         VIBIFO     63
     1           4HEIGE,4HABTF/                                         VIBIFO     64
      DATA NAME1 /4HMODM,4HASS /                                        VIBIFO     65
      DATA NAME2 /4HMODS,4HTIFF/                                        VIBIFO     66
C                                                                       VIBIFO     67
C     FUNCTION DEFINITIONS                                              VIBIFO     68
      MINOF(I,J)   =   MINO(I,J)                                        VIBIFO     69
      MAXOF(I,J)   =  MAXO(I,J)                                         VIBIFO     70
      ABSF(X)   =   ABS(X)                                              VIBIFO     71
C                                                                       VIBIFO     72
C     ROUTINE WHICH WILL PREPARE VIBRATION INFORMATION FOR              VIBIFO     73
C     FLUTTER ANALYSIS MODULE                                           VIBIFO     74
C                                                                       VIBIFO     75
C     INITIAL DATA                                                      VIBIFO     76
C                                                                       VIBIFO     77
      CALL PROGNA (4H(VIB, 4HIFO))                                      VIBIFO     78
      KOLUMN =    8                                                     VIBIFO     79
      IF  (KREPOR  .EQ.  2)    KOLUMN    =  4                           VIBIFO     80
      NTOTAL = NROOTS                                                   VIBIFO     81
      NRIGID = 0                                                        VIBIFO     82
C                                                                       VIBIFO     83
C MODE SHAPES PHBAR, AS COMPUTED IN THE VIBRATION SOLUTION, WERE STORED VIBIFO     84
C ON AN I/O DEVICE.                                                     VIBIFO     85
C 1. IF CANTILEVER MODES WERE COMPUTED (KFREE=1), PHBAR IS IN ABSOLUTE  VIBIFO     86
C COORDINATES.                                                          VIBIFO     87
C 2. IF FREE-FREE MODES WERE COMPUTED (KFREE=2), PHBAR IS IN RELATIVE   VIBIFO     88
C (TO THE PLUG) COORDINATES.                                            VIBIFO     89
C IN EITHER CASE, READ PHBAR INTO CORE AND NORMALIZE SUCH THAT THE      VIBIFO     90
C LARGEST ABSOLUTE VALUE IN EACH MODE IS UNITY.                         VIBIFO     91
C                                                                       VIBIFO     92
      NFIL  = IPOS(ISCR)                                                VIBIFO     93
      CALL GEDLAB (8HVIBIFO01,ISCR,NAME,NFIL,IROWS,JCOLS)               VIBIFO     94
      DO 60 I=1,NROOTS                                                  VIBIFO     95
      IANS5 = 1 + IROW*(I-1)                                            VIBIFO     96
      ILIM  = IANS5 + IROW - 1                                          VIBIFO     97
      CALL GETROW (ISCR,1,BUFFER,IROW)                                  VIBIFO     98
      DO 230 J=IANS5,ILIM                                               VIBIFO     99
      JB      =  J - IANS5 + 1                                          VIBIFO    100
      A(J)    = BUFFER(JB)                                              VIBIFO    101
      IF (J.GT.IANS5) GOTO 82                                           VIBIFO    102
      XLARGE  =  A(IANS5)                                               VIBIFO    103
   82 IF (ABSF(A(J)).GT.ABSF(XLARGE))  XLARGE = A(J)                    VIBIFO    104
  230 CONTINUE                                                          VIBIFO    105
      DO 83 J=IANS5,ILIM                                                VIBIFO    106
   83 A(J)  =  A(J) / XLARGE                                            VIBIFO    107
   60 CONTINUE                                                          VIBIFO    108
      CALL DCLOSE (ISCR)                                                VIBIFO    109
C                                                                       VIBIFO    110
      IF(KFREE.EQ.1) GO TO 5300                                         VIBIFO    111
C                                                                       VIBIFO    112
C    THIS IS A FREE-FREE ANALYSIS. DO THE FOLLOWING                     VIBIFO    113
C   1. COMPUTE PLUG MOTION FOR ALL MODES (PHP)                          VIBIFO    114
C   2. COMPUTE MODE SHAPES IN ABSOLUTE COORDINATES (PHAB)               VIBIFO    115
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115         C   3. RENORMALIZE SO THAT LARGEST (ABSOLUTE) VALUE OF EACH ABSOLUTE     VIBIFO    116
            C      MODE SHAPE (IN PHAB OR PHP) IS UNITY. FOR CONSISTENCY, THE        VIBIFO    117
            C      RELATIVE MODE SHAPES PHBAR MUST ALSO BE MODIFIED BY THE SAME      VIBIFO    118
            C      NORMALIZATION FACTORS.                                            VIBIFO    119
            C   4. STORE RELATIVE MODE SHAPES ON I/O UNIT                            VIBIFO    120
120         C                                                                        VIBIFO    121
            C PHP=-TPLUG*PHBAR WHERE TRANSFORMATION MATRIX TPLUG WAS GENERATED AND   VIBIFO    122
            C SAVED IN SUBROUTINE FFMASS                                             VIBIFO    123
            C                                                                        VIBIFO    124
                  CALL GEDLAB(8HVIBIF002,IUTPGT,NAME,IFTPGT,KROW,KCOL)               VIBIFO    125
125               DO 5000 I=1,KROW                                                   VIBIFO    126
                  CALL GETROW(IUTPGT,1,TPLUG(1,I),KCOL)                              VIBIFO    127
             5000 CONTINUE                                                           VIBIFO    128
                  CALL DCLOSE(IUTPGT)                                                VIBIFO    129
            C                                                                        VIBIFO    130
130               NROW=KCOL                                                          VIBIFO    131
                  NCOL=KROW                                                          VIBIFO    132
            C                                                                        VIBIFO    133
                  DO 5020 I=1,NROW                                                   VIBIFO    134
                  DO 5020 K=1,NROOTS                                                 VIBIFO    135
135               JO=(K-1)*NCOL                                                      VIBIFO    136
                  B=0.0                                                              VIBIFO    137
                  DO 5010 J=1,NCOL                                                   VIBIFO    138
                  B=B-TPLUG(I,J)*A(JO+J)                                             VIBIFO    139
             5010 CONTINUE                                                           VIBIFO    140
140               PHP(I,K)=B                                                         VIBIFO    141
             5020 CONTINUE                                                           VIBIFO    142
            C                                                                        VIBIFO    143
            C READ DYNAMIC LAMBDA MATRIX INTO CORE                                   VIBIFO    144
            C                                                                        VIBIFO    145
145               IFDLTI = 5                                                         VIBIFO    146
                  IF (KLUSE.LE.0)  IFDLTI = 2                                        VIBIFO    147
                  CALL GEDLAB(8HVIBIF003,IUDLTI,NAME.IFDLTI,KROW,KCOL)               VIBIFO    148
                  DO 5030 I=1,KROW                                                   VIBIFO    149
                  CALL GETROW(IUDLTI,1,ELAM(1,I),KCOL)                               VIBIFO    150
150          5030 CONTINUE                                                           VIBIFO    151
                  CALL DCLOSE(IUDLTI)                                                VIBIFO    152
            C                                                                        VIBIFO    153
                  LROW=KCOL                                                          VIBIFO    154
                  LCOL=KROW                                                          VIBIFO    155
155         C                                                                        VIBIFO    156
            C PREPARE FOR INCLUSION OF RIGID-BODY MODES IN OUTPUT FOR AFAM AND AFOM  VIBIFO    157
            C                                                                        VIBIFO    158
                  IF (KFREE.EQ.1.OR.KLUE(38).EQ.1)  GO TO 5040                       VIBIFO    159
                  NRIGID = KROW                                                      VIBIFO    160
160               NTOTAL = NROOTS + NRIGID                                           VIBIFO    161
             5040 CONTINUE                                                           VIBIFO    162
            C                                                                        VIBIFO    163
                  CALL PUDLAB(8HVIBIF001,IUPHTF,NAME3,IFPHTF,NTOTAL,LROW)            VIBIFO    164
            C                                                                        VIBIFO    165
165         C INSERT ZEROES FOR RIGID-BODY MODES IN RELATIVE COORDINATES AND         VIBIFO    166
            C WRITE ON I/O UNIT                                                      VIBIFO    167
            C                                                                        VIBIFO    168
                  IF (KFREE.EQ.1.OR.KLUE(38).EQ.1)  GO TO 5046                       VIBIFO    169
                  DO 5044 N=1,NRIGID                                                 VIBIFO    170
170               DO 5042 I=1,LROW                                                   VIBIFO    171
                  BUFFER(I) = 0.0                                                    VIBIFO    172
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 5042 CONTINUE                                                          VIBIFO   173
      CALL PUTROW(IUPHTF,1,BUFFER,LROW)                                 VIBIFO   174
 5044 CONTINUE                                                          VIBIFO   175
 5046 CONTINUE                                                          VIBIFO   176
C                                                                       VIBIFO   177
      DO 5200 K=1,NROOTS                                                VIBIFO   178
      IO=(K-1)*LROW                                                     VIBIFO   179
C                                                                       VIBIFO   180
C TRANSFER KTH RELATIVE FLEXIBLE MODE TO BUFFER                         VIBIFO   181
C                                                                       VIBIFO   182
      DO 5050 I=1,LROW                                                  VIBIFO   183
      II=IO+I                                                           VIBIFO   184
      BUFFER(I)=A(II)                                                   VIBIFO   185
 5050 CONTINUE                                                          VIBIFO   186
C                                                                       VIBIFO   187
C NOW ADD LAMBDA*PHP TO KTH RELATIVE MODE AS STORED IN VARIABLE A.      VIBIFO   188
C RESULT IS KTH ABSOLUTE MODE                                           VIBIFO   189
C                                                                       VIBIFO   190
      DO 5070 I=1,LROW                                                  VIBIFO   191
      B=0.0                                                             VIBIFO   192
      DO 5060 J=1,LCOL                                                  VIBIFO   193
      B=B+ELAM(I,J)*PHP(J,K)                                            VIBIFO   194
 5060 CONTINUE                                                          VIBIFO   195
      II=IO+I                                                           VIBIFO   196
      A(II)=A(II)+B                                                     VIBIFO   197
 5070 CONTINUE                                                          VIBIFO   198
C                                                                       VIBIFO   199
C NOW NORMALIZE KTH MODE SO THAT LARGEST(ABSOLUTE) VALUE OF EACH        VIBIFO   200
C ABSOLUTE MODE (INCLUDING PLUG MOTION) IS UNITY. FOR CONSISTENCY, THE  VIBIFO   201
C KTH RELATIVE MODE SHOULD BE RENORMALIZED.                             VIBIFO   202
C                                                                       VIBIFO   203
      XMAX=0.0                                                          VIBIFO   204
      DO 5080 I=1,LROW                                                  VIBIFO   205
      II=IO+I                                                           VIBIFO   206
      IF(ABSF(A(II)).GT.ABSF(XMAX)) XMAX=A(II)                          VIBIFO   207
 5080 CONTINUE                                                          VIBIFO   208
C                                                                       VIBIFO   209
      DO 5090 I=1,LCOL                                                  VIBIFO   210
      IF(ABSF(PHP(I,K)).GT.ABSF(XMAX)) XMAX=PHP(I,K)                    VIBIFO   211
 5090 CONTINUE                                                          VIBIFO   212
C                                                                       VIBIFO   213
      DO 5100 I=1,LROW                                                  VIBIFO   214
      II=IO+I                                                           VIBIFO   215
      A(II)=A(II)/XMAX                                                  VIBIFO   216
      BUFFER(I)=BUFFER(I)/XMAX                                          VIBIFO   217
 5100 CONTINUE                                                          VIBIFO   218
C                                                                       VIBIFO   219
      DO 5110 I=1,LCOL                                                  VIBIFO   220
      PHP(I,K)=PHP(I,K)/XMAX                                            VIBIFO   221
 5110 CONTINUE                                                          VIBIFO   222
C                                                                       VIBIFO   223
C WRITE KTH RELATIVE MODE ON I/O DEVICE                                 VIBIFO   224
C                                                                       VIBIFO   225
      CALL PUTROW(IUPHTF,1,BUFFER,LROW)                                 VIBIFO   226
C                                                                       VIBIFO   227
 5200 CONTINUE                                                          VIBIFO   228
      CALL DCLOSE(IUPHTF)                                               VIBIFO   229
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                C                                                               VIBIFO   230
230             C MODIFY OTHER MODAL DATA TO INCLUDE RIGID-BODY MODES IN OUTPUT  VIBIFO   231
                C PASSED TO AFAM AND AFOM.                                      VIBIFO   232
                C                                                               VIBIFO   233
                      IF (KFREE.EQ.1.OR.KLUE(38).EQ.1)  GO TO 5300              VIBIFO   234
                C                                                               VIBIFO   235
235             C     SHIFT INDICES OF FREQUENCIES AND PLUG MODE SHAPES TO       VIBIFO   236
                C     PROVIDE ROOM FOR RIGID-BODY VALUES AT LOWER END OF        VIBIFO   237
                C     INDEX NUMBERS.                                            VIBIFO   238
                C                                                               VIBIFO   239
                      DO 5210 N=1,NROOTS                                        VIBIFO   240
240                   INEW = NTOTAL - N + 1                                     VIBIFO   241
                      IOLD = NROOTS - N + 1                                     VIBIFO   242
                      FREQ(INEW) = FREQ(IOLD)                                   VIBIFO   243
                      DO 5205 L=1,NRIGID                                        VIBIFO   244
                      PHP(L,INEW) = PHP(L,IOLD)                                 VIBIFO   245
245              5205 CONTINUE                                                  VIBIFO   246
                 5210 CONTINUE                                                  VIBIFO   247
                C                                                               VIBIFO   248
                C     READ IN ASSUMED RIGID-BODY FREQUENCIES AND INSERT         VIBIFO   249
                C     UNIT VALUES FOR PLUG DISPLACEMENTS IN RIGID-BODY MODES.   VIBIFO.  250
250             C                                                               VIBIFO   251
                      IF (NCYC.GT.0)  GO TO 5212                                VIBIFO   252
                      READ (ITAPER,1001) (FREQ(N),N=1,NRIGID)                   VIBIFO   253
                      DO 5211 N=1,NRIGID                                        VIBIFO   254
                      IF (FREQ(N).LT.0.002)  FREQ(N) = 0.002                    VIBIFO   255
255                   RIGFRQ(N) = FREQ(N)                                       VIBIFO   256
                 5211 CONTINUE                                                  VIBIFO   257
                      GO TO 5214                                                VIBIFO   258
                 5212 CONTINUE                                                  VIBIFO   259
                      DO 5213 N=1,NRIGID                                        VIBIFO   260
260                   FREQ(N) = RIGFRQ(N)                                       VIBIFO   261
                 5213 CONTINUE                                                  VIBIFO   262
                 5214 CONTINUE                                                  VIBIFO   263
                      DO 5220 N=1,NRIGID                                        VIBIFO   264
                      DO 5215 K=1,NRIGID                                        VIBIFO   265
265                   PHP(K,N) = 0.0                                            VIBIFO   266
                      IF (K.EQ.N)  PHP(K,N) = 1.0                               VIBIFO   267
                 5215 CONTINUE                                                  VIBIFO   268
                 5220 CONTINUE                                                  VIBIFO   269
                C                                                               VIBIFO   270
270             C     SHIFT INDICES OF MODE SHAPES (OTHER THAN PLUG VALUES).    VIBIFO   271
                C                                                               VIBIFO   272
                      NDOF = KCOL                                               VIBIFO   273
                      NAFLEX = NROOTS*NDOF                                      VIBIFO   274
                      NATOTL = NAFLEX + NRIGID*NDOF                             VIBIFO   275
275                   DO 5230 I=1,NAFLEX                                        VIBIFO   276
                      INEW = NATOTL - I + 1                                     VIBIFO   277
                      IOLD = NAFLEX - I + 1                                     VIBIFO   278
                      A(INEW) = A(IOLD)                                         VIBIFO   279
                 5230 CONTINUE                                                  VIBIFO   280
280             C                                                               VIBIFO   281
                C     INSERT RIGID-BODY MODE SHAPES (OTHER THAN PLUG            VIBIFO   282
                C     DISPLACEMENTS) FROM LAMBDA MATRIX.                        VIBIFO   283
                C                                                               VIBIFO   284
                      DO 5240 N=1,NRIGID                                        VIBIFO   285
285                   JL = NDOF*(N-1) + 1                                       VIBIFO   286
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                      JU = NDOF*N                                                VIBIFO   287
                      DO 5235 J=JL,JU                                            VIBIFO   288
                      K = J - JL + 1                                             VIBIFO   289
                      A(J) = ELAM(K,N)                                           VIBIFO   290
290                5235 CONTINUE                                                 VIBIFO   291
                   5240 CONTINUE                                                 VIBIFO   292
                   C                                                             VIBIFO   293
                      NROOTS = NTOTAL                                            VIBIFO   294
                   C                                                             VIBIFO   295
295                5300 CONTINUE                                                 VIBIFO   296
                   C WRITE ABSOLUTE MODE SHAPES ON TAPE                          VIBIFO   297
                   C (PHBAR IF KFREE=1 , PHAB IF KFREE=2)                        VIBIFO   298
                   C                                                             VIBIFO   299
                      IUCOM=IUPHTF                                               VIBIFO   300
300                   IFCOM=IFPHTF                                               VIBIFO   301
                      IF(KFREE.EQ.1) GO TO 5310                                  VIBIFO   302
                      IUCOM=IUPATF                                               VIBIFO   303
                      IFCOM=IFPATF                                               VIBIFO   304
                   5310 CONTINUE                                                 VIBIFO   305
305                C                                                             VIBIFO   306
                      CALL PUDLAB(8HVIBIF002,IUCOM,NAME3(1,KFREE),IFCOM,NROOTS,IROW)  VIBIFO   307
                      DO 320  I=1,NROOTS                                         VIBIFO   308
                      JCL   = IROW*(I - 1) + 1                                   VIBIFO   309
                      JCU   =  I * IROW                                          VIBIFO   310
310                   CALL RITVEC(JCL,JCU,BUFFER,IUCOM)                          VIBIFO   311
                    320 CONTINUE                                                 VIBIFO   312
                      CALL DCLOSE(IUCOM)                                         VIBIFO   313
                   C                                                             VIBIFO   314
                   C                                                             VIBIFO   315
315                C                                                             VIBIFO   316
                   C LIST ABSOLUTE MODE SHAPES INCLUDING ALL REQUESTED DEGREES OF FREEDOM  VIBIFO   317
                   C                                                             VIBIFO   318
                      IF(KFREE.EQ.1) GO TO 5340                                  VIBIFO   319
                      KOUNT=LINES                                                VIBIFO   320
320                   KTOP=0                                                     VIBIFO   321
                   5315 CONTINUE                                                 VIBIFO   322
                      KBOT=KTOP+1                                                VIBIFO   323
                      KTOP=KTOP+KOLUMN                                           VIBIFO   324
                      IF(KTOP.GT.NROOTS) KTOP=NROOTS                             VIBIFO   325
325                   CALL TITLES(2)                                             VIBIFO   326
                      IF(KOUNT.GT.KOUNTH) GO TO 5320                             VIBIFO   327
                      WRITE(ITAPEW,4004)                                         VIBIFO   328
                      KOUNT=KOUNT+3                                              VIBIFO   329
                   5320 CONTINUE                                                 VIBIFO   330
330                   WRITE(ITAPEW,4005) (K,K=KBOT,KTOP)                         VIBIFO   331
                      CALL PLB (1,1,ITAPEW)                                      VIBIFO   332
                      KOUNT=KOUNT+4                                              VIBIFO   333
                      DO 5325 I=1,LCOL                                           VIBIFO   334
                      WRITE(ITAPEW,2002) I, (PHP(I,K),K=KBOT,KTOP)               VIBIFO   335
335                   KOUNT=KOUNT+1                                              VIBIFO   336
                   5325 CONTINUE                                                 VIBIFO   337
                      IF(KTOP.EQ.NROOTS) GO TO 5330                              VIBIFO   338
                      LEFT=LINES-KOUNT                                           VIBIFO   339
                      IF(LEFT.LT.7) KOUNT=LINES                                  VIBIFO   340
340                   GO TO 5315                                                 VIBIFO   341
                   C                                                             VIBIFO   342
                   5330 CONTINUE                                                 VIBIFO   343
```

```
                C                                                                VIBIFO   344
                 5340 CONTINUE                                                   VIBIFO   345
345             C                                                                VIBIFO   346
                      KCU    =  0                                               VIBIFO   347
                      JCU    =  0                                               VIBIFO   348
                  400 JCL    =  JCU + 1                                         VIBIFO   349
                      JCU    =  JCU + KOLUMN                                    VIBIFO   350
350                   JCU    =  MINOF(JCU,NROOTS)                               VIBIFO   351
                      INC    =  IROW*(JCU-JCL)                                  VIBIFO   352
                      MIN    =  KCU                                             VIBIFO   353
                      MAX    =  KCU + INC                                       VIBIFO   354
                      KOUNT  =  LINES                                           VIBIFO   355
355                   NCOLS  =  3                                               VIBIFO   356
                      DO 500 I=1,IROW                                           VIBIFO   357
                      CALL TITLES (2)                                           VIBIFO   358
                      IF (I .GT. 1 .OR. JCL .GT. 1) GO TO 405                   VIBIFO   359
                      NROWS  =  1                                               VIBIFO   360
360                   KTABLE =  2                                               VIBIFO   361
                      CALL PTABLE (1,52,52                                      VIBIFO   362
                     1   HFREQUENCIES, GENERALIZED MASSES, AND MODE SHAPES FOR)  VIBIFO   363
                      NROWS  =  0                                               VIBIFO   364
                      KTABLE =  2                                               VIBIFO   365
365                   CALL PTABLE (2,32,32                                      VIBIFO   366
                     1   HALL REQUESTED DEGREES OF FREEDOM)                     VIBIFO   367
                  405 CONTINUE                                                  VIBIFO   368
                      IF(KOUNT.GT.KOUNTH) GO TO 410                             VIBIFO   369
                      WRITE (ITAPEW,2000)                                       VIBIFO   370
370                   CALL PLB (1,1,ITAPEW)                                     VIBIFO   371
                      WRITE (ITAPEW,2001) (J, J=JCL,JCU)                        VIBIFO   372
                      CALL PLB (1,1,ITAPEW)                                     VIBIFO   373
                      KOUNT = KOUNT + 5                                         VIBIFO   374
                  410 CONTINUE                                                  VIBIFO   375
375                   KCL    =  I + MIN                                         VIBIFO   376
                      KCU    =  I + MAX                                         VIBIFO   377
                      KOUNT  =  KOUNT + 1                                       VIBIFO   378
                      WRITE (ITAPEW,2002)  I, (A(K), K=KCL,KCU, IROW)           VIBIFO   379
                  500 CONTINUE                                                  VIBIFO   380
380                   IF (JCU .LT. NROOTS) GO TO 400                            VIBIFO   381
                C                                                               VIBIFO   382
                C                                                               VIBIFO   383
                C                                                               VIBIFO   384
                C READ IN (CANTILEVER) MASS MATIX FROM I/O DEVICE               VIBIFO   385
385             C                                                               VIBIFO   386
                      IPOS(ISCR)=IFMD                                           VIBIFO   387
                      NFIL   = IPOS(ISCR)                                       VIBIFO   388
                      CALL GEDLAB(8HVIBIFOO4,ISCR,NAME,NFIL,IROWS,JCOLS)        VIBIFO   389
                      DO 43  I=1,IROW                                           VIBIFO   390
390                   IANS6 = (((I-1)**2 + (I-1))/2) + 1                        VIBIFO   391
                      ILIM2 = IANS6 + I - 1                                     VIBIFO   392
                      JCOL   =  ILIM2 - IANS6 + 1                               VIBIFO   393
                      CALL GETROW (ISCR,1,BUFFER,IROW)                          VIBIFO   394
                      DO 110 K=IANS6,ILIM2                                      VIBIFO   395
395                   KB     =  K - IANS6 + 1                                   VIBIFO   396
                  110 A(K)   =  BUFFER(KB)                                      VIBIFO   397
                   43 CONTINUE                                                  VIBIFO   398
                      CALL DCLOSE(ISCR)                                         VIBIFO   399
                C                                                               VIBIFO   400
```

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400         C                                                              VIBIFO   401
            C GENERALIZED MASS                                             VIBIFO   402
            C     FORM PHI(TRANSPOSE) * MASS * PHI                         VIBIFO   403
            C USE ABSOLUTE MODE SHAPES                                     VIBIFO   404
            C                                                              VIBIFO   405
405               DO 45  I=1,NROOTS                                        VIBIFO   406
                  CALL GETLAB(8HVIBIFO05,IUCOM,NAME,IFCOM,IROWS,JCOLS)     VIBIFO   407
                  DO 46  I1=1,I                                            VIBIFO   408
                  CALL GETROW(IUCOM,1,BUFFER,IROW)                         VIBIFO   409
                46 CONTINUE                                                VIBIFO   410
410               DO 47 J=1,IROW                                           VIBIFO   411
                  DO 48 K=1,IROW                                           VIBIFO   412
                  IF (K.GT.J) GO TO 49                                     VIBIFO   413
                  IANS2 = (((J-1)*(J-1) + (J-1))/2) + K                    VIBIFO   414
                  GO TO 52                                                 VIBIFO   415
415               49 IANS2 = (((K-1)*(K-1) + (K-1))/2) + J                 VIBIFO   416
                  52 Q(K) = A(IANS2)                                       VIBIFO   417
                  48 CONTINUE                                              VIBIFO   418
                  SUM = 0.E0                                               VIBIFO   419
                  QQ(J) = SCAPRO(Q(1),BUFFER(1),SUM,IROW,1,1)              VIBIFO   420
420               47 CONTINUE                                              VIBIFO   421
                  DO 53 II=1,NROOTS                                        VIBIFO   422
                  IF (II.LT.I) GO TO 53                                    VIBIFO   423
                  IF (II.EQ.I) GO TO 54                                    VIBIFO   424
                  CALL GETROW(IUCOM,1,BUFFER,IROW)                         VIBIFO   425
425               54 SUM = 0.E0                                            VIBIFO   426
                  QMASS(II,I) = SCAPRO(QQ(1),BUFFER(1),SUM,IROW,1,1)       VIBIFO   427
                  QMASS(I,II) = QMASS(II,I)                                VIBIFO   428
                  53 CONTINUE                                              VIBIFO   429
                  CALL DCLOSE(IUCOM)                                       VIBIFO   430
430               45 CONTINUE                                              VIBIFO   431
            C                                                              VIBIFO   432
            C IF KFREE=2, INCREMENT THE GENERALIZED MASS TO ACCOUNT FOR THE VIBIFO   433
            C PRESENCE OF THE PLUG.   PHP(TRAN)*EMP*PHP                    VIBIFO   434
            C                                                              VIBIFO   435
435               IF(KFREE.EQ.1) GO TO 5400                                VIBIFO   436
            C                                                              VIBIFO   437
                  DO 5370 I=1,NROOTS                                       VIBIFO   438
                  DO 5370 L=1,NROOTS                                       VIBIFO   439
                  B=0.0                                                    VIBIFO   440
440               DO 5360 K=1,LCOL                                         VIBIFO   441
                  DO 5360 J=1,LCOL                                         VIBIFO   442
                  B=B+PHP(J,I)*EMP(J,K)*PHP(K,L)                           VIBIFO   443
               5360 CONTINUE                                               VIBIFO   444
                  QMASS(I,L)=QMASS(I,L)+B                                  VIBIFO   445
445            5370 CONTINUE                                               VIBIFO   446
            C                                                              VIBIFO   447
               5400 CONTINUE                                               VIBIFO   448
            C                                                              VIBIFO   449
            C                                                              VIBIFO   450
450         C WRITE GENERALIZED MASS MATRIX OUT AS A VECTOR CONTAINING     VIBIFO   451
            C DIAGONAL TERMS ONLY                                          VIBIFO   452
                  DO 630 I=1,NROOTS                                        VIBIFO   453
                  BUFFER(I)  = QMASS(I,I)                                  VIBIFO   454
                630 CONTINUE                                               VIBIFO   455
455               CALL PUDLAB(8HVIBIFO03,IUMODM,NAME1,IFMODM,NROOTS,NROOTS) VIBIFO   456
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                CALL DCLOSE (IUMODM)                                              VIBIFO   458
              C                                                                   VIBIFO   459
              C                                                                   VIBIFO   460
460           C FORM GENERALIZED STIFFNESS MATRIX  (DIAGONAL ELEMENTS ONLY)       VIBIFO   461
              C                                                                   VIBIFO   462
                DO 620 I=1,NROOTS                                                 VIBIFO   463
                BUFFER(I)  = QMASS(I,I) * (FREQ(I)*6.28318)**2                    VIBIFO   464
              620 CONTINUE                                                        VIBIFO   465
465           C                                                                   VIBIFO   466
                CALL PUDLAB(8HVIBIFO04,IUMODK,NAME2,IFMODK,NROOTS,NROOTS)         VIBIFO   467
                CALL PUTROW (IUMODK, 1, BUFFER(1), NROOTS)                        VIBIFO   468
                CALL DCLOSE (IUMODK)                                              VIBIFO   469
              C                                                                   VIBIFO   470
470           C                                                                   VIBIFO   471
              C                                                                   VIBIFO   472
              C                                                                   VIBIFO   473
              C LIST GENERALIZED MASSES                                           VIBIFO   474
              C                                                                   VIBIFO   475
475             KOUNT=LINES                                                       VIBIFO   476
                JCU    =  0                                                       VIBIFO   477
              600 JCL    =  JCU + 1                                               VIBIFO   478
                JCU    =  JCU + KOLUMN                                            VIBIFO   479
                JCU    =  MINOF(JCU,NROOTS)                                       VIBIFO   480
480             LEFT=LINES-KOUNT                                                  VIBIFO   481
                IF(LEFT.LT.15) GO TO 602                                          VIBIFO   482
                CALL PLB(1,4,ITAPEW)                                              VIBIFO   483
                WRITE(ITAPEW,3001) (NC,NC=JCL,JCU)                                VIBIFO   484
                CALL PLB(1,1,ITAPEW)                                              VIBIFO   485
485             KOUNT=KOUNT+6                                                     VIBIFO   486
                GO TO 605                                                         VIBIFO   487
              602 KOUNT=LINES                                                     VIBIFO   488
              605 CONTINUE                                                        VIBIFO   489
                DO 700 MR=1,NROOTS                                                VIBIFO   490
490             CALL TITLES (2)                                                   VIBIFO   491
                IF(KOUNT.GT.KOUNTH) GO TO 610                                     VIBIFO   492
                IF(KFREE.EQ.1) WRITE(ITAPEW,3000)                                 VIBIFO   493
                IF(KFREE.EQ.2) WRITE(ITAPEW,3003)                                 VIBIFO   494
                WRITE(ITAPEW,3004)                                                VIBIFO   495
495             CALL PLB (1,1,ITAPEW)                                             VIBIFO   496
                WRITE (ITAPEW,3001) (NC, NC=JCL,JCU)                              VIBIFO   497
                CALL PLB(1,1,ITAPEW)                                              VIBIFO   498
                KOUNT=KOUNT+5                                                     VIBIFO   499
              610 CONTINUE                                                        VIBIFO   500
500             KOUNT  =  KOUNT + 1                                               VIBIFO   501
                WRITE (ITAPEW,3002) MR, (QMASS(MR,NC), NC=JCL,JCU)                VIBIFO   502
              700 CONTINUE                                                        VIBIFO   503
                IF (JCU .LT. NROOTS) GO TO 600                                    VIBIFO   504
              C                                                                   VIBIFO   505
505           C                                                                   VIBIFO   506
              C IF KFREE=2, DO THE FOLLOWING.                                     VIBIFO   507
              C   A. MOMENTUM CHECK                                               VIBIFO   508
              C      EMOM=LAMBDA(TRAN)*MD*PHI(ABS) + EMP*PHP                      VIBIFO   509
              C   B. COMPUTE THE GENERALIZED MASS ASSOCIATED WITH THE RIGID BODY MODES VIBIFO 510
510           C      RMASS=LAMBDA(TRAN)*MD*LAMBDA + EMP                           VIBIFO   511
              C                                                                   VIBIFO   512
                IF(KFREE.NE.2) GO TO 5800                                         VIBIFO   513
              C                                                                   VIBIFO   514
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      C CANTILEVER MASS MATRIX MD IS CURRENTLY STORED IN VARIABLE A.          VIBIFO    515
515   C FIRST, COMPUTE LAMBDA(TRAN)*MD . STORE RESULT IN ELMTMD.              VIBIFO    516
      C                                                                       VIBIFO    517
            CALL GEDLAB(8HVIBIFO09,IUDLTI,NAME,IFDLTI,KROW,KCOL)              VIBIFO    518
            DO 5405 I=1,KROW                                                  VIBIFO    519
            CALL GETROW(IUDLTI,1,ELAM(1,I),KCOL)                              VIBIFO    520
520          5405 CONTINUE                                                    VIBIFO    521
            CALL DCLOSE(IUDLTI)                                               VIBIFO    522
      C                                                                       VIBIFO    523
            DO 5420 I=1,LCOL                                                  VIBIFO    524
            DO 5420 K=1,LROW                                                  VIBIFO    525
525         B=0.0                                                             VIBIFO    526
            DO 5410 J=1,LROW                                                  VIBIFO    527
            IF(K.LE.J) L=((J-1)*J/2)+K                                        VIBIFO    528
            IF(K.GT.J) L=((K-1)*K/2)+J                                        VIBIFO    529
            B=B+ELAM(J,I)*A(L)                                                VIBIFO    530
530          5410 CONTINUE                                                    VIBIFO    531
            ELMTMD(I,K)=B                                                     VIBIFO    532
             5420 CONTINUE                                                    VIBIFO    533
      C                                                                       VIBIFO    534
      C COMPUTE EMOM                                                          VIBIFO    535
535   C                                                                       VIBIFO    536
            CALL GEDLAB(8HVIBIFO06,IUPATF,NAME,IFPATF,KROW,KCOL)              VIBIFO    537
      C                                                                       VIBIFO    538
            DO 5460 K=1,KROW                                                  VIBIFO    539
            CALL GETROW(IUPATF,1,BUFFER,KCOL)                                 VIBIFO    540
540         DO 5460 I=1,LCOL                                                  VIBIFO    541
            B=0.0                                                             VIBIFO    542
            DO 5440 J=1,LROW                                                  VIBIFO    543
            B=B+ELMTMD(I,J)*BUFFER(J)                                         VIBIFO    544
             5440 CONTINUE                                                    VIBIFO    545
545         EMOM(I,K)=B                                                       VIBIFO    546
             5460 CONTINUE                                                    VIBIFO    547
            CALL DCLOSE(IUPATF)                                               VIBIFO    548
      C                                                                       VIBIFO    549
            DO 5480 I=1,LCOL                                                  VIBIFO    550
550         DO 5480 K=1,NROOTS                                                VIBIFO    551
            B=0.0                                                             VIBIFO    552
            DO 5470 J=1,LCOL                                                  VIBIFO    553
            B=B+EMP(I,J)*PHP(J,K)                                             VIBIFO    554
             5470 CONTINUE                                                    VIBIFO    555
555         EMOM(I,K)=EMOM(I,K)+B                                             VIBIFO    556
             5480 CONTINUE                                                    VIBIFO    557
      C                                                                       VIBIFO    558
      C NOW, COMPUTE RMASS                                                    VIBIFO    559
      C                                                                       VIBIFO    560
560         DO 5540 I=1,LCOL                                                  VIBIFO    561
            DO 5540 K=1,LCOL                                                  VIBIFO    562
            B=0.0                                                             VIBIFO    563
            DO 5520 J=1,LROW                                                  VIBIFO    564
            B=B+ELMTMD(I,J)*ELAM(J,K)                                         VIBIFO    565
565          5520 CONTINUE                                                    VIBIFO    566
            RMASS(I,K)=B+EMP(I,K)                                             VIBIFO    567
             5540 CONTINUE                                                    VIBIFO    568
      C                                                                       VIBIFO    569
            LEFT=LINES-KOUNT                                                  VIBIFO    570
570         IF(LEFT.LT.14) GO TO 5560                                         VIBIFO    571
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                CALL PLB(1,4,ITAPEW)                                              VIBIFO   572
                KOUNT=KOUNT+4                                                     VIBIFO   573
                GO TO 5570                                                        VIBIFO   574
             5560 KOUNT=LINES                                                     VIBIFO   575
575          5570 CONTINUE                                                        VIBIFO   576
                CALL TITLES(2)                                                    VIBIFO   577
                WRITE(ITAPEW,3005) (J,J=1,LCOL)                                   VIBIFO   578
                KOUNT=KOUNT+4                                                     VIBIFO   579
                DO 5580 I=1,LCOL                                                  VIBIFO   580
580             CALL PLB(1,1,ITAPEW)                                              VIBIFO   581
                WRITE(ITAPEW,2002) I,(RMASS(I,J),J=1,LCOL)                        VIBIFO   582
                KOUNT=KOUNT+2                                                     VIBIFO   583
             5580 CONTINUE                                                        VIBIFO   584
               C                                                                  VIBIFO   585
585            C TRANSFER ALL GENERALIZED MASS TERMS (FLEX.+RIGID) TO VARIABLE CHK.  VIBIFO   586
               C NORMALIZE SO THAT ALL DIAGONALS ARE UNITY.                       VIBIFO   587
               C                                                                  VIBIFO   588
                DO 5610 I=1,NROOTS                                                VIBIFO   589
             5610 F(I)=SQRT(1.0/QMASS(I,I))                                       VIBIFO   590
590             IF (KLUE(38).EQ.2)  GO TO 5617                                    VIBIFO   591
                DO 5615 I=1,LCOL                                                  VIBIFO   592
             5615 F(NROOTS+I)=SQRT(1.0/RMASS(I,I))                                VIBIFO   593
             5617 CONTINUE                                                        VIBIFO   594
               C                                                                  VIBIFO   595
595             DO 5620 I=1,NROOTS                                                VIBIFO   596
                DO 5620 J=1,NROOTS                                                VIBIFO   597
             5620 CHK(I,J)=QMASS(I,J)*F(I)*F(J)                                   VIBIFO   598
               C                                                                  VIBIFO   599
                IF (KLUE(38).EQ.2)  GO TO 5645                                    VIBIFO   600
600             DO 5630 K=1,LCOL                                                  VIBIFO   601
                I=NROOTS+K                                                        VIBIFO   602
                DO 5630 J=1,NROOTS                                                VIBIFO   603
                CHK(I,J)=EMOM(K,J)*F(I)*F(J)                                      VIBIFO   604
             5630 CHK(J,I)=CHK(I,J)                                               VIBIFO   605
605            C                                                                  VIBIFO   606
                DO 5640 K=1,LCOL                                                  VIBIFO   607
                I=NROOTS+K                                                        VIBIFO   608
                DO 5640 L=1,LCOL                                                  VIBIFO   609
                J=NROOTS+L                                                        VIBIFO   610
610          5640 CHK(I,J)=RMASS(K,L)*F(I)*F(J)                                   VIBIFO   611
             5645 CONTINUE                                                        VIBIFO   612
               C                                                                  VIBIFO   613
               C                                                                  VIBIFO   614
                KOUNT=LINES                                                       VIBIFO   615
615             NSIZ=NROOTS+LCOL                                                  VIBIFO   616
                NFLEX = NTOTAL - NRIGID                                           VIBIFO   617
                IF (KLUE(38).EQ.2)  NSIZ = NROOTS                                 VIBIFO   618
                JCU=0                                                             VIBIFO   619
             5700 JCL=JCU+1                                                       VIBIFO   620
620             JCU=JCU+KOLUMN                                                    VIBIFO   621
                IF(JCU.GT.NSIZ) JCU=NSIZ                                          VIBIFO   622
                LEFT=LINES-KOUNT                                                  VIBIFO   623
                IF(LEFT.LT.15) GO TO 5705                                         VIBIFO   624
                CALL PLB(1,4,ITAPEW)                                              VIBIFO   625
625             WRITE(ITAPEW,3006) (NC,NC=JCL,JCU)                                VIBIFO   626
                CALL PLB(1,1,ITAPEW)                                              VIBIFO   627
                KOUNT=KOUNT+6                                                     VIBIFO   628
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                GO TO 5710                                                      VIBIFO   629
             5705 KOUNT=LINES                                                   VIBIFO   630
630          5710 CONTINUE                                                      VIBIFO   631
                DO 5750 I=1,NSIZ                                                VIBIFO   632
                CALL TITLES(2)                                                  VIBIFO   633
                IF(KOUNT.GT.KOUNTH) GO TO 5715                                  VIBIFO   634
                IF (KLUE(38).EQ.1)  WRITE (ITAPEW,3007) NROOTS,LCOL             VIBIFO   635
635             IF (KLUE(38).EQ.2)  WRITE (ITAPEW,3009) LCOL,NFLEX              VIBIFO   636
                CALL PLB(1,1,ITAPEW)                                            VIBIFO   637
                WRITE(ITAPEW,3006) (NC,NC=JCL,JCU)                              VIBIFO   638
                CALL PLB(1,1,ITAPEW)                                            VIBIFO   639
                KOUNT=KOUNT+7                                                   VIBIFO   640
640          5715 CONTINUE                                                      VIBIFO   641
                WRITE(ITAPEW,3008) I,(CHK(I,J),J=JCL,JCU)                       VIBIFO   642
                KOUNT=KOUNT+1                                                   VIBIFO   643
             5750 CONTINUE                                                      VIBIFO   644
                IF(JCU.LT.NSIZ) GO TO 5700                                      VIBIFO   645
645          C                                                                  VIBIFO   646
             5800 CONTINUE                                                      VIBIFO   647
                IF (KLUE(4).EQ.1)  STOP                                         VIBIFO   648
             C                                                                  VIBIFO   649
             C                                                                  VIBIFO   650
650          C STORE VIBRATION ANALYSIS INFORMATION ON TAPE FOR USE IN FLUTTER  VIBIFO   651
             C ANALYSIS EXCLUDING THE DEGREES OF FREEDOM WHICH HAVE BEEN ELIMINATED VIBIFO 652
             C                                                                  VIBIFO   653
                CALL FSIO (6HIDVIBA,IDVIBA,JDVIBA,KDVIBA,LOCFIL,1)              VIBIFO   654
                ITAPE  =  IDVIBA                                                VIBIFO   655
655             IROWR  =  NDOFFF + NZERO                                        VIBIFO   656
                REWIND ITAPE                                                    VIBIFO   657
                WRITE(ITAPE) IROWR,NROOTS                                       VIBIFO   658
                CALL RWBT (ITAPE,FREQ,NROOTS)                                   VIBIFO   659
                DO 720 M=1,NROOTS                                               VIBIFO   660
660           720 WRITE (ITAPE)  (QMASS(M,I),I=1,NROOTS)                        VIBIFO   661
             C                                                                  VIBIFO   662
             C     READ EIGENVECTORS BACK INTO CORE A MODE AT A TIME            VIBIFO   663
             C (ABSOLUTE MODE SHAPES)                                           VIBIFO   664
             C                                                                  VIBIFO   665
665             CALL GEDLAB(8HVIBIFOO6,IUCOM,NAME,IFCOM,IROWS,JCOLS)            VIBIFO   666
                DO 790  I=1,NROOTS                                              VIBIFO   667
                IANS1 = IROW*(I-1) + 1                                          VIBIFO   668
                ILIM  = I*IROW                                                  VIBIFO   669
                CALL GETROW(IUCOM,1,BUFFER,IROW)                                VIBIFO   670
670             DO 795 K1=IANS1,ILIM                                            VIBIFO   671
                A(K1)  =  BUFFER(K1 - IANS1 + 1)                                VIBIFO   672
              795 CONTINUE                                                      VIBIFO   673
              790 CONTINUE                                                      VIBIFO   674
                CALL DCLOSE(IUCOM)                                              VIBIFO   675
675          C                                                                  VIBIFO   676
             C     READ INDICES WHICH RELATE VIBRATION DOF'S TO FLUTTER DOF'S   VIBIFO   677
             C                                                                  VIBIFO   678
                IF(NCYC.GT.0) GO TO 734                                         VIBIFO   679
                READ (ITAPER,1000) (IDFV(IE),IDFF(IE),IE=1,NDOFFF)              VIBIFO   680
680           734 CONTINUE                                                      VIBIFO   681
             C                                                                  VIBIFO   682
                MOVE   =  IROW*NROOTS                                           VIBIFO   683
                NSL    =  MOVE + 1                                              VIBIFO   684
                NSU    =  2*MOVE                                                VIBIFO   685
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685                 DO 735 NS=NSL,NSU                                          VIBIFO   686
                    NR      =  NS - NSL + 1                                    VIBIFO   687
                    A(NS)   =  A(NR)                                           VIBIFO   688
                735 A(NR)   =  0.0                                             VIBIFO   689
                    KR      =  NSL - 1                                         VIBIFO   690
690                 KS      =  0                                               VIBIFO   691
                    DO 780 M=1,NROOTS                                          VIBIFO   692
                    IR      =  0                                               VIBIFO   693
                    DO 740 II=1,IROWR                                          VIBIFO   694
                740 BUFFER(II)  = 0.                                           VIBIFO   695
695                 DO 760 I=1,IROW                                            VIBIFO   696
                    KR   =  KR + 1                                             VIBIFO   697
                    DO 751 IJ=1,NDOFFF                                         VIBIFO   698
                    IF (IDFV(IJ).EQ.I)  GOTO 752                               VIBIFO   699
                751 CONTINUE                                                   VIBIFO   700
700                 GOTO 760                                                   VIBIFO   701
                752 IR= IDFF(IJ)                                               VIBIFO   702
                    BUFFER(IR)  =  A(KR)                                       VIBIFO   703
                760 CONTINUE                                                   VIBIFO   704
                    CALL RWBT (ITAPE,BUFFER,IROWR)                             VIBIFO   705
705                 DO 770 IS=1,IROWR                                          VIBIFO   706
                    KS      =  KS + 1                                          VIBIFO   707
                770 A(KS)   =  BUFFER(IS)                                      VIBIFO   708
                780 CONTINUE                                                   VIBIFO   709
                    CALL FCLOSE (IDVIBA,JDVIBA,1)                              VIBIFO   710
710             800 CONTINUE                                                   VIBIFO   711
              C                                                                VIBIFO   712
              C                                                                VIBIFO   713
              C LIST MODE SHAPES EXCLUDING THE ELIMINATED DEGREES OF FREEDOM   VIBIFO   714
              C                                                                VIBIFO   715
715                 IF (IROW .EQ. IROWR) GO TO 900                             VIBIFO   716
                    KOUNT=LINES                                                VIBIFO   717
                    KCU     =  0                                               VIBIFO   718
                    JCU     =  0                                               VIBIFO   719
                820 JCL     =  JCU + 1                                         VIBIFO   720
720                 JCU     =  JCU + KOLUMN                                    VIBIFO   721
                    JCU     =  MINOF(JCU,NROOTS)                               VIBIFO   722
                    INC     =  IROWR*(JCU-JCL)                                 VIBIFO   723
                    MIN     =  KCU                                             VIBIFO   724
                    MAX     =  KCU + INC                                       VIBIFO   725
725                 LEFT=LINES-KOUNT                                           VIBIFO   726
                    IF(LEFT.LT.15) GO TO 821                                   VIBIFO   727
                    CALL PLB (1,2,ITAPEW)                                      VIBIFO   728
                    WRITE(ITAPEW,4001) (J,J=JCL,JCU)                           VIBIFO   729
                    CALL PLB (1,1,ITAPEW)                                      VIBIFO   730
730                 KOUNT = KOUNT + 4                                          VIBIFO   731
                    GO TO 822                                                  VIBIFO   732
                821 KOUNT=LINES                                                VIBIFO   733
                822 CONTINUE                                                   VIBIFO   734
                    DO 850 I=1,IROWR                                           VIBIFO   735
735                 CALL TITLES (2)                                            VIBIFO   736
                    IF (I .GT. 1 .OR. JCL .GT. 1) GO TO 825                    VIBIFO   737
                    NROWS   =  1                                               VIBIFO   738
                    KTABLE  =  2                                               VIBIFO   739
                    CALL PTABLE (2,42,42                                       VIBIFO   740
740                1    HMODE SHAPES FOR REDUCED DEGREES OF FREEDOM)           VIBIFO   741
                825 CONTINUE                                                   VIBIFO   742
```

```
                IF(KOUNT.GT.KOUNTH) GO TO 840                                   VIBIFO   743
                WRITE (ITAPEW,4000)                                             VIBIFO   744
                CALL PLB (1,1,ITAPEW)                                           VIBIFO   745
745             WRITE (ITAPEW,4001) (J, J=JCL,JCU)                              VIBIFO   746
                CALL PLB (1,1,ITAPEW)                                           VIBIFO   747
                KOUNT = KOUNT + 4                                               VIBIFO   748
             840 CONTINUE                                                       VIBIFO   749
                KCL    =  I + MIN                                               VIBIFO   750
750             KCU    =  I + MAX                                               VIBIFO   751
                KOUNT  =  KOUNT + 1                                             VIBIFO   752
                DO 842 IJ=1,NDOFFF                                              VIBIFO   753
                IJF    =  IJ                                                    VIBIFO   754
                IF (IDFF(IJ) .EQ. I) GO TO 844                                  VIBIFO   755
755          842 CONTINUE                                                       VIBIFO   756
                IJF    =  0                                                     VIBIFO   757
             844 IF (IJF  EQ. 0) GO TO 846                                      VIBIFO   758
                WRITE(ITAPEW,4002) I, IDFV(IJF), (A(K),K=KCL,KCU,IROWR)         VIBIFO   759
                GO TO 850                                                       VIBIFO   760
760          846 WRITE(ITAPEW,4003) I, NONE     , (A(K),K=KCL,KCU,IROWR)         VIBIFO   761
             850 CONTINUE                                                       VIBIFO   762
                IF (JCU  LT  NROOTS) GO TO 820                                  VIBIFO   763
             900 CONTINUE                                                       VIBIFO   764
           C                                                                    VIBIFO   765
765        C RESET NROOTS FOR NEXT PASS                                         VIBIFO   766
           C                                                                    VIBIFO   767
                NROOTS = NTOTAL - NRIGID                                        VIBIFO   768
           C                                                                    VIBIFO   769
           C FORMATS                                                            VIBIFO   770
770         1000 FORMAT (10I4)                                                  VIBIFO   771
            1001 FORMAT (3E10.3)                                                VIBIFO   772
            2000 FORMAT (10X,87HNORMALIZED EIGENVECTORS FOR ALL VIBRATION-ANALYSIS VIBIFO 773
               1DEGREES OF FREEDOM (ABSOLUTE MOTION)/10X                        VIBIFO   774
               2,58HRIGID-BODY MODES (IF REQUESTED) FOLLOWED BY FLEXIBLE MODES) VIBIFO   775
775         2001 FORMAT (10X, 1X, 4HIOLD, 3X, 3HM =, 6X,I2, 7(12X,1I2))        VIBIFO   776
            2002 FORMAT (10X, I5, 1P8E14.6)                                     VIBIFO   777
            3000 FORMAT (10X, 21HGENERALIZED MASS, LBS)                         VIBIFO   778
            3001 FORMAT (10X, 4X, 1HM, 3HN =, 9X,I2, 7(12X,1I2))               VIBIFO   779
            3002 FORMAT (10X, I5, 1P8E14.6)                                     VIBIFO   780
780         3003 FORMAT (10X,83HGENERALIZED MASS (LBS) ASSOCIATED WITH RIGID-BODY ( VIBIFO 781
               1IF REQUESTED) AND FLEXIBLE MODES)                               VIBIFO   782
            3004 FORMAT(10X,51H(NORMALIZATION/LARGEST VALUE IN EACH MODE IS UNITY)) VIBIFO 783
            3005 FORMAT(10X,50HGENERALIZED MASS (LBS) ASSOCIATED WITH RIGID-BODY , VIBIFO 784
                1             5HMODES,                                          VIBIFO   785
785             2     /,10X,46H(NORMALIZATION/PLUG DISPLACEMENTS EQUAL UNITY),    VIBIFO   786
                3    //,10X, 5H MODE,3I14)                                      VIBIFO   787
            3006 FORMAT(10X, 5H MODE,2X,8I14)                                   VIBIFO   788
            3007 FORMAT(10X,46H*****ORTHOGONALIZATION AND MOMENTUM CHECK*****,  VIBIFO   789
                1     /,10X,43H(NORMALIZATION/ALL GEN. MASSES EQUAL UNITY),     VIBIFO   790
790             2     /,10X,10HTHE FIRST ,I3,   31H ROWS/COLS ARE ASSOCIATED WITH , VIBIFO 791
                3           19HTHE FLEXIBLE MODES.,                             VIBIFO   792
                4     /,10X, 9HTHE LAST  I2,    31H ROWS/COLS ARE ASSOCIATED WITH , VIBIFO 793
                5           21HTHE RIGID-BODY MODES.)                           VIBIFO   794
            3008 FORMAT(10X,I5,2X,1P8E14.6)                                     VIBIFO   795
795         3009 FORMAT(10X,46H*****ORTHOGONALIZATION AND MOMENTUM CHECK*****,  VIBIFO   796
                1     /,10X,43H(NORMALIZATION/ALL GEN. MASSES EQUAL UNITY),     VIBIFO   797
                2     /,10X,10HTHE FIRST ,I1,   31H ROWS/COLS ARE ASSOCIATED WITH , VIBIFO 798
                3           21HTHE RIGID-BODY MODES                             VIBIFO   799
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      C45700, SUB  COMPAK                                                       COMPAK      2
      C                                                                         COMPAK      3
      C*************************************************************************COMPAK      4
      C                                                                       * COMPAK      5
      C***  SUBROUTINE          ***************************************************COMPAK      6
      C                                                                       * COMPAK      7
      C***  COMPUTER VERSION    ***************************************************COMPAK      8
      C     ----------------                                                  * COMPAK      9
      C     IBM .... AS IS                                                    * COMPAK     10
      C                                                                       * COMPAK     11
      C     CDC .... AS IS                                                    * COMPAK     12
      C                                                                       * COMPAK     13
      C***  OBJECTIVE  ********************************************************COMPAK     14
      C     ---------                                                         * COMPAK     15
      C     READ, AND LIST ON AN OPTIONAL BASIS, THE STIFFNESS OR             * COMPAK     16
      C     FLEXIBILITY MATRIX.                                               * COMPAK     17
      C                                                                         COMPAK     18
      C     FORTRAN PROGRAM TO READ STIFFNESS OR FLEXIBILITY MATRIX           * COMPAK     19
      C                                                                         COMPAK     20
      C                                                                       * COMPAK     21
      C***  INPUT/OUTPUT  *****************************************************COMPAK     22
      C     ------------                                                      * COMPAK     23
      C                                                                       * COMPAK     24
      C***  SUMMARY OF SYMBOLS  ***********************************************COMPAK     25
      C     ------------------                                                * COMPAK     26
      C                                                                       * COMPAK     27
      C***  ERROR MESSAGES  ***************************************************COMPAK     28
      C     --------------                                                    * COMPAK     29
      C     NONE.                                                             * COMPAK     30
      C                                                                       * COMPAK     31
      C*************************************************************************COMPAK     32
            SUBROUTINE COMPAK (IROW,IROWD)                                      COMPAK     33
      C                                                                         COMPAK     34
            DIMENSION HEAD(5,5),HOLD(5)                                         COMPAK     35
            DIMENSION ISETUP(45),IPOS(20),ITAPES(50),KLUEV(20)                  COMPAK     36
            DIMENSION LCOL(5)           ,LROW(5)                                COMPAK     37
            DIMENSION MATNAM(2)                                                 COMPAK     38
            DIMENSION ROW(220),SFMAT(25000)                                     COMPAK     39
            DIMENSION TSHV(1)                                                   COMPAK     40
      C                                                                         COMPAK     41
            COMMON/PLACES/ IUIN1,IUIN2,IUOUT1,IUOUT2,IUGO1,IUGO2,IUGO3,IUGO4,   COMPAK     42
           1               IUSCR,IFSCR,IFS1,IFS2,IFS3,IFS4,IUCD,IUPR,           COMPAK     43
           2               IUA,IFA,IUY,IFY,IUMEMN,IFMEMN,IUSTFN,IFSTFN,         COMPAK     44
           3               IUKS,IFKS,IUB,IFB,IUDESO,IFDESO,                     COMPAK     45
           4               IUMDBI,IFMDBI,IUADDI,IFADDI,IUBALI,IFBALI,           COMPAK     46
           5               IUDESI,IFDESI,IUWTI,IFWTI,                           COMPAK     47
           6               IUMEMO,IFMEMO,IUBT,IFBT,                             COMPAK     48
           7               IUDESN,IFDESN,IUMD,IFMD,                             COMPAK     49
           8               IUMEMF,IFMEMF,                                       COMPAK     50
           9               IUSTFO,IFSTFO,IUMDB,IFMDB,IUADD,IFADD,IUBAL,IFBAL,   COMPAK     51
           A               IUDESF,IFDESF,IUWT,IFWT,                             COMPAK     52
           B               IUDUM1,IFDUM1,IUDUM2,IFDUM2,IUDUM3,IFDUM3,           COMPAK     53
           C               IUL,IFL,IUYT,IFYT,IUZ,IFZ,IUZR,IFZR,IULR,IFLR,       COMPAK     54
           D               IUBR,IFBR,                                           COMPAK     55
           E               IUPHTF,IFPHTF,IUMODM,IFMODM,                         COMPAK     56
           F               IUMODK,IFMODK,IUPHT,IFPHT,IUQT,IFQT,IUQ,IFQ,         COMPAK     57
           G               IUPH,IFPH,IUINCM,IFINCM,IUINCK,IFINCK                COMPAK     58
```

COMMON BLOCKS	LENGTH	MEMBERS - BIAS	NAME	(LENGTH)						
		69	IFL	(1)	70	IUYT	(1)	71	IFYT	(1)
		72	IUZ	(1)	73	IFZ	(1)	74	IUZR	(1)
		75	IFZR	(1)	76	IULR	(1)	77	IFLR	(1)
		78	IUBR	(1)	79	IFBR	(1)	80	IUPHTF	(1)
		81	IFPHTF	(1)	82	IUMODM	(1)	83	IFMODM	(1)
		84	IUMODK	(1)	85	IFMODK	(1)	86	IUPHT	(1)
		87	IFPHT	(1)	88	IUQT	(1)	89	IFQT	(1)
		90	IUQ	(1)	91	IFQ	(1)	92	IUPH	(1)
		93	IFPH	(1)	94	IUINCM	(1)	95	IFINCM	(1)
		96	IUINCK	(1)	97	IFINCK	(1)			
PLUG	129	0	EMP	(9)	9	PHP	(120)			
PLAYFF	26	0	IUMDFF	(1)	1	IFMDFF	(1)	2	IUDLTI	(1)
		3	IFDLTI	(1)	4	IUSLTI	(1)	5	IFSLTI	(1)
		6	IUMPLI	(1)	7	IFMPLI	(1)	8	IUTPGT	(1)
		9	IFTPGT	(1)	10	IUPATF	(1)	11	IFPATF	(1)
		12	IUMPL	(1)	13	IFMPL	(1)	14	IUSLT	(1)
		15	IFSLT	(1)	16	IUDLT	(1)	17	IFDLT	(1)
		18	IUQA	(1)	19	IFQA	(1)	20	IUQAT	(1)
		21	IFQAT	(1)	22	IUPHA	(1)	23	IFPHA	(1)
		24	IUPHAT	(1)	25	IFPHAT	(1)			
KLUFF	1	0	KFREE	(1)						
VKLUE	443	0	NROOTS	(1)	1	NDOFFF	(1)	2	NZERO	(1)
		3	IDFV	(220)	223	IDFF	(220)			
CLUEM	81	0	LKLUE	(1)	1	KLUE	(80)			
VIBIFR	3	0	RIGFRQ	(3)						

EQUIV CLASSES	LENGTH	MEMBERS - BIAS	NAME	(LENGTH)						
Q	2510	0	TPLUG	(660)	0	ELAM	(660)	0	CHK	(1849)
		1849	ELMTMD	(660)						

STATISTICS

PROGRAM LENGTH	15001B	6657
CM LABELED COMMON LENGTH	62370B	25848
520008 CM USED		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
2010		I	660 660	11B	EXT REFS
2027	790	I	666 673	21B	EXT REFS NOT INNER
2042	795	K1	670 672	3B	INSTACK
2057		IE	679 679	10B	EXT REFS
2100	735	NS	685 688	4B	INSTACK
2110	780	M	691 708	43B	EXT REFS NOT INNER
2114	740	II	693 694	2B	INSTACK
2120	760	I	695 703	17B	NOT INNER
2122	751	IJ	697 699	5B	INSTACK EXITS
2144	770	IS	705 707	3B	INSTACK
2202		J	728 728	4B	EXT REFS
2216	850	I	734 761	110B	EXT REFS NOT INNER
2241		J	745 745	4B	EXT REFS
2260	842	IJ	752 755	6B	INSTACK EXITS
2276		K	758 758	7B	EXT REFS
2313		K	760 760	7B	EXT REFS

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)
		6 NPAGEA (1)	7 ITAPET (1)	
CTSHV	2	0 LTSHV (1)	1 TSHV (1)	
CTAPES	1	0 ITAPES (1)		
CTITLE	37	0 LTITLE (1)	1 TITLE (36)	
FILE	1	0 IPOS (1)		
CFILES	2	0 KFILES (1)	1 IFILES (1)	
FREAKS	1	0 FREQ (1)		
CPMASS	25000	0 A (25000)		
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
REPORT	1	0 KREPOR (1)		
PLACES	98	0 IUIN1 (1)	1 IUIN2 (1)	2 IUOUT1 (1)
		3 IUOUT2 (1)	4 IUGO1 (1)	5 IUGO2 (1)
		6 IUGO3 (1)	7 IUGO4 (1)	8 IUSCR (1)
		9 IFSCR (1)	10 IFS1 (1)	11 IFS2 (1)
		12 IFS3 (1)	13 IFS4 (1)	14 IUCD (1)
		15 IUPR (1)	16 IUA (1)	17 IFA (1)
		18 IUY (1)	19 IFY (1)	20 IUMEMN (1)
		21 IFMEMN (1)	22 IUSTFN (1)	23 IFSTFN (1)
		24 IUKS (1)	25 IFKS (1)	26 IUB (1)
		27 IFB (1)	28 IUDESO (1)	29 IFDESO (1)
		30 IUMDBI (1)	31 IFMDBI (1)	32 IUADDI (1)
		33 IFADDI (1)	34 IUBALI (1)	35 IFBALI (1)
		36 IUDESI (1)	37 IFDESI (1)	38 IUWTI (1)
		39 IFWTI (1)	40 IUMEMO (1)	41 IFMEMO (1)
		42 IUBT (1)	43 IFBT (1)	44 IUDESN (1)
		45 IFDESN (1)	46 IUMD (1)	47 IFMD (1)
		48 IUMEMF (1)	49 IFMEMF (1)	50 IUSTFO (1)
		51 IFSTFO (1)	52 IUMDB (1)	53 IFMDB (1)
		54 IUADD (1)	55 IFADD (1)	56 IUBAL (1)
		57 IFBAL (1)	58 IUDESF (1)	59 IFDESF (1)
		60 IUWT (1)	61 IFWT (1)	62 IUDUM1 (1)
		63 IFDUM1 (1)	64 IUDUM2 (1)	65 IFDUM2 (1)

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
422	5215	K	264 267	4B	INSTACK
443	5230	I	275 279	5B	INSTACK
452	5240	N	284 291	21B	NOT INNER
464	5235	J	287 290	4B	INSTACK
512	320	I	307 311	10B	EXT REFS
551		K	330 330	4B	EXT REFS
563	5325	I	333 336	22B	EXT REFS NOT INNER
567		K	334 334	11B	EXT REFS
632	500	I	356 379	63B	EXT REFS NOT INNER
661		J	371 371	4B	EXT REFS
702		K	378 378	7B	EXT REFS
725	43	I	389 397	25B	EXT REFS NOT INNER
743	110	K	394 396	4B	INSTACK
756	45	I	405 430	71B	EXT REFS NOT INNER
761	46	I1	407 409	6B	EXT REFS
770	47	J	410 420	30B	EXT REFS NOT INNER
775	48	K	411 417	13B	OPT
1021	53	II	421 428	22B	EXT REFS
1051	5370	I	437 445	37B	NOT INNER
1052	5370	L	438 445	33B	NOT INNER
1054	5360	K	440 443	23B	NOT INNER
1067	5360	J	441 443	4B	INSTACK
1114	630	I	452 454	3B	INSTACK
1131	620	I	462 464	4B	INSTACK
1164		NC	483 483	4B	EXT REFS
1200	700	MR	489 502	57B	EXT REFS NOT INNER
1224		NC	496 496	4B	EXT REFS
1242		NC	501 501	11B	EXT REFS
1266	5405	I	518 520	7B	EXT REFS
1277	5420	I	523 532	40B	NOT INNER
1300	5420	K	524 532	34B	NOT INNER
1311	5410	J	526 530	15B	OPT
1341	5460	K	538 546	26B	EXT REFS NOT INNER
1344	5460	I	540 546	20B	NOT INNER
1352	5440	J	542 544	4B	INSTACK
1371	5480	I	549 556	30B	NOT INNER
1372	5480	K	550 556	24B	NOT INNER
1403	5470	J	552 554	4B	INSTACK
1422	5540	I	560 567	30B	NOT INNER
1423	5540	K	561 567	24B	NOT INNER
1434	5520	J	563 565	4B	INSTACK
1467		J	577 577	4B	EXT REFS
1477	5580	I	579 583	23B	EXT REFS NOT INNER
1504		J	581 581	11B	EXT REFS
1523	5610	I	588 589	10B	EXT REFS
1536	5615	I	591 592	7B	EXT REFS
1546	5620	I	595 597	20B	NOT INNER
1556	5620	J	596 597	4B	INSTACK
1571	5630	K	600 604	24B	NOT INNER
1605	5630	J	602 604	5B	INSTACK
1616	5640	K	606 610	25B	NOT INNER
1632	5640	L	608 610	5B	INSTACK
1672		NC	625 625	4B	EXT REFS
1706	5750	I	631 643	55B	EXT REFS NOT INNER
1730		NC	637 637	4B	EXT REFS
1745		J	641 641	11B	EXT REFS
2005	720	M	659 660	20B	EXT REFS NOT INNER

STATEMENT LABELS		DEF LINE	REFERENCES		
545	5320	329	326		
0	5325	336	333		
614	5330	342	337		
614	5340	344	318		
0	5360	443	440	441	
0	5370	445	437	438	
1110	5400	447	435		
0	5405	520	518		
0	5410	530	526		
0	5420	532	523	524	
0	5440	544	542		
0	5460	546	538	540	
0	5470	554	552		
0	5480	556	549	550	
0	5520	565	563		
0	5540	567	560	561	
1460	5560	574	570		
1462	5570	575	573		
0	5580	583	579		
0	5610	589	588		
0	5615	592	591		
1545	5617	593	590		
0	5620	597	595	596	
0	5630	604	600	602	
0	5640	610	606	608	
1643	5645	611	599		
1653	5700	619	644		
1703	5705	629	623		
1705	5710	630	628		
1741	5715	640	633		
0	5750	643	631		
1766	5800	646	512		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES		
23	60	I	94 107	43B		EXT REFS	NOT INNER
41	230	J	98 104	12B	OPT		
60	83	J	105 106	3B	INSTACK		
76	5000	I	125 127	7B		EXT REFS	
112	5020	I	133 141	30B		NOT INNER	
113	5020	K	134 141	24B		NOT INNER	
125	5010	J	137 139	4B	INSTACK		
151	5030	I	148 150	7B		EXT REFS	
201	5044	N	169 174	13B		EXT REFS	NOT INNER
204	5042	I	170 172	2B	INSTACK		
215	5200	K	177 227	117B		EXT REFS	NOT INNER
223	5050	I	182 185	4B	INSTACK		
231	5070	I	190 197	24B		NOT INNER	
242	5060	J	192 194	4B	INSTACK		
262	5080	I	204 207	6B	INSTACK		
277	5090	I	209 211	5B	INSTACK		
312	5100	I	213 217	4B	INSTACK		
324	5110	I	219 221	3B	INSTACK		
342	5210	N	239 246	22B		NOT INNER	
357	5205	L	243 245	2B	INSTACK		
376	5211	N	253 256	5B	INSTACK		
410	5213	N	259 261	3B	INSTACK		
415	5220	N	263 268	15B		NOT INNER	

STATEMENT LABELS			DEF LINE	REFERENCES		
2252	840		748	742		
0	842		755	752		
2267	844		757	754		
2307	846		760	757		
2323	850		761	734	759	
2330	900		763	715		
3106	1000	FMT	770	679		
3110	1001	FMT	771	252		
3112	2000	FMT	772	369		
3133	2001	FMT	775	371		
3140	2002	FMT	776	334	378	581
3143	3000	FMT	777	492		
3147	3001	FMT	778	483	496	
3153	3002	FMT	779	501		
3156	3003	FMT	780	493		
3171	3004	FMT	782	494		
3200	3005	FMT	783	577		
3217	3006	FMT	787	625	637	
3222	3007	FMT	788	634		
3255	3008	FMT	794	641		
3260	3009	FMT	795	635		
3313	4000	FMT	801	743		
3325	4001	FMT	803	728	745	
3333	4002	FMT	804	758		
3336	4003	FMT	805	760		
3341	4004	FMT	806	327		
3347	4005	FMT	807	330		
0	5000		127	125		
0	5010		139	137		
0	5020		141	133	134	
0	5030		150	148		
172	5040		161	158		
0	5042		172	170		
0	5044		174	169		
214	5046		175	168		
0	5050		185	182		
0	5060		194	192		
0	5070		197	190		
0	5080		207	204		
0	5090		211	209		
0	5100		217	213		
0	5110		221	219		
0	5200		227	177		
0	5205		245	243		
0	5210		246	239		
0	5211		256	253		
405	5212		258	251		
0	5213		261	259		
414	5214		262	257		
0	5215		267	264		
0	5220		268	263		
0	5230		279	275		
0	5235		290	287		
0	5240		291	284		
475	5300		295	110	233	
504	5310		304	301		
527	5315		321	240		

EXTERNALS	TYPE	ARGS		REFERENCES					
PUTROW		4		173	225	456	467		
RITVEC		4		310					
RWBT		3		658	704				
SCAPRO	REAL	6		419	426				
SQRT	REAL	1	LIBRARY	589	592				
TITLES		1		325	357	490	576	632	735

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES		
ABS	REAL	1	INTRIN		2*103	2*206	2*210
ABSF	REAL	1	SF	70	2*103	2*206	2*210
MAXOF	INTEGER	2	SF	69			
MINO	INTEGER	0	INTRIN		350	479	721
MINOF	INTEGER	2	SF	68	350	479	721

STATEMENT LABELS		DEF LINE	REFERENCES	
0	43	397	389	
0	45	430	405	
0	46	409	407	
0	47	420	410	
0	48	417	411	
1002	49	415	412	
1005	52	416	414	
1040	53	428	421	422
1027	54	425	423	
0	60	107	94	
46	82	103	101	
0	83	106	105	
0	110	396	394	
0	230	104	98	
0	320	311	307	
616	400	348	380	
647	405	367	358	
672	410	374	368	
0	500	379	356	
1146	600	477	503	
1175	602	487	481	
1177	605	488	486	
1235	610	499	491	
0	620	464	462	
0	630	454	452	
0	700	502	489	
0	720	660	659	
2070	734	680	678	
0	735	688	685	
0	740	694	693	
0	751	699	697	
2130	752	701	698	
2134	760	703	695	700
0	770	707	705	
0	780	708	691	
0	790	673	666	
0	795	672	670	
0	800	INACTIVE 710		
2161	820	719	762	
2213	821	732	726	
2215	822	733	731	

VARIABLES	SN	TYPE		RELOCATION								
0	NCYC	INTEGER		F.P.	REFS	251	678	DEFINED	1			
3421	NDOF	INTEGER			REFS	273	274	285	286	DEFINED	272	
1	NDOFFF	INTEGER		VKLUE	REFS	53	655	679	697	752		
3370	NFIL	INTEGER			REFS	93	388	DEFINED	92	387		
3454	NFLEX	INTEGER			REFS	635	DEFINED	616				
2651	NONE	INTEGER			REFS	760	DEFINED	61				
6	NPAGE	INTEGER		CLIST	REFS	17						
6	NPAGEA	INTEGER		CTABLE	REFS	19						
1	NPASS	INTEGER		CTABLE	REFS	19						
3473	NR	INTEGER			REFS	687	688	DEFINED	686			
3367	NRIGID	INTEGER			REFS	160	169	243	252	253	259	263
						264	274	284	616	767	DEFINED	81	159
0	NROOTS	INTEGER		VKLUE	REFS	53	80	94	134	160	177	239
						241	273	306	307	2*324	337	350	380
						405	421	437	438	452	2*455	456	462
						2*466	467	479	489	503	550	588	592
						595	596	601	602	607	609	615	617
						634	657	658	659	660	666	682	691
						721	762	DEFINED	293	767			
3403	NROW	INTEGER			REFS	133	DEFINED	130					
2	NROWS	INTEGER		CTABLE	REFS	19	DEFINED	359	363	737			
3472	NS	INTEGER			REFS	686	687	DEFINED	685				
3453	NSIZ	INTEGER			REFS	2*621	631	644	DEFINED	615	617		
3470	NSL	INTEGER			REFS	685	686	689	DEFINED	683			
3471	NSU	INTEGER			REFS	685	DEFINED	684					
3366	NTOTAL	INTEGER			REFS	163	240	293	616	767			
					DEFINED	80	160						
2	NZERO	INTEGER		VKLUE	REFS	53	655						
11	PHP	REAL	ARRAY	PLUG	REFS	47	193	2*210	220	244	334	2*442	
						553	DEFINED	140	220	244	265	266	
3502	Q	REAL	ARRAY		REFS	3	57	58	419	DEFINED	416		
10426	QMASS	REAL	ARRAY		REFS	3	427	444	453	463	501	589	
						597	660	DEFINED	426	427	444		
13526	QQ	REAL	ARRAY		REFS	3	426	DEFINED	419				
0	RIGFRQ	REAL	ARRAY	VIBIFR	REFS	55	260	DEFINED	255				
14252	RMASS	REAL	ARRAY		REFS	5	581	592	610	DEFINED	566		
3450	SUM	REAL			REFS	419	426	DEFINED	418	425			
1	TITLE	REAL	ARRAY	CTITLE	REFS	8	23						
3502	TPLUG	REAL	ARRAY		REFS	4	57	126	138				
1	TSHV	REAL	ARRAY	CTSHV	REFS	8	21						
3400	XLARGE	REAL			REFS	103	106	DEFINED	102	103			
3415	XMAX	REAL			REFS	206	210	215	216	220			
					DEFINED	203	206	210					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES								
DCLOSE		1	108	128	151	228	312	398	429	457	468
			521	547	674						
FCLOSE		3	709								
FSIO		6	653								
GEDLAB		6	93	124	147	388	406	17	536	665	
GETROW		4	97	126	149	393	408	424	519	539	669
PLB		3	331	370	372	482	484	495	497	571	580
			624	626	636	638	727	729	744	746	
PROGNA		2	77								
PTABLE		3	361	365	739						
PUDLAB		6	163	306	455	466					

VARIABLES	SN	TYPE	RELOCATION							
					487	498	500	572	574	578	582	614
					627	629	639	642	716	730	732	747
					751							
11	KOUNTH	INTEGER		CLIST	REFS	17	326	368	491	633	742	
12	KOUNTI	INTEGER		CLIST	REFS	17						
1	KPAGE	INTEGER		CLIST	REFS	17						
3474	KR	INTEGER			REFS	696	702	DEFINED	689	696		
0	KREPOR	INTEGER		REPORT	REFS	29	79					
3401	KROW	INTEGER			REFS	124	125	131	147	148	154	159
					517	518	536	538				
3475	KS	INTEGER			REFS	706	707	DEFINED	690	706		
0	KTABLE	INTEGER		CTABLE	REFS	19	DEFINED	360	364	738		
5	KTABLO	INTEGER		CTABLE	REFS	19						
3432	KTOP	INTEGER			REFS	322	323	324	330	334	337	
					DEFINED	320	323	324				
5	KTPAGE	INTEGER		CLIST	REFS	17						
3465	K1	INTEGER			REFS	2*671	DEFINED	670				
3420	L	INTEGER			REFS	2*244	442	2*444	529	609	610	
					DEFINED	243	438	527	528	608		
3411	LCOL	INTEGER			REFS	192	209	219	333	440	441	523
					540	549	552	560	561	577	579	581
					591	600	606	608	615	634	635	
					DEFINED	154						
3434	LEFT	INTEGER			REFS	339	481	570	623	726		
					DEFINED	338	480	569	622	725		
2	LINES	INTEGER		CLIST	REFS	17	319	338	339	354	475	480
					487	569	574	614	622	629	716	725
					732							
10	LINESG	INTEGER		CLIST	REFS	17						
3	LINEST	INTEGER		CLIST	REFS	17						
0	LKLUE	INTEGER		CLUEM	REFS	54						
3460	LOCFIL	* INTEGER			REFS	653						
3410	LROW	INTEGER			REFS	163	170	173	178	182	190	204
					213	225	524	526	542	563		
					DEFINED	153						
0	LTITLE	INTEGER		CTITLE	REFS	23						
0	LTSHV	INTEGER		CTSHV	REFS	21						
3463	M	INTEGER			REFS	660	DEFINED	659	691			
3440	MAX	INTEGER			REFS	376	750	DEFINED	353	724		
3437	MIN	INTEGER			REFS	375	749	DEFINED	352	723		
3467	MOVE	INTEGER			REFS	683	684	DEFINED	682			
3452	MR	INTEGER			REFS	2*501	DEFINED	489				
3412	N	INTEGER			REFS	240	241	252	2*254	2*255	2*260	265
					2*266	285	286	289	DEFINED	169	239	252
					253	259	263	284				
3422	NAFLEX	INTEGER			REFS	274	275	277	DEFINED	273		
10420	NAME	INTEGER	ARRAY		REFS	2	93	124	147	388	406	517
					536	665						
14672	NAME1	INTEGER	ARRAY		REFS	13	455	DEFINED	64			
14674	NAME2	INTEGER	ARRAY		REFS	13	466	DEFINED	65			
10422	NAME3	INTEGER	ARRAY		REFS	2	163	306	DEFINED	62		
3423	NATOTL	INTEGER			REFS	276	DEFINED	274				
3451	NC	INTEGER			REFS	483	496	501	625	637		
					DEFINED	483	496	501	625	637		
3404	NCOL	INTEGER			REFS	135	137	DEFINED	131			
3	NCOLS	INTEGER		CTABLE	REFS	19	DEFINED	355				
4	NCOLST	INTEGER		CTABLE	REFS	19						

VARIABLES		SN	TYPE	RELOCATION								
106	IUYT		INTEGER	PLACES	REFS	30						
110	IUZ		INTEGER	PLACES	REFS	30						
112	IUZR		INTEGER	PLACES	REFS	30						
3446	I1	*	INTEGER		DEFINED	407						
3376	J		INTEGER		REFS	99	100	101	2*103	2*106	2*138	2*193
						288	289	371	412	3*413	415	419	2*442
						3*527	2*528	529	2*543	2*553	2*564	577	581
						3*597	3*603	2*604	2*610	641	728	745	
					DEFINED	98	105	137	192	287	371	410	
						441	526	542	552	563	577	581	596
						602	609	641	728	745			
3377	JB		INTEGER		REFS	100	DEFINED	99					
3430	JCL		INTEGER		REFS	310	351	358	371	483	496	501	
						625	637	641	722	728	736	745	
					DEFINED	308	348	477	619	719			
3444	JCOL	*	INTEGER		DEFINED	392							
3372	JCOLS		INTEGER		REFS	93	388	406	665				
3431	JCU		INTEGER		REFS	310	348	349	350	351	371	380	
						477	478	479	483	496	501	503	619
						620	621	625	637	641	644	719	720
						721	722	728	745	762	DEFINED	309	347
						349	350	476	478	479	618	620	621
						718	720	721					
3456	JDVIBA		INTEGER		REFS	653	709						
3424	JL		INTEGER		REFS	287	288	DEFINED	285				
3406	JO		INTEGER		REFS	138	DEFINED	135					
3425	JU		INTEGER		REFS	287	DEFINED	286					
3405	K		INTEGER		REFS	135	140	178	193	2*210	2*220	265	
						2*266	289	330	334	378	395	396	412
						413	3*415	416	2*442	2*527	3*528	531	545
						553	2*555	564	2*566	601	603	607	610
						758	760	DEFINED	134	177	264	288	330
						334	378	394	411	440	524	538	550
						561	600	606	758	760			
3445	KB		INTEGER		REFS	396	DEFINED	395					
3433	KBOT		INTEGER		REFS	330	334	DEFINED	322				
7	KBPAGE		INTEGER	CLIST	REFS	17							
3441	KCL		INTEGER		REFS	378	758	760	DEFINED	375	749		
3402	KCOL		INTEGER		REFS	124	126	130	147	149	153	272	
						517	519	536	539				
3435	KCU		INTEGER		REFS	352	353	378	723	724	758	760	
					DEFINED	346	376	717	750				
3457	KDVIBA	*	INTEGER		REFS	653							
0	KFILES		INTEGER	CFILES	REFS	25							
0	KFREE		INTEGER	KLUFF	REFS	52	110	158	168	233	301	306	
						318	435	492	493	512			
4	KLABEL		INTEGER	CLIST	REFS	17							
1	KLUE		INTEGER ARRAY	CLUEM	REFS	54	158	168	233	590	599	617	
						634	635	647					
0	KLUSE		INTEGER	F.P.	REFS	146	DEFINED	1					
3365	KOLUMN		INTEGER		REFS	323	349	478	620	720			
					DEFINED	78	79						
0	KOUNT		INTEGER	CLIST	REFS	17	326	328	332	335	338	368	
						373	377	480	485	491	498	500	569
						572	578	582	622	627	633	639	642
						725	730	742	747	751	DEFINED	319	328

VARIABLES	SN	TYPE	RELOCATION							
52	IUBT	INTEGER	PLACES	REFS	30					
16	IUCD	INTEGER	PLACES	REFS	30					
3426	IUCOM	INTEGER		REFS	306	310	312	406	408	424	429
					665	669	674	DEFINED	299	302	
72	IUDESF	INTEGER	PLACES	REFS	30					
44	IUDESI	INTEGER	PLACES	REFS	30					
54	IUDESN	INTEGER	PLACES	REFS	30					
34	IUDESO	INTEGER	PLACES	REFS	30					
20	IUDLT	INTEGER	PLAYFF	REFS	48					
2	IUDLTI	INTEGER	PLAYFF	REFS	48	147	149	151	517	519	521
76	IUDUM1	INTEGER	PLACES	REFS	30					
100	IUDUM2	INTEGER	PLACES	REFS	30					
102	IUDUM3	INTEGER	PLACES	REFS	30					
4	IUGO1	INTEGER	PLACES	REFS	30					
5	IUGO2	INTEGER	PLACES	REFS	30					
6	IUGO3	INTEGER	PLACES	REFS	30					
7	IUGO4	INTEGER	PLACES	REFS	30					
140	IUINCK	INTEGER	PLACES	REFS	30					
136	IUINCM	INTEGER	PLACES	REFS	30					
0	IUIN1	INTEGER	PLACES	REFS	30					
1	IUIN2	INTEGER	PLACES	REFS	30					
30	IUKS	INTEGER	PLACES	REFS	30					
104	IUL	INTEGER	PLACES	REFS	30					
114	IULR	INTEGER	PLACES	REFS	30					
56	IUMD	INTEGER	PLACES	REFS	30					
64	IUMDB	INTEGER	PLACES	REFS	30					
36	IUMDBI	INTEGER	PLACES	REFS	30					
0	IUMDFF	INTEGER	PLAYFF	REFS	48					
60	IUMEMF	INTEGER	PLACES	REFS	30					
24	IUMEMN	INTEGER	PLACES	REFS	30					
50	IUMEMO	INTEGER	PLACES	REFS	30					
124	IUMODK	INTEGER	PLACES	REFS	30	466	467	468		
122	IUMODM	INTEGER	PLACES	REFS	30	455	456	457		
14	IUMPL	INTEGER	PLAYFF	REFS	48					
6	IUMPLI	INTEGER	PLAYFF	REFS	48					
2	IUOUT1	INTEGER	PLACES	REFS	30					
3	IUOUT2	INTEGER	PLACES	REFS	30					
12	IUPATF	INTEGER	PLAYFF	REFS	48	302	536	539	547		
134	IUPH	INTEGER	PLACES	REFS	30					
26	IUPHA	INTEGER	PLAYFF	REFS	48					
30	IUPHAT	INTEGER	PLAYFF	REFS	48					
126	IUPHT	INTEGER	PLACES	REFS	30					
120	IUPHTF	INTEGER	PLACES	REFS	30	163	173	225	228	299	
17	IUPR	INTEGER	PLACES	REFS	30					
132	IUQ	INTEGER	PLACES	REFS	30					
22	IUQA	INTEGER	PLAYFF	REFS	48					
24	IUQAT	INTEGER	PLAYFF	REFS	48					
130	IUQT	INTEGER	PLACES	REFS	30					
10	IUSCR	INTEGER	PLACES	REFS	30					
16	IUSLT	INTEGER	PLAYFF	REFS	48					
4	IUSLTI	INTEGER	PLAYFF	REFS	48					
26	IUSTFN	INTEGER	PLACES	REFS	30					
62	IUSTFO	INTEGER	PLACES	REFS	30					
10	IUTPGT	INTEGER	PLAYFF	REFS	48	124	126	128		
74	IUWT	INTEGER	PLACES	REFS	30					
46	IUWTI	INTEGER	PLACES	REFS	30					
22	IUX	INTEGER	PLACES	REFS	30					

VARIABLES	SN	TYPE		RELOCATION							
5	IFSLTI	INTEGER		PLAYFF	REFS	48					
27	IFSTFN	INTEGER		PLACES	REFS	30					
63	IFSTFO	INTEGER		PLACES	REFS	30					
12	IFS1	INTEGER		PLACES	REFS	30					
13	IFS2	INTEGER		PLACES	REFS	30					
14	IFS3	INTEGER		PLACES	REFS	30					
15	IFS4	INTEGER		PLACES	REFS	30					
11	IFTPGT	INTEGER		PLAYFF	REFS	48	124				
75	IFWT	INTEGER		PLACES	REFS	30					
47	IFWTI	INTEGER		PLACES	REFS	30					
23	IFY	INTEGER		PLACES	REFS	30					
107	IFYT	INTEGER		PLACES	REFS	30					
111	IFZ	INTEGER		PLACES	REFS	30					
113	IFZR	INTEGER		PLACES	REFS	30					
3414	II	INTEGER			REFS	184	2*196	2*206	2*215	422	423	426
					2*427	694	DEFINED	183	195	205	214	421
					693							
3477	IJ	INTEGER			REFS	698	701	753	754	DEFINED	697	752
3501	IJF	INTEGER			REFS	757	758	DEFINED	753	756		
3375	ILIM	INTEGER			REFS	98	105	670	DEFINED	96	668	
3443	ILIM2	INTEGER			REFS	392	394	DEFINED	391			
3436	INC	INTEGER			REFS	353	724	DEFINED	351	722		
0	INDEX1	INTEGER	*UNUSED	F.P.	DEFINED	1						
3416	INEW	INTEGER			REFS	242	244	278	DEFINED	240	276	
3413	IO	INTEGER			REFS	183	195	205	214	DEFINED	178	
3417	IOLD	INTEGER			REFS	242	244	278	DEFINED	241	277	
0	IPOS	INTEGER	ARRAY	FILE	REFS	10	24	92	387	DEFINED	386	
3476	IR	INTEGER			REFS	702	DEFINED	692	701			
0	IROW	INTEGER		F.P.	REFS	95	96	97	306	308	309	351
					356	378	389	393	408	410	411	419
					424	426	667	668	669	682	695	715
					DEFINED	1						
3462	IROWR	INTEGER			REFS	657	693	704	705	715	722	734
					758	760	DEFINED	655				
3371	IROWS	INTEGER			REFS	93	388	406	665			
3500	IS	INTEGER			REFS	707	DEFINED	705				
0	ISCR	INTEGER		F P.	REFS	92	93	97	108	386	387	388
					393	398	DEFINED	1				
3461	ITAPE	INTEGER			REFS	658	704	DEFINED	654	I/O REFS	656	657
					660							
2	ITAPEP	INTEGER		COMRWP	REFS	28						
0	ITAPER	INTEGER		COMRWP	REFS	28	I/O REFS	252	679			
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	9	22					
7	ITAPET	INTEGER		CTABLE	REFS	19						
1	ITAPEW	INTEGER		COMRWP	REFS	28	331	370	372	482	484	495
					497	571	580	624	626	636	638	727
					729	744	746	I/O REFS	327	330	334	369
					371	378	483	492	493	494	496	501
					577	581	625	634	635	637	641	728
					743	745	758	760				
20	IUA	INTEGER		PLACES	REFS	30						
66	IUADD	INTEGER		PLACES	REFS	30						
40	IUADDI	INTEGER		PLACES	REFS	30						
32	IUB	INTEGER		PLACES	REFS	30						
70	IUBAL	INTEGER		PLACES	REFS	30						
42	IUBALI	INTEGER		PLACES	REFS	30						
116	IUBR	INTEGER		PLACES	REFS	30						

VARIABLES	SN	TYPE		RELOCATION							
					631	660	666	695	734		
3464	IANS1	INTEGER			REFS	670	671	DEFINED	667		
3447	IANS2	INTEGER			REFS	416	DEFINED	413	415		
3374	IANS5	INTEGER			REFS	96	98	99	101	102	105
					DEFINED	95					
3442	IANS6	INTEGER			REFS	391	392	394	395	DEFINED	390
337	IDFF	INTEGER	ARRAY	VKLUE	REFS	53	701	754	DEFINED	679	
3	IDFV	INTEGER	ARRAY	VKLUE	REFS	53	698	758	DEFINED	679	
3455	IDVIBA	INTEGER			REFS	653	654	709			
3466	IE	INTEGER			REFS	2*679	DEFINED	679			
21	IFA	INTEGER		PLACES	REFS	30					
67	IFADD	INTEGER		PLACES	REFS	30					
41	IFADDI	INTEGER		PLACES	REFS	30					
33	IFB	INTEGER		PLACES	REFS	30					
71	IFBAL	INTEGER		PLACES	REFS	30					
43	IFBALI	INTEGER		PLACES	REFS	30					
117	IFBR	INTEGER		PLACES	REFS	30					
53	IFBT	INTEGER		PLACES	REFS	30					
3427	IFCOM	INTEGER			REFS	306	406	665	DEFINED	300	303
73	IFDESF	INTEGER		PLACES	REFS	30					
45	IFDESI	INTEGER		PLACES	REFS	30					
55	IFDESN	INTEGER		PLACES	REFS	30					
35	IFDESO	INTEGER		PLACES	REFS	30					
21	IFDLT	INTEGER		PLAYFF	REFS	48					
3	IFDLTI	INTEGER		PLAYFF	REFS	48	147	517	DEFINED	145	146
77	IFDUM1	INTEGER		PLACES	REFS	30					
101	IFDUM2	INTEGER		PLACES	REFS	30					
103	IFDUM3	INTEGER		PLACES	REFS	30					
1	IFILES	INTEGER	ARRAY	CFILES	REFS	11	25				
141	IFINCK	INTEGER		PLACES	REFS	30					
137	IFINCM	INTEGER		PLACES	REFS	30					
31	IFKS	INTEGER		PLACES	REFS	30					
105	IFL	INTEGER		PLACES	REFS	30					
115	IFLR	INTEGER		PLACES	REFS	30					
57	IFMD	INTEGER		PLACES	REFS	30	386				
65	IFMDB	INTEGER		PLACES	REFS	30					
37	IFMDBI	INTEGER		PLACES	REFS	30					
1	IFMDFF	INTEGER		PLAYFF	REFS	48					
61	IFMEMF	INTEGER		PLACES	REFS	30					
25	IFMEMN	INTEGER		PLACES	REFS	30					
51	IFMEMO	INTEGER		PLACES	REFS	30					
125	IFMODK	INTEGER		PLACES	REFS	30	466				
123	IFMODM	INTEGER		PLACES	REFS	30	455				
15	IFMPL	INTEGER		PLAYFF	REFS	48					
7	IFMPLI	INTEGER		PLAYFF	REFS	48					
13	IFPATF	INTEGER		PLAYFF	REFS	48	303	536			
135	IFPH	INTEGER		PLACES	REFS	30					
27	IFPHA	INTEGER		PLAYFF	REFS	48					
31	IFPHAT	INTEGER		PLAYFF	REFS	48					
127	IFPHT	INTEGER		PLACES	REFS	30					
121	IFPHTF	INTEGER		PLACES	REFS	30	163	300			
133	IFQ	INTEGER		PLACES	REFS	30					
23	IFQA	INTEGER		PLAYFF	REFS	48					
25	IFQAT	INTEGER		PLAYFF	REFS	48					
131	IFQT	INTEGER		PLACES	REFS	30					
11	IFSCR	INTEGER		PLACES	REFS	30					
17	IFSLT	INTEGER		PLAYFF	REFS	48					

```
                4     /,10X, 9HTHE LAST ,I2,    31H ROWS/COLS ARE ASSOCIATED WITH , VIBIFO    800
800             5           19HTHE FLEXIBLE MODES.)                                 VIBIFO    801
               4000 FORMAT (10X,55HNORMALIZED EIGEN VECTORS FOR REDUCED DEGREES OF FRE VIBIFO  802
                 1EDOM,3X,17H(ABSOLUTE MOTION))                                     VIBIFO    803
               4001 FORMAT (10X, 1X,4HINEW, 1X,4HIOLD, 3X, 3HM =, 6X,I2, 7(12X,1I2)) VIBIFO  804
               4002 FORMAT (10X, I5, I5, 1P8E14.6)                                 VIBIFO    805
805            4003 FORMAT (10X, I5, A5, 1P8E14.6)                                 VIBIFO    806
               4004 FORMAT(/,10X,   32HMODAL DISPLACEMENTS OF PLUG MASS,/)         VIBIFO    807
               4005 FORMAT (//10X,5H  DOF,8(10X,I4))                               VIBIFO    808
              C                                                                    VIBIFO    809
                    RETURN                                                         VIBIFO    810
810                 END                                                            VIBIFO    811
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 VIBIFO 1 809

VARIABLES SN TYPE RELOCATION

0	A	REAL	ARRAY	CPMASS	REFS	6	27	102	2*103	106	138	184
					196	2*206	215	278	378	416	529	687
					702	758	760	DEFINED	100	106	196	215
					278	289	396	671	687	688	707	
3407	B	REAL			REFS	138	140	193	196	442	444	529
					531	543	545	553	555	564	566	
					DEFINED	136	138	191	193	439	442	525
					529	541	543	551	553	562	564	
14336	BUFFER	REAL	ARRAY		REFS	7	97	100	173	216	225	310
					393	396	408	419	424	426	456	467
					539	543	669	671	704	707		
					DEFINED	171	184	216	453	463	694	702
3502	CHK	REAL	ARRAY		REFS	5	57	604	641	DEFINED	597	603
					604	610						
3502	ELAM	REAL	ARRAY		REFS	4	57	149	193	289	519	529
					564							
7173	ELMTMD	REAL	ARRAY		REFS	5	58	543	564	DEFINED	531	
14062	EMOM	REAL	ARRAY		REFS	5	555	603	DEFINED	545	555	
0	EMP	REAL	ARRAY	PLUG	REFS	47	442	553	566			
14263	F	REAL	ARRAY		REFS	5	2*597	2*603	2*610	DEFINED	589	592
0	FREQ	REAL	ARRAY	FREAKS	REFS	12	26	242	254	255	463	658
					DEFINED	242	252	254	260			
3373	I	INTEGER			REFS	95	126	138	140	149	171	183
					184	193	195	205	2*210	214	2*216	2*220
					276	277	308	309	2*334	358	375	376
					378	2*390	391	407	422	423	426	2*427
					442	2*444	3*453	4*463	519	529	531	543
					545	553	2*555	564	2*566	2*581	3*589	3*592
					3*597	2*603	2*604	2*610	2*641	660	667	668
					698	736	749	750	754	758	760	
					DEFINED	94	125	133	148	170	182	190
					204	209	213	219	275	307	333	356
					389	405	437	452	462	518	523	540

```
      COMMON/KLUES/ KLUSE,KLUNAL,IRED,KLUMD,KLUBAL,MSADD,NPAS, IDNOPT,    COMPAK     59
     1              VDES,EPS1,DWMAX,NBAR,NFIX,D,DEL,EPS2,NCYC,NNN,IBAND,  COMPAK     60
60   2              IFIN,KLUB,KLUQ,MORBAL,DBAL                            COMPAK     61
      COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE     COMPAK     62
     1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                          COMPAK     63
      COMMON /CTABLE/ KTABLE,NPASS ,NROWS, NCOLS , NCOLST,KTABLO,NPAGEA   COMPAK     64
     1               ,ITAPET                                              COMPAK     65
65    COMMON /CTSHV / LTSHV ,TSHV                                         COMPAK     66
      COMMON /CLUEV / LKLUEV,KLUEV                                        COMPAK     67
      COMMON /CPMASS/  SFMAT                                              COMPAK     68
      COMMON /CTAPES/ ITAPES                                              COMPAK     69
      COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                                COMPAK     70
70    COMMON /MATRIX/ ISETUP                                              COMPAK     71
      COMMON /REPORT/ KREPOR                                              COMPAK     72
      COMMON /FILE  / IPOS                                                COMPAK     73
C                                                                         COMPAK     74
C                                                                         COMPAK     75
75    C FUNCTION DEFINITION                                               COMPAK     76
C                                                                         COMPAK     77
      MINOF(I1,I2)      =  MINO(I1,I2)                                    COMPAK     78
C                                                                         COMPAK     79
C                                                                         COMPAK     80
80    C INITIAL CONDITIONS                                                COMPAK     81
      DATA HOLD/ 4HROW ,4H COL,4H    ,4H   V,4HALUE/                      COMPAK     82
      DO  5 IH=1,5                                                        COMPAK     83
      DO, 5 JH=1,5                                                        COMPAK     84
    5 HEAD(IH,JH) = HOLD(IH)                                              COMPAK     85
85    ZERO = 0.0                                                          COMPAK     86
      NMATD  =  (IROWD*(IROWD+1))/2                                       COMPAK     87
      CALL DVALUE (ROW,ZERO,IROWD)                                        COMPAK     88
      CALL DVALUE (SFMAT,ZERO,NMATD)                                      COMPAK     89
      ITAPEW = ITAPES(6)                                                  COMPAK     90
90    M      =  0                                                         COMPAK     91
      KMATV  =  1                                                         COMPAK     92
      IF (IRED.EQ.1) KMATV = 2                                            COMPAK     93
      KLISTV=KLUEV(3)                                                     COMPAK     94
      KOUNT  =  LINES                                                     COMPAK     95
95    CALL PROGNA (4H(COM, 4HPAK))                                        COMPAK     96
C                                                                         COMPAK     97
      GO TO ( 10, 12), KMATV                                              COMPAK     98
   10 NTAPE  =  IUKS                                                      COMPAK     99
      IFILE  =  IFKS                                                      COMPAK    100
100   KOLUMN =  5                                                         COMPAK    101
      IF (KREPOR .EQ. 2) KOLUMN = 3                                       COMPAK    102
      GO TO 14                                                            COMPAK    103
   12 NTAPE  =  IUA                                                       COMPAK    104
      IFILE  =  IFA                                                       COMPAK    105
105   KOLUMN =  8                                                         COMPAK    106
      IF (KREPOR .EQ. 2) KOLUMN = 4                                       COMPAK    107
   14 CONTINUE                                                            COMPAK    108
C                                                                         COMPAK    109
C                                                                         COMPAK    110
110   C READ STIFFNESS OR FLEXIBILITY MATRIX                              COMPAK    111
      CALL TITLES (2)                                                     COMPAK    112
      IFILE = 1                                                           COMPAK    113
      IPOS(NTAPE) = IFILE                                                 COMPAK    114
      CALL GEDLAB (6HCOMPAK,NTAPE,MATNAM,IFILE,IROW,NM)                   COMPAK    115
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115                DO 100 J=1,IROW                                                  COMPAK    116
                   CALL GETROW (NTAPE,1,ROW ,NM)                                    COMPAK    117
                   DO 20 L=1,J                                                      COMPAK    118
                   M      =  M + 1                                                  COMPAK    119
                   SFMAT(M) = ROW(L)                                                COMPAK    120
120              20 CONTINUE                                                        COMPAK    121
                100 CONTINUE                                                        COMPAK    122
                   CALL DCLOSE (NTAPE)                                              COMPAK    123
             C                                                                      COMPAK    124
             C                                                                      COMPAK    125
125          C LIST STIFFNESS OR FLEXIBILITY MATRIX                                 COMPAK    126
                   IF (KLISTV .EQ. 1) GO TO 195                                     COMPAK    127
                   NROWS  =  1                                                      COMPAK    128
                   NCOLS  =  3                                                      COMPAK    129
                   KTABLE =  2                                                      COMPAK    130
130                IF (KMATV .EQ. 2) GO TO 92                                       COMPAK    131
                   LOC    =  0                                                      COMPAK    132
                   IROWS  =  IROW                                                   COMPAK    133
                   DO 90 I=1,IROWS                                                  COMPAK    134
                   J      =  0                                                      COMPAK    135
135                JCOLS  =  I                                                      COMPAK    136
                52 KOL    =  0                                                      COMPAK    137
                55 LOC    =  LOC + 1                                                COMPAK    138
                   J      =  J + 1                                                  COMPAK    139
                   IF (J .GE. JCOLS) GO TO 60                                       COMPAK    140
140                IF (SFMAT(LOC)) 60, 55, 60                                       COMPAK    141
                60 KOL    =  KOL + 1                                                COMPAK    142
                   LROW(KOL) =  I                                                   COMPAK    143
                   LCOL(KOL) =  J                                                   COMPAK    144
                   ROW(KOL) =  SFMAT(LOC)                                           COMPAK    145
145                IF (J .EQ. JCOLS) GO TO 65                                       COMPAK    146
                   IF (KOL .LT. KOLUMN) GO TO 55                                    COMPAK    147
                65 JCU    =  KOL                                                    COMPAK    148
                   CALL TITLES (2)                                                  COMPAK    149
                   CALL PTABLE (2,35,35                                             COMPAK    150
150                1   HSTIFFNESS MATRIX IN STRUCTURES GRID)                        COMPAK    151
                   IF (KOUNT .GT. KOUNTH .AND. I .EQ. 1) GO TO 68                   COMPAK    152
                   IF (KOUNT .GT. KOUNTH) GO TO 70                                  COMPAK    153
                68 CONTINUE                                                         COMPAK    154
                   WRITE (ITAPEW,2001)                                              COMPAK    155
155                CALL PLB (1,1,ITAPEW)                                            COMPAK    156
                   WRITE (ITAPEW,2002)   ((HEAD(IH,JH),IH=1,5),JH=1,KOLUMN)         COMPAK    157
                   KOUNT  = KOUNT + 3                                               COMPAK    158
                70 CONTINUE                                                         COMPAK    159
                   KOUNT  = KOUNT + 1                                               COMPAK    160
160                WRITE (ITAPEW,2003) (LROW(KOL), LCOL(KOL), ROW(KOL), KOL=1,JCU)  COMPAK    161
                   IF (J .LT. JCOLS) GO TO 52                                       COMPAK    162
                90 CONTINUE                                                         COMPAK    163
                   GO TO 195                                                        COMPAK    164
                92 CONTINUE                                                         COMPAK    165
165                LOC    =  0                                                      COMPAK    166
                   IROWS  =  IROW                                                   COMPAK    167
                   DO 190 I=1,IROWS                                                 COMPAK    168
                   DO 152 J=1,I                                                     COMPAK    169
                   LOC    =  LOC + 1                                                COMPAK    170
170             152 ROW(J) =  SFMAT(LOC)                                            COMPAK    171
```

```
                      JCOLS  =  I                                                    COMPAK    173
                  155 JCL    =  JCU + 1                                             COMPAK    174
                      JCU    =  JCU + KOLUMN                                        COMPAK    175
      175             JCU    =  MINOF(JCU,JCOLS)                                    COMPAK    176
                      CALL TITLES (2)                                               COMPAK    177
                      CALL PTABLE (2,35,35                                          COMPAK    178
                     1   HFLEXIBILITY MATRIX IN DYNAMICS GRID)                      COMPAK    179
                      IF (KOUNT .GT. KOUNTH .AND. I .EQ. 1) GO TO 158               COMPAK    180
      180             IF (KOUNT .GT. KOUNTH) GO TO 160                              COMPAK    181
                  158 CONTINUE                                                      COMPAK    182
                      CALL PLB (1,1,ITAPEW)                                         COMPAK    183
                      WRITE (ITAPEW,3001)                                           COMPAK    184
                      KOUNT  =  KOUNT + 2                                           COMPAK    185
      185         160 CONTINUE                                                      COMPAK    186
                      KOUNT  =  KOUNT + 1                                           COMPAK    187
                      WRITE (ITAPEW,3003) I, JCL, (ROW(J), J=JCL,JCU)               COMPAK    188
                      IF (JCU .LT. JCOLS) GO TO 155                                 COMPAK    189
                  190 CONTINUE                                                      COMPAK    190
      190         195 CONTINUE                                                      COMPAK    191
                C                                                                   COMPAK    192
                C                                                                   COMPAK    193
                C FORMATS                                                           COMPAK    194
                 2001 FORMAT (10X, 16HSTIFFNESS MATRIX)                             COMPAK    195
      195        2002 FORMAT (10X, 5(2X, 5A4))                                      COMPAK    196
                 2003 FORMAT (10X, 5(2I5,1P1E12.4))                                 COMPAK    197
                 3001 FORMAT (10X, 2X, 3HROW, 2X, 3HCOL, 2X                         COMPAK    198
                     1           , 18HFLEXIBILITY MATRIX)                           COMPAK    199
                 3003 FORMAT (10X, 2I5, 1P8E14.6)                                   COMPAK    200
      200       C                                                                   COMPAK    201
                      RETURN                                                        COMPAK    202
                      END                                                           COMPAK    203
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

97 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	COMPAK	32	201

VARIABLES	SN	TYPE	RELOCATION					
15	D	REAL		KLUES	REFS	58		
27	DBAL	REAL		KLUES	REFS	58		
16	DEL	REAL		KLUES	REFS	58		
12	DWMAX	REAL		KLUES	REFS	58		
11	EPS1	REAL		KLUES	REFS	58		
17	EPS2	REAL		KLUES	REFS	58		
456	HEAD	REAL	ARRAY		REFS	34	156 DEFINED	84
507	HOLD	REAL	ARRAY		REFS	34	84 DEFINED	81

VARIABLES	SN	TYPE	RELOCATION								
451	I	INTEGER		REFS	135	142	151	168	172	179	187
				DEFINED	133	167					
22	IBAND	INTEGER	KLUES	REFS	58						
7	IDNOPT	INTEGER	KLUES	REFS	58						
21	IFA	INTEGER	PLACES	REFS	41	104					
67	IFADD	INTEGER	PLACES	REFS	41						
41	IFADDI	INTEGER	PLACES	REFS	41						
33	IFB	INTEGER	PLACES	REFS	41						
71	IFBAL	INTEGER	PLACES	REFS	41						
43	IFBALI	INTEGER	PLACES	REFS	41						
117	IFBR	INTEGER	PLACES	REFS	41						
53	IFBT	INTEGER	PLACES	REFS	41						
73	IFDESF	INTEGER	PLACES	REFS	41						
45	IFDESI	INTEGER	PLACES	REFS	41						
55	IFDESN	INTEGER	PLACES	REFS	41						
35	IFDESO	INTEGER	PLACES	REFS	41						
77	IFDUM1	INTEGER	PLACES	REFS	41						
101	IFDUM2	INTEGER	PLACES	REFS	41						
103	IFDUM3	INTEGER	PLACES	REFS	41						
442	IFILE	INTEGER		REFS	113	114	DEFINED	99	104	112	
23	IFIN	INTEGER	KLUES	REFS	58						
141	IFINCK	INTEGER	PLACES	REFS	41						
137	IFINCM	INTEGER	PLACES	REFS	41						
31	IFKS	INTEGER	PLACES	REFS	41	99					
105	IFL	INTEGER	PLACES	REFS	41						
115	IFLR	INTEGER	PLACES	REFS	41						
57	IFMD	INTEGER	PLACES	REFS	41						
65	IFMDB	INTEGER	PLACES	REFS	41						
37	IFMDBI	INTEGER	PLACES	REFS	41						
61	IFMEMF	INTEGER	PLACES	REFS	41						
25	IFMEMN	INTEGER	PLACES	REFS	41						
51	IFMEMO	INTEGER	PLACES	REFS	41						
125	IFMODK	INTEGER	PLACES	REFS	41						
123	IFMODM	INTEGER	PLACES	REFS	41						
135	IFPH	INTEGER	PLACES	REFS	41						
127	IFPHT	INTEGER	PLACES	REFS	41						
121	IFPHTF	INTEGER	PLACES	REFS	41						
133	IFQ	INTEGER	PLACES	REFS	41						
131	IFQT	INTEGER	PLACES	REFS	41						
11	IFSCR	INTEGER	PLACES	REFS	41						
27	IFSTFN	INTEGER	PLACES	REFS	41						
63	IFSTFO	INTEGER	PLACES	REFS	41						
12	IFS1	INTEGER	PLACES	REFS	41						
13	IFS2	INTEGER	PLACES	REFS	41						
14	IFS3	INTEGER	PLACES	REFS	41						
15	IFS4	INTEGER	PLACES	REFS	41						
75	IFWT	INTEGER	PLACES	REFS	41						
47	IFWTI	INTEGER	PLACES	REFS	41						
23	IFY	INTEGER	PLACES	REFS	41						
107	IFYT	INTEGER	PLACES	REFS	41						
111	IFZ	INTEGER	PLACES	REFS	41						
113	IFZR	INTEGER	PLACES	REFS	41						
432	IH	INTEGER		REFS	2*84	156	DEFINED	82	156		
0	IPOS	INTEGER ARRAY	FILE	REFS	35	72	DEFINED	113			
2	IRED	INTEGER	KLUES	REFS	58	92					
0	IROW	INTEGER	F.P.	REFS	114	115	132	166	DEFINED	32	
0	IROWD	INTEGER	F.P.	REFS	2*86	87	DEFINED	32			

VARIABLES	SN	TYPE		RELOCATION						
450	IROWS	INTEGER			REFS	133	167	DEFINED	132	166
0	ISETUP	INTEGER	ARRAY	MATRIX	REFS	35	70			
2	ITAPEP	INTEGER		COMRWP	REFS	69				
0	ITAPER	INTEGER		COMRWP	REFS	69				
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	35	68	89		
7	ITAPET	INTEGER		CTABLE	REFS	63				
1	ITAPEW	INTEGER		COMRWP	REFS	69	155	182	DEFINED	89
					I/O REFS	154	156	160	183	187
20	IUA	INTEGER		PLACES	REFS	41	103			
66	IUADD	INTEGER		PLACES	REFS	41				
40	IUADDI	INTEGER		PLACES	REFS	41				
32	IUB	INTEGER		PLACES	REFS	41				
70	IUBAL	INTEGER		PLACES	REFS	41				
42	IUBALI	INTEGER		PLACES	REFS	41				
116	IUBR	INTEGER		PLACES	REFS	41				
52	IUBT	INTEGER		PLACES	REFS	41				
16	IUCD	INTEGER		PLACES	REFS	41				
72	IUDESF	INTEGER		PLACES	REFS	41				
44	IUDESI	INTEGER		PLACES	REFS	41				
54	IUDESN	INTEGER		PLACES	REFS	41				
34	IUDESO	INTEGER		PLACES	REFS	41				
76	IUDUM1	INTEGER		PLACES	REFS	41				
100	IUDUM2	INTEGER		PLACES	REFS	41				
102	IUDUM3	INTEGER		PLACES	REFS	41				
4	IUGO1	INTEGER		PLACES	REFS	41				
5	IUGO2	INTEGER		PLACES	REFS	41				
6	IUGO3	INTEGER		PLACES	REFS	41				
7	IUGO4	INTEGER		PLACES	REFS	41				
140	IUINCK	INTEGER		PLACES	REFS	41				
136	IUINCM	INTEGER		PLACES	REFS	41				
0	IUIN1	INTEGER		PLACES	REFS	41				
1	IUIN2	INTEGER		PLACES	REFS	41				
30	IUKS	INTEGER		PLACES	REFS	41	98			
104	IUL	INTEGER		PLACES	REFS	41				
114	IULR	INTEGER		PLACES	REFS	41				
56	IUMD	INTEGER		PLACES	REFS	41				
64	IUMDB	INTEGER		PLACES	REFS	41				
36	IUMDBI	INTEGER		PLACES	REFS	41				
60	IUMEMF	INTEGER		PLACES	REFS	41				
24	IUMEMN	INTEGER		PLACES	REFS	41				
50	IUMEMO	INTEGER		PLACES	REFS	41				
124	IUMODK	INTEGER		PLACES	REFS	41				
122	IUMODM	INTEGER		PLACES	REFS	41				
2	IUOUT1	INTEGER		PLACES	REFS	41				
3	IUOUT2	INTEGER		PLACES	REFS	41				
134	IUPH	INTEGER		PLACES	REFS	41				
126	IUPHT	INTEGER		PLACES	REFS	41				
120	IUPHTF	INTEGER		PLACES	REFS	41				
17	IUPR	INTEGER		PLACES	REFS	41				
132	IUQ	INTEGER		PLACES	REFS	41				
130	IUQT	INTEGER		PLACES	REFS	41				
10	IUSCR	INTEGER		PLACES	REFS	41				
26	IUSTFN	INTEGER		PLACES	REFS	41				
62	IUSTFO	INTEGER		PLACES	REFS	41				
74	IUWT	INTEGER		PLACES	REFS	41				
46	IUWTI	INTEGER		PLACES	REFS	41				

VARIABLES	SN	TYPE		RELOCATION							
106	IUYT	INTEGER		PLACES	REFS	41					
110	IUZ	INTEGER		PLACES	REFS	41					
112	IUZR	INTEGER		PLACES	REFS	41					
445	J	INTEGER			REFS	117	138	139	143	145	161	170
					187	DEFINED	115	134	138	168	187	
455	JCL	INTEGER			REFS	2*187	DEFINED	173				
452	JCOLS	INTEGER			REFS	139	145	161	175	188		
					DEFINED	135	172					
454	JCU	INTEGER			REFS	160	173	174	175	187	188	
					DEFINED	147	171	174	175			
433	JH	INTEGER			REFS	84	156	DEFINED	83	156		
7	KBPAGE	INTEGER		CLIST	REFS	61						
4	KLABEL	INTEGER		CLIST	REFS	61						
440	KLISTV	INTEGER			REFS	126	DEFINED	93				
24	KLUB	INTEGER		KLUES	REFS	58						
4	KLUBAL	INTEGER		KLUES	REFS	58						
1	KLUEV	INTEGER	ARRAY	CLUEV	REFS	35	66	93				
3	KLUMD	INTEGER		KLUES	REFS	58						
1	KLUNAL	INTEGER		KLUES	REFS	58						
25	KLUQ	INTEGER		KLUES	REFS	58						
0	KLUSE	INTEGER		KLUES	REFS	58						
437	KMATV	INTEGER			REFS	97	130	DEFINED	91	92		
453	KOL	INTEGER			REFS	141	142	143	144	146	147	3*160
					DEFINED	136	141	160				
443	KOLUMN	INTEGER			REFS	146	156	174	DEFINED	100	101	105
					106							
0	KOUNT	INTEGER		CLIST	REFS	61	151	152	157	159	179	180
					184	186	DEFINED	94	157	159	184	186
11	KOUNTH	INTEGER		CLIST	REFS	61	151	152	179	180		
12	KOUNTI	INTEGER		CLIST	REFS	61						
1	KPAGE	INTEGER		CLIST	REFS	61						
0	KREPOR	INTEGER		REPORT	REFS	71	101	106				
0	KTABLE	INTEGER		CTABLE	REFS	63	DEFINED	129				
5	KTABLO	INTEGER		CTABLE	REFS	63						
5	KTPAGE	INTEGER		CLIST	REFS	61						
446	L	INTEGER			REFS	119	DEFINED	117				
514	LCOL	INTEGER	ARRAY		REFS	36	160	DEFINED	143			
2	LINES	INTEGER		CLIST	REFS	61	94					
10	LINESG	INTEGER		CLIST	REFS	61						
3	LINEST	INTEGER		CLIST	REFS	61						
0	LKLUEV	INTEGER		CLUEV	REFS	66						
447	LOC	INTEGER			REFS	137	140	144	169	170		
					DEFINED	131	137	165	169			
521	LROW	INTEGER	ARRAY		REFS	36	160	DEFINED	142			
0	LTSHV	INTEGER		CTSHV	REFS	65						
436	M	INTEGER			REFS	118	119	DEFINED	90	118		
526	MATNAM	INTEGER	ARRAY		REFS	37	114					
26	MORBAL	INTEGER		KLUES	REFS	58						
5	MSADD	INTEGER		KLUES	REFS	58						
13	NBAR	INTEGER		KLUES	REFS	58						
3	NCOLS	INTEGER		CTABLE	REFS	63	DEFINED	128				
4	NCOLST	INTEGER		CTABLE	REFS	63						
20	NCYC	INTEGER		KLUES	REFS	58						
14	NFIX	INTEGER		KLUES	REFS	58						
444	NM	INTEGER			REFS	114	116					
435	NMATD	INTEGER			REFS	88	DEFINED	86				
21	NNN	INTEGER		KLUES	REFS	58						

VARIABLES	SN	TYPE		RELOCATION								
6	NPAGE	INTEGER		CLIST	REFS	61						
6	NPAGEA	INTEGER		CTABLE	REFS	63						
6	NPAS	INTEGER		KLUES	REFS	58						
1	NPASS	INTEGER		CTABLE	REFS	63						
2	NROWS	INTEGER		CTABLE	REFS	63	DEFINED	127				
441	NTAPE	INTEGER			REFS	113	114	116	122	DEFINED	98	103
530	ROW	REAL	ARRAY		REFS	38	87	116	119	160	187	
					DEFINED	144	170					
0	SFMAT	REAL	ARRAY	CPMASS	REFS	38	67	88	140	144	170	
					DEFINED	119						
1	TSHV	REAL	ARRAY	CTSHV	REFS	39	65					
10	VDES	REAL		KLUES	REFS	58						
434	ZERO	REAL			REFS	87	88	DEFINED	85			

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES		
DCLOSE		1	122		
DVALUE		3	87	88	
GEDLAB		6	114		
GETROW		4	116		
PLB		3	155	182	
PROGNA		2	95		
PTABLE		3	149	177	
TITLES		1	111	148	176

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
MINO	INTEGER	0	INTRIN		175
MINOF	INTEGER	2	SF	77	175

STATEMENT LABELS			DEF LINE	REFERENCES	
0	5		84	82	83
54	10		98	97	
64	12		103	97	
73	14		107	102	
0	20		120	117	
134	52		136	161	
135	55		137	140	146
142	60		141	139	2*140
153	65		147	145	
165	68		153	151	
201	70		158	152	
0	90		162	133	
226	92		164	130	
0	100		121	115	
0	152		170	168	
243	155		173	188	
260	158		181	179	
266	160		185	180	
0	190		189	167	
303	195		190	126	163
404	2001	FMT	194	154	
410	2002	FMT	195	156	
413	2003	FMT	196	160	
416	3001	FMT	197	183	
424	3003	FMT	199	187	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
7	5	IH	82 84	14B	NOT INNER
15	5	JH	83 84	3B	INSTACK
103	100	J	115 121	15B	EXT REFS NOT INNER
111	20	L	117 120	3B	INSTACK
132	90	I	133 162	73B	EXT REFS NOT INNER
205		KOL	160 160	12B	EXT REFS
231	190	I	167 189	52B	EXT REFS NOT INNER
235	152	J	168 170	3B	INSTACK

COMMON BLOCKS LENGTH MEMBERS - BIAS NAME(LENGTH)

PLACES 98

0 IUIN1 (1)	1 IUIN2 (1)	2 IUOUT1 (1)
3 IUOUT2 (1)	4 IUGO1 (1)	5 IUGO2 (1)
6 IUGO3 (1)	7 IUGO4 (1)	8 IUSCR (1)
9 IFSCR (1)	10 IFS1 (1)	11 IFS2 (1)
12 IFS3 (1)	13 IFS4 (1)	14 IUCD (1)
15 IUPR (1)	16 IUA (1)	17 IFA (1)
18 IUY (1)	19 IFY (1)	20 IUMEMN (1)
21 IFMEMN (1)	22 IUSTFN (1)	23 IFSTFN (1)
24 IUKS (1)	25 IFKS (1)	26 IUB (1)
27 IFB (1)	28 IUDESO (1)	29 IFDESO (1)
30 IUMDBI (1)	31 IFMDBI (1)	32 IUADDI (1)
33 IFADDI (1)	34 IUBALI (1)	35 IFBALI (1)
36 IUDESI (1)	37 IFDESI (1)	38 IUWTI (1)
39 IFWTI (1)	40 IUMEMO (1)	41 IFMEMO (1)
42 IUBT (1)	43 IFBT (1)	44 IUDESN (1)
45 IFDESN (1)	46 IUMD (1)	47 IFMD (1)
48 IUMEMF (1)	49 IFMEMF (1)	50 IUSTFO (1)
51 IFSTFO (1)	52 IUMDB (1)	53 IFMDB (1)
54 IUADD (1)	55 IFADD (1)	56 IUBAL (1)
57 IFBAL (1)	58 IUDESF (1)	59 IFDESF (1)
60 IUWT (1)	61 IFWT (1)	62 IUDUM1 (1)
63 IFDUM1 (1)	64 IUDUM2 (1)	65 IFDUM2 (1)
66 IUDUM3 (1)	67 IFDUM3 (1)	68 IUL (1)
69 IFL (1)	70 IUYT (1)	71 IFYT (1)
72 IUZ (1)	73 IFZ (1)	74 IUZR (1)
75 IFZR (1)	76 IULR (1)	77 IFLR (1)
78 IUBR (1)	79 IFBR (1)	80 IUPHTF (1)
81 IFPHTF (1)	82 IUMODM (1)	83 IFMODM (1)
84 IUMODK (1)	85 IFMODK (1)	86 IUPHT (1)
87 IFPHT (1)	88 IUQT (1)	89 IFQT (1)
90 IUQ (1)	91 IFQ (1)	92 IUPH (1)
93 IFPH (1)	94 IUINCM (1)	95 IFINCM (1)
96 IUINCK (1)	97 IFINCK (1)	

KLUES 24

0 KLUSE (1)	1 KLUNAL (1)	2 IRED (1)
3 KLUMD (1)	4 KLUBAL (1)	5 MSADD (1)
6 NPAS (1)	7 IDNOPT (1)	8 VDES (1)
9 EPS1 (1)	10 DWMAX (1)	11 NBAR (1)
12 NFIX (1)	13 D (1)	14 DEL (1)
15 EPS2 (1)	16 NCYC (1)	17 NNN (1)
18 IBAND (1)	19 IFIN (1)	20 KLUB (1)
21 KLUQ (1)	22 MORBAL (1)	23 DBAL (1)

CLIST 11

0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
9 KOUNTH (1)	10 KOUNTI (1)	

CTABLE 8

0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)

```
COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
                                3 NCOLS  (1)          4 NCOLST (1)          5 KTABLO (1)
                                6 NPAGEA (1)          7 ITAPET (1)
        CTSHV         2         0 LTSHV  (1)          1 TSHV   (1)
        CLUEV        21         0 LKLUEV (1)          1 KLUEV  (20)
        CPMASS    25000         0 SFMAT  (25000)
        CTAPES       50         0 ITAPES (50)
        COMRWP        3         0 ITAPER (1)          1 ITAPEW (1)          2 ITAPEP (1)
        MATRIX       45         0 ISETUP (45)
        REPORT        1         0 KREPOR (1)
        FILE         20         0 IPOS   (20)

STATISTICS
  PROGRAM LENGTH                 1106B     582
  CM LABELED COMMON LENGTH      61303B   25283
          520008 CM USED
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```
      C45700, SUB. EIGEN                                                    EIGEN      2
      C                                                                     EIGEN      3
      C*********************************************************************** EIGEN      4
      C                                                                     * EIGEN      5
      C***  SUBROUTINE         ************************************************ EIGEN      6
      C                                                                     * EIGEN      7
      C***  COMPUTER VERSION   ************************************************ EIGEN      8
      C     ----------------                                                * EIGEN      9
      C     IBM .... INCLUDES DOUBLE PRECISION TYPE STATEMENTS.  COLUMN ONE * EIGEN     10
      C               SHOULD BE BLANK.                                      * EIGEN     11
      C                                                                     * EIGEN     12
      C     CDC .... DOES NOT INCLUDE DOUBLE PRECISION TYPE STATEMENTS.     * EIGEN     13
      C               THESE STATEMENTS ARE CONVERTED INTO COMMENTS BY       * EIGEN     14
      C               INSERTING THE LETTER C IN COLUMN ONE.                 * EIGEN     15
      C                                                                     * EIGEN     16
      C***  OBJECTIVE  ************************************************** EIGEN     17
      C     ---------                                                       * EIGEN     18
      C                                                                       EIGEN     19
      C     SOLVE THE STANDARD EIGEN VALUE PROBLEM FOR FREQUENCIES AND MODE * EIGEN     20
      C     SHAPES USING THE FOLLOWING EXPRESSION.                          * EIGEN     21
      C                                                                     * EIGEN     22
      C     (A) * (Y) = (LAMBDA) * (Y)                                      * EIGEN     23
      C                                                                     * EIGEN     24
      C     WHERE ....                                                      * EIGEN     25
      C         LAMBDA =  1/FREQ**2                                         * EIGEN     26
      C         Y      =  (X) * (L TRANSPOSE)                               * EIGEN     27
      C         A IS THE STANDARD EIGENVALUE COEFFICIENT MATRIX.            * EIGEN     28
      C         Y IS THE TRANSFORMED COORDINATE SYSTEM.                     * EIGEN     29
      C         X IS THE PHYSICAL COORDINATE SYSTEM.                        * EIGEN     30
      C         L TRANSPOSE IS THE CHOLESKY DECOMPOSITION (L) OF THE MASS   * EIGEN     31
      C         OR STIFFNESS MATRIX                                         * EIGEN     32
      C                                                                     * EIGEN     33
      C     FOR THE STIFFNESS APPROACH                                      * EIGEN     34
      C                                                                     * EIGEN     35
      C     A     = (INVERSE OF L) * (M) * (INVERSE OF L TRANSPOSE)         * EIGEN     36
      C     KSUBS = (L) * ( L TRANSPOSE)                                    * EIGEN     37
      C                                                                     * EIGEN     38
      C     WHERE .....                                                     * EIGEN     39
      C         M IS THE MASS MATRIX.                                       * EIGEN     40
      C         KSUBS IS THE STIFFNESS MATRIX                               * EIGEN     41
      C                                                                     * EIGEN     42
      C     FOR THE FLEXIBILITY APPROACH                                    * EIGEN     43
      C                                                                     * EIGEN     44
      C     A     = (L TRANSPOSE) * (KSUBF) * (L)                           * EIGEN     45
      C     M     = (L) * (L TRANSPOSE)                                     * EIGEN     46
      C                                                                     * EIGEN     47
      C     WHERE .....                                                     * EIGEN     48
      C         M IS THE MASS MATRIX                                        * EIGEN     49
      C         KSUBF IS THE FLEXIBILITY MATRIX.                            * EIGEN     50
      C                                                                     * EIGEN     51
      C     NOTE THAT THE VARIABLE A(I) USED IN THE PROGRAM BELOW IS USED   * EIGEN     52
      C     FOR MANY PURPOSES IN ADDITION TO STORING THE EIGENVALUE         * EIGEN     53
      C     COEFFICIENT MATRIX.                                             * EIGEN     54
      C                                                                     * EIGEN     55
      C***  INPUT/OUTPUT  ************************************************** EIGEN     56
      C     ------------                                                    * EIGEN     57
      C                                                                     * EIGEN     58
```

```
      C***  SUMMARY OF SYMBOLS  ********************************************** EIGEN      59
      C     ------------------                                                * EIGEN      60
60    C                                                                       EIGEN      61
      C                                                                     * EIGEN      62
      C***  ERROR MESSAGES  ************************************************** EIGEN      63
      C     --------------                                                  * EIGEN      64
      C     NONE.                                                           * EIGEN      65
65    C                                                                     * EIGEN      66
      C*********************************************************************** EIGEN      67
      C                                                                       EIGEN      68
            SUBROUTINE EIGEN (IROWD,KMATV,ISCR,IROW,NCYC,INDEX1)              EIGEN      69
      C                                                                       EIGEN      70
70    C                                                                       EIGEN      71
      CIBM  BEGINNING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS EIGEN      72
      C     DOUBLE PRECISION SUM                                              EIGEN      73
      CIBM  ENDING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   EIGEN      74
      C                                                                       EIGEN      75
75          DIMENSION A(25000),BUFFER(440)                                    EIGEN      76
            DIMENSION FREQ(40)                                                EIGEN      77
            DIMENSION IPOS(1)           ,IFILES(1)                            EIGEN      78
            DIMENSION JSETUP(1)                                               EIGEN      79
            DIMENSION MATNAM(2)                                               EIGEN      80
80          DIMENSION NAME(2)           ,NAME2(2)                             EIGEN      81
           1         ,NAME3(2)          ,NAME4(2)          ,NAME5(2)          EIGEN      82
            DIMENSION Q(1760),QQ(220)                                         EIGEN      83
            DIMENSION TSHV(1)           ,TITLE(18,2)                          EIGEN      84
      C                                                                       EIGEN      85
85          COMMON /CPMASS/ A                                                 EIGEN      86
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              EIGEN      87
            COMMON /DSRN  / JSETUP                                            EIGEN      88
            COMMON /FILE  / IPOS                                              EIGEN      89
            COMMON /REPORT/ KREPOR                                            EIGEN      90
90          COMMON /CTSHV / LTSHV ,TSHV                                       EIGEN      91
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE   EIGEN      92
           1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                       EIGEN      93
            COMMON /CTABLE/ KTABLE,NPASS ,NROWS, NCOLS , NCOLST,KTABLO,NPAGEA EIGEN      94
           1              ,ITAPET                                            EIGEN      95
95          COMMON /CFILES/ KFILES,IFILES                                     EIGEN      96
            COMMON /CTITLE/ LTITLE,TITLE                                      EIGEN      97
            COMMON /FREAKS/ FREQ                                              EIGEN      98
            COMMON/PLACES/ IUIN1,IUIN2,IUOUT1,IUOUT2,IUGO1,IUGO2,IUGO3,IUGO4, EIGEN      99
           1               IUSCR,IFSCR,IFS1,IFS2,IFS3,IFS4,IUCD,IUPR,         EIGEN     100
100        2               IUA,IFA,IUY,IFY,IUMEMN,IFMEMN,IUSTFN,IFSTFN,       EIGEN     101
           3               IUKS,IFKS,IUB,IFB,IUDESO,IFDESO,                   EIGEN     102
           4               IUMDBI,IFMDBI,IUADDI,IFADDI,IUBALI,IFBALI,         EIGEN     103
           5               IUDESI,IFDESI IUWTI,IFWTI,                         EIGEN     104
           6               IUMEMO,IFMEMO,IUBT,IFBT,                           EIGEN     105
105        7               IUDESN,IFDESN,IUMD,IFMD,                           EIGEN     106
           8               IUMEMF,IFMEMF,                                     EIGEN     107
           9               IUSTFO,IFSTFO,IUMDB,IFMDB,IUADD,IFADD,IUBAL,IFBAL, EIGEN     108
           A               IUDESF,IFDESF,IUWT,IFWT,                           EIGEN     109
           B               IUDUM1,IFDUM1,IUDUM2,IFDUM2,IUDUM3,IFDUM3,         EIGEN     110
110        C               IUL,IFL,IUYT,IFYT,IUZ,IFZ,IUZR,IFZR,IULR,IFLR,     EIGEN     111
           D               IUBR,IFBR,                                         EIGEN     112
           E               IUPHTF,IFPHTF,IUMODM,IFMODM,                       EIGEN     113
           F               IUMODK,IFMODK,IUPHT,IFPHT,IUQT,IFQT,IUQ,IFQ,       EIGEN     114
           G               IUPH,IFPH,IUINCM,IFINCM,IUINCK,IFINCK              EIGEN     115
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```
      COMMON /PLAYFF/ IUMDFF,IFMDFF,IUDLTI,IFDLTI,IUSLTI,IFSLTI          EIGEN     116
     1               ,IUMPLI,IFMPLI,IUTPGT,IFTPGT,IUPATF,IFPATF          EIGEN     117
     2               ,IUMPL,IFMPL,IUSLT,IFSLT,IUDLT,IFDLT                EIGEN     118
     3               ,IUQA,IFQA,IUQAT,IFQAT,IUPHA,IFPHA,IUPHAT,IFPHAT    EIGEN     119
      COMMON /KLUFF/ KFREE                                               EIGEN     120
      COMMON /VKLUE/ NROOTS,NDOFFF,NZERO,IDFV(220),IDFF(220)             EIGEN     121
C                                                                        EIGEN     122
      EQUIVALENCE (QQ(1),Q(221))                                         EIGEN     123
C                                                                        EIGEN     124
C                                                                        EIGEN     125
C FUNCTION DEFINITION                                                    EIGEN     126
      ABSF(X)       =  ABS(X)                                          EIGEN     127
      SQRTF(X)      =  SQRT(X)                                         EIGEN     128
      MAXOF(I,J)    =  MAXO(I,J)                                       EIGEN     129
      MINOF(I,J)    =  MINO(I,J)                                       EIGEN     130
C                                                                        EIGEN     131
C                                                                        EIGEN     132
C INITIAL CONDITIONS                                                     EIGEN     133
C                                                                        EIGEN     134
      DATA MATNAM /4HMASS,4HSTIF/                                        EIGEN     135
      DATA MASS   /4HMASS/                                               EIGEN     136
      DATA MATR   /4HSTIF/                                               EIGEN     137
      DATA NAME2  /4H    ,4HLMAT/                                        EIGEN     138
      DATA NAME3  /4HEIGE,4HNPCS/                                        EIGEN     139
      DATA NAME4  /4HLTFL,4HEXL /                                        EIGEN     140
      DATA NAME5  /4HEIGE,4HNTCS/                                        EIGEN     141
      ISCR  =  IUMD                                                      EIGEN     142
      IFCOM=IFMD                                                         EIGEN     143
      IF(KFREE.EQ.2) ISCR=IUMDFF                                         EIGEN     144
      IF(KFREE.EQ.2) IFCOM=IFMDFF                                        EIGEN     145
      JSCR  =  IUG03                                                     EIGEN     146
      IF (KMATV .EQ. 1) NAME2(1) = MATR                                  EIGEN     147
      IF (KMATV .EQ. 2) NAME2(1) = MASS                                  EIGEN     148
      INDIC8=-1                                                          EIGEN     149
      L=1                                                                EIGEN     150
      INDEX = (IROW*IROW + IROW)/2 + 1                                   EIGEN     151
      INDEX1=INDEX-1                                                     EIGEN     152
      NAMER = MATNAM(1)                                                  EIGEN     153
      IF (KMATV .EQ. 1) NAMER = MATNAM(2)                                EIGEN     154
      CALL PROGNA (4H(EIG, 4HEN ))                                       EIGEN     155
C                                                                        EIGEN     156
C                                                                        EIGEN     157
C READ DATA FROM CARDS                                                   EIGEN     158
C                                                                        EIGEN     159
      IF(NCYC.GT.0) GO TO 9                                              EIGEN     160
      READ (ITAPER,1000) NROOTS, NDOFFF,NZERO                            EIGEN     161
    9 CONTINUE                                                           EIGEN     162
C                                                                        EIGEN     163
C                                                                        EIGEN     164
C     READ EITHER THE STIFFNESS MATRIX OR THE MASS MATRIX INTO CORE      EIGEN     165
C     DEPENDING ON WHETHER THE PROBLEM BEING SOLVED IS STIFFNESS         EIGEN     166
C     OR FLEXIBILITY                                                     EIGEN     167
C                                                                        EIGEN     168
C                                                                        EIGEN     169
      IF (KMATV.EQ.1) GO TO 11                                           EIGEN     170
C                                                                        EIGEN     171
C     FLEXIBILITY PROBLEM                                                EIGEN     172
```

```
      C     READ MASS MATRIX FROM TAPE                                        EIGEN    173
      C                                                                       EIGEN    174
            CALL TITLES (2)                                                   EIGEN    175
175         IPOS(ISCR)=IFCOM                                                  EIGEN    176
            CALL READMA (ISCR,IROW,BUFFER,NAME)                               EIGEN    177
      C                                                                       EIGEN    178
            IPOS(ISCR)=IFCOM+1                                                EIGEN    179
            NIX  =  0                                                         EIGEN    180
180         GOTO 13                                                           EIGEN    181
      C                                                                       EIGEN    182
      C                                                                       EIGEN    183
         11 CONTINUE                                                          EIGEN    184
            IPOS(ISCR)=IFCOM+1                                                EIGEN    185
185         NIX = 0                                                           EIGEN    186
      C                                                                       EIGEN    187
      C     STIFFNESS PROBLEM                                                 EIGEN    188
      C                                                                       EIGEN    189
      C     READ STIFFNESS MATRIX FROM TAPE                                   EIGEN    190
190   C                                                                       EIGEN    191
            CALL COMPAK (IROW,IROWD)                                          EIGEN    192
      C                                                                       EIGEN    193
      C                                                                       EIGEN    194
         13 CONTINUE                                                          EIGEN    195
195         CALL PROGNA (4H(EIG, 4HEN ))                                      EIGEN    196
            CALL TITLES (2)                                                   EIGEN    197
      C                                                                       EIGEN    198
      C                                                                       EIGEN    199
      C FORM CHOLESKY DECOMPOSITION (L-MATRIX)                                EIGEN    200
200   C 1.  USE OF STIFFNESS MATRIX (KMATV=1) REQUIRES THE CHOLESKY           EIGEN    201
      C     DECOMPOSITION OF THE STIFFNESS MATRIX WHICH IS STORED IN 'A'.     EIGEN    202
      C 2.  USE OF THE FLEXIBILITY MATRIX (KMATV=2) REQUIRES THE CHOLESKY     EIGEN    203
      C     DECOMPOSITION OF THE MASS MATRIX WHICH IS STORED IN 'A'.          EIGEN    204
      C                                                                       EIGEN    205
205         CALL FUTILE (A, IROW, NIX)                                        EIGEN    206
         12 IF (NIX) 2,3,4                                                    EIGEN    207
          2 WRITE(ITAPEW,41) NAMER                                            EIGEN    208
            GOTO 500                                                          EIGEN    209
          4 WRITE(ITAPEW,42)                                                  EIGEN    210
210   C                                                                       EIGEN    211
      C                                                                       EIGEN    212
          3 CONTINUE                                                          EIGEN    213
      C                                                                       EIGEN    214
      C                                                                       EIGEN    215
215         IF (KMATV.EQ.2) GO TO 14                                          EIGEN    216
      C                                                                       EIGEN    217
      C     STIFFNESS PROBLEM                                                 EIGEN    218
      C                                                                       EIGEN    219
      C     STORE A MATRIX WHICH IS SPLIT OF STIFFNESS ON TAPE                EIGEN    220
220   C     THE ELEMENTS OF SPLIT ARE WRITTEN OUT A ROW AT A TIME             EIGEN    221
      C                     (ONLY LOWER TRIANGLE ELEMENTS PRESENT)            EIGEN    222
            NFIL  = IPOS(ISCR)                                                EIGEN    223
            CALL PUDLAB (8HEIGENO1 ,ISCR,NAME2,NFIL,IROW,IROW)                EIGEN    224
            JCL    =  1                                                       EIGEN    225
225         DO 140 I=1,IROW                                                   EIGEN    226
            JCU    =  JCL + I - 1                                             EIGEN    227
            CALL RITVEC (JCL, JCU, BUFFER, ISCR)                              EIGEN    228
```

```
  140 CONTINUE                                                          EIGEN  230
230       CALL DCLOSE (ISCR)                                           EIGEN  231
      C                                                                EIGEN  232
      C FORM THE COEFFICIENT MATRIX FOR THE STANDARD EIGENVALUE PROBLEM EIGEN  233
      C                                                                EIGEN  234
      C                                                                EIGEN  235
235   C FORM THE COEFFICIENT MATRIX THROUGH THE PRODUCT OF - (INVERSE OF L) EIGEN 236
      C TIMES (MASS) TIMES (INVERSE OF L TRANSPOSE)                    EIGEN  237
      C NOTE THAT THE COEFFICIENT MATRIX MUST BE IN COLUMN SORT FOR USE IN EIGEN 238
      C THE SYMEIG ROUTINE.                                            EIGEN  239
      C THE SWAP   ROUTINE IS BEING CALLED AT THE END OF THE COEFFICIENT EIGEN 240
240   C MATRIX CALCULATION IN ORDER TO ARRANGE THE COEFFICIENT MATRIX   EIGEN  241
      C IN COLUMN SORT.                                                EIGEN  242
      C                                                                EIGEN  243
      C                                                                EIGEN  244
      C     FIRST READ MASS MATRIX INTO CORE                           EIGEN  245
245         IPOS(ISCR)=IFCOM                                           EIGEN  246
            CALL READMA (ISCR,IROW,BUFFER,NAME)                        EIGEN  247
      C                                                                EIGEN  248
      C     NOW FORM MATRIX PRODUCT                                    EIGEN  249
      C                                                                EIGEN  250
250         IPOS(ISCR)=IFCOM+1                                         EIGEN  251
            NFIL  = IPOS(ISCR)                                         EIGEN  252
            CALL GEDLAB (8HEIGEN 01,ISCR,NAME,NFIL,IROWS,JCOLS)        EIGEN  253
            DO 10  I=1,IROW                                            EIGEN  254
            JCOL   =  I                                                EIGEN  255
255         CALL GETROW (ISCR,1,Q,JCOL)                                EIGEN  256
            X=-Q(I)                                                    EIGEN  257
            Q(I)=-1.                                                   EIGEN  258
            DO 20 J=1,I                                                EIGEN  259
         20 Q(J)=Q(J)/X                                                EIGEN  260
260      10 CALL DAGGER (A,IROW,Q,I,A(INDEX))                          EIGEN  261
            CALL DCLOSE (ISCR)                                         EIGEN  262
            CALL SWAP (A,IROW)                                         EIGEN  263
            GOTO 16                                                    EIGEN  264
      C                                                                EIGEN  265
265   C                                                                EIGEN  266
         14 CONTINUE                                                   EIGEN  267
      C                                                                EIGEN  268
      C FLEXIBILITY MATRIX APPROACH.                                   EIGEN  269
      C FORM THE COEFFICIENT MATRIX THROUGH THE PRODUCT OF - (L TRANSPOSE) EIGEN 270
270   C TIMES (FLEXIBILITY) TIMES (L).                                 EIGEN  271
      C NOTE THAT THE COEFFICIENT MATRIX MUST BE IN COLUMN SORT FOR USE IN EIGEN 272
      C THE SYMEIG ROUTINE.                                            EIGEN  273
      C                                                                EIGEN  274
      C     WRITE L-MATRIX OUT IN ROW SORT ON I/O UNIT                 EIGEN  275
275         NFIL  =  IPOS(ISCR)                                        EIGEN  276
            CALL PUDLAB (8HEIGEN 02,ISCR,NAME2,NFIL,IROW,IROW)         EIGEN  277
            JCL   =  1                                                 EIGEN  278
            DO 141  I=1,IROW                                           EIGEN  279
            JCU   =  JCL + I - 1                                       EIGEN  280
280         CALL RITVEC (JCL, JCU, BUFFER, ISCR)                       EIGEN  281
            JCL   =  JCL + I                                           EIGEN  282
        141 CONTINUE                                                   EIGEN  283
            CALL DCLOSE (ISCR)                                         EIGEN  284
            IPOS(ISCR)=IFCOM+2                                         EIGEN  285
285   C                                                                EIGEN  286
```

```
      1                SUBROUTINE RITVEC (JCL,JCU,BUFFER,ISCR)                  RITVEC     2
                     C                                                         RITVEC     3
                     C                                                         RITVEC     4
                       DIMENSION A(25000)                                      RITVEC     5
      5                DIMENSION      BUFFER(1)                                RITVEC     6
                     C                                                         RITVEC     7
                     C                                                         RITVEC     8
                       COMMON /CPMASS/ A                                       RITVEC     9
                       DO 151  J=JCL,JCU                                       RITVEC    10
     10                JB     =  J - JCL + 1                                   RITVEC    11
                     151 BUFFER(JB)  =  A(J)                                   RITVEC    12
                       JCOL   =  JCU - JCL + 1                                 RITVEC    13
                       CALL PUTROW (ISCR, 1, BUFFER, JCOL)                     RITVEC    14
                       RETURN                                                  RITVEC    15
     15                END                                                     RITVEC    16
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

	DEF LINE	REFERENCES
3 RITVEC	1	14

VARIABLES

	SN	TYPE		RELOCATION							
0	A	REAL	ARRAY	CPMASS	REFS	4	8	11			
0	BUFFER	REAL	ARRAY	F.P.	REFS	5	13	DEFINED	1	11	
0	ISCR	INTEGER		F.P.	REFS	13	DEFINED	1			
36	J	INTEGER			REFS	10	11	DEFINED	9		
37	JB	INTEGER			REFS	11	DEFINED	10			
0	JCL	INTEGER		F.P.	REFS	9	10	12	DEFINED	1	
40	JCOL	INTEGER			REFS	13	DEFINED	12			
0	JCU	INTEGER		F.P.	REFS	9	12	DEFINED	1		

EXTERNALS

	TYPE	ARGS	REFERENCES
PUTROW		4	13

STATEMENT LABELS

	DEF LINE	REFERENCES
0 151	11	9

LOOPS

	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
13	151	J	9 11	4B	INSTACK

COMMON BLOCKS

	LENGTH	MEMBERS - BIAS NAME(LENGTH)
CPMASS	25000	0 A (25000)

STATISTICS

PROGRAM LENGTH	41B	33
CM LABELED COMMON LENGTH	60650B	25000
520008 CM USED		

```
LOOPS  LABEL    INDEX      FROM-TO    LENGTH    PROPERTIES
   17  105      J            13 20       258              EXT REFS  NOT INNER
   35  100      K            17 19        48     INSTACK

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       CPMASS    25000               0 A      (25000)
       FILE          1               0 IPOS   (1)

STATISTICS
  PROGRAM LENGTH                 1058       69
  CM LABELED COMMON LENGTH     60651B    25001
          520008 CM USED
```

```
      1                SUBROUTINE READMA (ISCR,IROW,BUFFER,NAME)                  READMA      2
                     C                                                           READMA      3
                       DIMENSION A(25000)                                        READMA      4
                       DIMENSION BUFFER(1)                                       READMA      5
      5                DIMENSION IPOS(1)                                         READMA      6
                       DIMENSION NAME(1)                                         READMA      7
                     C                                                           READMA      8
                       COMMON /CPMASS/ A                                         READMA      9
                       COMMON /FILE  / IPOS                                      READMA     10
     10              C                                                           READMA     11
                       NFIL  = IPOS(ISCR)                                        READMA     12
                       CALL GEDLAB (6HREADMA,ISCR,NAME,NFIL,IROW,IROW)           READMA     13
                       DO 105 J=1,IROW                                           READMA     14
                       IANS6 = (((J-1)**2+(J-1))/2) + 1                          READMA     15
     15                ILIM1 = IANS6 + J - 1                                     READMA     16
                       CALL GETROW (ISCR, 1, BUFFER, IROW)                       READMA     17
                       DO 100  K=IANS6,ILIM1                                     READMA     18
                       KB  =  K - IANS6 + 1                                      READMA     19
                   100 A(K)  = BUFFER(KB)                                        READMA     20
     20            105 CONTINUE                                                  READMA     21
                       CALL DCLOSE (ISCR)                                        READMA     22
                       RETURN                                                    READMA     23
                       END                                                       READMA     24
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	READMA	1	22

VARIABLES

	SN	TYPE		RELOCATION							
0	A	REAL	ARRAY	CPMASS	REFS	3	8	DEFINED	19		
0	BUFFER	REAL	ARRAY	F.P.	REFS	4	16	19	DEFINED	1	
71	IANS6	INTEGER			REFS	15	17	18	DEFINED	14	
72	ILIM1	INTEGER			REFS	17	DEFINED	15			
0	IPOS	INTEGER	ARRAY	FILE	REFS	5	9	11			
0	IROW	INTEGER		F.P.	REFS	2*12	13	16	DEFINED	1	
0	ISCR	INTEGER		F.P.	REFS	11	12	16	21	DEFINED	1
70	J	INTEGER			REFS	2*14	15	DEFINED	13		
73	K	INTEGER			REFS	18	19	DEFINED	17		
74	KB	INTEGER			REFS	19	DEFINED	18			
0	NAME	INTEGER	ARRAY	F.P.	REFS	6	12	DEFINED	1		
67	NFIL	INTEGER			REFS	12	DEFINED	11			

EXTERNALS

	TYPE	ARGS	REFERENCES
DCLOSE		1	21
GEDLAB		6	12
GETROW		4	16

STATEMENT LABELS

		DEF LINE	REFERENCES
0	100	19	17
0	105	20	13

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
		66 IUDUM3 (1)	67 IFDUM3 (1)	68 IUL (1)
		69 IFL (1)	70 IUYT (1)	71 IFYT (1)
		72 IUZ (1)	73 IFZ (1)	74 IUZR (1)
		75 IFZR (1)	76 IULR (1)	77 IFLR (1)
		78 IUBR (1)	79 IFBR (1)	80 IUPHTF (1)
		81 IFPHTF (1)	82 IUMODM (1)	83 IFMODM (1)
		84 IUMODK (1)	85 IFMODK (1)	86 IUPHT (1)
		87 IFPHT (1)	88 IUQT (1)	89 IFQT (1)
		90 IUQ (1)	91 IFQ (1)	92 IUPH (1)
		93 IFPH (1)	94 IUINCM (1)	95 IFINCM (1)
		96 IUINCK (1)	97 IFINCK (1)	
PLAYFF	26	0 IUMDFF (1)	1 IFMDFF (1)	2 IUDLTI (1)
		3 IFDLTI (1)	4 IUSLTI (1)	5 IFSLTI (1)
		6 IUMPLI (1)	7 IFMPLI (1)	8 IUTPGT (1)
		9 IFTPGT (1)	10 IUPATF (1)	11 IFPATF (1)
		12 IUMPL (1)	13 IFMPL (1)	14 IUSLT (1)
		15 IFSLT (1)	16 IUDLT (1)	17 IFDLT (1)
		18 IUQA (1)	19 IFQA (1)	20 IUQAT (1)
		21 IFQAT (1)	22 IUPHA (1)	23 IFPHA (1)
		24 IUPHAT (1)	25 IFPHAT (1)	
KLUFF	1	0 KFREE (1)		
VKLUE	443	0 NROOTS (1)	1 NDOFFF (1)	2 NZERO (1)
		3 IDFV (220)	223 IDFF (220)	

EQUIV CLASSES	LENGTH	MEMBERS - BIAS NAME(LENGTH)
Q	1760	220 QQ (220)

STATISTICS

PROGRAM LENGTH	5675B	3005
CM LABELED COMMON LENGTH	62112B	25674
52000B CM USED		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES		
256	150	I	295 299	12B		EXT REFS	
306	70	I	308 354	122B		EXT REFS	NOT INNER
317	73	II	311 312	2B	INSTACK		
326	77	J1	319 322	12B		EXT REFS	
341	71	J	324 339	32B		EXT REFS	NOT INNER
346	72	K	330 336	13B	OPT		
374	76	J	344 350	21B		EXT REFS	
435	19	I	362 370	24B		EXT REFS	NOT INNER
452	240	J	367 369	4B	INSTACK		
473	300	I	380 381	3B	INSTACK		
500	310	I	382 383	7B		EXT REFS	
512	315	I	385 396	27B		EXT REFS	
547	30	I	403 411	27B		EXT REFS	NOT INNER
562	250	J	406 408	4B	INSTACK		
607	220	I	429 436	23B		EXT REFS	NOT INNER
622	210	J	433 435	4B	INSTACK		
650	50	I	446 450	15B		EXT REFS	

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CPMASS	25000	0 A (25000)		
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
DSRN	1	0 JSETUP (1)		
FILE	1	0 IPOS (1)		
REPORT	1	0 KREPOR (1)		
CTSHV	2	0 LTSHV (1)	1 TSHV (1)	
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)
		6 NPAGEA (1)	7 ITAPET (1)	
CFILES	2	0 KFILES (1)	1 IFILES (1)	
CTITLE	37	0 LTITLE (1)	1 TITLE (36)	
FREAKS	40	0 FREQ (40)		
PLACES	98	0 IUIN1 (1)	1 IUIN2 (1)	2 IUOUT1 (1)
		3 IUOUT2 (1)	4 IUGO1 (1)	5 IUGO2 (1)
		6 IUGO3 (1)	7 IUGO4 (1)	8 IUSCR (1)
		9 IFSCR (1)	10 IFS1 (1)	11 IFS2 (1)
		12 IFS3 (1)	13 IFS4 (1)	14 IUCD (1)
		15 IUPR (1)	16 IUA (1)	17 IFA (1)
		18 IUY (1)	19 IFY (1)	20 IUMEMN (1)
		21 IFMEMN (1)	22 IUSTFN (1)	23 IFSTFN (1)
		24 IUKS (1)	25 IFKS (1)	26 IUB (1)
		27 IFB (1)	28 IUDESO (1)	29 IFDESO (1)
		30 IUMDBI (1)	31 IFMDBI (1)	32 IUADDI (1)
		33 IFADDI (1)	34 IUBALI (1)	35 IFBALI (1)
		36 IUDESI (1)	37 IFDESI (1)	38 IUWTI (1)
		39 IFWTI (1)	40 IUMEMO (1)	41 IFMEMO (1)
		42 IUBT (1)	43 IFBT (1)	44 IUDESN (1)
		45 IFDESN (1)	46 IUMO (1)	47 IFMO (1)
		48 IUMEMF (1)	49 IFMEMF (1)	50 IUSTFO (1)
		51 IFSTFO (1)	52 IUMDB (1)	53 IFMDB (1)
		54 IUADD (1)	55 IFADD (1)	56 IUBAL (1)
		57 IFBAL (1)	58 IUDESF (1)	59 IFDESF (1)
		60 IUWT (1)	61 IFWT (1)	62 IUDUM1 (1)
		63 IFDUM1 (1)	64 IUDUM2 (1)	65 IFDUM2 (1)

EXTERNALS	TYPE	ARGS	REFERENCES		
SYMEIG		10	379	404	
TITLES		1	174	196	388
TRIEQ		5	448		

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
ABSF	REAL	1	SF	126	
MAXOF	INTEGER	2	SF	128	
MINOF	INTEGER	2	SF	129	
SQRTF	REAL	1	SF	127	383

STATEMENT LABELS			DEF LINE	REFERENCES
0	2	INACTIVE	207	206
114	3		212	206
112	4		209	206
51	9		161	159
0	10		260	253
67	11		183	169
0	12	INACTIVE	206	
77	13		194	180
213	14		266	215
463	16		378	263
0	19		370	362
0	20		259	258
0	30		411	403
1233	41	FMT	457	207
1241	42	FMT	458	209
0	50		450	446
1245	51	FMT	459	390
1252	56	FMT	460	394
0	70		354	308
0	71		339	324
0	72		336	330
0	73		312	311
353	74		334	331
356	75		335	333
0	76		350	344
0	77		322	319
404	78		348	346
0	140		229	225
0	141		282	278
0	150		299	295
0	210		435	433
0	220		436	429
0	240		369	367
0	250		408	406
0	300		381	380
0	310		383	382
530	312		393	389
0	315		396	385
671	500		453	208
1255	1000	FMT	461	160

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
127	140	I	225 229	11B	EXT REFS	
160	10	I	253 260	25B	EXT REFS	NOT INNER
172	20	J	258 259	3B	INSTACK	
221	111	I	278 282	11B	EXT REFS	

VARIABLES	SN	TYPE		RELOCATION							
0	LTSHV	INTEGER		CTSHV	REFS	90					
1203	MASS	INTEGER			REFS	147	DEFINED	135			
5552	MATNAM	INTEGER	ARRAY		REFS	79	152	153	DEFINED	134	
1204	MATR	INTEGER			REFS	146	DEFINED	136			
5554	NAME	INTEGER	ARRAY		REFS	80	176	246	252	310	361	427
					443						
1272	NAMER	INTEGER			REFS	207	DEFINED	152	153		
5556	NAME2	INTEGER	ARRAY		REFS	80	223	276	294	DEFINED	137	146
					147						
5560	NAME3	INTEGER	ARRAY		REFS	80	445	DEFINED	138		
5562	NAME4	INTEGER	ARRAY		REFS	80	307	DEFINED	139		
5564	NAME5	INTEGER	ARRAY		REFS	80	402	DEFINED	140		
3	NCOLS	INTEGER		CTABLE	REFS	93					
4	NCOLST	INTEGER		CTABLE	REFS	93					
0	NCYC	INTEGER		F.P.	REFS	159	DEFINED	68			
1	NDOFFF	INTEGER		VKLUE	REFS	120	DEFINED	160			
1306	NDOT	INTEGER			REFS	338	DEFINED	313			
1310	NDOTV	INTEGER			REFS	321	DEFINED	320			
1314	NDOT1	INTEGER			REFS	347	349	DEFINED	345		
1274	NFIL	INTEGER			REFS	223	252	276	294	307	310	361
					402	427	443	445	DEFINED	222	251	275
					293	306	309	360	401	426	442	444
1273	NIX	INTEGER			REFS	205	206	DEFINED	179	185		
6	NPAGE	INTEGER		CLIST	REFS	91					
6	NPAGEA	INTEGER		CTABLE	REFS	93					
1	NPASS	INTEGER		CTABLE	REFS	93					
0	NROOTS	INTEGER		VKLUE	REFS	120	379	380	382	385	402	403
					404	445	446	DEFINED	160			
2	NROWS	INTEGER		CTABLE	REFS	93					
2	NZERO	INTEGER		VKLUE	REFS	120	DEFINED	160			
1322	Q	REAL	ARRAY		REFS	82	122	255	256	259	260	338
					352	379	381	404	447	448	449	
					DEFINED	257	259	312	335	349		
1656	QQ	REAL	ARRAY		REFS	82	122	349	DEFINED	338		
1313	SUM	REAL			REFS	338	349	DEFINED	337	348		
1	TITLE	REAL	ARRAY	CTITLE	REFS	83	96					
1	TSHV	REAL	ARRAY	CTSHV	REFS	83	90					
1303	X	REAL			REFS	259	DEFINED	256				

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS		REFERENCES							
COMPAK		2		191	304						
DAGGER		5		260							
DCLOSE		1		230	261	283	300	353	355	371	412	437
				451	452						
FUTILE		3		205							
GEDLAB		6		252	310	361	427	443			
GETROW		4		255	321	347	366	432	447		
PLB		3		391							
PROGNA		2		154	195	305					
PUDLAB		6		223	276	294	307	402	445		
PUTROW		4		352	410	449					
READMA		4		176	246						
RITVEC		4		227	280	298					
SCAPRO	REAL	6		338	349						
SQRT	REAL	1	LIBRARY	383							
SWAP		2		262	289						

VARIABLES	SN	TYPE		RELOCATION								
120	IUPHTF	INTEGER		PLACES	REFS	98						
17	IUPR	INTEGER		PLACES	REFS	98						
132	IUQ	INTEGER		PLACES	REFS	98						
22	IUQA	INTEGER		PLAYFF	REFS	115						
24	IUQAT	INTEGER		PLAYFF	REFS	115						
130	IUQT	INTEGER		PLACES	REFS	98						
10	IUSCR	INTEGER		PLACES	REFS	98						
16	IUSLT	INTEGER		PLAYFF	REFS	115						
4	IUSLTI	INTEGER		PLAYFF	REFS	115						
26	IUSTFN	INTEGER		PLACES	REFS	98						
62	IUSTFO	INTEGER		PLACES	REFS	98						
10	IUTPGT	INTEGER		PLAYFF	REFS	115						
74	IUWT	INTEGER		PLACES	REFS	98						
46	IUWTI	INTEGER		PLACES	REFS	98						
22	IUY	INTEGER		PLACES	REFS	98						
106	IUYT	INTEGER		PLACES	REFS	98						
110	IUZ	INTEGER		PLACES	REFS	98						
112	IUZR	INTEGER		PLACES	REFS	98						
1304	J	INTEGER			REFS	2*259	331	3*332	334	338	345	346
						347	3*349	368	369	407	408	434	435
					DEFINED	258	324	344	367	406	433	
1317	JB	INTEGER			REFS	369	408	435	DEFINED	368	407	434
1275	JCL	INTEGER			REFS	226	227	228	279	280	281	298
						430	433	434	436	DEFINED	224	228	277
						281	297	428	436			
1302	JCOL	INTEGER			REFS	255	352	366	410	432		
					DEFINED	254	351	365	409	431		
1301	JCOLS	INTEGER			REFS	252	361	427	443			
1277	JCU	INTEGER			REFS	227	280	297	298	433		
					DEFINED	226	279	296	430			
1266	JSCR	INTEGER			REFS	307	352	355	361	366	371	401
						402	410	412	442	443	447	452
					DEFINED	145						
0	JSETUP	INTEGER	ARRAY	DSRN	REFS	78	87					
1307	J1	INTEGER			REFS	320	DEFINED	319				
1311	K	INTEGER			REFS	331	332	3*334	335	DEFINED	330	
7	KBPAGE	INTEGER		CLIST	REFS	91						
0	KFILES	INTEGER		CFILES	REFS	95						
0	KFREE	INTEGER		KLUFF	REFS	119	143	144				
4	KLABEL	INTEGER		CLIST	REFS	91						
0	KMATV	INTEGER		F.P.	REFS	146	147	153	169	215		
					DEFINED	68						
0	KOUNT	INTEGER		CLIST	REFS	91	386	389	392	395		
					DEFINED	384	387	392	395			
11	KOUNTH	INTEGER		CLIST	REFS	91	389					
12	KOUNTI	INTEGER		CLIST	REFS	91						
1	KPAGE	INTEGER		CLIST	REFS	91						
0	KREPOR	INTEGER		REPORT	REFS	89						
0	KTABLE	INTEGER		CTABLE	REFS	93						
5	KTABLO	INTEGER		CTABLE	REFS	93						
5	KTPAGE	INTEGER		CLIST	REFS	91						
1270	L	INTEGER			REFS	448	DEFINED	149				
1320	LEFT	INTEGER			REFS	387	DEFINED	386				
2	LINES	INTEGER		CLIST	REFS	91	384	386	387			
10	LINESG	INTEGER		CLIST	REFS	91						
3	LINEST	INTEGER		CLIST	REFS	91						
0	LTITLE	INTEGER		CTITLE	REFS	96						

VARIABLES	SN	TYPE	RELOCATION							
0	ISCR	INTEGER	F.P.	REFS	175	176	178	184	222	223	227
					230	245	246	250	251	252	255	261
					275	276	280	283	284	293	294	298
					300	309	310	321	347	353	417	426
					427	432	437	444	445	449	451	
				DEFINED		68	141	143				
2	ITAPEP	INTEGER	COMRWP	REFS		86						
0	ITAPER	INTEGER	COMRWP	REFS		86	I/O REFS	160				
7	ITAPET	INTEGER	CTABLE	REFS		93						
1	ITAPEW	INTEGER	COMRWP	REFS		86	391	I/O REFS	207	209	390	394
20	IUA	INTEGER	PLACES	REFS		98						
66	IUADD	INTEGER	PLACES	REFS		98						
40	IUADDI	INTEGER	PLACES	REFS		98						
32	IUB	INTEGER	PLACES	REFS		98						
70	IUBAL	INTEGER	PLACES	REFS		98						
42	IUBALI	INTEGER	PLACES	REFS		98						
116	IUBR	INTEGER	PLACES	REFS		98						
52	IUBT	INTEGER	PLACES	REFS		98						
16	IUCD	INTEGER	PLACES	REFS		98						
72	IUDESF	INTEGER	PLACES	REFS		98						
44	IUDESI	INTEGER	PLACES	REFS		98						
54	IUDESN	INTEGER	PLACES	REFS		98						
34	IUDESO	INTEGER	PLACES	REFS		98						
20	IUDLT	INTEGER	PLAYFF	REFS		115						
2	IUDLTI	INTEGER	PLAYFF	REFS		115						
76	IUDUM1	INTEGER	PLACES	REFS		98						
100	IUDUM2	INTEGER	PLACES	REFS		98						
102	IUDUM3	INTEGER	PLACES	REFS		98						
4	IUGO1	INTEGER	PLACES	REFS		98						
5	IUGO2	INTEGER	PLACES	REFS		98						
6	IUGO3	INTEGER	PLACES	REFS		98	145					
7	IUGO4	INTEGER	PLACES	REFS		98						
140	IUINCK	INTEGER	PLACES	REFS		98						
136	IUINCM	INTEGER	PLACES	REFS		98						
0	IUIN1	INTEGER	PLACES	REFS		98						
1	IUIN2	INTEGER	PLACES	REFS		98						
30	IUKS	INTEGER	PLACES	REFS		98						
104	IUL	INTEGER	PLACES	REFS		98						
114	IULR	INTEGER	PLACES	REFS		98						
56	IUMD	INTEGER	PLACES	REFS		98	141					
64	IUMDB	INTEGER	PLACES	REFS		98						
36	IUMDBI	INTEGER	PLACES	REFS		98						
0	IUMDFF	INTEGER	PLAYFF	REFS		115	143					
60	IUMEMF	INTEGER	PLACES	REFS		98						
24	IUMEMN	INTEGER	PLACES	REFS		98						
50	IUMEMO	INTEGER	PLACES	REFS		98						
124	IUMODK	INTEGER	PLACES	REFS		98						
122	IUMODM	INTEGER	PLACES	REFS		98						
14	IUMPL	INTEGER	PLAYFF	REFS		115						
6	IUMPLI	INTEGER	PLAYFF	REFS		115						
2	IUOUT1	INTEGER	PLACES	REFS		98						
3	IUOUT2	INTEGER	PLACES	REFS		98						
12	IUPATF	INTEGER	PLAYFF	REFS		115						
134	IUPH	INTEGER	PLACES	REFS		98						
26	IUPHA	INTEGER	PLAYFF	REFS		115						
30	IUPHAT	INTEGER	PLAYFF	REFS		115						
126	IUPUT	INTEGER	PLACES	REFS		98						

VARIABLES	SN	TYPE		RELOCATION								
105	IFL	INTEGER		PLACES	REFS	98						
115	IFLR	INTEGER		PLACES	REFS	98						
57	IFMD	INTEGER		PLACES	REFS	98	142					
65	IFMDB	INTEGER		PLACES	REFS	98						
37	IFMDBI	INTEGER		PLACES	REFS	98						
1	IFMDFF	INTEGER		PLAYFF	REFS	115	144					
61	IFMEMF	INTEGER		PLACES	REFS	98						
25	IFMEMN	INTEGER		PLACES	REFS	98						
51	IFMEMO	INTEGER		PLACES	REFS	98						
125	IFMODK	INTEGER		PLACES	REFS	98						
123	IFMODM	INTEGER		PLACES	REFS	98						
15	IFMPL	INTEGER		PLAYFF	REFS	115						
7	IFMPLI	INTEGER		PLAYFF	REFS	115						
13	IFPATF	INTEGER		PLAYFF	REFS	115						
135	IFPH	INTEGER		PLACES	REFS	98						
27	IFPHA	INTEGER		PLAYFF	REFS	115						
31	IFPHAT	INTEGER		PLAYFF	REFS	115						
127	IFPHT	INTEGER		PLACES	REFS	98						
121	IFPHTF	INTEGER		PLACES	REFS	98						
133	IFQ	INTEGER		PLACES	REFS	98						
23	IFQA	INTEGER		PLAYFF	REFS	115						
25	IFQAT	INTEGER		PLAYFF	REFS	115						
131	IFQT	INTEGER		PLACES	REFS	98						
11	IFSCR	INTEGER		PLACES	REFS	98						
17	IFSLT	INTEGER		PLAYFF	REFS	115						
5	IFSLTI	INTEGER		PLAYFF	REFS	115						
27	IFSTFN	INTEGER		PLACES	REFS	98						
63	IFSTFO	INTEGER		PLACES	REFS	98						
12	IFS1	INTEGER		PLACES	REFS	98						
13	IFS2	INTEGER		PLACES	REFS	98						
14	IFS3	INTEGER		PLACES	REFS	98	306	360				
15	IFS4	INTEGER		PLACES	REFS	98						
11	IFTPGT	INTEGER		PLAYFF	REFS	115						
75	IFWT	INTEGER		PLACES	REFS	98						
47	IFWTI	INTEGER		PLACES	REFS	98						
23	IFY	INTEGER		PLACES	REFS	98						
107	IFYT	INTEGER		PLACES	REFS	98						
111	IFZ	INTEGER		PLACES	REFS	98						
113	IFZR	INTEGER		PLACES	REFS	98						
1305	II	INTEGER			REFS	312	DEFINED	311				
1316	ILIM	INTEGER			REFS	365	367	DEFINED	364			
1321	IN	INTEGER			REFS	406	409	DEFINED	405			
1271	INDEX	INTEGER			REFS	151	260	379	404	406	407	409
					DEFINED	150						
0	INDEX1	INTEGER		F.P.	REFS	405	DEFINED	68	151			
1267	INDIC8	INTEGER			REFS	448	DEFINED	148				
0	IPOS	INTEGER	ARRAY	FILE	REFS	77	88	222	251	275	293	309
					401	426	442	444	DEFINED	175	178	184
					245	250	284	417				
0	IROW	INTEGER		F.P.	REFS	3*150	176	191	205	2*223	225	246
					253	260	262	2*276	278	289	2*294	295
					296	297	304	2*307	308	2*310	311	313
					320	324	330	344	345	351	362	363
					364	2*379	402	2*404	405	429	445	447
					448	449	DEFINED	68				
0	IROWD	INTEGER		F.P.	REFS	191	304	DEFINED	68			
1300	IROWS	INTEGER			REFS	252	261	427	443			

```
                41 FORMAT (5X,1A4,32H MATRIX IS NOT POSITIVE DEFINITE  )          EIGEN    458
                42 FORMAT(19H OVERFLOW IN FUTILE  )                              EIGEN    459
                51 FORMAT (10X, 4X, 1HM, 2X, 16HFREQUENCIES, CPS)                EIGEN    460
460             56 FORMAT(/,10X,I5,F14.4)                                        EIGEN    461
              1000 FORMAT (1014)                                                 EIGEN    462
                   RETURN                                                        EIGEN    463
                   END                                                           EIGEN    464
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	EIGEN	68	462

VARIABLES

		SN	TYPE		RELOCATION							
0	A		REAL	ARRAY	CPMASS	REFS	75	85	205	2*260	262	289	335
							2*379	2*404	408	448	DEFINED	369	435
4662	BUFFER		REAL	ARRAY		REFS	75	176	227	246	280	298	321
							338	347	349	366	369	410	432	435
						DEFINED	408						
0	FREQ		REAL	ARRAY	FREAKS	REFS	76	97	383	394	DEFINED	381	383
1276	I		INTEGER			REFS	226	228	254	256	257	258	260
							279	281	4*296	297	313	319	321	2*338
							344	346	351	352	3*363	364	379	2*381
							2*383	2*394	404	430	431	436		
						DEFINED	225	253	278	295	308	362	380	
							382	385	403	429	446			
1315	IANS1		INTEGER			REFS	364	365	367	368	DEFINED	363		
1312	IANS2		INTEGER			REFS	335	DEFINED	332	334				
337	IDFF		INTEGER	ARRAY	VKLUE	REFS	120							
3	IDFV		INTEGER	ARRAY	VKLUE	REFS	120							
21	IFA		INTEGER		PLACES	REFS	98							
67	IFADD		INTEGER		PLACES	REFS	98							
41	IFADDI		INTEGER		PLACES	REFS	98							
33	IFB		INTEGER		PLACES	REFS	98							
71	IFBAL		INTEGER		PLACES	REFS	98							
43	IFBALI		INTEGER		PLACES	REFS	98							
117	IFBR		INTEGER		PLACES	REFS	98							
53	IFBT		INTEGER		PLACES	REFS	98							
1265	IFCOM		INTEGER			REFS	175	178	184	245	250	284	417	
						DEFINED	142	144						
73	IFDESF		INTEGER		PLACES	REFS	98							
45	IFDESI		INTEGER		PLACES	REFS	98							
55	IFDESN		INTEGER		PLACES	REFS	98							
35	IFDESO		INTEGER		PLACES	REFS	98							
21	IFDLT		INTEGER		PLAYFF	REFS	115							
3	IFDLTI		INTEGER		PLAYFF	REFS	115							
77	IFDUM1		INTEGER		PLACES	REFS	98							
101	IFDUM2		INTEGER		PLACES	REFS	98							
103	IFDUM3		INTEGER		PLACES	REFS	98							
1	IFILES		INTEGER	ARRAY	CFILES	REFS	77	95						
141	IFINCK		INTEGER		PLACES	REFS	98							
137	IFINCM		INTEGER		PLACES	REFS	98							
31	IFKS		INTEGER		PLACES	REFS	98							

```
400         C                                                                 EIGEN    401
                  NFIL  = IPOS(JSCR)                                          EIGEN    402
                  CALL PUDLAB (8HEIGEN 05,JSCR,NAME5,NFIL,NROOTS,IROW)        EIGEN    403
                  DO 30 I=1,NROOTS                                            EIGEN    404
                  CALL SYMEIG (A,IROW,1,NROOTS,Q,A(INDEX),I,1,IROW,2)         EIGEN    405
405               IN  = INDEX1 + IROW                                         EIGEN    406
                  DO 250 J=INDEX,IN                                           EIGEN    407
                  JB     =  J - INDEX + 1                                     EIGEN    408
                250 BUFFER(JB) =  A(J)                                        EIGEN    409
                  JCOL   =  IN - INDEX + 1                                    EIGEN    410
410               CALL PUTROW (JSCR,1,BUFFER,JCOL)                            EIGEN    411
                 30 CONTINUE                                                  EIGEN    412
                  CALL DCLOSE (JSCR)                                          EIGEN    413
            C                                                                 EIGEN    414
            C                                RETURN TAPE ISCR TO POSITION     EIGEN    415
415         C     WHERE L MATRIX IS WRITTEN IN ROW SORT.                      EIGEN    416
            C                                                                 EIGEN    417
                  IPOS(ISCR)=IFCOM+1                                          EIGEN    418
            C                                                                 EIGEN    419
            C                                                                 EIGEN    420
420         C                                                                 EIGEN    421
            C                                                                 EIGEN    422
            C     READ THE L MATRIX FROM TAPE FOR USE IN THE TRANSFORMATION   EIGEN    423
            C     OF THE EIGENVECTORS TO PHYSICAL COORDINATES.                EIGEN    424
            C         (LOWER TRIANGLE ELEMENTS ONLY ARE PRESENT)              EIGEN    425
425         C                                                                 EIGEN    426
                  NFIL  = IPOS(ISCR)                                          EIGEN    427
                  CALL GEDLAB (8HEIGEN 04,ISCR,NAME,NFIL,IROWS,JCOLS)         EIGEN    428
                  JCL    =  1                                                 EIGEN    429
                  DO 220 I=1,IROW                                             EIGEN    430
430               JCU    =  JCL + I - 1                                       EIGEN    431
                  JCOL   =  I                                                 EIGEN    432
                  CALL GETROW (ISCR,1,BUFFER,JCOL)                            EIGEN    433
                  DO 210 J=JCL,JCU                                            EIGEN    434
                  JB     =  J - JCL + 1                                       EIGEN    435
435               210 A(J)   =  BUFFER(JB)                                    EIGEN    436
                  220 JCL    =  JCL + I                                       EIGEN    437
                  CALL DCLOSE (ISCR)                                          EIGEN    438
            C                                                                 EIGEN    439
            C                                                                 EIGEN    440
440         C CALCULATE EIGEN VECTORS IN THE PHYSICAL COORDINATE SYSTEM AND STORE ON EIGEN    441
            C                                                                 EIGEN    442
                  NFIL  = IPOS(JSCR)                                          EIGEN    443
                  CALL GEDLAB (8HEIGEN 05,JSCR,NAME,NFIL,IROWS,JCOLS)         EIGEN    444
                  NFIL  = IPOS(ISCR)                                          EIGEN    445
445               CALL PUDLAB (8HEIGEN 06,ISCR,NAME3,NFIL,NROOTS,IROW)        EIGEN    446
                  DO 50 I=1,NROOTS                                            EIGEN    447
                  CALL GETROW (JSCR,1,Q,IROW)                                 EIGEN    448
                  CALL TRIEQ (A,Q,IROW,L,INDIC8)                              EIGEN    449
                  CALL PUTROW (ISCR,1,Q,IROW)                                 EIGEN    450
450                50 CONTINUE                                                EIGEN    451
                  CALL DCLOSE (ISCR)                                          EIGEN    452
                  CALL DCLOSE (JSCR)                                          EIGEN    453
                500 CONTINUE                                                  EIGEN    454
            C                                                                 EIGEN    455
455         C                                                                 EIGEN    456
            C FORMATS                                                         EIGEN    457
```

```
      C                                                                 EIGEN     344
            DO 76  J=I,IROW                                             EIGEN     345
345         NDOT1  =  IROW - J + 1                                      EIGEN     346
            IF (J.EQ.I) GOTO 78                                         EIGEN     347
            CALL GETROW (ISCR, 1, BUFFER(J), NDOT1)                     EIGEN     348
         78 SUM  = 0.E0                                                 EIGEN     349
            Q(J) = SCAPRO (QQ(J), BUFFER(J), SUM, NDOT1, 1, 1)          EIGEN     350
350         76 CONTINUE                                                 EIGEN     351
            JCOL   =  IROW - I + 1                                      EIGEN     352
            CALL PUTROW (JSCR,1,Q(I),JCOL)                              EIGEN     353
            CALL DCLOSE(ISCR)                                           EIGEN     354
            70 CONTINUE                                                 EIGEN     355
355         CALL DCLOSE (JSCR)                                          EIGEN     356
      C                                                                 EIGEN     357
      C                                                                 EIGEN     358
      C READ THE COEFFICIENT MATRIX FROM TAPE FOR USE IN SYMEIG ROUTINE. EIGEN     359
      C                                                                 EIGEN     360
360         NFIL  = IFS3                                                EIGEN     361
            CALL GEDLAB (8HEIGEN 03,JSCR,NAME,NFIL,IROWS,JCOLS)         EIGEN     362
            DO 19  I=1,IROW                                             EIGEN     363
            IANS1 = IROW*(I-1) - ((I-1)*(I-2)/2) + 1                    EIGEN     364
            ILIM  =  IANS1 + IROW - I                                   EIGEN     365
365         JCOL   =  ILIM - IANS1 + 1                                  EIGEN     366
            CALL GETROW (JSCR,1,BUFFER,JCOL)                            EIGEN     367
            DO 240 J=IANS1,ILIM                                         EIGEN     368
            JB     =  J - IANS1 + 1                                     EIGEN     369
         240 A(J)   =  BUFFER(JB)                                       EIGEN     370
370         19 CONTINUE                                                 EIGEN     371
            CALL DCLOSE (JSCR)                                          EIGEN     372
      C                                                                 EIGEN     373
      C                                                                 EIGEN     374
      C CALCULATE EIGENVALUES (Q(I)) AND FREQUENCIES (FREQ(I)).         EIGEN     375
375   C NOTE THAT AT THIS POINT THE COEFFICIENT MATRIX IS STORED IN A(I) EIGEN     376
      C IN COLUMN SORT.                                                 EIGEN     377
      C                                                                 EIGEN     378
         16 CONTINUE                                                    EIGEN     379
            CALL SYMEIG (A,IROW,1,NROOTS,Q,A(INDEX),I,1,IROW,1)         EIGEN     380
380         DO 300 I=1,NROOTS                                           EIGEN     381
         300 FREQ(I)=  1.0/Q(I)                                         EIGEN     382
            DO 310 I=1,NROOTS                                           EIGEN     383
         310 FREQ(I) = SQRTF (FREQ(I)*386.4)/6.28318                    EIGEN     384
            KOUNT=LINES                                                 EIGEN     385
385         DO 315 I=1,NROOTS                                           EIGEN     386
            LEFT=LINES-KOUNT                                            EIGEN     387
            IF(LEFT.LT.2) KOUNT=LINES                                   EIGEN     388
            CALL TITLES (2)                                             EIGEN     389
            IF(KOUNT.GT.KOUNTH) GO TO 312                               EIGEN     390
390         WRITE(ITAPEW,51)                                            EIGEN     391
            CALL PLB(1,1,ITAPEW)                                        EIGEN     392
            KOUNT=KOUNT+2                                               EIGEN     393
         312 CONTINUE                                                   EIGEN     394
            WRITE(ITAPEW,56) I,FREQ(I)                                  EIGEN     395
395         KOUNT=KOUNT+2                                               EIGEN     396
         315 CONTINUE                                                   EIGEN     397
      C                                                                 EIGEN     398
      C                                                                 EIGEN     399
      C CALCULATE EIGEN VECTORS IN THE TRANSFORMED COORDINATE SYSTEM    EIGEN     400
```

```
      C     SINCE 'A' MATRIX IS SPLIT OF MASS, REARRANGE IN COLUMN SORT
      C     BEFORE STORING ON TAPE
      C
            CALL SWAP (A, IROW)
290   C
      C     WRITE L-TRANSPOSE ON TAPE
      C
            NFIL   =  IPOS(ISCR)
            CALL PUDLAB (8HEIGEN 03,ISCR,NAME2,NFIL,IROW,IROW)
295         DO 150 I=1,IROW
            JCU  = I*IROW - ((I*I - I)/2)
            JCL    =  JCU - IROW + I
            CALL RITVEC (JCL,JCU,BUFFER,ISCR)
          150 CONTINUE
300         CALL DCLOSE (ISCR)
      C
      C     READ FLEXIBILITY MATRIX INTO CORE
      C
            CALL COMPAK (IROW, IROWD)
305         CALL PROGNA(4H(EIG,4HEN ))
            NFIL         =  IFS3
            CALL PUDLAB (8HEIGEN 04,JSCR,NAME4,NFIL,IROW,IROW)
            DO 70 I=1,IROW
            NFIL   =   IPOS(ISCR)
310         CALL GEDLAB (8HEIGEN 02,ISCR,NAME,NFIL,IROW,IROW)
            DO 73 II=1,IROW
           73 Q(II) = 0.
            NDOT   = IROW - I + 1
      C
315   C     READ A COLUMN OF L MATRIX INTO CORE; COLUMN LENGTH IS
      C                 NDOT = IROW - I + 1  AND IS LOADED AT POSITION I
      C                 OF BUFFER ARRAY
      C
            DO 77  J1 =1,I
320         NDOTV  = IROW - J1 + 1
            CALL GETROW (ISCR,1,BUFFER(I),NDOTV)
           77 CONTINUE
      C
            DO 71  J=1,IROW
325   C     LOAD VECTOR Q FROM POSITION I WITH ELEMENTS OF FLEXIBILITY
      C     MATRIX (J,K)
      C                          K GOING FROM I TO N
      C     FLEXIBILITY MATRIX IS STORED IN CORE IN ROW SORT
      C           (LOWER TRIANGLE ONLY)
330         DO 72  K=1,IROW
            IF (K.GT.J) GOTO 74
            IANS2 = (((J-1)*(J-1) + (J-1))/2) + K
            GOTO 75
           74 IANS2 = (((K-1)*(K-1) + (K-1))/2) + J
335        75 Q(K)  =  A(IANS2)
           72 CONTINUE
            SUM = 0.E0
            QQ(J) = SCAPRO(Q(I),BUFFER(I),SUM,NDOT,1,1)
           71 CONTINUE
340   C
      C     MULTIPLY EVERY ROW OF L-TRANSPOSE MATRIX BY ITH COLUMN
      C     OF PREVIOUS PRODUCT STORED IN QQ.
```

```
      C45700, SUB. SYMEIG                                                    SYMEIG      2
      C                                                                      SYMEIG      3
      C**********************************************************************SYMEIG      4
      C                                                                     * SYMEIG      5
      C***  SUBROUTINE         ***********************************************SYMEIG      6
      C                                                                     * SYMEIG      7
      C***  COMPUTER VERSION   ***********************************************SYMEIG      8
      C     ----------------                                                * SYMEIG      9
      C     IBM .... AS IS.                                                 * SYMEIG     10
      C                                                                     * SYMEIG     11
      C     CDC .... AS IS.                                                 * SYMEIG     12
      C                                                                     * SYMEIG     13
      C***  OBJECTIVE  *******************************************************SYMEIG     14
      C     ---------                                                       * SYMEIG     15
      C  MASTER ROUTINE FOR EIGENVALUES AND (OPTIONALLY) EIGENVECTORS OF A    SYMEIG     16
      C    REAL SYMMETRIC MATRIX STORED TRIANGULARLY IN CORE. THE HOUSEHOLDER SYMEIG     17
      C    REDUCTION TO TRIDIAGONAL FORM (SUBROUTINE TFORM) IS FOLLOWED BY A  SYMEIG     18
      C    BISECTION TECHNIQUE (SUBROUTINE STURM) FOR THE ROOTS AND THEN IN-  SYMEIG     19
      C    VERSE ITERATION (SUBROUTINE TRIVEC) FOR THE VECTORS.               SYMEIG     20
      C                                                                     * SYMEIG     21
      C***  INPUT/OUTPUT  ****************************************************SYMEIG     22
      C     ------------                                                    * SYMEIG     23
      C                                                                     * SYMEIG     24
      C***  SUMMARY OF SYMBOLS  **********************************************SYMEIG     25
      C     ------------------                                              * SYMEIG     26
      C                                                                       SYMEIG     27
      C    A        -  THE TRIANGULAR ARRAY CONTAINING THE MATRIX. DURING EXEC-SYMEIG     28
      C                  CUTION THE ARRAY IS CHANGED.                         SYMEIG     29
      C                                                                       SYMEIG     30
      C    M        -  ORDER OF A.                                            SYMEIG     31
      C                                                                       SYMEIG     32
      C    INDEX    -  INDEX OF FIRST EIGENVALUE REQUIRED.                    SYMEIG     33
      C                                                                       SYMEIG     34
      C    NUMBR    - NUMBER OF EIGENVALUES REQUIRED.                         SYMEIG     35
      C                                                                       SYMEIG     36
      C    R        - REAL ARRAY FOR THE ROOTS AND WORKING STORAGE. R MUST CON-SYMEIG     37
      C                 TAIN AT LEAST 8*M WORDS AND START ON A D.P. BOUNDARY. SYMEIG     38
      C                                                                       SYMEIG     39
      C    TOL      - TOLERANCE. IF B IS THE MAG. OF LARGEST ROOT, THE ROOTS  SYMEIG     40
      C                 WILL USUALLY HAVE ERRORS AS LARGE AS B*TOL.           SYMEIG     41
      C                                                                     * SYMEIG     42
      C***  ERROR MESSAGES  **************************************************SYMEIG     43
      C     --------------                                                  * SYMEIG     44
      C     NONE.                                                           * SYMEIG     45
      C                                                                     * SYMEIG     46
      C**********************************************************************SYMEIG     47
            SUBROUTINE SYMEIG (A,M,INDEX,NUMBR,R,X,LOW,KOUNT,MID,KSYMEI)     SYMEIG     48
      C                                                                       SYMEIG     49
            DIMENSION A(1),R(1)                                               SYMEIG     50
            DIMENSION X(MID,1)                                                SYMEIG     51
      C                                                                       SYMEIG     52
            COMMON /CVIBRA/ TOL    ,TOL1   ,TOL2   ,MINUS2                    SYMEIG     53
      C                                                                       SYMEIG     54
      C                                                                       SYMEIG     55
      C FUNCTION DEFINITION                                                   SYMEIG     56
            AMIN1F(X,Y)    =  AMIN1(X,Y)                                      SYMEIG     57
      C                                                                       SYMEIG     58
```

```
                      GO TO (50,80), KSYMEI                                    SYMEIG     59
                   50 CONTINUE                                                 SYMEIG     60
      60           C                                                           SYMEIG     61
                   C                                                           SYMEIG     62
                   C CALCULATE EIGENVALUES                                     SYMEIG     63
                   C                                                           SYMEIG     64
                        LD = 1 + M                                             SYMEIG     65
      65                LO = LD + M                                            SYMEIG     66
                        LS = LO + M                                            SYMEIG     67
                        LP = LS + M                                            SYMEIG     68
                        LQ = LP + M                                            SYMEIG     69
                        LR = LQ + M                                            SYMEIG     70
      70                CALL TFORM(A,M,R(LD),R(LO),R(LS),R(LP))                SYMEIG     71
                        EPS    =  AMIN1F(TOL,TOL1)                             SYMEIG     72
                        CALL STURM(M,INDEX,NUMBR,R(LD),R(LO),R(LS),R(LP),R,EPS) SYMEIG    73
                        GO TO 300                                              SYMEIG     74
                   C                                                           SYMEIG     75
      75           80 CONTINUE                                                 SYMEIG     76
                   C                                                           SYMEIG     77
                   C                                                           SYMEIG     78
                   C CALCULATE EIGEN VECTORS                                   SYMEIG     79
                   C                                                           SYMEIG     80
      80                CALL QSVEC(A,R(LD),R(LO),R(LP),R(LQ),R(LR),R(LS),M,ROOT,X(1,1),1) SYMEIG 81
                        ROOT = R(LS-1)                                         SYMEIG     82
                        EPS    =  ROOT*TOL2                                    SYMEIG     83
                        K = LOW                                                SYMEIG     84
                        DO 200  I = 1,KOUNT                                    SYMEIG     85
      85                ROOT = AMIN1F(ROOT-EPS,R(K))                           SYMEIG     86
                        CALL QSVEC(A,R(LD),R(LO),R(LP),R(LQ),R(LR),R(LS),M,ROOT,X(1,I),2) SYMEIG 87
                  200 K = K + 1                                                SYMEIG     88
                   C                                                           SYMEIG     89
                   300 CONTINUE                                                SYMEIG     90
      90                RETURN                                                 SYMEIG     91
                        END                                                    SYMEIG     92
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

58 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	SYMEIG	47	90

VARIABLES	SN	TYPE	RELOCATION									
0	A	REAL	ARRAY	F.P.	REFS	49	70	80	86	DEFINED	47	
224	EPS	REAL			REFS	72	85	DEFINED	71	82		
227	I	INTEGER			REFS	86	DEFINED	84				
0	INDEX	INTEGER		F.P.	REFS	72	DEFINED	47				
226	K	INTEGER			REFS	85	87	DEFINED	83	87		

```
VARIABLES      SN  TYPE            RELOCATION
     0  KOUNT      INTEGER              F.P.        REFS        84    DEFINED       47
     0  KSYMEI     INTEGER              F.P.        REFS        58    DEFINED       47
   216  LD         INTEGER                          REFS        65       70         72         80         86
                                                  DEFINED       64
   217  LO         INTEGER                          REFS        66       70         72         80         86
                                                  DEFINED       65
     0  LOW        INTEGER              F.P.        REFS        83    DEFINED       47
   221  LP         INTEGER                          REFS        68       70         72         80         86
                                                  DEFINED       67
   222  LQ         INTEGER                          REFS        69       80         86    DEFINED       68
   223  LR         INTEGER                          REFS        80       86    DEFINED       69
   220  LS         INTEGER                          REFS        67       70         72         80         81         86
                                                  DEFINED       66
     0  M          INTEGER              F.P.        REFS        64       65         66         67         68         69         70
                                                     72         80       86    DEFINED       47
     0  MID        INTEGER              F.P.        REFS        50    DEFINED       47
     3  MINUS2     INTEGER             CVIBRA       REFS        52
     0  NUMBR      INTEGER              F.P.        REFS        72    DEFINED       47
     0  R          REAL       ARRAY     F.P.        REFS        49      4*70       5*72       6*80         81         85       6*86
                                                  DEFINED       47
   225  ROOT       REAL                             REFS        80       82         85         86    DEFINED       81         85
     0  TOL        REAL                CVIBRA       REFS        52       71
     1  TOL1       REAL                CVIBRA       REFS        52       71
     2  TOL2       REAL                CVIBRA       REFS        52       82
     0  X          REAL       ARRAY     F.P.        REFS        50       80         86    DEFINED       47

EXTERNALS           TYPE   ARGS       REFERENCES
       QSVEC                 11            80        86
       STURM                  9            72
       TFORM                  6            70

INLINE FUNCTIONS    TYPE   ARGS       DEF LINE  REFERENCES
       AMIN1       REAL      0  INTRIN                71        85
       AMIN1F      REAL      2     SF       56        71        85

STATEMENT LABELS              DEF LINE   REFERENCES
    17  50                       59         58
    61  80                       75         58
     0  200                      87         84
   141  300                      89         73

LOOPS  LABEL     INDEX      FROM-TO     LENGTH     PROPERTIES
   111  200      I           84 87        30B                EXT REFS

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       CVIBRA        4              0 TOL    (1)              1 TOL1   (1)              2 TOL2   (1)
                                    3 MINUS2 (1)

STATISTICS
  PROGRAM LENGTH                 244B      164
  CM LABELED COMMON LENGTH         4B        4
         520000B CM USED
```

```
      C45700, SUB. TFORM                                                    TFORM      2
      C                                                                     TFORM      3
      C*************************************************************************TFORM      4
      C                                                                    * TFORM      5
      C***  SUBROUTINE          ********************************************** TFORM      6
      C                                                                    * TFORM      7
      C***  COMPUTER VERSION    ********************************************** TFORM      8
      C     ----------------                                               * TFORM      9
      C     IBM .... AS IS.                                                * TFORM     10
      C                                                                    * TFORM     11
      C     CDC .... AS IS.                                                * TFORM     12
      C                                                                    * TFORM     13
      C***  OBJECTIVE  ************************************************** TFORM     14
      C     ---------                                                      * TFORM     15
      C     A LOWER TRIANGULAR MATRIX OF THE STANDARD EIGENVALUE PROBLEM IS * TFORM     16
      C     REDUCED TO A TRI-DIAGONAL FORM USING THE HOUSEHOLDER METHOD.   * TFORM     17
      C                                                                    * TFORM     18
      C***  INPUT/OUTPUT  *********************************************** TFORM     19
      C     ------------                                                   * TFORM     20
      C                                                                    * TFORM     21
      C***  SUMMARY OF SYMBOLS  ***************************************** TFORM     22
      C     ------------------                                             * TFORM     23
      C                                                                    * TFORM     24
      C***  ERROR MESSAGES  ********************************************* TFORM     25
      C     --------------                                                 * TFORM     26
      C     NONE.                                                          * TFORM     27
      C                                                                    * TFORM     28
      C*************************************************************************TFORM     29
            SUBROUTINE TFORM(A,N,D,O,S,P)                                   TFORM     30
      C                                                                     TFORM     31
            DIMENSION A(1),D(1),O(1),S(1)                                   TFORM     32
      C                                                                     TFORM     33
      C                                                                     TFORM     34
      C FUNCTION DEFINITION                                                 TFORM     35
            AMAX1F(X,Y)    =  AMAX1(X,Y)                                    TFORM     36
            AMIN1F(X,Y)    =  AMIN1(X,Y)                                    TFORM     37
            SQRTF(X)       =  SQRT(X)                                       TFORM     38
      C                                                                     TFORM     39
            BL = O.                                                         TFORM     40
            BU = O.                                                         TFORM     41
            OLD = O.                                                        TFORM     42
            D(1) = A(1)                                                     TFORM     43
            K1K1 = 1                                                        TFORM     44
            N1 = N - 1                                                      TFORM     45
            DO 230  K = 1,N1                                                TFORM     46
            KP1 = K + 1                                                     TFORM     47
            KK = K1K1                                                       TFORM     48
            KKP1 = KK + 1                                                   TFORM     49
            NK = N - K                                                      TFORM     50
            KN = KK + NK                                                    TFORM     51
            K1K1 = KN + 1                                                   TFORM     52
            SUM = O.                                                        TFORM     53
            DO 100  KJ = KKP1,KN                                            TFORM     54
          100 SUM = SUM + A(KJ)*A(KJ)                                       TFORM     55
            S(K) = SUM                                                      TFORM     56
            RHO = SQRTF(SUM)                                                TFORM     57
            RAD = OLD + RHO                                                 TFORM     58
```

```
                BL = AMIN1F(BL,D(K)-RAD)                                TFORM   59
                BU = AMAX1F(BU,D(K)+RAD)                                TFORM   60
60              IF (K - N1) 120,230,230                                 TFORM   61
              120 OLD = RHO                                             TFORM   62
                IF (A(KKP1)) 140,140,130                                TFORM   63
              130 RHO = -RHO                                            TFORM   64
              140 O(K) = RHO                                            TFORM   65
65              IF (SUM) 150,230,150                                    TFORM   66
              150 A(KKP1) = A(KKP1) - RHO                               TFORM   67
                RHO =  1. / (RHO*A(KKP1))                               TFORM   68
                A(KK) = RHO                                             TFORM   69
                IJ = KK                                                 TFORM   70
70              DO 160  J = KP1,N                                       TFORM   71
                IJ = IJ + 1                                             TFORM   72
                O(J) = A(IJ)                                            TFORM   73
              160 D(J) = 0.                                             TFORM   74
                II = K1K1                                               TFORM   75
75              NI = NK                                                 TFORM   76
                DO 190  I = KP1,N                                       TFORM   77
                D(I) = D(I) + A(II)*O(I)                                TFORM   78
                IJ = II                                                 TFORM   79
                II = II + NI                                            TFORM   80
80              NI = NI - 1                                             TFORM   81
                IF (NI) 170,190,170                                     TFORM   82
              170 X = O(I)                                              TFORM   83
                DO 180  J = I,N1                                        TFORM   84
                IJ = IJ + 1                                             TFORM   85
85              D(J+1) = O(J+1) + A(IJ)*X                               TFORM   86
              180 D(I) = D(I) + A(IJ)*O(J+1)                            TFORM   87
              190 D(I) = D(I) * RHO                                     TFORM   88
                SUM = 0.                                                TFORM   89
                DO 200  I = KP1,N                                       TFORM   90
90            200 SUM = SUM + D(I)*O(I)                                 TFORM   91
                TAU = RHO * SUM * .5                                    TFORM   92
                DO 210  I = KP1,N                                       TFORM   93
              210 D(I) = D(I) + TAU*O(I)                                TFORM   94
                II = K1K1                                               TFORM   95
95              NI = NK                                                 TFORM   96
                DO 220  I = KP1,N                                       TFORM   97
                RHO = D(I)                                              TFORM   98
                TAU = O(I)                                              TFORM   99
                IJ = II                                                 TFORM  100
100             II = II + NI                                            TFORM  101
                NI = NI - 1                                             TFORM  102
                DO 220  J = I,N                                         TFORM  103
                A(IJ) = A(IJ) + RHO*O(J) + TAU*D(J)                     TFORM  104
              220 IJ = IJ + 1                                           TFORM  105
105           230 D(K+1) = A(K1K1)                                      TFORM  106
                O(N1) = A(KKP1)                                         TFORM  107
                O(N) = AMIN1F(BL,D(N)-RHO)                              TFORM  108
                S(N) = AMAX1F(BU,D(N)+RHO)                              TFORM  109
            C                                                           TFORM  110
110             RETURN                                                  TFORM  111
                END                                                     TFORM  112
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	TFORM	29	110

VARIABLES	SN	TYPE	RELOCATION							
0	A	REAL	ARRAY F.P.	REFS	31	42	2*54	62	66	67	72
					77	85	86	103	105	106	
				DEFINED	29	66	68	103			
233	BL	REAL		REFS	58	107	DEFINED	39	58		
234	BU	REAL		REFS	59	108	DEFINED	40	59		
0	D	REAL	ARRAY F.P.	REFS	31	58	59	77	85	86	87
					90	93	97	103	107	108	
				DEFINED	29	42	73	77	85	86	87
					93	105					
256	I	INTEGER		REFS	3*77	82	83	2*86	2*87	2*90	3*93
					97	98	102	DEFINED	76	89	92	96
254	II	INTEGER		REFS	77	78	79	99	100		
				DEFINED	74	79	94	100			
252	IJ	INTEGER		REFS	71	72	84	85	86	2*103	104
				DEFINED	69	71	78	84	99	104	
253	J	INTEGER		REFS	72	73	2*85	86	2*103		
				DEFINED	70	83	102				
240	K	INTEGER		REFS	46	49	55	58	59	60	64
					105	DEFINED	45				
247	KJ	INTEGER		REFS	2*54	DEFINED	53				
242	KK	INTEGER		REFS	48	50	68	69	DEFINED	47	
243	KKP1	INTEGER		REFS	53	62	2*66	67	106		
				DEFINED	48						
245	KN	INTEGER		REFS	51	53	DEFINED	50			
241	KP1	INTEGER		REFS	70	76	89	92	96		
				DEFINED	46						
236	K1K1	INTEGER		REFS	47	74	94	105	DEFINED	43	51
0	N	INTEGER	F.P.	REFS	44	49	70	76	89	92	96
					102	2*107	2*108	DEFINED	29		
255	NI	INTEGER		REFS	79	80	81	100	101		
				DEFINED	75	80	95	101			
244	NK	INTEGER		REFS	50	75	95	DEFINED	49		
237	N1	INTEGER		REFS	45	60	83	106	DEFINED	44	
0	O	REAL	ARRAY F.P.	REFS	31	77	82	86	90	93	98
					103	DEFINED	29	64	72	106	107
235	OLD	REAL		REFS	57	DEFINED	41	61			
0	P	REAL	*UNUSED F.P.	DEFINED	29						
251	RAD	REAL		REFS	58	59	DEFINED	57			
250	RHO	REAL		REFS	57	61	63	64	66	67	68
					87	91	103	107	108	DEFINED	56	63
					67	97					
0	S	REAL	ARRAY F.P.	REFS	31	DEFINED	29	55	108		
246	SUM	REAL		REFS	54	55	56	65	90	91	
				DEFINED	52	54	88	90			
260	TAU	REAL		REFS	93	103	DEFINED	91	98		
257	X	REAL		REFS	85	DEFINED	82				

EXTERNALS	TYPE	ARGS	REFERENCES
SQRT	REAL	1 LIBRARY	56

INLINE	FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES	
	AMAX1	REAL	0	INTRIN		59	108
	AMAX1F	REAL	2	SF	35	59	108
	AMIN1	REAL	0	INTRIN		58	107
	AMIN1F	REAL	2	SF	36	58	107
	SQRTF	REAL	1	SF	37	56	

STATEMENT LABELS			DEF LINE	REFERENCES		
0	100		54	53		
0	120	INACTIVE	61	60		
0	130	INACTIVE	63	62		
53	140		64	2*62		
0	150	INACTIVE	66	2*65		
0	160		73	70		
0	170	INACTIVE	82	2*81		
0	180		86	83		
126	190		87	76	81	
0	200		90	89		
0	210		93	92		
0	220		104	96	102	
207	230		105	45	2*60	65

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES		
15	230	K	45 105	177B		EXT REFS	NOT INNER
27	100	KJ	53 54	3B	INSTACK		
71	160	J	70 73	3B	INSTACK		
101	190	I	76 87	31B		NOT INNER	
117	180	J	83 86	6B	INSTACK		
137	200	I	89 90	4B	INSTACK		
152	210	I	92 93	3B	INSTACK		
162	220	I	96 104	25B		NOT INNER	
176	220	J	102 104	5B	INSTACK		

STATISTICS

PROGRAM LENGTH	326B	214

52000B CM USED

```
      C45700, SUB. STURM                                                    STURM      2
      C                                                                     STURM      3
      C*********************************************************************STURM      4
      C                                                                    * STURM      5
      C***  SUBROUTINE         ************************************************STURM      6
      C                                                                    * STURM      7
      C***  COMPUTER VERSION   ************************************************STURM      8
      C     ----------------                                               * STURM      9
      C     IBM .... AS IS.                                                * STURM     10
      C                                                                    * STURM     11
      C     CDC .... AS IS.                                                * STURM     12
      C                                                                    * STURM     13
      C***  OBJECTIVE  ********************************************************STURM     14
      C     ---------                                                      * STURM     15
      C     APPLY BISECTION TECHNIQUE FOR THE ROOTS                        * STURM     16
      C                                                                    * STURM     17
      C***  INPUT/OUTPUT  *****************************************************STURM     18
      C     ------------                                                   * STURM     19
      C                                                                    * STURM     20
      C***  SUMMARY OF SYMBOLS  ***********************************************STURM     21
      C     ------------------                                             * STURM     22
      C                                                                    * STURM     23
      C***  ERROR MESSAGES  ***************************************************STURM     24
      C     --------------                                                 * STURM     25
      C     NONE.                                                          * STURM     26
      C                                                                    * STURM     27
      C*********************************************************************STURM     28
            SUBROUTINE STURM (N,LIM1,NUMB,D,OFFD,SEC,PFFD,SIGMA,EPS)        STURM     29
      C                                                                     STURM     30
            DIMENSION D(1),OFFD(1),SEC(1),SIGMA(1),PFFD(1)                  STURM     31
      C                                                                     STURM     32
      C                                                                     STURM     33
      C FUNCTION DEFINITION                                                 STURM     34
            ABSF(X)       =  ABS(X)                                         STURM     35
            AMAX1F(X,Y)   =  AMAX1(X,Y)                                     STURM     36
      C                                                                     STURM     37
            DATA HALF / .5/                                                 STURM     38
      C                                                                     STURM     39
            BL = OFFD(N)                                                    STURM     40
            BU = SEC(N)                                                     STURM     41
            LIM2 = LIM1 + NUMB - 1                                          STURM     42
            CALL PREP(N,D,SEC,ROOT,LORD,1)                                  STURM     43
            N1 = N - 1                                                      STURM     44
            IF (N1) 16,200,200                                              STURM     45
        200 TOL = AMAX1F(-BL,BU)                                            STURM     46
            OFFD(N) = TOL                                                   STURM     47
            TOL = TOL * AMAX1F(1.E-15,EPS)                                  STURM     48
            DO 2  I = LIM1,LIM2                                             STURM     49
            SIGMA(I) = BL                                                   STURM     50
          2 PFFD(I) = BU                                                    STURM     51
            LORD = 0                                                        STURM     52
            L = LIM1 - 1                                                    STURM     53
            RUTE = 1.E20                                                    STURM     54
            GO TO 3                                                         STURM     55
        300 DO 400  I = K,L                                                 STURM     56
        400 SIGMA(I) = ROOT                                                 STURM     57
          3 K = L + 1                                                       STURM     58
```

```
                      IF (K - LIM2) 4,4,16                                    STURM      59
                    4 BU = PFFD(K)                                            STURM      60
   60                 ROOT = BU  +  HALF * (SIGMA(K) - BU)                    STURM      61
                      IF (K - L) 5,7,5                                        STURM      62
                    5 DO 6  I = K,LIM2                                        STURM      63
                      IF (BU - PFFD(I)) 7,6,7                                 STURM      64
                    6 L = I                                                   STURM      65
   65               7 IF (ABSF(ROOT - RUTE) - TOL) 300,300,8                  STURM      66
                    8 CALL PREP(N,D,SEC,ROOT,LORD,2)                          STURM      67
                      DO 11  I = K,L                                          STURM      68
                      IF(I -LORD) 9,9,10                                      STURM      69
                    9 SIGMA(I) = ROOT                                         STURM      70
   70                 GO TO 11                                                STURM      71
                   10 PFFD(I) = ROOT                                          STURM      72
                   11 CONTINUE                                                STURM      73
                      RUTE = ROOT                                             STURM      74
                      GO TO 4                                                 STURM      75
   75             C                                                           STURM      76
                   16 RETURN                                                  STURM      77
                      END                                                     STURM      78
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 STURM 28 76

VARIABLES	SN	TYPE	RELOCATION										
161	BL	REAL			REFS	45	49	DEFINED	39				
162	BU	REAL			REFS	45	50	2*60	63	DEFINED	40	59	
0	D	REAL	ARRAY	F.P.	REFS	30	42	66	DEFINED	28			
0	EPS	REAL		F.P.	REFS	47	DEFINED	28					
154	HALF	REAL			REFS	60	DEFINED	37					
170	I	INTEGER			REFS	49	50	56	63	64	68	69	
					71	DEFINED	48	55	62	67			
173	K	INTEGER			REFS	55	58	59	60	61	62	67	
					DEFINED	57							
171	L	INTEGER			REFS	55	57	61	67	DEFINED	52	64	
0	LIM1	INTEGER		F.P.	REFS	41	48	52	DEFINED	28			
163	LIM2	INTEGER			REFS	48	58	62	DEFINED	41			
165	LORD	INTEGER			REFS	42	66	68	DEFINED	51			
0	N	INTEGER		F.P.	REFS	39	40	42	43	46	66		
					DEFINED	28							
0	NUMB	INTEGER		F.P.	REFS	41	DEFINED	28					
166	N1	INTEGER			REFS	44	DEFINED	43					
0	OFFD	REAL	ARRAY	F.P.	REFS	30	39	DEFINED	28	46			
0	PFFD	REAL	ARRAY	F.P.	REFS	30	59	63	DEFINED	28	50	71	
164	ROOT	REAL			REFS	42	56	65	66	69	71	73	
					DEFINED	60							
172	RUTE	REAL			REFS	65	DEFINED	53	73				
0	SEC	REAL	ARRAY	F.P.	REFS	30	40	42	66	DEFINED	28		
0	SIGMA	REAL	ARRAY	F.P.	REFS	30	60	DEFINED	28	49	56	69	
167	TOL	REAL			REFS	46	47	65	DEFINED	45	47		

```
EXTERNALS          TYPE   ARGS       REFERENCES
       PREP                 6            42        66

INLINE FUNCTIONS   TYPE   ARGS        DEF LINE  REFERENCES
       ABS        REAL      1  INTRIN                65
       ABSF       REAL      1    SF         34        65
       AMAX1      REAL      0  INTRIN                45        47
       AMAX1F     REAL      2    SF         35        45        47

STATEMENT LABELS                  DEF LINE   REFERENCES
    0  2                             50         48
   62  3                             57         54
   66  4                             59         2*58       74
    0  5              INACTIVE       62         2*61
    0  6                             64         62         63
  105  7                             65         61         2*63
    0  8              INACTIVE       66         65
    0  9              INACTIVE       69         2*68
  130  10                            71         68
  131  11                            72         67         70
  135  16                            76         44         58
    0  200            INACTIVE       45         2*44
   53  300                           55         2*65
    0  400                           56         55

LOOPS  LABEL    INDEX      FROM-TO     LENGTH     PROPERTIES
   42  2        I            48 50        3B      INSTACK
   57  400      I            55 56        2B      INSTACK
   77  6        I            62 64        6B      INSTACK     EXITS
  124  11       I            67 72        6B      INSTACK

STATISTICS
  PROGRAM LENGTH                 176B      126
        520008 CM USED
```

```
      C45700, SUB. PREP                                                      PREP      2
      C                                                                      PREP      3
      C*********************************************************************** PREP      4
      C                                                                     * PREP      5
      C***  SUBROUTINE          ************************************************ PREP      6
      C                                                                     * PREP      7
      C***  COMPUTER VERSION    ************************************************ PREP      8
      C     ----------------                                                * PREP      9
      C     IBM .... AS IS.                                                 * PREP     10
      C                                                                     * PREP     11
      C     CDC .... AS IS.                                                 * PREP     12
      C                                                                     * PREP     13
      C***  OBJECTIVE  ********************************************************** PREP     14
      C     ---------                                                       * PREP     15
      C     PROVIDE PROGRAM STURM WITH CRITICAL INFORMATION FOR THE LOCATION * PREP     16
      C     AND NUMBER OF ROOTS.  THE PROCEDURE IS TO CHOOSE A TRIAL VALUE  * PREP     17
      C     FOR THE ROOT, LOCATE THE NUMBER OF ROOTS ABOVE THIS VALUE, AND  * PREP     18
      C     THEN USING AN ITERATIVE PROCESS LOCATE THE NEXT ROOT.           * PREP     19
      C                                                                     * PREP     20
      C***  INPUT/OUTPUT  ******************************************************* PREP     21
      C     ------------                                                    * PREP     22
      C                                                                     * PREP     23
      C***  SUMMARY OF SYMBOLS  ************************************************ PREP     24
      C     ------------------                                              * PREP     25
      C                                                                     * PREP     26
      C***  ERROR MESSAGES  ****************************************************** PREP     27
      C     --------------                                                  * PREP     28
      C     NONE.                                                           * PREP     29
      C                                                                     * PREP     30
      C*********************************************************************** PREP     31
            SUBROUTINE PREP(N,D,SEC,ROOT,LORD,KPREP)                        PREP     32
      C                                                                     PREP     33
            DIMENSION D(1),SEC(1)                                           PREP     34
      C                                                                     PREP     35
            EQUIVALENCE (RD2,RE2),(RD4,RE4)                                 PREP     36
      C                                                                     PREP     37
            GO TO (50,80), KPREP                                            PREP     38
         50 CONTINUE                                                        PREP     39
            N1 = N - 1                                                      PREP     40
            GO TO 200                                                       PREP     41
         80 CONTINUE                                                        PREP     42
            RDO = ROOT                                                      PREP     43
            LOW = 0                                                         PREP     44
            LAWD = 0                                                        PREP     45
        100 RD2 = 0.0                                                       PREP     46
            RD4 = 1.0                                                       PREP     47
            DO 120  I = LOW,N1                                              PREP     48
            RD4 = D(I+1) - RDO - RD2                                        PREP     49
            IF (RD4) 120,140,110                                            PREP     50
        110 LAWD = LAWD + 1                                                 PREP     51
        120 RE2 = SEC(I+1) / RE4                                            PREP     52
        130 LORD = LAWD                                                     PREP     53
            GO TO 200                                                       PREP     54
        140 LAWD = LAWD + 1                                                 PREP     55
            IF (RE2) 150,160,150                                            PREP     56
        150 I = I + 1                                                       PREP     57
        160 LOW = I + 1                                                     PREP     58
```

```
                IF (LOW - N1) 100,100,130                                   PREP      59
              C                                                             PREP      60
     60         200 RETURN                                                  PREP      61
                END                                                         PREP      62
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

37 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 PREP 31 60

VARIABLES	SN	TYPE		RELOCATION									
0	D	REAL	ARRAY	F.P.	REFS	33	48	DEFINED	31				
62	I	INTEGER			REFS	48	51	56	57	DEFINED	47	56	
0	KPREP	INTEGER		F.P.	REFS	37	DEFINED	31					
61	LAWD	INTEGER			REFS	50	52	54	DEFINED	44	50	54	
0	LORD	INTEGER		F.P.	DEFINED	31	52						
60	LOW	INTEGER			REFS	47	58	DEFINED	43	57			
0	N	INTEGER		F.P.	REFS	39	DEFINED	31					
56	N1	INTEGER			REFS	47	58	DEFINED	39				
57	RDO	REAL			REFS	48	DEFINED	42					
63	RD2	REAL			REFS	35	48	DEFINED	45				
64	RD4	REAL			REFS	35	49	DEFINED	46	48			
63	RE2	REAL			REFS	35	55	DEFINED	51				
64	RE4	REAL			REFS	35	51						
0	ROOT	REAL		F.P.	REFS	42	DEFINED	31					
0	SEC	REAL	ARRAY	F.P.	REFS	33	51	DEFINED	31				

STATEMENT LABELS			DEF LINE	REFERENCES	
15	50		38	37	
20	80		41	37	
23	100		45	2*58	
0	110	INACTIVE	50	49	
35	120		51	47	49
42	130		52	58	
44	140		54	49	
0	150	INACTIVE	56	2*55	
50	160		57	55	
54	200		60	40	53

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	EXITS
27	120	I	47 51	138	OPT	

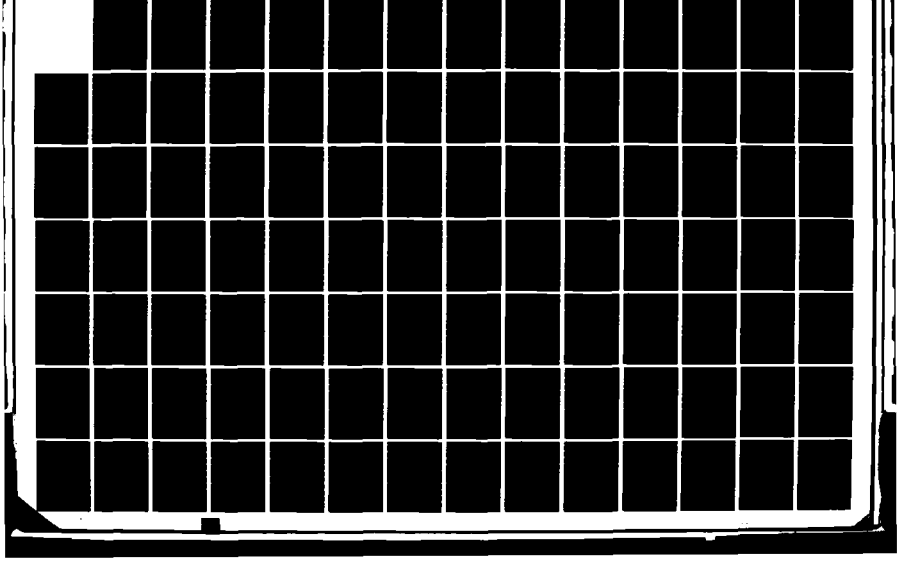
EQUIV CLASSES	LENGTH	MEMBERS - BIAS NAME(LENGTH)
RD2	1	0 RE2 (1)
RD4	1	0 RE4 (1)

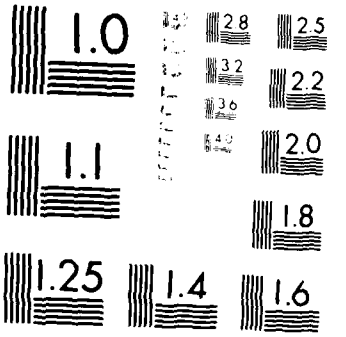
```
STATISTICS
  PROGRAM LENGTH                 708       56
        520000B CM USED
```

```
      C45700, SUB. QSVEC                                                        QSVEC      2
      C                                                                         QSVEC      3
      C*************************************************************************QSVEC      4
      C                                                                        * QSVEC      5
      C***  SUBROUTINE          ***************************************************QSVEC      6
      C                                                                        * QSVEC      7
      C***  COMPUTER VERSION  ***************************************************QSVEC      8
      C     ----------------                                                   * QSVEC      9
      C     IBM .... INCLUDES DOUBLE PRECISION TYPE STATEMENTS.  COLUMN ONE    * QSVEC     10
      C               SHOULD BE BLANK.                                         * QSVEC     11
      C                                                                        * QSVEC     12
      C     CDC .... DOES NOT INCLUDE DOUBLE PRECISION TYPE STATEMENTS.        * QSVEC     13
      C               THESE STATEMENTS ARE CONVERTED INTO COMMENTS BY          * QSVEC     14
      C               INSERTING THE LETTER C IN COLUMN ONE.                    * QSVEC     15
      C                                                                        * QSVEC     16
      C***  OBJECTIVE  ***********************************************************QSVEC     17
      C     ---------                                                          * QSVEC     18
      C  SYMMETRIC MATRIX EIGENVECTOR CALCULATION.                              QSVEC     19
      C  GIVEN THE ENTRIES (D AND OFFD) OF THE HOUSEHOLDER TRI-DIAGONAL FORM B QSVEC     20
      C    OF A REAL SYMMETRIC MATRIX A, AND GIVEN A GOOD APPROXIMATE ROOT OF   QSVEC     21
      C    B (AND A) THIS FORTRAN 4 SUBROUTINE COMPUTES A UNIT EIGENVECTOR X    QSVEC     22
      C    OF B, THEN TRANSFORMS IT TO A UNIT VECTOR OF A, USING THE VECTORS W  QSVEC     23
      C    STORED IN THE A ARRAY.                                               QSVEC     24
      C                                                                        * QSVEC     25
      C***  INPUT/OUTPUT  ********************************************************QSVEC     26
      C     ------------                                                       * QSVEC     27
      C                                                                        * QSVEC     28
      C***  SUMMARY OF SYMBOLS  **************************************************QSVEC     29
      C     ------------------                                                 * QSVEC     30
      C                                                                        * QSVEC     31
      C***  ERROR MESSAGES  ******************************************************QSVEC     32
      C     --------------                                                     * QSVEC     33
      C     NONE.                                                              * QSVEC     34
      C                                                                        * QSVEC     35
      C*************************************************************************QSVEC     36
      C                                                                         QSVEC     37
            SUBROUTINE QSVEC(A,D,OFFD,P,Q,R,S,N,ROOT,X,KQSVEC)                  QSVEC     38
      C                                                                         QSVEC     39
      C                                                                         QSVEC     40
      CIBM  BEGINNING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS  QSVEC     41
      C     DOUBLE PRECISION SUM                                                QSVEC     42
      CIBM  ENDING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS     QSVEC     43
      C                                                                         QSVEC     44
            DIMENSION A(1),D(1),OFFD(1),P(1),Q(1),R(1),S(1),X(1)                QSVEC     45
      C                                                                         QSVEC     46
            COMMON /INFO/ SUM,M,IX,IA                                           QSVEC     47
            COMMON /CVIBRA/ TOL0  ,TOL1  ,TOL2  ,MINUS2                         QSVEC     48
      C                                                                         QSVEC     49
      C                                                                         QSVEC     50
      C FUNCTION DEFINITION                                                     QSVEC     51
            ABSF(X)       =  ABS(X)                                             QSVEC     52
            AMAX1F(X,Y)   =  AMAX1(X,Y)                                         QSVEC     53
            SQRTF(X)      =  SQRT(X)                                            QSVEC     54
      C                                                                         QSVEC     55
            GO TO (50,80), KQSVEC                                               QSVEC     56
      C                                                                         QSVEC     57
      C                                                                         QSVEC     58
```

AD-A152 270 ESP (EXTERNAL-STORES PROGRAM) - A PILOT COMPUTER PROGRAM FOR DETERMINING.. (U) GRUMMAN AEROSPACE CORP BETHPAGE NY J B SMEDFJELD FEB 85 ADCR-85-1-VOL-3-PT-1 5/8

UNCLASSIFIED N00019-81-C-0395 F/G 9/2 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

```
      C  PART 1.  PRELIMINARIES.                                        QSVEC     59
      C                                                                 QSVEC     60
60       50 CONTINUE                                                    QSVEC     61
            IX = 1                                                      QSVEC     62
            IA = 1                                                      QSVEC     63
            N1 = N - 1                                                  QSVEC     64
            N2 = N - 2                                                  QSVEC     65
65          GO TO 370                                                   QSVEC     66
      C                                                                 QSVEC     67
            80 CONTINUE                                                 QSVEC     68
               ASSIGN 170 TO KOUNT                                      QSVEC     69
               TOL = 0.                                                 QSVEC     70
70             DO 100  I = 1,N                                          QSVEC     71
               P(I) = D(I) - ROOT                                       QSVEC     72
               Q(I) = OFFD(I)                                           QSVEC     73
               R(I) = 0.                                                QSVEC     74
               TOL = AMAX1F(TOL,ABSF(D(I)))                             QSVEC     75
75          100 X(I) = RDM(X) + .1                                      QSVEC     76
               TOL = (TOL + 1.E-15) * 1.E-15                            QSVEC     77
      C                                                                 QSVEC     78
      C  PART 2.  MATRIX DECOMPOSITION.                                 QSVEC     79
      C                                                                 QSVEC     80
80             DO 150  I = 1,N1                                         QSVEC     81
               T = ABSF(P(I))                                           QSVEC     82
               U = ABSF(OFFD(I))                                        QSVEC     83
               IF (T + U - TOL) 110,120,120                             QSVEC     84
            110 P(I) = TOL                                              QSVEC     85
85             T = P(I)                                                 QSVEC     86
            120 IF (T - U) 130,140,140                                  QSVEC     87
            130 S(I) = P(I)/OFFD(I)                                     QSVEC     88
               S(I) = ANDOR(S(I),1,1)                                   QSVEC     89
               TEMP = Q(I)                                              QSVEC     90
90             P(I) = OFFD(I)                                           QSVEC     91
               Q(I) = P(I+1)                                            QSVEC     92
               R(I) = Q(I+1)                                            QSVEC     93
               P(I+1) = TEMP - S(I)*Q(I)                                QSVEC     94
               Q(I+1) = -S(I)*R(I)                                      QSVEC     95
95             GO TO 150                                                QSVEC     96
            140 S(I) = OFFD(I)/P(I)                                     QSVEC     97
               S(I) =  ANDOR(S(I),MINUS2,0)                             QSVEC     98
               P(I+1) = P(I+1) - S(I)*Q(I)                              QSVEC     99
            150 CONTINUE                                                QSVEC    100
100            IF (ABSF(P(N)) .LT. TOL)  P(N) = TOL                     QSVEC    101
               GO TO 210                                                QSVEC    102
      C                                                                 QSVEC    103
      C  PART 3.  RIGHT SIDE MODIFICATION.                              QSVEC    104
      C                                                                 QSVEC    105
105         170 ASSIGN 330 TO KOUNT                                     QSVEC    106
               DO 200  I = 1,N1                                         QSVEC    107
               TEMP = ANDOR(S(I),1,0)                                   QSVEC    108
               IF (TEMP) 180,190,180                                    QSVEC    109
            180 T = X(I)                                                QSVEC    110
110            X(I) = X(I+1)                                            QSVEC    111
               X(I+1) = T - S(I)*X(I)                                   QSVEC    112
               GO TO 200                                                QSVEC    113
            190 X(I+1) = X(I+1) - S(I)*X(I)                             QSVEC    114
            200 CONTINUE                                                QSVEC    115
```

```
115           C                                                              QSVEC    116
              C  PART 4.  TRIANGULAR SYSTEM SOLUTION.                        QSVEC    117
              C                                                              QSVEC    118
                210 X(N) = X(N)/P(N)                                         QSVEC    119
                    X(N1) = (X(N1) - Q(N1)*X(N)) / P(N1)                     QSVEC    120
120                 DO 220  I = 2,N1                                         QSVEC    121
                    K = N - I                                                QSVEC    122
                220 X(K) = (X(K) - Q(K)*X(K+1) - R(K)*X(K+2)) / P(K)         QSVEC    123
              C                                                              QSVEC    124
              C  PART 5. SCALING TO UNIT VECTOR.                             QSVEC    125
125           C                                                              QSVEC    126
                230 SUM = 0.E0                                               QSVEC    127
                    M = N                                                    QSVEC    128
                    SCALAR = SQRTF(DOTPRO(X,X))                              QSVEC    129
                    DO 250  I = 1,N                                          QSVEC    130
130             250 X(I) = X(I)/SCALAR                                       QSVEC    131
                    GO TO KOUNT, (170,330,370)                               QSVEC    132
              C                                                              QSVEC    133
              C  PART 6.  TRANSFORMATION BY ORTHOGONAL MATRICES.             QSVEC    134
              C                                                              QSVEC    135
135             330 L = (N*(N+1))/2 - 4                                      QSVEC    136
                    DO 360  I = 1,N2                                         QSVEC    137
                    NI = N - I                                               QSVEC    138
                    SUM = 0.E0                                               QSVEC    139
                    M = I + 1                                                QSVEC    140
140                 SCALAR =  A(L-1) * DOTPRO(X(NI),A(L))                    QSVEC    141
                    IJ = L                                                   QSVEC    142
                    DO 350  J = NI,N                                         QSVEC    143
                    X(J) = X(J) + SCALAR*A(IJ)                               QSVEC    144
                350 IJ = IJ + 1                                              QSVEC    145
145             360 L = L - I - 3                                            QSVEC    146
                    ASSIGN 370 TO KOUNT                                      QSVEC    147
                    GO TO 230                                                QSVEC    148
              C                                                              QSVEC    149
                370 RETURN                                                   QSVEC    150
150                 END                                                      QSVEC    151
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

55 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	QSVEC	37	149

VARIABLES	SN	TYPE	RELOCATION								
0	A	REAL	ARRAY	F.P.	REFS	44	2*140	143	DEFINED	37	
0	D	REAL	ARRAY	F.P.	REFS	44	71	74	DEFINED	37	
304	I	INTEGER			REFS	2*71	2*72	73	74	75	81	82

VARIABLES	SN	TYPE		RELOCATION								
					84	85	3*87	2*88	89	2*90	2*91	2*92
					3*93	3*94	3*96	2*97	4*98	107	109	2*110
					3*111	4*113	121	2*130	137	139	145	
					DEFINED	70	80	106	120	129	136	
3	IA	INTEGER		INFO	REFS	46	DEFINED	62				
314	IJ	INTEGER			REFS	143	144	DEFINED	141	144		
2	IX	INTEGER		INFO	REFS	46	DEFINED	61				
315	J	INTEGER			REFS	2*143	DEFINED	142				
310	K	INTEGER			REFS	7*122	DEFINED	121				
302	KOUNT	INTEGER			REFS	131	DEFINED	68	105	146		
0	KQSVEC	INTEGER		F.P.	REFS	55	DEFINED	37				
312	L	INTEGER			REFS	2*140	141	145	DEFINED	135	145	
1	M	INTEGER		INFO	REFS	46	DEFINED	127	139			
3	MINUS2	INTEGER		CVIBRA	REFS	47	97					
0	N	INTEGER		F.P.	REFS	63	64	70	2*100	3*118	119	121
					127	129	2*135	137	142	DEFINED	37	
313	NI	INTEGER			REFS	140	142	DEFINED	137			
300	N1	INTEGER			REFS	80	106	4*119	120	DEFINED	63	
301	N2	INTEGER			REFS	136	DEFINED	64				
0	OFFD	REAL	ARRAY	F.P.	REFS	44	72	82	87	90	96	
					DEFINED	37						
0	P	REAL	ARRAY	F.P.	REFS	44	81	85	87	91	96	98
					100	118	119	122	DEFINED	37	71	84
					90	93	98	100				
0	Q	REAL	ARRAY	F.P.	REFS	44	89	92	93	98	119	122
					DEFINED	37	72	91	94			
0	R	REAL	ARRAY	F.P.	REFS	44	94	122	DEFINED	37	73	92
0	ROOT	REAL		F.P.	REFS	71	DEFINED	37				
0	S	REAL	ARRAY	F.P.	REFS	44	88	93	94	97	98	107
					111	113	DEFINED	37	87	88	96	97
311	SCALAR	REAL			REFS	130	143	DEFINED	128	140		
0	SUM	REAL		INFO	REFS	46	DEFINED	126	138			
305	T	REAL			REFS	83	86	111	DEFINED	81	85	109
307	TEMP	REAL			REFS	93	108	DEFINED	89	107		
303	TOL	REAL			REFS	74	76	83	84	2*100		
					DEFINED	69	74	76				
0	TOLO	REAL		CVIBRA	REFS	47						
1	TOL1	REAL		CVIBRA	REFS	47						
2	TOL2	REAL		CVIBRA	REFS	47						
306	U	REAL			REFS	83	86	DEFINED	82			
0	X	REAL	ARRAY	F.P.	REFS	44	75	109	110	111	2*113	118
					2*119	3*122	2*128	130	140	143		
					DEFINED	37	75	110	111	113	118	119
					122	130	143					

EXTERNALS	TYPE	ARGS		REFERENCES			
ANDOR	REAL	3		88	97	107	
DOTPRO	REAL	2		128	140		
RDM	REAL	1		75			
SQRT	REAL	1	LIBRARY	128			

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES			
ABS	REAL	1	INTRIN		74	81	82	100
ABSF	REAL	1	SF	51	74	81	82	100
AMAX1	REAL	0	INTRIN		74			
AMAX1F	REAL	2	SF	52	74			
SQRTF	REAL	1	SF	53	128			

STATEMENT LABELS			DEF LINE	REFERENCES		
15	50		60	55		
22	80		67	55		
0	100		75	70		
0	110	INACTIVE	84	83		
56	120		86	2*83		
0	130	INACTIVE	87	86		
76	140		96	2*86		
106	150		99	80	95	
117	170		105	68	131	
0	180	INACTIVE	109	2*108		
132	190		113	108		
136	200		114	106	112	
141	210		118	101		
0	220		122	120		
171	230		126	147		
0	250		130	129		
212	330		135	105	131	
0	350		144	142		
0	360		145	136		
251	370		149	65	131	146

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES		
25	100	I	70 75	17B		EXT REFS	
47	150	I	80 99	42B		EXT REFS	
121	200	I	106 114	20B		EXT REFS	
161	220	I	120 122	7B	INSTACK		
205	250	I	129 130	3B	INSTACK		
216	360	I	136 145	31B		EXT REFS	NOT INNER
236	350	J	142 144	3B	INSTACK		

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
INFO	4	0 SUM	(1)	1 M	(1)	2 IX	(1)
		3 IA	(1)				
CVIBRA	4	0 TOLO	(1)	1 TOL1	(1)	2 TOL2	(1)
		3 MINUS2	(1)				

STATISTICS

PROGRAM LENGTH	370B	248
CM LABELED COMMON LENGTH	10B	8

520000B CM USED

```
      C45700, SUB. SWAP                                                      SWAP       2
      C                                                                      SWAP       3
      C*************************************************************************SWAP       4
      C                                                                     * SWAP       5
      C***  SUBROUTINE SWAP    ***************************************************SWAP       6
      C                                                                     * SWAP       7
      C***  COMPUTER VERSION  ***************************************************SWAP       8
      C     ----------------                                                * SWAP       9
      C     IBM .... AS IS.                                                 * SWAP      10
      C                                                                     * SWAP      11
      C     CDC .... AS IS.                                                 * SWAP      12
      C                                                                     * SWAP      13
      C***  OBJECTIVE  ***********************************************************SWAP      14
      C     ---------                                                       * SWAP      15
      C     A LOWER TRIANGULAR MATRIX STORED IN ROW SORT IN A SINGLE ARRAY   * SWAP      16
      C     IS SWITHED TO A COLUMN SORT.                                    * SWAP      17
      C                                                                     * SWAP      18
      C***  INPUT/OUTPUT  ********************************************************SWAP      19
      C     ------------                                                    * SWAP      20
      C                                                                     * SWAP      21
      C***  SUMMARY OF SYMBOLS  **************************************************SWAP      22
      C     ------------------                                              * SWAP      23
      C                                                                     * SWAP      24
      C***  ERROR MESSAGES  ******************************************************SWAP      25
      C     --------------                                                  * SWAP      26
      C     NONE.                                                           * SWAP      27
      C                                                                     * SWAP      28
      C*************************************************************************SWAP      29
            SUBROUTINE SWAP   (A,M)                                         SWAP      30
      C                                                                     SWAP      31
            DIMENSION A(1)                                                  SWAP      32
      C                                                                     SWAP      33
      C                                                                     SWAP      34
      C FUNCTION DEFINITION                                                 SWAP      35
            IABSF(I)      =  IABS(I)                                        SWAP      36
      C                                                                     SWAP      37
            N = IABSF(M)                                                    SWAP      38
            IF (N - 2) 190,190,90                                           SWAP      39
         90 L = (N*(N+1)) / 2                                               SWAP      40
            KEY = 1                                                         SWAP      41
            LOCK = N/2 + 1                                                  SWAP      42
            IF (M) 100,190,160                                              SWAP      43
        100 IF (N - 3) 110,140,110                                          SWAP      44
        110 KKT = 3                                                         SWAP      45
            NKF = N - 1                                                     SWAP      46
            IMAGE = L                                                       SWAP      47
            INTO = L - 3                                                    SWAP      48
            I = 3                                                           SWAP      49
            DO 130  K = 2,LOCK                                              SWAP      50
            DO 120  IK = KKT,NKF                                            SWAP      51
            X = A(IK)                                                       SWAP      52
            A(IK) = A(INTO)                                                 SWAP      53
            A(INTO) = X                                                     SWAP      54
            INTO = INTO - I                                                 SWAP      55
        120 I = I + 1                                                       SWAP      56
            KKT = NKF + K                                                   SWAP      57
            NKF = NKF + N - K                                               SWAP      58
```

```
                      IMAGE = IMAGE - K                                  SWAP      59
                      INTO = IMAGE                                       SWAP      60
     60             130 I = K                                           SWAP      61
                    140 IF (KEY) 150,190,150                            SWAP      62
                    150 KEY = 0                                         SWAP      63
                    160 LOV2 = L / 2                                    SWAP      64
                      K = L - 2                                         SWAP      65
     65               DO 170  I = 3,LOV2                                 SWAP      66
                      X = A(I)                                          SWAP      67
                      A(I) = A(K)                                       SWAP      68
                      A(K) = X                                          SWAP      69
                    170 K = K - 1                                       SWAP      70
     70               IF (KEY) 180,190,180                               SWAP      71
                    180 KEY = 0                                         SWAP      72
                      GO TO 100                                         SWAP      73
                  C                                                     SWAP      74
                    190 RETURN                                          SWAP      75
     75               END                                                SWAP      76
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	SWAP	29	74

VARIABLES

	SN	TYPE	RELOCATION									
0	A	REAL	ARRAY	F.P.	REFS	31	51	52	66	67		
					DEFINED	29	52	53	67	68		
103	I	INTEGER			REFS	54	55	66	67	DEFINED	48	55
						60	65					
105	IK	INTEGER			REFS	51	52	DEFINED	50			
101	IMAGE	INTEGER			REFS	58	59	DEFINED	46	58		
102	INTO	INTEGER			REFS	52	53	54	DEFINED	47	54	59
104	K	INTEGER			REFS	56	57	58	60	67	68	69
					DEFINED	49	64	69				
75	KEY	INTEGER			REFS	61	70	DEFINED	40	62	71	
77	KKT	INTEGER			REFS	50	DEFINED	44	56			
74	L	INTEGER			REFS	46	47	63	64	DEFINED	39	
76	LOCK	INTEGER			REFS	49	DEFINED	41				
107	LOV2	INTEGER			REFS	65	DEFINED	63				
0	M	INTEGER		F.P.	REFS	37	42	DEFINED	29			
73	N	INTEGER			REFS	38	2*39	41	43	45	57	
					DEFINED	37						
100	NKF	INTEGER			REFS	50	56	57	DEFINED	45	57	
106	X	REAL			REFS	53	68	DEFINED	51	66		

INLINE FUNCTIONS

	TYPE	ARGS		DEF LINE	REFERENCES
IABS	INTEGER	1	INTRIN		37
IABSF	INTEGER	1	SF	35	37

STATEMENT LABELS

			DEF LINE	REFERENCES	
0	90	INACTIVE	39	38	
17	100		43	42	72
0	110	INACTIVE	44	2*43	

STATEMENT LABELS			DEF LINE	REFERENCES			
0	120		55	50			
0	130		60	49			
51	140		61	43			
0	150	INACTIVE	62	2*61			
53	160		63	42			
0	170		69	65			
0	180	INACTIVE	71	2*70			
72	190		74	2*38	42	61	70

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
27	130	K	49 60	228	NOT INNER
33	120	IK	50 55	58	INSTACK
63	170	I	65 69	38	INSTACK

STATISTICS

PROGRAM LENGTH 112B 74

520008 CM USED

```
      C45700, FUN. DOTPRO                                                    DOTPRO     2
      C                                                                      DOTPRO     3
      C*************************************************************************DOTPRO     4
      C                                                                     * DOTPRO     5
      C***  SUBROUTINE          ********************************************** DOTPRO     6
      C                                                                     * DOTPRO     7
      C***  COMPUTER VERSION    ********************************************** DOTPRO     8
      C     ----------------                                                * DOTPRO     9
      C     IBM .... INCLUDES DOUBLE PRECISION TYPE STATEMENTS.  COLUMN ONE * DOTPRO    10
      C               SHOULD BE BLANK.                                      * DOTPRO    11
      C                                                                     * DOTPRO    12
      C     CDC .... DOES NOT INCLUDE DOUBLE PRECISION TYPE STATEMENTS.     * DOTPRO    13
      C               THESE STATEMENTS ARE CONVERTED INTO COMMENTS BY       * DOTPRO    14
      C               INSERTING THE LETTER C IN COLUMN ONE.                 * DOTPRO    15
      C                                                                     * DOTPRO    16
      C***  OBJECTIVE  ************************************************** DOTPRO    17
      C     ---------                                                       * DOTPRO    18
      C     CALCULATE THE DOT PRODUCT OF TWO VECTORS                        * DOTPRO    19
      C                                                                     * DOTPRO    20
      C***  INPUT/OUTPUT  ********************************************** DOTPRO    21
      C     ------------                                                    * DOTPRO    22
      C                                                                     * DOTPRO    23
      C***  SUMMARY OF SYMBOLS  ***************************************** DOTPRO    24
      C     ------------------                                              * DOTPRO    25
      C                                                                     * DOTPRO    26
      C***  ERROR MESSAGES  ********************************************* DOTPRO    27
      C     --------------                                                  * DOTPRO    28
      C     NONE.                                                           * DOTPRO    29
      C                                                                     * DOTPRO    30
      C*************************************************************************DOTPRO    31
            FUNCTION DOTPRO(X,Y)                                            DOTPRO    32
      C                                                                     DOTPRO    33
      CIBM  BEGINNING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS DOTPRO   34
      C     DOUBLE PRECISION S,DOTPRO                                       DOTPRO    35
      CIBM  ENDING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS  DOTPRO    36
      C                                                                     DOTPRO    37
            DIMENSION X(1),Y(1)                                             DOTPRO    38
      C                                                                     DOTPRO    39
            COMMON /INFO/ S,N,IX,IY                                         DOTPRO    40
      C                                                                     DOTPRO    41
            IF (N) 120,120,100                                              DOTPRO    42
        100 JX = 1                                                          DOTPRO    43
            JY = 1                                                          DOTPRO    44
            DO 110  J = 1,N                                                 DOTPRO    45
            S = S + X(JX)*Y(JY)                                             DOTPRO    46
            JX = JX + IX                                                    DOTPRO    47
        110 JY = JY + IY                                                    DOTPRO    48
        120 DOTPRO = S                                                      DOTPRO    49
      C                                                                     DOTPRO    50
            RETURN                                                          DOTPRO    51
            END                                                             DOTPRO    52
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
4	DOTPRO	31	50

VARIABLES		SN	TYPE	RELOCATION							
30	DOTPRO		REAL		DEFINED	48					
2	IX		INTEGER	INFO	REFS	39	46				
3	IY		INTEGER	INFO	REFS	39	47				
33	J	*	INTEGER		DEFINED	44					
31	JX		INTEGER		REFS	45	46	DEFINED	42	46	
32	JY		INTEGER		REFS	45	47	DEFINED	43	47	
1	N		INTEGER	INFO	REFS	39	41	44			
0	S		REAL	INFO	REFS	39	45	48	DEFINED	45	
0	X		REAL ARRAY	F.P.	REFS	37	45	DEFINED	31		
0	Y		REAL ARRAY	F.P.	REFS	37	45	DEFINED	31		

STATEMENT LABELS			DEF LINE	REFERENCES
0	100	INACTIVE	42	41
0	110		47	44
26	120		48	2*41

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
20	110	J	44 47	4B	INSTACK

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
INFO	4	0 S	(1)	1 N	(1)	2 IX	(1)
		3 IY	(1)				

STATISTICS

PROGRAM LENGTH	36B	30
CM LABELED COMMON LENGTH	4B	4

520000B CM USED

```
      C54700, FUN  ANDOR                                                    ANDOR      2
      C                                                                     ANDOR      3
      C*********************************************************************ANDOR      4
      C                                                                    * ANDOR      5
      C***  SUBROUTINE          ********************************************** ANDOR      6
      C                                                                    * ANDOR      7
      C***  COMPUTER VERSION    ********************************************** ANDOR      8
      C     ----------------                                               * ANDOR      9
      C     IBM .... AS IS.                                                * ANDOR     10
      C                                                                    * ANDOR     11
      C     CDC .... AS IS.                                                * ANDOR     12
      C                                                                    * ANDOR     13
      C***  OBJECTIVE  ************************************************** ANDOR     14
      C     ---------                                                      * ANDOR     15
      C                                                                    * ANDOR     16
      C***  INPUT/OUTPUT  *********************************************** ANDOR     17
      C     ------------                                                   * ANDOR     18
      C                                                                    * ANDOR     19
      C***  SUMMARY OF SYMBOLS  ***************************************** ANDOR     20
      C     ------------------                                             * ANDOR     21
      C                                                                    * ANDOR     22
      C***  ERROR MESSAGES  ********************************************* ANDOR     23
      C     --------------                                                 * ANDOR     24
      C     NONE.                                                          * ANDOR     25
      C                                                                    * ANDOR     26
      C*********************************************************************ANDOR     27
            FUNCTION ANDOR(X,Y,IFLAG)                                       ANDOR     28
      C                                                                     ANDOR     29
            LOGICAL UND,JA,NEIN                                             ANDOR     30
      C                                                                     ANDOR     31
            EQUIVALENCE (UND,E),(JA,SI),(NEIN,RNO)                          ANDOR     32
      C                                                                     ANDOR     33
          1 SI=X                                                            ANDOR     34
            RNO = Y                                                         ANDOR     35
            UND=JA.AND.NEIN                                                 ANDOR     36
            IF(IFLAG.EQ.1)UND=JA.OR.NEIN                                    ANDOR     37
            ANDOR = E                                                       ANDOR     38
      C                                                                     ANDOR     39
            RETURN                                                          ANDOR     40
            END                                                             ANDOR     41
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
4	ANDOR	27	39

VARIABLES	SN	TYPE	RELOCATION						
17	ANDOR	REAL		DEFINED	37				
20	E	REAL		REFS	31	37			
0	IFLAG	INTEGER	F.P.	REFS	36	DEFINED	27		
21	JA	LOGICAL		REFS	29	31	35	36	
22	NEIN	LOGICAL		REFS	29	31	35	36	
23	RNO	REAL		REFS	31	DEFINED	34		

```
VARIABLES      SN  TYPE            RELOCATION
   21  SI         REAL                                REFS      31    DEFINED      33
   20  UND        LOGICAL                             REFS      29      31   DEFINED      35      36
    0  X          REAL                    F.P.        REFS      33    DEFINED      27
    0  Y          REAL                    F.P.        REFS      34    DEFINED      27

STATEMENT LABELS              DEF LINE    REFERENCES
    0  1            INACTIVE      33

EQUIV CLASSES    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       UND            1              0 E       (1)
       JA             1              0 SI      (1)
       NEIN           1              0 RNO     (1)

STATISTICS
  PROGRAM LENGTH                 238       19
        520008 CM USED
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```
      C45700. SUB  TRIEQ                                                        TRIEQ      2
      C                                                                         TRIEQ      3
      C*************************************************************************TRIEQ      4
      C                                                                        * TRIEQ      5
      C***  SUBROUTINE          ***************************************************TRIEQ      6
      C                                                                        * TRIEQ      7
      C***  COMPUTER VERSION  ***************************************************TRIEQ      8
      C     ----------------                                                   * TRIEQ      9
      C     IBM  ...  INCLUDES DOUBLE PRECISION TYPE STATEMENTS.  COLUMN ONE   * TRIEQ     10
      C               SHOULD BE BLANK.                                         * TRIEQ     11
      C                                                                        * TRIEQ     12
      C     CDC  ....  DOES NOT INCLUDE DOUBLE PRECISION TYPE STATEMENTS.      * TRIEQ     13
      C               THESE STATEMENTS ARE CONVERTED INTO COMMENTS BY          * TRIEQ     14
      C               INSERTING THE LETTER C IN COLUMN ONE.                    * TRIEQ     15
      C                                                                        * TRIEQ     16
      C***  OBJECTIVE  ***********************************************************TRIEQ     17
      C     ---------                                                          * TRIEQ     18
      C     CALCULATE THE EIGENVECTORS IN THE PHYSICAL COORDINATE SYSTEM       * TRIEQ     19
      C     USING THE TRANSPOSE OF THE CHOLESKY DECOMPOSITION MATRIX           * TRIEQ     20
      C     AND THE EIGENVECTORS IN THE TRANSFORMED COORDINATE SYSTEM.         * TRIEQ     21
      C                                                                        * TRIEQ     22
      C***  INPUT/OUTPUT  ********************************************************TRIEQ     23
      C     ------------                                                       * TRIEQ     24
      C                                                                        * TRIEQ     25
      C***  SUMMARY OF SYMBOLS  **************************************************TRIEQ     26
      C     ------------------                                                 * TRIEQ     27
      C                                                                        * TRIEQ     28
      C***  ERROR MESSAGES  ******************************************************TRIEQ     29
      C     --------------                                                     * TRIEQ     30
      C     NONE.                                                              * TRIEQ     31
      C                                                                        * TRIEQ     32
      C*************************************************************************TRIEQ     33
            SUBROUTINE TRIEQ (A,Y,M,L,INDIC8)                                   TRIEQ     34
      C                                                                         TRIEQ     35
      CIBM  BEGINNING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS  TRIEQ     36
      C     DOUBLE PRECISION SUM                                                TRIEQ     37
      CIBM  ENDING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS     TRIEQ     38
      C                                                                         TRIEQ     39
      C                                                                         TRIEQ     40
            DIMENSION A(1),Y(1)                                                 TRIEQ     41
      C                                                                         TRIEQ     42
      C                                                                         TRIEQ     43
            EQUIVALENCE (SUN,SUM)                                               TRIEQ     44
      C                                                                         TRIEQ     45
            L1 = L                                                              TRIEQ     46
            LM1 = L1-1                                                          TRIEQ     47
            MM1 = M-1                                                           TRIEQ     48
            IF (INDIC8) 130,100,100                                             TRIEQ     49
          100 Y(L1) = Y(L1)/A(L1)                                               TRIEQ     50
            IF (MM1) 105,125,105                                                TRIEQ     51
          105 I1 = L1                                                           TRIEQ     52
            DO 120 I=L1,MM1                                                     TRIEQ     53
            I1 = I1+I                                                           TRIEQ     54
            SUM = -Y(I+1)                                                       TRIEQ     55
            IJ = I1                                                             TRIEQ     56
            DO 110 J=L1,I                                                       TRIEQ     57
            SUM = SUM+A(IJ)*Y(J)                                                TRIEQ     58
```

```
                  WRITE(ITAPEW,9004)                                                VIBRAP   287
                  KOUNT=KOUNT+4                                                     VIBRAP   288
               25 CONTINUE                                                          VIBRAP   289
                  WRITE(ITAPEW,9006) NUM,(XPRIM(J,NUM),J=1,3),DOF(NUM)              VIBRAP   290
290               KOUNT=KOUNT+1                                                     VIBRAP   291
               20 CONTINUE                                                          VIBRAP   292
            C                                                                       VIBRAP   293
            C     READ THE REFERENCE BEAM & THE RATIO OF MAXIMUM DISPLACEMENT       VIBRAP   294
            C     TO THE REFERENCE BEAM LENGTH                                      VIBRAP   295
295               READ(ITAPER,9007) BMREF,RATIO                                     VIBRAP   296
            C                                                                       VIBRAP   297
            C                                                                       VIBRAP   298
            C                                                                       VIBRAP   299
            C                                                                       VIBRAP   300
300         C     READ BEAM NAME, NUMBER OF PTS ON BEAM, AND BEAM POINT NUMBERS     VIBRAP   301
            C                                                                       VIBRAP   302
                  READ(ITAPER,9003) NBEAMS                                          VIBRAP   303
                  KOUNT=LINES                                                       VIBRAP   304
            C                                                                       VIBRAP   305
305               DO 30 I=1,NBEAMS                                                  VIBRAP   306
                  READ(ITAPER,9008) WORD1,WORD2,NPTBM                               VIBRAP   307
                  READ(ITAPER,9003) (JPTS(K),K=1,NPTBM)                             VIBRAP   308
                  CALL TITLES(2)                                                    VIBRAP   309
                  IF(KOUNT.GT.KOUNTH) GO TO 29                                      VIBRAP   310
310               WRITE(ITAPEW,9009)                                                VIBRAP   311
                  KOUNT=KOUNT+5                                                     VIBRAP   312
               29 CONTINUE                                                          VIBRAP   313
                  WRITE(ITAPEW,9010) I,WORD1,WORD2,(JPTS(K),K=1,NPTBM)              VIBRAP   314
                  KOUNT=KOUNT+1                                                     VIBRAP   315
315         C     WRITE THE INPUT DATA ON MTAP3 FOR USE LATER ON IN THE PROGRAM     VIBRAP   316
                  WRITE (MTAP3)  WORD1, WORD2, NPTBM                                VIBRAP   317
                  WRITE (MTAP3)  (JPTS(K),K=1,NPTBM)                                VIBRAP   318
                  IF (WORD1.EQ.BMREF(1).AND.WORD2.EQ.BMREF(2)) GO TO 17             VIBRAP   319
                  GO TO 30                                                          VIBRAP   320
320         C     COMPUTE THE REFERENCE BEAM LENGTH TO RESCALE MODAL DISPLACEMENTS   VIBRAP   321
               17 NENDP1  =  JPTS(1)                                                VIBRAP   322
                  NENDP2  =  JPTS(NPTBM)                                            VIBRAP   323
                  XDIST  =  XPRIM(1,NENDP1)  -  XPRIM(1,NENDP2)                     VIBRAP   324
                  YDIST  =  XPRIM(2,NENDP1)  -  XPRIM(2,NENDP2)                     VIBRAP   325
325               ZDIST  =  XPRIM(3,NENDP1)  -  XPRIM(3,NENDP2)                     VIBRAP   326
                  BEAML2 =  XDIST**2  +  YDIST**2 + ZDIST**2                        VIBRAP   327
                  BEAML  =  SQRT(BEAML2)                                            VIBRAP   328
                  DSPMX1  =  RATIO *  BEAML                                         VIBRAP   329
               30 CONTINUE                                                          VIBRAP   330
330         C                                                                       VIBRAP   331
            C                                                                       VIBRAP   332
            C                                                                       VIBRAP   333
            C                                                                       VIBRAP   334
            C                                                                       VIBRAP   335
335         C                                                                       VIBRAP   336
                  IUCOM=IUPHTF                                                      VIBRAP   337
                  IFCOM=IFPHTF                                                      VIBRAP   338
                  IF(KFREE.EQ.2) IUCOM=IUPATF                                       VIBRAP   339
                  IF(KFREE.EQ.2) IFCOM=IFPATF                                       VIBRAP   340
340         C                                                                       VIBRAP   341
                  CALL GEDLAB(8HVIBRAPO1,IUCOM,NAME,IFCOM,NMODES,NCOL)              VIBRAP   342
            C                                                                       VIBRAP   343
```

```
      C     FORM ELEMENTS OF A MATRIX - USED TO DEFINE FIRST ROTATION          VIBRAP  230
230   C                                                                        VIBRAP  231
      C                                                                        VIBRAP  232
            A(1,1)  = 1.                                                       VIBRAP  233
            A(2,2)  = COS(THET1R)                                              VIBRAP  234
            A(2,3)  = SIN(THET1R)                                              VIBRAP  235
235         A(3,2)  = -SIN(THET1R)                                             VIBRAP  236
            A(3,3)  =  COS(THET1R)                                             VIBRAP  237
      C                                                                        VIBRAP  238
      C     FORM ELEMENTS OF B MATRIX - USED TO DEFINE SECOND ROTATION         VIBRAP  239
            B(1,1) = COS(THET2R)                                               VIBRAP  240
240         B(1,3) =-SIN(THET2R)                                               VIBRAP  241
            B(2,2) = 1.                                                        VIBRAP  242
            B(3,1) = SIN(THET2R)                                               VIBRAP  243
            B(3,3) = COS(THET2R)                                               VIBRAP  244
      C                                                                        VIBRAP  245
245   C     FORM ELEMENTS OF C MATRIX - USED TO DEFINE THIRD ROTATION          VIBRAP  246
            C(1,1) = COS(THET3R)                                               VIBRAP  247
            C(1,2) = SIN(THET3R)                                               VIBRAP  248
            C(2,1) =-SIN(THET3R)                                               VIBRAP  249
            C(2,2) = COS(THET3R)                                               VIBRAP  250
250         C(3,3) = 1.                                                        VIBRAP  251
      C                                                                        VIBRAP  252
      C     POSTMULTIPLY C MATRIX BY B                                         VIBRAP  253
            CALL MMULT (C,B,XXX,3,3,3,3,3,3)                                   VIBRAP  254
      C                                                                        VIBRAP  255
255   C     POSTMULTIPLY  CB  BY A                                             VIBRAP  256
            CALL MMULT (XXX,A,PI,3,3,3,3,3,3)                                  VIBRAP  257
      C                                                                        VIBRAP  258
      C     TRANSPOSE PI MATRIX                                                VIBRAP  259
      C                                                                        VIBRAP  260
260         DO 10 I=1,3                                                        VIBRAP  261
            DO 10 J=1,3                                                        VIBRAP  262
         10 PITR(I,J) = PI(J,I)                                                VIBRAP  263
      C                                                                        VIBRAP  264
      C     PREMULTIPLY PI TRANSPOSE BY RORMV TO GET PROJECTING MATRIX INTO    VIBRAP  265
265   C     Y-Z PLANE.                                                         VIBRAP  266
            CALL  MMULT (RORMV,PITR,PROD,2,3,3,2,3,2)                          VIBRAP  267
      C                                                                        VIBRAP  268
      C     PROD IS MATRIX USED TO TRANSFORM TO VIEWING PLANE (Y-Z)            VIBRAP  269
      C     WRITE (ITAPEW,500)  ((PROD(I,J),J=1,3),I=1,2)                      VIBRAP  270
270   C 500 FORMAT (3E15.6)                                                    VIBRAP  271
      C                                                                        VIBRAP  272
      C                                                                        VIBRAP  273
      C                                                                        VIBRAP  274
            READ(ITAPER,9003) NC                                               VIBRAP  275
275   C     NC IS THE NUMBER OF CARDS ON WHICH COORDINATES ARE ENTERED          VIBRAP  276
      C                                                                        VIBRAP  277
            CALL PLB(1,3,ITAPEW)                                               VIBRAP  278
            KOUNT=KOUNT+3                                                      VIBRAP  279
            WRITE(ITAPEW,9004)                                                 VIBRAP  280
280         KOUNT=KOUNT+4                                                      VIBRAP  281
      C                                                                        VIBRAP  282
            DO 20 I=1,NC                                                       VIBRAP  283
            READ(ITAPER,9005) NUM,(XPRIM(J,NUM),J=1,3),DOF(NUM)                VIBRAP  284
            CALL TITLES(2)                                                     VIBRAP  285
            IF(KOUNT.GT.KOUNTH) GO TO 25                                       VIBRAP  286
```

```
                MAX1   =  800                                                   VIBRAP   173
                MAX2   =  457                                                   VIBRAP   174
                MAX3   =  20                                                    VIBRAP   175
175             CALL DVALUE (A      ,ZERO,I33)                                  VIBRAP   176
                CALL DVALUE (B      ,ZERO,I33)                                  VIBRAP   177
                CALL DVALUE (C      ,ZERO,I33)                                  VIBRAP   178
                CALL DVALUE (PI     ,ZERO,I33)                                  VIBRAP   179
                CALL DVALUE (PITR   ,ZERO,I33)                                  VIBRAP   180
180             CALL DVALUE (XXX    ,ZERO,I33)                                  VIBRAP   181
                CALL DVALUE (PROD   ,ZERO,I23)                                  VIBRAP   182
                CALL DVALUE (RORMV  ,ZERO,I23)                                  VIBRAP   183
                CALL DVALUE (SCRTCH,ZERO,3)                                     VIBRAP   184
                CALL DVALUE (SCRT2  ,ZERO,2)                                    VIBRAP   185
185             CALL DVALUE (XPRIM  ,ZERO,3*MAX1)                               VIBRAP   186
                CALL DVALUE (WKAREA,ZERO,3*MAX3)                                VIBRAP   187
                CALL DVALUE (COORD  ,ZERO,3*MAX2)                               VIBRAP   188
                CALL DVALUE (DISPPT,ZERO,3*MAX3)                                VIBRAP   189
                CALL DVALUE (DISP   ,ZERO,MAX1)                                 VIBRAP   190
190             CALL DVALUE (DOF    ,ZERO,MAX1)                                 VIBRAP   191
                CALL DVALUE (U      ,ZERO,MAX2)                                 VIBRAP   192
                CALL DVALUE (V      ,ZERO,MAX2)                                 VIBRAP   193
            C                                                                   VIBRAP   194
            C     DEFINE ELEMENTS REQUIRED TO TRANSFORM TO Y-Z PLANE            VIBRAP   195
195             RORMV(1,2) =-1.                                                 VIBRAP   196
                RORMV(2,3) = 1.                                                 VIBRAP   197
            C                                                                   VIBRAP   198
            C                                                                   VIBRAP   199
            C                                                                   VIBRAP   200
200         C                                                                   VIBRAP   201
            C     THE VIEW THAT THIS PROGRAM WILL PRINT ON THE CALCOMP PLOTTER  VIBRAP   202
            C     IS SPECIFIED BY 3 ANGLES OF ROTATION, THET1D, THET2D,         VIBRAP   203
            C     AND THET3D. IMAGINE A LEFT HAND COORDINATE SYSTEM ATTACHED TO VIBRAP   204
            C     THE SURFACE TO BE DRAWN WITH THE ORIGIN AT THE FORWARD MOST   VIBRAP   205
205         C     POINT OF THE SURFACE. THE                                     VIBRAP   206
            C          POSITIVE X  AXIS IS AFT                                  VIBRAP   207
            C          POSITIVE Y  AXIS IS OUTBOARD ON THE LEFT WING            VIBRAP   208
            C          POSITIVE Z  AXIS IS UP                                   VIBRAP   209
            C     THE SURFACE TO BE DRAWN IS FIRST ROTATED ALONG THE X -AXIS    VIBRAP   210
210         C     THROUGH AN ANGLE, THET1D (DEGREES). NEXT, FOLLOWS A ROTATION  VIBRAP   211
            C     ABOUT THE CARRIED Y -AXIS OF THET2D (DEGREES) AND FINALLY     VIBRAP   212
            C     A ROTATION OF THET3D (DEGREES)  ABOUT THE CARRIED Z -AXIS. NOTE VIBRAP  213
            C     THAT ALL ROTATIONS ARE POSITIVE ACCORDING TO THE LEFT HAND RULE. VIBRAP  214
            C     THE VIEW ON THE CALCOMP WILL BE ALONG THE ORIGINAL (I.E. UNROTATED VIBRAP 215
215         C     X AXIS FROM AFT TO FORE (I.E. ALONG VECTOR ALONG NEGATIVE X AXIS) VIBRAP 216
            C                                                                   VIBRAP   217
            C                                                                   VIBRAP   218
            C                                                                   VIBRAP   219
            C                                                                   VIBRAP   220
220         C     READ THE ANGLES ASSOCIATED WITH THE PERSPECTIVE VIEWING       VIBRAP   221
            C                                                                   VIBRAP   222
                  READ(ITAPER,9002) THET1D,THET2D,THET3D                        VIBRAP   223
            C                                                                   VIBRAP   224
               23 DEGTOR  = 3.14159/180.                                        VIBRAP   225
225             THET1R  =  THET1D * DEGTOR                                      VIBRAP   226
                THET2R  = THET2D  * DEGTOR                                      VIBRAP   227
                THET3R  = THET3D  * DEGTOR                                      VIBRAP   228
            C                                                                   VIBRAP   229
```

```
      DASH   =  0.14                                                    VIBRAP   116
      BLANK  =   .07                                                    VIBRAP   117
C                                                                       VIBRAP   118
C     LENGTH OF HORIZONTAL SCALE FOR CALCOMP, HSCALE                    VIBRAP   119
C                                                                       VIBRAP   120
C     LENGTH OF VERTICAL SCALE FOR CALCOMP, VSCALE                      VIBRAP   121
C                                                                       VIBRAP   122
      HSCALE=15.                                                        VIBRAP   123
      VSCALE=10.                                                        VIBRAP   124
      HSCLP4  =  HSCALE  +  4.                                          VIBRAP   125
      REWIND MTAP1                                                      VIBRAP   126
      REWIND MTAP2                                                      VIBRAP   127
      REWIND MTAP3                                                      VIBRAP   128
      REWIND MTAP4                                                      VIBRAP   129
C                                                                       VIBRAP   130
CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS     VIBRAP   131
C     REWIND MTAP8                                                      VIBRAP   132
C     REWIND MTAP9                                                      VIBRAP   133
CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS        VIBRAP   134
C                                                                       VIBRAP   135
C                                                                       VIBRAP   136
      CALL PROGNA (4H(VIB, 4HRAP))                                      VIBRAP   137
C                                                                       VIBRAP   138
      KOUNT  =  LINES                                                   VIBRAP   139
      CALL TITLES (2)                                                   VIBRAP   140
      KOUNT  =  KOUNT + 3                                               VIBRAP   141
      DO 1  I=1,3                                                       VIBRAP   142
      READ (ITAPER,9000)  TITLE                                         VIBRAP   143
      WRITE(ITAPEW,9001) TITLE                                          VIBRAP   144
    1 CONTINUE                                                          VIBRAP   145
C                                                                       VIBRAP   146
      IF(KPLOTS.EQ.NO) GO TO 77                                         VIBRAP   147
      KPLOTS =  NO                                                      VIBRAP   148
      KOUNT  =  KOUNT + 2                                               VIBRAP   149
      CALL PLB (1,1,ITAPEW)                                             VIBRAP   150
      WRITE(ITAPEW,9016)                                                VIBRAP   151
C                                                                       VIBRAP   152
CIBM                                                                    VIBRAP   153
C     IBUFD  =  1512                                                    VIBRAP   154
C     CALL PLOTS (BUFFER,IBUFD)                                         VIBRAP   155
CIBM                                                                    VIBRAP   156
C                                                                       VIBRAP   157
CCDC                                                                    VIBRAP   158
      IBUFD = 512                                                       VIBRAP   159
      ITAP60 = 60                                                       VIBRAP   160
      REWIND ITAP60                                                     VIBRAP   161
      CALL PLOTS (BUFFER,IBUFD,ITAP60)                                  VIBRAP   162
CCDC                                                                    VIBRAP   163
C                                                                       VIBRAP   164
   77 CONTINUE                                                          VIBRAP   165
C                                                                       VIBRAP   166
C                                                                       VIBRAP   167
C     INITIALIZE MATRICES                                               VIBRAP   168
C                                                                       VIBRAP   169
      I33    =  3*3                                                     VIBRAP   170
      ZERO   =  0.0                                                     VIBRAP   171
      I23    =  2*3                                                     VIBRAP   172
```

```
                     1              ,KBPAGE,LINESG,KOUNTH,KOUNTI                                    VIBRAP     59
                      COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA              VIBRAP     60
60                   1              ,ITAPET                                                          VIBRAP     61
                      COMMON/PLACES/ IUIN1,IUIN2,IUOUT1,IUOUT2,IUGO1,IUGO2,IUGO3,IUGO4,            VIBRAP     62
                     1               IUSCR,IFSCR,IFS1,IFS2,IFS3,IFS4,IUCD,IUPR,                     VIBRAP     63
                     2               IUA,IFA,IUY,IFY,IUMEMN,IFMEMN,IUSTFN,IFSTFN,                   VIBRAP     64
                     3               IUKS,IFKS,IUB,IFB,IUDESO,IFDESO,                               VIBRAP     65
65                   4               IUMDBI,IFMDBI,IUADDI,IFADDI,IUBALI,IFBALI,                     VIBRAP     66
                     5               IUDESI,IFDESI,IUWTI,IFWTI,                                     VIBRAP     67
                     6               IUMEMO,IFMEMO,IUBT,IFBT,                                       VIBRAP     68
                     7               IUDESN,IFDESN,IUMD,IFMD,                                       VIBRAP     69
                     8               IUMEMF,IFMEMF,                                                 VIBRAP     70
70                   9               IUSTFO,IFSTFO,IUMDB,IFMDB,IUADD,IFADD,IUBAL,IFBAL,             VIBRAP     71
                     A               IUDESF,IFDESF,IUWT,IFWT,                                       VIBRAP     72
                     B               IUDUM1,IFDUM1,IUDUM2,IFDUM2,IUDUM3,IFDUM3,                     VIBRAP     73
                     C               IUL,IFL,IUYT,IFYT,IUZ,IFZ,IUZR,IFZR,IULR,IFLR,                 VIBRAP     74
                     D               IUBR,IFBR,                                                     VIBRAP     75
75                   E               IUPHTF,IFPHTF,IUMODM,IFMODM,                                   VIBRAP     76
                     F               IUMODK,IFMODK,IUPHT,IFPHT,IUQT,IFQT,IUQ,IFQ,                   VIBRAP     77
                     G               IUPH,IFPH,IUINCM,IFINCM,IUINCK,IFINCK                          VIBRAP     78
                      COMMON /PLAYFF/ IUMDFF,IFMDFF,IUDLTI,IFDLTI,IUSLTI,IFSLTI                     VIBRAP     79
                     1               ,IUMPLI,IFMPLI,IUTPGT,IFTPGT,IUPATF,IFPATF                     VIBRAP     80
80                   2               ,IUMPL,IFMPL,IUSLT,IFSLT,IUDLT,IFDLT                           VIBRAP     81
                     3               ,IUQA,IFQA,IUQAT,IFQAT,IUPHA,IFPHA,IUPHAT,IFPHAT               VIBRAP     82
                      COMMON /KLUFF/ KFREE                                                          VIBRAP     83
                C                                                                                   VIBRAP     84
                      EQUIVALENCE    (U(1),COORD(1,1)) , (V(1),COORD(2,153))                        VIBRAP     85
85                    EQUIVALENCE    (UU(1),XX(1)) ,  (VV(1),XX(48))                                VIBRAP     86
                      EQUIVALENCE    (MPLOT(1),A(1,1)),  (MPLOT(10),B(1,1))                         VIBRAP     87
                      EQUIVALENCE    (MPLOT(19),C(1,1))                                             VIBRAP     88
                      EQUIVALENCE    (TITLE(1),MPLOT(1))                                            VIBRAP     89
                C                                                                                   VIBRAP     90
90                    DATA   XSYM/4H   X/,  YSYM/4H   Y/,  ZSYM/4H   Z/                             VIBRAP     91
                      DATA   VAPL/4HVAPL/                                                           VIBRAP     92
                C                                                                                   VIBRAP     93
                C                                                                                   VIBRAP     94
                      REWIND ITAPER                                                                 VIBRAP     95
95                  100 READ (ITAPER,9000) VPVAR                                                    VIBRAP     96
                      IF (VPVAR.NE.VAPL)   GOTO 100                                                 VIBRAP     97
                C                                                                                   VIBRAP     98
                C                                                                                   VIBRAP     99
                C                                                                                   VIBRAP    100
100             C     INITIALIZATION OF I/O UNITS                                                   VIBRAP    101
                C                                                                                   VIBRAP    102
                      MTAP1  =  ITAPES(21)                                                          VIBRAP    103
                      MTAP2  =  ITAPES(22)                                                          VIBRAP    104
                      MTAP3  =  ITAPES(23)                                                          VIBRAP    105
105                   MTAP4  =  ITAPES(24)                                                          VIBRAP    106
                C                                                                                   VIBRAP    107
                CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS                 VIBRAP    108
                C     MTAP8  =  ITAPES(28)                                                          VIBRAP    109
                C     MTAP9  =  ITAPES(29)                                                          VIBRAP    110
110             CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS                    VIBRAP    111
                C                                                                                   VIBRAP    112
                C                                                                                   VIBRAP    113
                C     DATA FOR DASHED LINE THROUGH DISPLACEMENT                                     VIBRAP    114
                C                                                                                   VIBRAP    115
```

```
      SUBROUTINE VIBRAP (KPLOTV,KPLOTF,NPLOTV)                          VIBRAP     2
C                                                                       VIBRAP     3
      INTEGER YES                                                       VIBRAP     4
C                                                                       VIBRAP     5
C     THIS PROGRAM WILL DRAW A GRID AND MODE SHAPE IN PROJECTION ON THE VIBRAP     6
C     CALCOMP PLOTTER                                                   VIBRAP     7
C                                                                       VIBRAP     8
C                                                                       VIBRAP     9
C                                                                       VIBRAP    10
C     MAXIMUM NUMBER OF BEAMS IN GRID  =  40                            VIBRAP    11
C                                                                       VIBRAP    12
C                                                                       VIBRAP    13
C     MAXIMUM NUMBER OF POINTS ON A BEAM  =  20                         VIBRAP    14
C                                                                       VIBRAP    15
C     LARGEST VALUE OF GRID PT. NUMBER  =  800                          VIBRAP    16
C                                                                       VIBRAP    17
C     MAXIMUM NUMBER OF MODES TO BE PLOTTED  =  20                      VIBRAP    18
C                                                                       VIBRAP    19
C                                                                       VIBRAP    20
CIBM                                                                    VIBRAP    21
C     DIMENSION BUFFER(1512)                                            VIBRAP    22
CIBM                                                                    VIBRAP    23
C                                                                       VIBRAP    24
CCDC                                                                    VIBRAP    25
      DIMENSION BUFFER(512)                                             VIBRAP    26
CCDC                                                                    VIBRAP    27
C                                                                       VIBRAP    28
      DIMENSION         A(3,3) ,       B(3,3) ,       C(3,3)           VIBRAP    29
      DIMENSION       BMREF(2)                                          VIBRAP    30
      DIMENSION      DISP(800) ,     DOF(800)                           VIBRAP    31
      DIMENSION   DISPPT(3,20)                                          VIBRAP    32
      DIMENSION     IDISP(800)                                          VIBRAP    33
      DIMENSION ITAPES(50)                                              VIBRAP    34
      DIMENSION       JPTS(20)                                          VIBRAP    35
      DIMENSION MPLOT(40)                                               VIBRAP    36
      DIMENSION    NCOORD(457) ,   NCDEF(457) ,   NPTSBM(40)            VIBRAP    37
      DIMENSION     RORMV(2,3) ,   PROD(2,3)                            VIBRAP    38
      DIMENSION      SCRTCH(3) ,     SCRT2(2)                           VIBRAP    39
      DIMENSION      TITLE(18)                                          VIBRAP    40
      DIMENSION         U(457) ,       V(457)                          VIBRAP    41
      DIMENSION        UU(457) ,      VV(457)                          VIBRAP    42
      DIMENSION  U1(4) ,  V1(4)                                         VIBRAP    43
      DIMENSION   WKAREA(3,20) , COORD(3,457)                           VIBRAP    44
      DIMENSION      WORK(200)                                          VIBRAP    45
      DIMENSION       XXX(3,3) ,      PI(3,3) ,    PITR(3,3)           VIBRAP    46
      DIMENSION   XPRIM(3,800)                                          VIBRAP    47
      DIMENSION      XX(954  )                                          VIBRAP    48
      DIMENSION       XX2(954)                                          VIBRAP    49
      DIMENSION       YMIN(40) ,     ZMIN(40)                           VIBRAP    50
      DIMENSION       YMAX(40) ,     ZMAX(40)                           VIBRAP    51
      DIMENSION NAME(2)                                                 VIBRAP    52
C                                                                       VIBRAP    53
      COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              VIBRAP    54
      COMMON /CTAPES/ ITAPES                                            VIBRAP    55
      COMMON /CPLOTS/ KPLOTS                                            VIBRAP    56
      COMMON /CONSTS/ NO    ,YES                                        VIBRAP    57
      COMMON /CLIST/ NO,LP,ERASE,LINES,LINEST,WLABEL,KTRACE,NPAGE       VIBRAP    58
```

STATEMENT LABELS			DEF LINE	REFERENCES
46	120		52	46
0	130		54	40
0	140		59	56
0	150	INACTIVE	62	2*61
0	180		67	65
0	190		69	62
123	200		70	61

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
14	130	I	40 54	40B	NOT INNER
23	90	J	43 45	4B	INSTACK
40	110	J	49 51	5B	INSTACK
64	140	I	56 59	4B	INSTACK
77	190	L	62 69	24B	NOT INNER
110	180	J	65 67	4B	INSTACK

EQUIV CLASSES	LENGTH	MEMBERS - BIAS NAME(LENGTH)
SUN	1	0 SUM (1)

STATISTICS

PROGRAM LENGTH 150B 104

52000B CM USED

```
                      A(LL+1) = Q(I)                                    DAGGER     59
                  140 LL = LL + 1                                       DAGGER     60
        60            A(LL) = SUN                                       DAGGER     61
                      IF (M - K)  150, 200, 150                         DAGGER     62
                  150 DO 190  L = K1,M                                  DAGGER     63
                      JL = LL+L-K                                       DAGGER     64
                      SUM = 0.                                          DAGGER     65
        65            DO 180  J = 1,K                                   DAGGER     66
                      SUM = SUM + P(J)*A(JL)                            DAGGER     67
                  180 JL = JL + 1                                       DAGGER     68
                      LL = LL + L - 1                                   DAGGER     69
                  190 A(LL) = SUM                                       DAGGER     70
        70        200 CONTINUE                                          DAGGER     71
                C                                                       DAGGER     72
                      RETURN                                            DAGGER     73
                      END                                               DAGGER     74
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	DAGGER	29	72

VARIABLES	SN	TYPE	RELOCATION								
0	A	REAL	ARRAY	F.P.	REFS	31	44	50	66	DEFINED	29	58
					60	69						
131	I	INTEGER			REFS	49	52	54	2*57	58		
					DEFINED	40	56					
130	INDEX	INTEGER			REFS	41	53	DEFINED	39	53		
133	J	INTEGER			REFS	44	50	51	66	DEFINED	43	49
					65							
134	JL	INTEGER			REFS	66	67	DEFINED	63	67		
124	K	INTEGER			REFS	36	46	49	56	61	63	65
					DEFINED	35						
0	KO	INTEGER		F.P.	REFS	35	DEFINED	29				
125	K1	INTEGER			REFS	40	62	DEFINED	36			
126	L	INTEGER			REFS	43	46	47	48	53	63	68
					DEFINED	37	54	62				
132	LJ	INTEGER			REFS	44	45	50	51	DEFINED	41	45
					48	51						
127	LL	INTEGER			REFS	47	48	58	59	60	63	68
					69	DEFINED	38	47	59	68		
0	M	INTEGER		F.P.	REFS	61	62	DEFINED	29			
0	P	REAL	ARRAY	F.P.	REFS	31	44	50	57	66		
					DEFINED	29						
0	Q	REAL	ARRAY	F.P.	REFS	31	57	58	DEFINED	29	52	
135	SUM	REAL			REFS	33	44	50	57	66	69	
					DEFINED	42	44	50	55	57	64	66
135	SUN	REAL			REFS	33	52	60				

STATEMENT LABELS			DEF LINE	REFERENCES
0	90		45	43
0	100	INACTIVE	47	2*46
0	110		51	49

```
      C45700, SUB. DAGGER                                                    DAGGER      2
      C                                                                      DAGGER      3
      C*********************************************************************** DAGGER      4
      C                                                                     * DAGGER      5
      C***  SUBROUTINE          ********************************************** DAGGER      6
      C                                                                     * DAGGER      7
      C***  COMPUTER VERSION    ********************************************** DAGGER      8
      C     ----------------                                                * DAGGER      9
      C     IBM .... AS IS.                                                 * DAGGER     10
      C                                                                     * DAGGER     11
      C     CDC .... AS IS.                                                 * DAGGER     12
      C                                                                     * DAGGER     13
      C***  OBJECTIVE  ************************************************************ DAGGER     14
      C     ---------                                                       * DAGGER     15
      C     FORM THE EIGENVALUE COEFFICIENT MATRIX IN COLUMN SORT FOR THE   * DAGGER     16
      C     STIFFNESS APPROACH.                                             * DAGGER     17
      C                                                                     * DAGGER     18
      C***  INPUT/OUTPUT  ********************************************************* DAGGER     19
      C     ------------                                                    * DAGGER     20
      C                                                                     * DAGGER     21
      C***  SUMMARY OF SYMBOLS  *************************************************** DAGGER     22
      C     ------------------                                              * DAGGER     23
      C                                                                     * DAGGER     24
      C***  ERROR MESSAGES  ******************************************************* DAGGER     25
      C     --------------                                                  * DAGGER     26
      C     NONE.                                                           * DAGGER     27
      C                                                                     * DAGGER     28
      C*********************************************************************** DAGGER     29
            SUBROUTINE DAGGER(A,M,P,KO,Q)                                    DAGGER     30
      C                                                                      DAGGER     31
            DIMENSION A(1),P(1),Q(1)                                         DAGGER     32
      C                                                                      DAGGER     33
            EQUIVALENCE (SUN,SUM)                                            DAGGER     34
      C                                                                      DAGGER     35
            K = KO                                                           DAGGER     36
            K1 = K + 1                                                       DAGGER     37
            L=1                                                              DAGGER     38
            LL = 0                                                           DAGGER     39
            INDEX = 1                                                        DAGGER     40
            DO 130  I = 2,K1                                                 DAGGER     41
            LJ = INDEX                                                       DAGGER     42
            SUM = 0.                                                         DAGGER     43
            DO 90  J = 1,L                                                   DAGGER     44
            SUM = SUM + A(LJ)*P(J)                                           DAGGER     45
         90 LJ = LJ + 1                                                      DAGGER     46
            IF (K - L) 100,120,100                                           DAGGER     47
        100 LL = LL + L                                                      DAGGER     48
            LJ = LL + L                                                      DAGGER     49
            DO 110  J = I,K                                                  DAGGER     50
            SUM = SUM + A(LJ)*P(J)                                           DAGGER     51
        110 LJ = LJ + J                                                      DAGGER     52
        120 Q(I-1) = SUN                                                     DAGGER     53
            INDEX = INDEX + L                                                DAGGER     54
        130 L = I                                                            DAGGER     55
            SUM = 0.                                                         DAGGER     56
            DO 140  I = 1,K                                                  DAGGER     57
            SUM = SUM + P(I)*Q(I)                                            DAGGER     58
```

```
EXTERNALS            TYPE    ARGS        REFERENCES
       SQRT        REAL        1 LIBRARY      70

INLINE FUNCTIONS    TYPE    ARGS         DEF LINE  REFERENCES
       SQRTF       REAL        1    SF        46        70

STATEMENT LABELS                DEF LINE    REFERENCES
    0  50           INACTIVE        55          54
   17  60                           57          2*54
   20  70                           58          56
   26  80                           62          57          61
    0  90                           65          63
   41  100                          66          55          61
    0  105          INACTIVE        68          67
    0  110          INACTIVE        70          69
   52  120                          73          2*67
   55  130                          74          72
    0  140                          75          59
    0  210                          77          50
   66  220                          80          83
   67  980                          82          2*69

LOOPS  LABEL     INDEX      FROM-TO     LENGTH    PROPERTIES
   11  210       K            50 77       54B              EXT REFS    EXITS   NOT INNER
   23  140       I            59 75       36B              EXT REFS    EXITS   NOT INNER
   34  90        KJ           63 65        4B      INSTACK

EQUIV CLASSES    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       SUN            1                 0 SUM    (1)

STATISTICS
  PROGRAM LENGTH                 114B       76
          52000B CM USED
```

```
                    70 I1 = K1                                                  FUTILE     59
                       DO 140 I=K,N                                             FUTILE     60
      60               SUM = -A(IK)                                             FUTILE     61
                       GO TO LEAP, (80,100)                                     FUTILE     62
                    80 IJ = I1                                                  FUTILE     63
                       DO 90 KJ=K1,KK1                                          FUTILE     64
                       SUM = SUM+A(IJ)*A(KJ)                                    FUTILE     65
      65            90 IJ = IJ+1                                                FUTILE     66
                   100 I1 = I1+I                                                FUTILE     67
                       IF (I-K) 120,105,120                                     FUTILE     68
                   105 DENOM = -SUM                                             FUTILE     69
                       IF (DENOM) 980,980,110                                   FUTILE     70
      70           110 DENOM = -SQRTF(DENOM)                                    FUTILE     71
                       A(IK) = -DENOM                                           FUTILE     72
                       GO TO 130                                                FUTILE     73
                   120 A(IK) = SUM/DENOM                                        FUTILE     74
                   130 IK = IK+I                                                FUTILE     75
      75           140 CONTINUE                                                 FUTILE     76
                       K1 = K1+K                                                FUTILE     77
                   210 CONTINUE                                                 FUTILE     78
                       NIX = 0                                                  FUTILE.    79
                 C                                                              FUTILE     80
      80           220 RETURN                                                   FUTILE     81
                 C                                                              FUTILE     82
                   980 NIX = -K                                                 FUTILE     83
                       GO TO 220                                                FUTILE     84
                 C                                                              FUTILE     85
      85               END                                                      FUTILE     86
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	FUTILE	34	80

VARIABLES	SN	TYPE	RELOCATION									
0	A	REAL	ARRAY	F.P.	REFS	40	60	2*64	DEFINED	34	71	73
103	DENOM	REAL			REFS	69	70	71	73	DEFINED	68	70
100	I	INTEGER			REFS	66	67	74	DEFINED	59		
101	IJ	INTEGER			REFS	64	65	DEFINED	62	65		
74	IK	INTEGER			REFS	60	71	73	74	DEFINED	52	74
77	I1	INTEGER			REFS	62	66	DEFINED	58	66		
73	K	INTEGER			REFS	51	59	67	76	82		
					DEFINED	50						
102	KJ	INTEGER			REFS	64	DEFINED	63				
72	KK	INTEGER			REFS	51	52	53	DEFINED	49	51	
75	KK1	INTEGER			REFS	54	63	DEFINED	53			
71	K1	INTEGER			REFS	58	63	76	DEFINED	48	76	
76	LEAP	INTEGER			REFS	61	DEFINED	55	57			
0	N	INTEGER		F.P.	REFS	50	59	DEFINED	34			
0	NIX	INTEGER		F.P.	DEFINED	34	78	82				
104	SUM	REAL			REFS	42	64	68	73	DEFINED	60	64
104	SUN	REAL			REFS	42						

```
      C45700, SUB. FUTILE                                                    FUTILE     2
      C                                                                      FUTILE     3
      C*********************************************************************** FUTILE     4
      C                                                                     * FUTILE     5
      C***  SUBROUTINE          ********************************************** FUTILE     6
      C                                                                     * FUTILE     7
      C***  COMPUTER VERSION    ********************************************** FUTILE     8
      C     ----------------                                                * FUTILE     9
      C     IBM .... INCLUDES DOUBLE PRECISION TYPE STATEMENTS.  COLUMN ONE * FUTILE    10
      C               SHOULD BE BLANK.                                      * FUTILE    11
      C                                                                     * FUTILE    12
      C     CDC .... DOES NOT INCLUDE DOUBLE PRECISION TYPE STATEMENTS.     * FUTILE    13
      C               THESE STATEMENTS ARE CONVERTED INTO COMMENTS BY       * FUTILE    14
      C               INSERTING THE LETTER C IN COLUMN ONE.                 * FUTILE    15
      C                                                                     * FUTILE    16
      C***  OBJECTIVE  ********************************************************** FUTILE    17
      C     ---------                                                       * FUTILE    18
      C     FORM THE CHOLESKY DECOMPOSITION OF A MATRIX.  GIVEN THE MATRIX  * FUTILE    19
      C     X, THE PROGRAM USES THE CHOLESKY DECOMPOSITION PROCEDURE TO SOLVE* FUTILE    20
      C     FOR A MATRIX WHICH IS A LOWER TRIANGULAR MATRIX AS FOLLOWS,     * FUTILE    21
      C     X =  (L) * (L TRANSPOSE).                                       * FUTILE    22
      C                                                                     * FUTILE    23
      C***  INPUT/OUTPUT  ********************************************************** FUTILE    24
      C     ------------                                                    * FUTILE    25
      C                                                                     * FUTILE    26
      C***  SUMMARY OF SYMBOLS  ************************************************ FUTILE    27
      C     ------------------                                              * FUTILE    28
      C                                                                     * FUTILE    29
      C***  ERROR MESSAGES  ****************************************************** FUTILE    30
      C     --------------                                                  * FUTILE    31
      C     NONE.                                                           * FUTILE    32
      C                                                                     * FUTILE    33
      C*********************************************************************** FUTILE    34
            SUBROUTINE FUTILE (A,N,NIX)                                     FUTILE    35
      C                                                                     FUTILE    36
      CIBM  BEGINNING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS FUTILE    37
      C     DOUBLE PRECISION SUM                                            FUTILE    38
      CIBM  ENDING OF TYPE STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS  FUTILE    39
      C                                                                     FUTILE    40
            DIMENSION A(1)                                                  FUTILE    41
      C                                                                     FUTILE    42
            EQUIVALENCE (SUN,SUM)                                           FUTILE    43
      C                                                                     FUTILE    44
      C                                                                     FUTILE    45
      C FUNCTION DEFINITION                                                 FUTILE    46
            SQRTF(X)      =  SQRT(X)                                        FUTILE    47
      C                                                                     FUTILE    48
            K1 = 1                                                          FUTILE    49
            KK = 0                                                          FUTILE    50
            DO 210 K=1,N                                                    FUTILE    51
            KK = KK+K                                                       FUTILE    52
            IK = KK                                                         FUTILE    53
            KK1 = KK-1                                                      FUTILE    54
            IF (KK1) 60,50,60                                               FUTILE    55
         50 ASSIGN 100 TO LEAP                                              FUTILE    56
            GO TO 70                                                        FUTILE    57
         60 ASSIGN 80 TO LEAP                                               FUTILE    58
```

STATEMENT LABELS			DEF LINE	REFERENCES
45	125		61	50
47	130		62	48
52	140		63	61
54	145		64	73
0	150	INACTIVE	68	2*67
0	160		72	70
101	170		75	2*61 67

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
21	120	I	52 60	24B	NOT INNER
32	110	J	56 58	4B	INSTACK
74	160	J	70 72	3B	INSTACK

EQUIV CLASSES	LENGTH	MEMBERS - BIAS NAME(LENGTH)
SUN	1	0 SUM (1)

STATISTICS
PROGRAM LENGTH 121B 81
520000B CM USED

```
                  110 IJ = IJ+1                                                  TRIEQ     59
                      II = IJ                                                    TRIEQ     60
      60              120 Y(I+1) = -SUM/A(II)                                    TRIEQ     61
                      125 IF (INDIC8) 170,140,170                                TRIEQ     62
                      130 II = (M*M+M)/2-LM1                                     TRIEQ     63
                      140 I = M                                                  TRIEQ     64
                      145 Y(I) = Y(I)/A(II)                                      TRIEQ     65
      65              II = II-I                                                  TRIEQ     66
                      I = I-1                                                    TRIEQ     67
                      IF (I-L1) 170,150,150                                      TRIEQ     68
                      150 SUN = -Y(I+1)                                          TRIEQ     69
                      IJ = II+L1                                                 TRIEQ     70
      70              DO 160 J=L1,I                                              TRIEQ     71
                      Y(J) = Y(J)+SUN*A(IJ)                                      TRIEQ     72
                      160 IJ = IJ+1                                              TRIEQ     73
                      GO TO 145                                                  TRIEQ     74
                  C                                                              TRIEQ     75
      75              170 RETURN                                                 TRIEQ     76
                      END                                                        TRIEQ     77
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	TRIEQ	33	75

VARIABLES	SN	TYPE	RELOCATION								
0	A	REAL	ARRAY	F.P.	REFS	40	49	57	60	64	71	
					DEFINED	33						
106	I	INTEGER			REFS	53	54	56	60	2*64	65	66
						67	68	70	DEFINED	52	63	66
111	II	INTEGER			REFS	60	64	65	69	DEFINED	59	62
						65						
107	IJ	INTEGER			REFS	57	58	59	71	72		
					DEFINED	55	58	69	72			
0	INDIC8	INTEGER		F.P.	REFS	48	61	DEFINED	33			
105	I1	INTEGER			REFS	53	55	DEFINED	51	53		
110	J	INTEGER			REFS	57	2*71	DEFINED	56	70		
0	L	INTEGER		F.P.	REFS	45	DEFINED	33				
103	LM1	INTEGER			REFS	62	DEFINED	46				
102	L1	INTEGER			REFS	46	3*49	51	52	56	67	69
						70	DEFINED	45				
0	M	INTEGER		F.P.	REFS	47	3*62	63	DEFINED	33		
104	MM1	INTEGER			REFS	50	52	DEFINED	47			
112	SUM	REAL			REFS	43	57	60	DEFINED	54	57	
112	SUN	REAL			REFS	43	71	DEFINED	68			
0	Y	REAL	ARRAY	F.P.	REFS	40	49	54	57	64	68	71
					DEFINED	33	49	60	64	71		

STATEMENT LABELS			DEF LINE	REFERENCES
0	100	INACTIVE	49	2*48
0	105	INACTIVE	51	2*50
0	110		58	56
0	120		60	52

```
      C                                                                 VIBRAP   344
            KOUNT=LINES                                                 VIBRAP   345
345         CALL TITLES(2)                                              VIBRAP   346
            WRITE(ITAPEW,9011) BMREF,BEAML,RATIO                        VIBRAP   347
            KOUNT=KOUNT+5                                               VIBRAP   348
      C     MPLOT IS AN ARRAY CONTAINING MODES TO BE PLOTTED            VIBRAP   349
      C                                                                 VIBRAP   350
350         READ(ITAPER,9003) NPLOTS                                    VIBRAP   351
            READ(ITAPER,9003) (MPLOT(I),I=1,NPLOTS)                     VIBRAP   352
            CALL PLB(1,3,ITAPEW)                                        VIBRAP   353
            KOUNT=KOUNT+3                                               VIBRAP   354
            WRITE(ITAPEW,9012) NPLOTS,(MPLOT(I),I=1,NPLOTS)             VIBRAP   355
355         KOUNT=KOUNT+1                                               VIBRAP   356
      C     READ DYNAMIC DOF'S IN THE ORDER IN WHICH THEY WILL BE PLOTTED VIBRAP  357
      C     IN THE DYNAMICS GRID                                        VIBRAP   358
            READ(ITAPER,9003) NCDI                                      VIBRAP   359
            READ(ITAPER,9003) (IDISP(I),I=1,NCDI)                       VIBRAP   360
360   C                                                                 VIBRAP   361
      C     IF MPLOT(K) IS NEGATIVE, MODE PLOT WILL BE MULTIPLIED BY -1 VIBRAP   362
      C                                                                 VIBRAP   363
            MODE=0                                                      VIBRAP   364
            DO 21 KNTR=1,NPLOTS                                         VIBRAP   365
365         NEXT=MODE+1                                                 VIBRAP   366
            MODE=IABS(MPLOT(KNTR))                                      VIBRAP   367
            DO 48 I=NEXT,MODE                                           VIBRAP   368
         48 CALL GETROW(IUCOM,1,WORK,NCOL)                              VIBRAP   369
            IF (KNTR.EQ.1)  GOTO 22                                     VIBRAP   370
370         CALL PLOT (HSCLP4, 0., -3)                                  VIBRAP   371
         22 CONTINUE                                                    VIBRAP   372
            XMODNO=MODE                                                 VIBRAP   373
            CALL NUMBER(-.5, 8., .28, XMODNO, 90., -1)                  VIBRAP   374
            JKNTR  =  1                                                 VIBRAP   375
375      39 CONTINUE                                                    VIBRAP   376
            L=IDISP(JKNTR)                                              VIBRAP   377
            VALU=0.0                                                    VIBRAP   378
            IF(L.GE.1.AND.L.LE.NCOL) VALU=WORK(L)                       VIBRAP   379
            DISP(JKNTR)=VALU                                            VIBRAP   380
380         IF (JKNTR .EQ. NCDI) GO TO 44                               VIBRAP   381
            JKNTR  =  JKNTR + 1                                         VIBRAP   382
            GOTO 39                                                     VIBRAP   383
         44 CONTINUE                                                    VIBRAP   384
            IF (MPLOT(KNTR).GT.0)  GOTO 27                              VIBRAP   385
385         DO 28 IM = 1,NCDI                                           VIBRAP   386
            DISP(IM) = -DISP(IM)                                        VIBRAP   387
         28 CONTINUE                                                    VIBRAP   388
      C                                                                 VIBRAP   389
         27 CONTINUE                                                    VIBRAP   390
390         KOUNT=LINES                                                 VIBRAP   391
            NF=0                                                        VIBRAP   392
         90 CONTINUE                                                    VIBRAP   393
            NS=NF+1                                                     VIBRAP   394
            NF=NF+5                                                     VIBRAP   395
395         IF(NF.GT.NCDI) NF=NCDI                                      VIBRAP   396
            CALL TITLES(2)                                              VIBRAP   397
            IF(KOUNT.GT.KOUNTH) GO TO 92                                VIBRAP   398
            WRITE(ITAPEW,9013) MODE                                     VIBRAP   399
            KOUNT=KOUNT+5                                               VIBRAP   400
```

```
      92 CONTINUE                                                        VIBRAP   401
         WRITE(ITAPEW,9014) (L,DISP(L),L=NS,NF)                          VIBRAP   402
         KOUNT=KOUNT+1                                                   VIBRAP   403
         IF(NF.LT.NCDI) GO TO 90                                         VIBRAP   404
C                                                                        VIBRAP   405
C                                                                        VIBRAP   406
C     SEARCH FOR THE LARGEST DISPLACEMENT IN ABSOLUTE VALUE              VIBRAP   407
C                                                                        VIBRAP   408
      CALL ARAYMX (DISP, 800, DISPMX)                                    VIBRAP   409
C     WRITE (ITAPEW,500)  DISPMX                                         VIBRAP   410
C                                                                        VIBRAP   411
C     MULTIPLY ALL DISPLACEMENTS TO REFLECT NEW RATIO                    VIBRAP   412
      RRAT  =  DSPMX1 / DISPMX                                           VIBRAP   413
C     WRITE (ITAPEW,500)  BEAML, DSPMX1, RRAT                            VIBRAP   414
      DO  18  II=1,800                                                   VIBRAP   415
      DISP(II)  =  RRAT * DISP(II)                                       VIBRAP   416
C     WRITE (ITAPEW,500)  DISP(II)                                       VIBRAP   417
   18 CONTINUE                                                           VIBRAP   418
C                                                                        VIBRAP   419
      NSUM  = 0                                                          VIBRAP   420
      REWIND MTAP3                                                       VIBRAP   421
      DO 62  I=1,NBEAMS                                                  VIBRAP   422
      READ (MTAP3)  WORD1, WORD2,   NPTBM                                VIBRAP   423
      READ (MTAP3)  (JPTS(K),K=1,NPTBM)                                  VIBRAP   424
      NPTSBM(I)  =  NPTBM                                                VIBRAP   425
C                                                                        VIBRAP   426
      DO 31  II=1,NPTBM                                                  VIBRAP   427
      NUM  =  JPTS(II)                                                   VIBRAP   428
      WKAREA(1,II)  =  XPRIM(1,NUM)                                      VIBRAP   429
      WKAREA(2,II)  =  XPRIM(2,NUM)                                      VIBRAP   430
      WKAREA(3,II)  =  XPRIM(3,NUM)                                      VIBRAP   431
      IF (DOF(NUM).EQ.XSYM) GOTO 33                                      VIBRAP   432
      IF (DOF(NUM).EQ.YSYM) GOTO 34                                      VIBRAP   433
      IF (DOF(NUM).EQ.ZSYM) GOTO 35                                      VIBRAP   434
      LEFT=LINES-KOUNT                                                   VIBRAP   435
      IF(LEFT.LT.3) KOUNT=LINES                                          VIBRAP   436
      CALL TITLES(2)                                                     VIBRAP   437
      WRITE(ITAPEW,9015) NUM                                             VIBRAP   438
      KOUNT=KOUNT+3                                                      VIBRAP   439
      DISPPT(1,II )  = XPRIM(1,NUM)                                      VIBRAP   440
      DISPPT(2,II )  = XPRIM(2,NUM)                                      VIBRAP   441
      DISPPT(3,II )  = XPRIM(3,NUM)                                      VIBRAP   442
      GO TO 31                                                           VIBRAP   443
   33 DISPPT(1,II )  = XPRIM(1,NUM) - DISP(NUM)                          VIBRAP   444
      DISPPT(2,II )  = XPRIM(2,NUM)                                      VIBRAP   445
      DISPPT(3,II )  = XPRIM(3,NUM)                                      VIBRAP   446
      GO TO 31                                                           VIBRAP   447
   34 DISPPT(2,II )  = XPRIM(2,NUM) + DISP(NUM)                          VIBRAP   448
      DISPPT(1,II )  = XPRIM(1,NUM)                                      VIBRAP   449
      DISPPT(3,II )  = XPRIM(3,NUM)                                      VIBRAP   450
      GO TO 31                                                           VIBRAP   451
   35 DISPPT(3,II )  = XPRIM(3,NUM)  - DISP(NUM)                         VIBRAP   452
      DISPPT(1,II )  = XPRIM(1,NUM)                                      VIBRAP   453
      DISPPT(2,II )  = XPRIM(2,NUM)                                      VIBRAP   454
C     DISPPT IS THE ARRAY CONTAINING THE COORDINATES OF THE              VIBRAP   455
C     DISPLACED PTS. ON THE GIVEN BEAM                                   VIBRAP   456
   31 CONTINUE                                                           VIBRAP   457
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      C     WRITE(6,500)  ((WKAREA(K1,K2),K1=1,3),K2=1,NPTBM)                  VIBRAP   458
      C     WRITE (ITAPEW,500)  (DISPPT(1,II),DISPPT(2,II),DISPPT(3,II),       VIBRAP   459
      C    1                                                  II=1,NPTBM)     VIBRAP   460
460         IF (NPTBM.EQ.2)  GO TO 11                                          VIBRAP   461
      C                                                                        VIBRAP   462
            JUMP  =  6                                                         VIBRAP   463
      C                                                                        VIBRAP   464
      C     24/JUMP DEFINES THE NUMBER OF SPACES BETWEEN ADJACENT PTS USED     VIBRAP   465
465   C     TO DRAW        THE CURVE THRU THE UNDEFORMED BEAM                  VIBRAP   466
      C                                                                        VIBRAP   467
            NCOORD(I)  =  (NPTBM - 1) * 24 / JUMP + 1                          VIBRAP   468
      C                                                                        VIBRAP   469
      C     NCOORD IS THE NUMBER OF POINTS NEEDED TO DEFINE THE CURVE          VIBRAP   470
470   C     THROUGH THE UNDEFORMED BEAM                                        VIBRAP   471
      C     COORD IS THE (3,NCOORD) ARRAY CONTAINING THE COORDINATES           VIBRAP   472
      C     OF THE CURVE THROUGH THE UNDEFORMED BEAM                           VIBRAP   473
      C                                                                        VIBRAP   474
            N1  =  NCOORD(I)                                                   VIBRAP   475
475         CALL FERGCV (JUMP,WKAREA,NPTBM,COORD,N1)                           VIBRAP   476
      C     WRITE (ITAPEW,500)  ((COORD(II,J),II=1,3),J=1,N1)                  VIBRAP   477
            DO 32  II=1,N1                                                     VIBRAP   478
      C     TRANSFORM TOTHE Y-Z PLANE                                          VIBRAP   479
            CALL CLCORD  (PROD, COORD(1,II), SCRT2)                            VIBRAP   480
480         XX(II)  =  SCRT2(1)                                                VIBRAP   481
            XX2(II)  =  SCRT2(2)                                               VIBRAP   482
      C     WRITE (ITAPEW,500) SCRT2(1),SCRT2(2)                               VIBRAP   483
         32 CONTINUE                                                           VIBRAP   484
      C                                                                        VIBRAP   485
485         GO TO 12                                                           VIBRAP   486
         11 DO 13  II=1,2                                                      VIBRAP   487
            CALL CLCORD (PROD, WKAREA(1,II), SCRT2)                            VIBRAP   488
            XX(II)  =  SCRT2(1)                                                VIBRAP   489
            XX2(II)  =  SCRT2(2)                                               VIBRAP   490
490   C     WRITE (ITAPEW,500)  SCRT2(1),  SCRT2(2)                            VIBRAP   491
         13 CONTINUE                                                           VIBRAP   492
            NCOORD(I)  = 2                                                     VIBRAP   493
            N1   =  NCOORD(I)                                                  VIBRAP   494
      C                                                                        VIBRAP   495
495      12 CONTINUE                                                           VIBRAP   496
      C                                                                        VIBRAP   497
      C                                                                        VIBRAP   498
      C     DEFINE COORDINATES OF DISPLACEMENT LINE FOR EACH POINT ON THE BEAM VIBRAP   499
      C                                                                        VIBRAP   500
500         INDX   =  NPTBM + 1                                                VIBRAP   501
            DO 41  II=1,NPTBM                                                  VIBRAP   502
            IND1  =  INDX  - II                                                VIBRAP   503
            NUM  =  JPTS(IND1)                                                 VIBRAP   504
            CALL CLCORD  (PROD, XPRIM(1,NUM), SCRT2)                           VIBRAP   505
505         XX(N1   + 2*II - 1)  =  SCRT2(1)                                   VIBRAP   506
            XX2(N1   + 2*II -1)  =  SCRT2(2)                                   VIBRAP   507
      C     WRITE (ITAPEW,500) SCRT2(1),SCRT2(2)                               VIBRAP   508
            CALL CLCORD  (PROD, DISPPT(1,IND1), SCRT2)                         VIBRAP   509
            XX(N1   + 2*II)  =  SCRT2(1)                                       VIBRAP   510
510         XX2(N1   + 2*II)  =  SCRT2(2)                                      VIBRAP   511
      C     WRITE (ITAPEW,500) SCRT2(1),SCRT2(2)                               VIBRAP   512
         41 CONTINUE                                                           VIBRAP   513
      C                                                                        VIBRAP   514
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                C                                                               VIBRAP    515
515             C     NOW DEFINE CURVE THROUGH THE DEFORMED BEAM                VIBRAP    516
                      IF (NPTBM.EQ.2)  GO TO 14                                 VIBRAP    517
                      JUMP  =  1                                                VIBRAP    518
                      NCDEF(I)  =  (NPTBM - 1) * 24 /JUMP  +  1                 VIBRAP    519
                      N2    =  NCDEF(I)                                         VIBRAP    520
520                   CALL FERGCV (JUMP,DISPPT,NPTBM,COORD,N2)                  VIBRAP    521
                      DO 38  II=1,N2                                            VIBRAP    522
                      CALL CLCORD  (PROD, COORD(1,II),  SCRT2)                  VIBRAP    523
                      XX(N1 + 2*NPTBM + II)  =  SCRT2(1)                        VIBRAP    524
                      XX2(N1 + 2*NPTBM + II)  =  SCRT2(2)                       VIBRAP    525
525             C     WRITE (ITAPEW,500) SCRT2(1),SCRT2(2)                      VIBRAP    526
                   38 CONTINUE                                                  VIBRAP    527
                C                                                               VIBRAP    528
                      GO TO 15                                                  VIBRAP    529
                   14 DO 16  II=1,2                                             VIBRAP    530
530                   CALL CLCORD (PROD,  DISPPT(1,II),  SCRT2)                 VIBRAP    531
                      XX(N1 + 2*NPTBM + II)  =  SCRT2(1)                        VIBRAP    532
                      XX2(N1 + 2*NPTBM + II)  =  SCRT2(2)                       VIBRAP    533
                C     WRITE (ITAPEW,500) SCRT2(1),SCRT2(2)                      VIBRAP    534
                   16 CONTINUE                                                  VIBRAP    535
535                   NCDEF(I)  =  2                                            VIBRAP    536
                C                                                               VIBRAP    537
                   15 CONTINUE                                                  VIBRAP    538
                C                                                               VIBRAP    539
                C                                                               VIBRAP    540
540                   NSUM = NCOORD(I) + 2*NPTSBM(I)  +  NCDEF(I)               VIBRAP    541
                C                                                               VIBRAP    542
                C                                                               VIBRAP    543
                C                                                               VIBRAP    544
                C     WRITE UNSCALED VALUES OF Y ON UNIT MTAP1                  VIBRAP    545
545             C                                                               VIBRAP    546
                      DO 53  M=1,NSUM                                           VIBRAP    547
                      WRITE (MTAP1)  XX(M)                                      VIBRAP    548
                C     WRITE (ITAPEW,500)  XX(M)                                 VIBRAP    549
                   53 CONTINUE                                                  VIBRAP    550
550             C                                                               VIBRAP    551
                C                                                               VIBRAP    552
                C     WRITE ORIGINAL VALUES OF  Z ON UNIT MTAP2                 VIBRAP    553
                C                                                               VIBRAP    554
                      DO 56  M=1,NSUM                                           VIBRAP    555
555                   WRITE (MTAP2) XX2(M)                                      VIBRAP    556
                C     WRITE (ITAPEW,500) XX2(M)                                 VIBRAP    557
                   56 CONTINUE                                                  VIBRAP    558
                C                                                               VIBRAP    559
                      IF (KNTR .GT. 1) GOTO 62                                  VIBRAP    560
560             C                                                               VIBRAP    561
                C                                                               VIBRAP    562
                C     COMPUTE LARGEST AND SMALLEST VALUES OF UNSCALED Y'S       VIBRAP    563
                C           (HORIZONTAL SCALE VARIABLES)                        VIBRAP    564
                C                                                               VIBRAP    565
565                   CALL ARAYMN (XX, NCOORD(I), YMIN(I))                      VIBRAP    566
                      CALL MAX    (XX, NCOORD(I), YMAX(I))                      VIBRAP    567
                C                                                               VIBRAP    568
                C                                                               VIBRAP    569
                C     WRITE (ITAPEW, 500)  YMIN(I)                              VIBRAP    570
570             C     WRITE (ITAPEW, 500) YMAX(I)                               VIBRAP    571
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      C     WRITE (ITAPEW, 500) (XX(II),II=1,NSUM)                          VIBRAP   572
      C                                                                     VIBRAP   573
      C                                                                     VIBRAP   574
      C     COMPUTE LARGEST AND SMALLEST VALUES OF UNSCALED Z'S             VIBRAP   575
575   C           (VERTICAL SCALE VARIABLES)                                VIBRAP   576
      C                                                                     VIBRAP   577
            CALL ARAYMN (XX2, NCOORD(I), ZMIN(I))                           VIBRAP   578
            CALL MAX    (XX2, NCOORD(I), ZMAX(I))                           VIBRAP   579
      C                                                                     VIBRAP   580
580   C     WRITE (ITAPEW, 500)  ZMIN(I)                                    VIBRAP   581
      C     WRITE (ITAPEW, 500)  ZMAX(I)                                    VIBRAP   582
      C     WRITE (ITAPEW, 500)  (XX2(II),II=1,NSUM)                        VIBRAP   583
      C                                                                     VIBRAP   584
      C                                                                     VIBRAP   585
585      62 CONTINUE                                                        VIBRAP   586
      C                                                                     VIBRAP   587
            REWIND MTAP1                                                    VIBRAP   588
            REWIND MTAP2                                                    VIBRAP   589
      C                                                                     VIBRAP   590
590         IF (KNTR .GT.1) GOTO 68                                         VIBRAP   591
      C     COMPUTE LARGEST  Y  AND  Z  VALUES FOR ALL BEAMS                VIBRAP   592
      C           (TO BE USED IN SCALING)                                   VIBRAP   593
      C                                                                     VIBRAP   594
            CALL MAX (YMAX, NBEAMS, BGSTY)                                  VIBRAP   595
595         CALL MAX (ZMAX, NBEAMS, BGSTZ)                                  VIBRAP   596
      C     WRITE (ITAPEW,500)  BGSTY, BGSTZ                                VIBRAP   597
      C                                                                     VIBRAP   598
      C     COMPUTE SMALLEST  Y  AND  Z  VALUES FOR ALL BEAMS               VIBRAP   599
      C           (TO BE USED IN SCALING)                                   VIBRAP   600
600   C                                                                     VIBRAP   601
            CALL ARAYMN (YMIN  , NBEAMS, SMLSTY)                            VIBRAP   602
            CALL ARAYMN (ZMIN  , NBEAMS, SMLSTZ)                            VIBRAP   603
      C     WRITE (ITAPEW,500)  SMLSTY,  SMLSTZ                             VIBRAP   604
      C                                                                     VIBRAP   605
605         DY  =  (BGSTY - SMLSTY) / HSCALE                                VIBRAP   606
            DZ  = (BGSTZ - SMLSTZ + 2.*ABS(DSPMX1*PROD(2,3)))/ VSCALE       VIBRAP   607
      C                                                                     VIBRAP   608
            DSCALC  =  DY                                                   VIBRAP   609
            IF (DZ .GT. DY)  DSCALC  =  DZ                                  VIBRAP   610
610         SHIFT  =  (10.0 - (DZ*VSCALE/DY)) / 2.                          VIBRAP   611
            IF (DZ .GT. DY)  SHIFT  =  (10.0 - VSCALE) / 2.                 VIBRAP   612
      C     WRITE (ITAPEW, 500)  DY, DZ                                     VIBRAP   613
      C                                                                     VIBRAP   614
         68  CONTINUE                                                       VIBRAP   615
615   C                                                                     VIBRAP   616
      C                                                                     VIBRAP   617
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   VIBRAP   618
      C     UNSCALED  Y  AND  Z  VALUES ARE READ OFF MTAP1 AND MTAP2        VIBRAP   619
      C     SCALED AND REWRITTEN ON MTAP8 AND MTAP9.                        VIBRAP   620
620   C                                                                     VIBRAP   621
      C     DO 80  I=1,NBEAMS                                               VIBRAP   622
      C     NPTS  =  2*NPTSBM(I)  +  NCOORD(I)  +  NCDEF(I)                 VIBRAP   623
      C     DO 81  II=1,NPTS                                                VIBRAP   624
      C     READ (MTAP1)  YY                                                VIBRAP   625
625   C     YY  =  (YY - SMLSTY) / DSCALC                                   VIBRAP   626
      C     WRITE (ITAPEW,500)  YY                                          VIBRAP   627
      C     WRITE (MTAP8)  YY                                               VIBRAP   628
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                C     READ  (MTAP2)  YY                                                    VIBRAP   629
                C     YY =  (YY - (SMLSTZ - ABS(DSPMX1*PROD(2,3))))/DSCALC + SHIFT        VIBRAP   630
630             C     WRITE (ITAPEW,500)  YY                                              VIBRAP   631
                C     WRITE (MTAP9)  YY                                                   VIBRAP   632
                C  81 CONTINUE                                                            VIBRAP   633
                C  80 CONTINUE                                                            VIBRAP   634
                C     REWIND MTAP1                                                        VIBRAP   635
635             C     REWIND MTAP2                                                        VIBRAP   636
                C     REWIND MTAP8                                                        VIBRAP   637
                C     REWIND MTAP9                                                        VIBRAP   638
                CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS         VIBRAP   639
                C                                                                         VIBRAP   640
640             C                                                                         VIBRAP   641
                C                                                                         VIBRAP   642
                C     BEAMS ARE PLOTTED ONE AT A TIME                                     VIBRAP   643
                C                                                                         VIBRAP   644
                C                                                                         VIBRAP   645
645                   DO  60  I=1,NBEAMS                                                  VIBRAP   646
                      NPTS  =  NCOORD(I)                                                  VIBRAP   647
                C                                                                         VIBRAP   648
                C     PLOT THE CURVE THROUGH THE UNDEFORMED BEAM   FIRST                  VIBRAP   649
                C                                                                         VIBRAP   650
650             CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS       VIBRAP   651
                C     DO  61  M=1,NPTS                                                    VIBRAP   652
                C     READ (MTAP8)  U(M)                                                  VIBRAP   653
                C     READ (MTAP9)  V(M)                                                  VIBRAP   654
                C     WRITE (ITAPEW,500)  U(M),   V(M)                                    VIBRAP   655
655             C  61 CONTINUE                                                            VIBRAP   656
                C     CALL  LINE (U,V,NPTS,1,1,1,JL,S)                                    VIBRAP   657
                CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS         VIBRAP   658
                C                                                                         VIBRAP   659
                C                                                                         VIBRAP   660
660             CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS       VIBRAP   661
                                                                                          VIBRAP   662
                      U(NPTS+1)=SMLSTY                                                    VIBRAP   663
                      U(NPTS+2)=DSCALC                                                    VIBRAP   664
                      V(NPTS+1)=SMLSTZ - ABS(DSPMX1 *PROD(2,3)) - SHIFT*DSCALC            VIBRAP   665
665                   V(NPTS+2)=DSCALC                                                    VIBRAP   666
                                                                                          VIBRAP   667
                      DO 61 M=1,NPTS                                                      VIBRAP   668
                      READ(MTAP1) U(M)                                                    VIBRAP   669
                      READ(MTAP2) V(M)                                                    VIBRAP   670
670                61 CONTINUE                                                            VIBRAP   671
                      CALL LINE(U,V,NPTS,1,0,LM)                                          VIBRAP   672
                                                                                          VIBRAP   673
                CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS         VIBRAP   674
                C                                                                         VIBRAP   675
675             C     PLOT STRAIGHT LINE THROUGH UNDEFORMED & DEFORMED POINTS             VIBRAP   676
                C                                                                         VIBRAP   677
                      NPTBMI  =  NPTSBM(I)                                                VIBRAP   678
                      DO 71  II = 1,NPTBMI                                                VIBRAP   679
                C                                                                         VIBRAP   680
680             CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS       VIBRAP   681
                C     READ (MTAP8)  U(1)                                                  VIBRAP   682
                C     READ (MTAP9)  V(1)                                                  VIBRAP   683
                C     READ (MTAP8)  U(2)                                                  VIBRAP   684
                C     READ (MTAP9)  V(2)                                                  VIBRAP   685
```

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685          CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS          VIBRAP   686
             C                                                                        VIBRAP   687
             CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS      VIBRAP   688
                   READ(MTAP1) U(1)                                                   VIBRAP   689
                   READ(MTAP2) V(1)                                                   VIBRAP   690
690                READ(MTAP1) U(2)                                                   VIBRAP   691
                   READ(MTAP2) V(2)                                                   VIBRAP   692
                   U(1)   =  (U(1) - SMLSTY)/DSCALC                                   VIBRAP   693
                   U(2)   =  (U(2) - SMLSTY)/DSCALC                                   VIBRAP   694
                   V(1)   =  (V(1) - (SMLSTZ - ABS(DSPMX1*PROD(2,3))                  VIBRAP   695
695               1                  - SHIFT*DSCALC))/DSCALC                         VIBRAP   696
                   V(2)   =  (V(2) - (SMLSTZ - ABS(DSPMX1*PROD(2,3))                  VIBRAP   697
                  1                  - SHIFT*DSCALC))/DSCALC                         VIBRAP   698
             CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS         VIBRAP   699
             C                                                                        VIBRAP   700
700                DIST  =  SQRT((V(2) - V(1))**2 + (U(2) - U(1))**2)                 VIBRAP   701
             C     WRITE (ITAPEW,500)    DIST                                         VIBRAP   702
                   NCYCL  =  DIST / (DASH + BLANK)                                    VIBRAP   703
             C     WRITE (ITAPEW, 1000)  NCYCL                                        VIBRAP   704
                   IF (NCYCL.EQ.0) GO TO 72                                           VIBRAP   705
705          C     AT LEAST ONE DASH AND BLANK WILL BE DRAWN                          VIBRAP   706
                   ARG1  =  V(2) - V(1)                                               VIBRAP   707
                   ARG2  =  U(2) - U(1)                                               VIBRAP   708
                   ANGLE  =  ATAN2 (ARG1, ARG2)                                       VIBRAP   709
                   CALL PLOT (U(1),V(1),3)                                            VIBRAP   710
710          C     WRITE (ITAPEW,500)    ANGLE                                        VIBRAP   711
                   DO 73  IJ=1,NCYCL                                                  VIBRAP   712
                   IF (IJ.EQ.1)  ULL =  U(1)                                          VIBRAP   713
                   IF (IJ.EQ.1)  VLL =  V(1)                                          VIBRAP   714
                   UUL =  ULL+ 0.14 * COS (ANGLE)                                     VIBRAP   715
715                VUL =  VLL+ 0.14 * SIN (ANGLE)                                     VIBRAP   716
             C     WRITE (ITAPEW,500)    ULL,VLL, UUL, VUL                            VIBRAP   717
                   CALL PLOT (UUL, VUL, 2)                                            VIBRAP   718
                   UUL =  UUL+  .07 * COS (ANGLE)                                     VIBRAP   719
                   VUL =  VUL+  .07 * SIN (ANGLE)                                     VIBRAP   720
720          C     WRITE (ITAPEW,500)    ULL, VLL, UUL, VUL                           VIBRAP   721
                   CALL PLOT (UUL, VUL, 3)                                            VIBRAP   722
                   ULL =   UUL                                                        VIBRAP   723
                   VLL =  VUL                                                         VIBRAP   724
                73 CONTINUE                                                           VIBRAP   725
725                CALL PLOT (U(2),V(2),2)                                            VIBRAP   726
                   GO TO 71                                                           VIBRAP   727
             C     WRITE (ITAPEW,500)  U(1),  V(1),  U(2), V(2)                       VIBRAP   728
             C                                                                        VIBRAP   729
                72 CONTINUE                                                           VIBRAP   730
730                CALL PLOT (U(1),V(1),3)                                            VIBRAP   731
                   CALL PLOT (U(2),V(2),2)                                            VIBRAP   732
             C                                                                        VIBRAP   733
                71 CONTINUE                                                           VIBRAP   734
             C                                                                        VIBRAP   735
735          C     DRAW A HEAVY CURVE THROUGH THE DEFORMED BEAM                       VIBRAP   736
             C                                                                        VIBRAP   737
             C     FIRST READ POINTS DEFINING THE DEFORMED BEAM FROM I/O UNIT         VIBRAP   738
             C                                                                        VIBRAP   739
                   NPTS  = NCDEF(I)                                                   VIBRAP   740
740          C                                                                        VIBRAP   741
             CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS      VIBRAP   742
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      C     DO 63   II=1,NPTS                                                 VIBRAP   743
      C     READ (MTAP8)  U(II)                                               VIBRAP   744
      C     READ (MTAP9)   V(II)                                              VIBRAP   745
745   C     WRITE (ITAPEW,500)  U(II),  V(II)                                 VIBRAP   746
      C  63 CONTINUE                                                          VIBRAP   747
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS        VIBRAP   748
      C                                                                       VIBRAP   749
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS     VIBRAP   750
750                                                                           VIBRAP   751
            DO 63 II=1,NPTS                                                   VIBRAP   752
            READ(MTAP1) U(II)                                                 VIBRAP   753
            READ(MTAP2) V(II)                                                 VIBRAP   754
         63 CONTINUE                                                          VIBRAP   755
755   CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS        VIBRAP   756
      C                                                                       VIBRAP   757
      C                                                                       VIBRAP   758
      C     NEXT DRAW THREE CURVES EACH SLIGHTLY DISPLACED FROM ONE ANOTHER   VIBRAP   759
      C     THROUGH THE DEFORMED BEAM                                         VIBRAP   760
760   C                                                                       VIBRAP   761
            NPTSM1  =  NPTS - 1                                               VIBRAP   762
            DO  64  K=1,NPTSM1                                                VIBRAP   763
            DO 65  J=1,3                                                      VIBRAP   764
            IF (J.EQ.1)  GOTO 66                                              VIBRAP   765
765         ARG1  =  V(K+1)  - V(K)                                           VIBRAP   766
            ARG2  =  U(K+1)  - U(K)                                           VIBRAP   767
            ANGLE  =  ATAN2  (ARG1, ARG2)                                     VIBRAP   768
            DU  =  .005 * SIN(ANGLE)                                          VIBRAP   769
            DV  =  .005 * COS(ANGLE)                                          VIBRAP   770
770         IF (J.EQ.3)  DU  =  -DU                                           VIBRAP   771
            IF (J.EQ.3)  DV  =  -DV                                           VIBRAP   772
            GO TO 67                                                          VIBRAP   773
         66 DU  = 0                                                           VIBRAP   774
            DV  = 0.                                                          VIBRAP   775
775   C                                                                       VIBRAP   776
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS     VIBRAP   777
      C  67 U1(2)  = U(K+1)  - DU                                             VIBRAP   778
      C     V1(2)  =  V(K+1)  + DV                                            VIBRAP   779
      C     U1(1)  =  U(K) - DU                                               VIBRAP   780
780   C     V1(1)  =  V(K) + DV                                               VIBRAP   781
      C     CALL LINE  (U1,V1,2,1,1,1,JL,S)                                   VIBRAP   782
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS        VIBRAP   783
      C                                                                       VIBRAP   784
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS     VIBRAP   785
785      67 CONTINUE                                                          VIBRAP   786
            U1(2)  =  U(K+1) - DU*DSCALC                                      VIBRAP   787
            V1(2)  =  V(K+1) + DV*DSCALC                                      VIBRAP   788
            U1(1)  =  U(K)   - DU*DSCALC                                      VIBRAP   789
            V1(1)  =  V(K)   + DV*DSCALC                                      VIBRAP   790
790         U1(3)  =  SMLSTY                                                  VIBRAP   791
            U1(4)  =  DSCALC                                                  VIBRAP   792
            V1(3)  =  SMLSTZ - ABS(DSPMX1*PROD(2,3)) - SHIFT*DSCALC           VIBRAP   793
            V1(4)  =  DSCALC                                                  VIBRAP   794
            CALL LINE(U1,V1,2,1,0,LM)                                         VIBRAP   795
795   CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS        VIBRAP   796
      C                                                                       VIBRAP   797
         65 CONTINUE                                                          VIBRAP   798
         64 CONTINUE                                                          VIBRAP   799
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      C                                                                 VIBRAP  800
800   C                                                                 VIBRAP  801
         60 CONTINUE                                                    VIBRAP  802
      C                                                                 VIBRAP  803
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS VIBRAP 804
      C     REWIND MTAP8                                              VIBRAP  805
805   C     REWIND  MTAP9                                             VIBRAP  806
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS VIBRAP 807
      C                                                                 VIBRAP  808
      CCDC                                                              VIBRAP  809
            REWIND MTAP1                                                VIBRAP  810
810         REWIND MTAP2                                                VIBRAP  811
      CCDC                                                              VIBRAP  812
      C                                                                 VIBRAP  813
         21 CONTINUE                                                    VIBRAP  814
      C                                                                 VIBRAP  815
815         CALL DCLOSE(IUCOM)                                          VIBRAP  816
      C                                                                 VIBRAP  817
      C TERMINATE PLOTTING                                              VIBRAP  818
      C                                                                 VIBRAP  819
            CALL PLOT(HSCLP4, 0., -3)                                   VIBRAP  820
820         IF (KPLOTF .EQ. YES) GO TO 9500                             VIBRAP  821
            LEFT=LINES-KOUNT                                            VIBRAP  822
            IF(LEFT.LT.2) KOUNT=LINES                                   VIBRAP  823
            CALL TITLES (2)                                             VIBRAP  824
            CALL PLB (1,1,ITAPEW)                                       VIBRAP  825
825         WRITE(ITAPEW,9017)                                          VIBRAP  826
            KOUNT=KOUNT+2                                               VIBRAP  827
       9500 CONTINUE                                                    VIBRAP  828
      C                                                                 VIBRAP  829
            CALL TIMEB (36,36HFROM VIBRAP - PLOT VIBRATION RESULTS)     VIBRAP  830
830   C                                                                 VIBRAP  831
      C                                                                 VIBRAP  832
      C     FORMATS                                                     VIBRAP  833
      C                                                                 VIBRAP  834
       9000 FORMAT(18A4)                                                VIBRAP  835
835    9001 FORMAT(10X,18A4)                                           VIBRAP  836
       9002 FORMAT(3E15.5)                                              VIBRAP  837
       9003 FORMAT(10I5)                                                VIBRAP  838
       9004 FORMAT(10X,10(1H*),  25HGEOMETRY OF PLOTTING GRID,10(1H*),  VIBRAP  839
           1    //,10X,3H PT,16X,1HX,20X,1HY,20X,1HZ,15X,3HDOF,/)      VIBRAP  840
840    9005 FORMAT(I5,3E15.5,1X,A4)                                     VIBRAP  841
       9006 FORMAT(10X,I3,3(10X,1PE11.4),10X,A4)                        VIBRAP  842
       9007 FORMAT(2A4,2X,E10.3)                                        VIBRAP  843
       9008 FORMAT(2A4,2X,I5)                                           VIBRAP  844
       9009 FORMAT(/,10X,10(1H*),16HBEAM DEFINITIONS,10(1H*),           VIBRAP  845
845        1      //,10X,5H  NO.,3X,5HTITLE, 8X,16HCONNECTING NODES,84(1H.),/) VIBRAP 846
       9010 FORMAT(10X,I5,3X,2A4,5X,20I5)                               VIBRAP  847
       9011 FORMAT(/,10X,    29HTHE SELECTED REFERENCE BEAM (,2A4,      VIBRAP  848
           1                 18H) HAS A LENGTH OF ,F10.3,               VIBRAP  849
           2      //,10X,    44HRATIO OF MAX DISPLACEMENT TO REFERENCE BEAM , VIBRAP 850
850        3                  8HLENGTH =,F8.3,/)                        VIBRAP  851
       9012 FORMAT (10X, 13HTHE FOLLOWING, I3,,2X,25HMODES WILL BE PLOTTED... VIBRAP 852
           1      ,/,(10X, 14I5))                                       VIBRAP  853
       9013 FORMAT(/,10X,10(1H*),29HDISPLACEMENTS FOR MODE NUMBER,I3.1H . VIBRAP  854
           1             10(1H*),                                       VIBRAP  855
855        2     // 10X  5(22H     PT   DISPLACEMENT) /)                 VIBRAP  856
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                 9014 FORMAT(10X,5(I7,1PE15.5))                                  VIBRAP   857
                 9015 FORMAT(/,10X,   25HTHE DISPLACEMENT AT POINT,I4,           VIBRAP   858
                     1                34H CANNOT BE CLASSIFIED AS X,Y OR Z.,     VIBRAP   859
                     2                37H CHECK THE INPUT DATA FOR THIS POINT.,  VIBRAP   860
860                  3       /,10X,   45H ACCORDINGLY, THE DISPLACEMENT WILL BE SET TO,  VIBRAP   861
                     4                 6H ZERO.)                                 VIBRAP   862
                 9016 FORMAT(10X,37HINITIALIZE PLOTTING IN PROGRAM VIBRAP)       VIBRAP   863
                 9017 FORMAT(10X,36HTERMINATE PLOTTING IN PROGRAM VIBRAP)        VIBRAP   864
                C                                                                VIBRAP   865
865             C                                                                VIBRAP   866
                      RETURN                                                     VIBRAP   867
                      END                                                        VIBRAP   868
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	VIBRAP	1	866

VARIABLES

		SN	TYPE	RELOCATION								
2727	A		REAL	ARRAY	REFS	28	86	175	256	DEFINED	232	233
					234	235	236					
2716	ANGLE		REAL		REFS	714	715	718	719	768	769	
					DEFINED	708	767					
2714	ARG1		REAL		REFS	708	767	DEFINED	706	765		
2715	ARG2		REAL		REFS	708	767	DEFINED	707	766		
2740	B		REAL	ARRAY	REFS	28	86	176	253	DEFINED	239	240
					241	242	243					
2642	BEAML		REAL		REFS	328	346	DEFINED	327			
2641	BEAML2		REAL		REFS	327	DEFINED	326				
2677	BGSTY		REAL		REFS	594	605					
2700	BGSTZ		REAL		REFS	595	606					
2577	BLANK		REAL		REFS	702	DEFINED	116				
10424	BMREF		REAL	ARRAY	REFS	29	2*318	346	DEFINED	295		
7424	BUFFER		REAL	ARRAY	REFS	25	161					
2751	C		REAL	ARRAY	REFS	28	87	177	253	DEFINED	246	247
					248	249	250					
4671	COORD		REAL	ARRAY	REFS	43	2*84	187	475	479	520	522
2576	DASH		REAL		REFS	702	DEFINED	115				
2617	DEGTOR		REAL		REFS	225	226	227	DEFINED	224		
10426	DISP		REAL	ARRAY	REFS	30	189	386	401	408	415	443
					447	451	DEFINED	379	386	415		
2664	DISPMX		REAL		REFS	408	412					
13526	DISPPT		REAL	ARRAY	REFS	31	188	508	520	530		
					DEFINED	439	440	441	443	444	445	447
					448	449	451	452	453			
2712	DIST		REAL		REFS	702	DEFINED	700				
12066	DOF		REAL	ARRAY	REFS	30	190	289	431	432	433	
					DEFINED	283						
2705	DSCALC		REAL		REFS	663	664	665	692	693	2*694	2*696
					786	787	788	789	791	792	793	
					DEFINED	608	609					
2643	DSPMX1		REAL		REFS	412	606	664	694	696	792	

VARIABLES	SN	TYPE		RELOCATION								
2725	DU	REAL			REFS	770	786	788	DEFINED	768	770	773
2726	DV	REAL			REFS	771	787	789	DEFINED	769	771	774
2703	DY	REAL			REFS	608	609	610	611	DEFINED	605	
2704	DZ	REAL			REFS	2*609	610	611	DEFINED	606		
2600	HSCALE	REAL			REFS	124	605	DEFINED	122			
2602	HSCLP4	REAL			REFS	370	819	DEFINED	124			
2603	I	INTEGER			REFS	2*262	313	351	354	359	424	467
						474	492	493	518	519	535	3*540	2*565
						2*566	2*577	2*578	646	677	739	
					DEFINED	141	260	282	305	351	354	359
						367	421	645				
2604	IBUFD	INTEGER			REFS	161	DEFINED	158				
13622	IDISP	INTEGER	ARRAY		REFS	32	376	DEFINED	359			
21	IFA	INTEGER		PLACES	REFS	61						
67	IFADD	INTEGER		PLACES	REFS	61						
41	IFADDI	INTEGER		PLACES	REFS	61						
33	IFB	INTEGER		PLACES	REFS	61						
71	IFBAL	INTEGER		PLACES	REFS	61						
43	IFBALI	INTEGER		PLACES	REFS	61						
117	IFBR	INTEGER		PLACES	REFS	61						
53	IFBT	INTEGER		PLACES	REFS	61						
2645	IFCOM	INTEGER			REFS	341	DEFINED	337	339			
73	IFDESF	INTEGER		PLACES	REFS	61						
45	IFDESI	INTEGER		PLACES	REFS	61						
55	IFDESN	INTEGER		PLACES	REFS	61						
35	IFDESO	INTEGER		PLACES	REFS	61						
21	IFDLT	INTEGER		PLAYFF	REFS	78						
3	IFDLTI	INTEGER		PLAYFF	REFS	78						
77	IFDUM1	INTEGER		PLACES	REFS	61						
101	IFDUM2	INTEGER		PLACES	REFS	61						
103	IFDUM3	INTEGER		PLACES	REFS	61						
141	IFINCK	INTEGER		PLACES	REFS	61						
137	IFINCM	INTEGER		PLACES	REFS	61						
31	IFKS	INTEGER		PLACES	REFS	61						
105	IFL	INTEGER		PLACES	REFS	61						
115	IFLR	INTEGER		PLACES	REFS	61						
57	IFMD	INTEGER		PLACES	REFS	61						
65	IFMDB	INTEGER		PLACES	REFS	61						
37	IFMDBI	INTEGER		PLACES	REFS	61						
1	IFMDFF	INTEGER		PLAYFF	REFS	78						
61	IFMEMF	INTEGER		PLACES	REFS	61						
25	IFMEMN	INTEGER		PLACES	REFS	61						
51	IFMEMO	INTEGER		PLACES	REFS	61						
125	IFMODK	INTEGER		PLACES	REFS	61						
123	IFMODM	INTEGER		PLACES	REFS	61						
15	IFMPL	INTEGER		PLAYFF	REFS	78						
7	IFMPLI	INTEGER		PLAYFF	REFS	78						
13	IFPATF	INTEGER		PLAYFF	REFS	78	339					
135	IFPH	INTEGER		PLACES	REFS	61						
27	IFPHA	INTEGER		PLAYFF	REFS	78						
31	IFPHAT	INTEGER		PLAYFF	REFS	78						
127	IFPHT	INTEGER		PLACES	REFS	61						
121	IFPHTF	INTEGER		PLACES	REFS	61	337					
133	IFQ	INTEGER		PLACES	REFS	61						
23	IFQA	INTEGER		PLAYFF	REFS	78						
25	IFQAT	INTEGER		PLAYFF	REFS	78						
131	IFQT	INTEGER		PLACES	REFS	61						

VARIABLES	SN	TYPE		RELOCATION								
11	IFSCR	INTEGER		PLACES	REFS	61						
17	IFSLT	INTEGER		PLAYFF	REFS	78						
5	IFSLTI	INTEGER		PLAYFF	REFS	78						
27	IFSTFN	INTEGER		PLACES	REFS	61						
63	IFSTFO	INTEGER		PLACES	REFS	61						
12	IFS1	INTEGER		PLACES	REFS	61						
13	IFS2	INTEGER		PLACES	REFS	61						
14	IFS3	INTEGER		PLACES	REFS	61						
15	IFS4	INTEGER		PLACES	REFS	61						
11	IFTPGT	INTEGER		PLAYFF	REFS	78						
75	IFWT	INTEGER		PLACES	REFS	61						
47	IFWTI	INTEGER		PLACES	REFS	61						
23	IFY	INTEGER		PLACES	REFS	61						
107	IFYT	INTEGER		PLACES	REFS	61						
111	IFZ	INTEGER		PLACES	REFS	61						
113	IFZR	INTEGER		PLACES	REFS	61						
2666	II	INTEGER			REFS	2*415	427	428	429	430	439	440
					441	443	444	445	447	448	449	451
					452	453	479	480	481	487	488	489
					502	505	506	509	510	522	523	524
					530	531	532	752	753	DEFINED	414	426
					477	486	501	521	529	678	751	
2717	IJ	INTEGER			REFS	712	713	DEFINED	711			
2661	IM	INTEGER			REFS	2*386	DEFINED	385				
2673	INDX	INTEGER			REFS	502	DEFINED	500				
2674	IND1	INTEGER			REFS	503	508	DEFINED	502			
2	ITAPEP	INTEGER		COMRWP	REFS	53						
0	ITAPER	INTEGER		COMRWP	REFS	53	I/O REFS	94	95	142	222	274
					283	295	302	306	307	350	351	358
					359							
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	33	54	102	103	104	105	
7	ITAPET	INTEGER		CTABLE	REFS	59						
1	ITAPEW	INTEGER		COMRWP	REFS	53	149	277	352	824		
					I/O REFS	143	150	279	286	289	310	313
					346	354	398	401	437	825		
2605	ITAP60	INTEGER			REFS	161	DEFINED	159	I/O REFS	160		
20	IUA	INTEGER		PLACES	REFS	61						
66	IUADD	INTEGER		PLACES	REFS	61						
40	IUADDI	INTEGER		PLACES	REFS	61						
32	IUB	INTEGER		PLACES	REFS	61						
70	IUBAL	INTEGER		PLACES	REFS	61						
42	IUBALI	INTEGER		PLACES	REFS	61						
116	IUBR	INTEGER		PLACES	REFS	61						
52	IUBT	INTEGER		PLACES	REFS	61						
16	IUCD	INTEGER		PLACES	REFS	61						
2644	IUCOM	INTEGER			REFS	341	368	815	DEFINED	336	338	
72	IUDESF	INTEGER		PLACES	REFS	61						
44	IUDESI	INTEGER		PLACES	REFS	61						
54	IUDESN	INTEGER		PLACES	REFS	61						
34	IUDESO	INTEGER		PLACES	REFS	61						
20	IUDLT	INTEGER		PLAYFF	REFS	78						
2	IUDLTI	INTEGER		PLAYFF	REFS	78						
76	IUDUM1	INTEGER		PLACES	REFS	61						
100	IUDUM2	INTEGER		PLACES	REFS	61						
102	IUDUM3	INTEGER		PLACES	REFS	61						
4	IUGO1	INTEGER		PLACES	REFS	61						
5	IUGO2	INTEGER		PLACES	REFS	61						

VARIABLES	SN	TYPE	RELOCATION							
6	IUG03	INTEGER	PLACES	REFS	61					
7	IUG04	INTEGER	PLACES	REFS	61					
140	IUINCK	INTEGER	PLACES	REFS	61					
136	IUINCM	INTEGER	PLACES	REFS	61					
0	IUIN1	INTEGER	PLACES	REFS	61					
1	IUIN2	INTEGER	PLACES	REFS	61					
30	IUKS	INTEGER	PLACES	REFS	61					
104	IUL	INTEGER	PLACES	REFS	61					
114	IULR	INTEGER	PLACES	REFS	61					
56	IUMD	INTEGER	PLACES	REFS	61					
64	IUMDB	INTEGER	PLACES	REFS	61					
36	IUMDBI	INTEGER	PLACES	REFS	61					
0	IUMDFF	INTEGER	PLAYFF	REFS	78					
60	IUMEMF	INTEGER	PLACES	REFS	61					
24	IUMEMN	INTEGER	PLACES	REFS	61					
50	IUMEMO	INTEGER	PLACES	REFS	61					
124	IUMODK	INTEGER	PLACES	REFS	61					
122	IUMODM	INTEGER	PLACES	REFS	61					
14	IUMPL	INTEGER	PLAYFF	REFS	78					
6	IUMPLI	INTEGER	PLAYFF	REFS	78					
2	IUOUT1	INTEGER	PLACES	REFS	61					
3	IUOUT2	INTEGER	PLACES	REFS	61					
12	IUPATF	INTEGER	PLAYFF	REFS	78	338				
134	IUPH	INTEGER	PLACES	REFS	61					
26	IUPHA	INTEGER	PLAYFF	REFS	78					
30	IUPHAT	INTEGER	PLAYFF	REFS	78					
126	IUPHT	INTEGER	PLACES	REFS	61					
120	IUPHTF	INTEGER	PLACES	REFS	61	336				
17	IUPR	INTEGER	PLACES	REFS	61					
132	IUQ	INTEGER	PLACES	REFS	61					
22	IUQA	INTEGER	PLAYFF	REFS	78					
24	IUQAT	INTEGER	PLAYFF	REFS	78					
130	IUQT	INTEGER	PLACES	REFS	61					
10	IUSCR	INTEGER	PLACES	REFS	61					
16	IUSLT	INTEGER	PLAYFF	REFS	78					
4	IUSLTI	INTEGER	PLAYFF	REFS	78					
26	IUSTFN	INTEGER	PLACES	REFS	61					
62	IUSTFO	INTEGER	PLACES	REFS	61					
10	IUTPGT	INTEGER	PLAYFF	REFS	78					
74	IUWT	INTEGER	PLACES	REFS	61					
46	IUWTI	INTEGER	PLACES	REFS	61					
22	IUY	INTEGER	PLACES	REFS	61					
106	IUYT	INTEGER	PLACES	REFS	61					
110	IUZ	INTEGER	PLACES	REFS	61					
112	IUZR	INTEGER	PLACES	REFS	61					
2610	I23	INTEGER		REFS	181	182	DEFINED	171		
2606	I33	INTEGER		REFS	175	176	177	178	179	180
				DEFINED	169					
2623	J	INTEGER		REFS	2*262	283	289	764	770	771
				DEFINED	261	283	289	763		
2656	JKNTR	INTEGER		REFS	376	379	380	381	DEFINED	374
15262	JPTS	INTEGER	ARRAY	REFS	34	313	317	321	322	427
				DEFINED	307	423				
2671	JUMP	INTEGER		REFS	467	475	518	520	DEFINED	462
2633	K	INTEGER		REFS	307	313	317	423	2*765	2*766
					787	788	789	DEFINED	307	313
					762					

VARIABLES	SN	TYPE		RELOCATION								
7	KBPAGE	INTEGER		CLIST	REFS	57						
0	KFREE	INTEGER		KLUFF	REFS	82	338	339				
4	KLABEL	INTEGER		CLIST	REFS	57						
2653	KNTR	INTEGER			REFS	366	369	384	559	590		
					DEFINED	364						
0	KOUNT	INTEGER		CLIST	REFS	57	140	148	278	280	285	287
						290	309	311	314	347	353	355	397
						399	402	434	438	821	826		
					DEFINED	138	140	148	278	280	287	290
						303	311	314	344	347	353	355	390
						399	402	435	438	822	826		
11	KOUNTH	INTEGER		CLIST	REFS	57	285	309	397			
12	KOUNTI	INTEGER		CLIST	REFS	57						
1	KPAGE	INTEGER		CLIST	REFS	57						
0	KPLOTF	INTEGER		F.P.	REFS	820	DEFINED	1				
0	KPLOTS	INTEGER		CPLOTS	REFS	55	146	DEFINED	147			
0	KPLOTV	INTEGER	*UNUSED	F.P.	DEFINED	1						
0	KTABLE	INTEGER		CTABLE	REFS	59						
5	KTABLO	INTEGER		CTABLE	REFS	59						
5	KTPAGE	INTEGER		CLIST	REFS	57						
2657	L	INTEGER			REFS	3*378	2*401	DEFINED	376	401		
2670	LEFT	INTEGER			REFS	435	822	DEFINED	434	821		
2	LINES	INTEGER		CLIST	REFS	57	138	303	344	390	434	435
						821	822					
10	LINESG	INTEGER		CLIST	REFS	57						
3	LINEST	INTEGER		CLIST	REFS	57						
2710	LM	INTEGER			REFS	671	794					
2676	M	INTEGER			REFS	547	555	668	669	DEFINED	546	554
						667						
2611	MAX1	INTEGER			REFS	185	189	190	DEFINED	172		
2612	MAX2	INTEGER			REFS	187	191	192	DEFINED	173		
2613	MAX3	INTEGER			REFS	186	188	DEFINED	174			
2652	MODE	INTEGER			REFS	365	367	372	398	DEFINED	363	366
2727	MPLOT	INTEGER	ARRAY		REFS	35	2*86	87	88	354	366	384
					DEFINED	351						
2572	MTAP1	INTEGER			DEFINED	102	I/O REFS	125	547	587	668	688
						690	752	809				
2573	MTAP2	INTEGER			DEFINED	103	I/O REFS	126	555	588	669	689
						691	753	810				
2574	MTAP3	INTEGER			DEFINED	104	I/O REFS	127	316	317	420	422
						423						
2575	MTAP4	INTEGER			DEFINED	105	I/O REFS	128				
26562	NAME	INTEGER	ARRAY		REFS	51	341					
2627	NBEAMS	INTEGER			REFS	305	421	594	595	601	602	645
					DEFINED	302						
2624	NC	INTEGER			REFS	282	DEFINED	274				
16217	NCDEF	INTEGER	ARRAY		REFS	36	519	540	739	DEFINED	518	535
2651	NCDI	INTEGER			REFS	359	380	385	2*395	403		
					DEFINED	358						
2647	NCOL	INTEGER			REFS	341	368	378				
3	NCOLS	INTEGER		CTABLE	REFS	59						
4	NCOLST	INTEGER		CTABLE	REFS	59						
15306	NCOORD	INTEGER	ARRAY		REFS	36	474	493	540	565	566	577
						578	646	DEFINED	467	492		
2713	NCYCL	INTEGER			REFS	704	711	DEFINED	702			
2634	NENDP1	INTEGER			REFS	323	324	325	DEFINED	321		
2635	NENDP2	INTEGER			REFS	322	324	325	DEFINED	322		

```
                16      COORD(J,NP)=CPOINT(J,N)                                 FERGCV     59
                   RETURN                                                       FERGCV     60
      60           END                                                          FERGCV     61
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	FERGCV	1	59

VARIABLES

	SN	TYPE		RELOCATION								
0	COORD	REAL	ARRAY	F.P.	REFS	8	DEFINED	1	54	56	58	
0	CPOINT	REAL	ARRAY	F.P.	REFS	8	2*35	54	56	58		
					DEFINED	1						
253	F1	REAL	ARRAY		REFS	9	56	DEFINED	18			
302	GO	REAL	ARRAY		REFS	10	2*56	DEFINED	14			
245	I	INTEGER			REFS	3*35	4*36	7*39	3*42	3*45	3*47	2*49
						53	54	5*56	DEFINED	33	38	41	44
						46	52					
246	J	INTEGER			REFS	3*35	3*39	2*49	2*54	5*56	2*58	
					DEFINED	34	37	48	51			
250	JJ	INTEGER			REFS	2*55	56	DEFINED	50			
0	JUMP	INTEGER		F.P.	REFS	25	26	DEFINED	1			
252	K	INTEGER			REFS	4*56	DEFINED	55				
242	L	INTEGER			REFS	26	29	50	53	DEFINED	25	26
251	M	INTEGER			REFS	54	56	DEFINED	53			
0	N	INTEGER		F.P	REFS	28	45	46	58	DEFINED	1	
0	NCOORD	INTEGER	*UNUSED	F.P.	DEFINED	1						
243	NM	INTEGER			REFS	29	33	38	7*43	2*45	52	
					DEFINED	28						
244	NP	INTEGER			REFS	58	DEFINED	29				
240	PCT	REAL			REFS	47	DEFINED	22				
331	S	REAL	ARRAY		REFS	11	4*39	40	43	56		
					DEFINED	36						
354	T	REAL	ARRAY		REFS	12	3*40	42	3*43	45	3*47	49
					2*56	DEFINED	39	42	45	49		
247	TEMP	REAL			REFS	42	45	49	DEFINED	40	43	47
450	V	REAL	ARRAY		REFS	13	3*36	2*39	3*40	42	3*43	45
					56	DEFINED	35					

EXTERNALS

	TYPE	ARGS		REFERENCES	
SQRT	REAL	1	LIBRARY	36	47

STATEMENT LABELS

		DEF LINE	REFERENCES	
0	10	36	33	
0	11	35	34	
0	12	39	37	38
0	13	42	41	
0	14	45	44	
0	15	49	46	48
0	16	58	51	
0	17	56	52	55

```
      SUBROUTINE FERGCV(JUMP,CPOINT,N,COORD,NCOORD)                     FERGCV     2
C     24/JUMP IS THE NUMBER OF INTERVALS IN INTERPOLATION.              FERGCV     3
C     CPOINT(3,20) CONTAINS THE COORDINATES TO BG FIT                   FERGCV     4
C     N IS NUMBER OF POINTS TO BE USED FROM CPOINT                      FERGCV     5
C     COORD(3,NCOORD) CONTAINS COORDINATES OF CURVE FIT                 FERGCV     6
C     NCOORD SHOULD BE (N-1)*24/JUMP+1                                  FERGCV     7
C                                                                       FERGCV     8
      DIMENSION COORD(3,1)         ,CPOINT(3,1)                         FERGCV     9
      DIMENSION F1(23)                                                  FERGCV    10
      DIMENSION GO(23)                                                  FERGCV    11
      DIMENSION S(19)                                                   FERGCV    12
      DIMENSION T(3,20)                                                 FERGCV    13
      DIMENSION V(3,19)                                                 FERGCV    14
      DATA GO      /.03827,.07002,.09570,.11574, 13057,.14063,          FERGCV    15
     1             .14634,.14815,.14648,.14178,.13448,.12500,           FERGCV    16
     2             .11379,.10127,.08789,.07407,.06026,.04688,           FERGCV    17
     3             .03436,.02315,.01367,.00637,.00166/                  FERGCV    18
      DATA F1      /.00506,.01968,.04297,.07407,.11212,.15625,          FERGCV    19
     1             .20558,.25926,.31641,.37616,.43764,.50000,           FERGCV    20
     2             .56236,.62384,.68359,.74074,.79442,.84375,           FERGCV    21
     3             .88788,.92593,.95703,.98032, 99494/                  FERGCV    22
      DATA PCT     /0.90/                                               FERGCV    23
C     20=MAXIMUM NUMBER OF POINTS ON A BEAM                             FERGCV    24
C     19=MAXIMUM-1                                                      FERGCV    25
      L=24/JUMP                                                         FERGCV    26
      IF (L*JUMP.NE.24)L=4                                              FERGCV    27
C     JUMP SHOULD BE DIVISOR OF 24                                      FERGCV    28
      NM=N-1                                                            FERGCV    29
      NP=NM*L+1                                                         FERGCV    30
C                                                                       FERGCV    31
C     GET THE DISTANCE BETWEEN CONSECUTIVE NODE PTS.                    FERGCV    32
C                                                                       FERGCV    33
      DO 10 I=1,NM                                                      FERGCV    34
      DO 11 J=1,3                                                       FERGCV    35
   11     V(J,I)=CPOINT(J,I+1)-CPOINT(J,I)                              FERGCV    36
   10     S(I)=SQRT(V(1,I)**2+V(2,I)**2+V(3,I)**2)                      FERGCV    37
      DO 12 J=1,3                                                       FERGCV    38
      DO 12 I=2,NM                                                      FERGCV    39
   12     T(J,I)=(S(I)*V(J,I-1)+S(I-1)*V(J,I))/(S(I)+S(I-1))            FERGCV    40
      TEMP=(V(1,1)*T(1,2)+V(2,1)*T(2,2)+V(3,1)*T(3,2))/(S(1)**2)        FERGCV    41
      DO 13 I=1,3                                                       FERGCV    42
   13     T(I,1)=2.*V(I,1)*TEMP-T(I,2)                                  FERGCV    43
      TEMP=(V(1,NM)*T(1,NM)+V(2,NM)*T(2,NM)+V(3,NM)*T(3,NM))/S(NM)**2   FERGCV    44
      DO 14 I=1,3                                                       FERGCV    45
   14     T(I,N)=2.*V(I,NM)*TEMP-T(I,NM)                                FERGCV    46
      DO 15 I=1,N                                                       FERGCV    47
          TEMP=PCT/SQRT(T(1,I)**2+T(2,I)**2+T(3,I)**2)                  FERGCV    48
      DO 15 J=1,3                                                       FERGCV    49
   15     T(J,I)=T(J,I)*TEMP                                            FERGCV    50
      JJ=24/L                                                           FERGCV    51
      DO 16 J=1,3                                                       FERGCV    52
      DO 17 I=1,NM                                                      FERGCV    53
          M=(I-1)*L+1                                                   FERGCV    54
          COORD(J,M)=CPOINT(J,I)                                        FERGCV    55
      DO 17 K=JJ,23,JJ                                                  FERGCV    56
   17     COORD(J,M+K/JJ)=S(I)*(T(J,I)*GO(K)-T(J,I+1)*GO(24-K))         FERGCV    57
     1          +CPOINT(J,I)+V(J,I)*F1(K)                              FERGCV    58
```

```
      1              SUBROUTINE  CLCORD (PROD, VEC, ANS)                          CLCORD      2
                   C SUBROUTINE TO TRANSFORM COORDINATES TO CALCOMP COORDINATES:  CLCORD      3
                     DIMENSION      PROD(2,1) ,     VEC(3,1) ,       ANS(1)     CLCORD      4
                     CALL MCMULT  (PROD, VEC, ANS, 2, 3, 2)                      CLCORD      5
      5              RETURN                                                      CLCORD      6
                     END                                                         CLCORD      7
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	CLCORD	1	5

VARIABLES	SN	TYPE		RELOCATION					
0	ANS	REAL	ARRAY	F.P.	REFS	3	4	DEFINED	1
0	PROD	REAL	ARRAY	F.P.	REFS	3	4	DEFINED	1
0	VEC	REAL	ARRAY	F.P.	REFS	3	4	DEFINED	1

EXTERNALS	TYPE	ARGS	REFERENCES
MCMULT		6	4

STATISTICS

PROGRAM LENGTH 258 21

520000B CM USED

```
                SUBROUTINE MAX (VEC, MID, ANS)                          MAX       2
                DIMENSION       VEC(1)                                  MAX       3
                ANS  =  VEC(1)                                          MAX       4
                DO 1  I=2,MID                                           MAX       5
5               IF (VEC(I).GT.ANS)  ANS  =  VEC(I)                      MAX       6
              1 CONTINUE                                                MAX       7
                RETURN                                                  MAX       8
                END                                                     MAX       9
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	MAX	1	7

VARIABLES	SN	TYPE		RELOCATION								
0	ANS	REAL		F.P.	REFS	5	DEFINED	1	3	5		
22	I	INTEGER			REFS	2*5	DEFINED	4				
0	MID	INTEGER		F.P.	REFS	4	DEFINED	1				
0	VEC	REAL	ARRAY	F.P.	REFS	2	3	2*5	DEFINED	1		

STATEMENT LABELS		DEF LINE	REFERENCES
C	1	6	4

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
14	1	I	4 6	4B	INSTACK

STATISTICS

PROGRAM LENGTH	25B	21

520000B CM USED

```
1                SUBROUTINE ARAYMN (VEC, MID, ANS)                          ARAYMN      2
           C     SUBROUTINE TO GET THE MINIMUM VALUE OF AN ARRAY            ARAYMN      3
                 DIMENSION      VEC(1)                                      ARAYMN      4
                 ANS  =  VEC(1)                                             ARAYMN      5
5                DO 1  I=2,MID                                              ARAYMN      6
                 IF (VEC(I).LT.ANS)  ANS  = VEC(I)                          ARAYMN      7
               1 CONTINUE                                                   ARAYMN      8
                 RETURN                                                     ARAYMN      9
                 END                                                        ARAYMN     10
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	ARAYMN	1	8

VARIABLES	SN	TYPE		RELOCATION							
0	ANS	REAL		F.P.	REFS	6	DEFINED	1	4	6	
22	I	INTEGER			REFS	2*6	DEFINED	5			
0	MID	INTEGER		F.P.	REFS	5	DEFINED	1			
0	VEC	REAL	ARRAY	F.P.	REFS	3	4	2*6	DEFINED	1	

STATEMENT LABELS		DEF LINE	REFERENCES
0	1	7	5

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
14	1	I	5 7	48	INSTACK

STATISTICS

PROGRAM LENGTH 258 21

520008 CM USED

```
      1              SUBROUTINE ARAYMX (VEC,MID,ANS)                                  ARAYMX      2
                   C SUBROUTINE WHICH COMPUTES THE LARGEST ABSOLUTE VALUE OF AN ARRAY  ARAYMX      3
                     DIMENSION         VEC(1)                                         ARAYMX      4
                     KEY = 0                                                          ARAYMX      5
      5              DO 1  I=1,MID                                                    ARAYMX      6
                     IF (VEC(I).EQ.0.) GOTO 1                                         ARAYMX      7
                     IF (KEY.NE.0) GO TO 2                                            ARAYMX      8
                     ANS  =  ABS(VEC(I))                                              ARAYMX      9
                     KEY = 1                                                          ARAYMX     10
     10              GO TO 1                                                          ARAYMX     11
                   2 IF (ABS(VEC(I)).GT.ANS)   ANS = ABS(VEC(I))                      ARAYMX     12
                   1 CONTINUE                                                         ARAYMX     13
                     RETURN                                                           ARAYMX     14
                     END                                                              ARAYMX     15
```

SYMBOLIC REFERENCE MAP (R=3)

```
ENTRY POINTS      DEF LINE      REFERENCES
    3  ARAYMX            1        13

VARIABLES      SN  TYPE             RELOCATION
    0  ANS         REAL                  F.P.          REFS        11    DEFINED        1         8         11
   26  I           INTEGER                             REFS         6          8       2*11    DEFINED          5
   25  KEY         INTEGER                             REFS         7    DEFINED          4         9
    0  MID         INTEGER               F.P.          REFS         5    DEFINED          1
    0  VEC         REAL         ARRAY    F.P.          REFS         3          6          8       2*11    DEFINED          1

INLINE FUNCTIONS   TYPE    ARGS        DEF LINE  REFERENCES
       ABS         REAL       1  INTRIN                 8        2*11

STATEMENT LABELS              DEF LINE    REFERENCES
   23  1                          12          5          6         10
   20  2                          11          7

LOOPS  LABEL     INDEX      FROM-TO     LENGTH     PROPERTIES
   14  1         I             5 12        10B        OPT

STATISTICS
  PROGRAM LENGTH                  32B       26
         52000B CM USED
```

```
      1              SUBROUTINE  MCMULT (A,B,C,NRA,NCA,IDA)                    MCMULT      2
                     DIMENSION   A(IDA,1),B(1),C(1)                           MCMULT      3
                     DO 100  I=1,NRA                                          MCMULT      4
                     C(I)  =  0.                                              MCMULT      5
      5              DO 100  J=1,NCA                                          MCMULT      6
                   100 C(I)  =  C(I) +  A(I,J) * B(J)                         MCMULT      7
                     RETURN                                                   MCMULT      8
                     END                                                      MCMULT      9
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	MCMULT	1	7

VARIABLES

	SN	TYPE		RELOCATION						
0	A	REAL	ARRAY	F.P.	REFS	2	6	DEFINED	1	
0	B	REAL	ARRAY	F.P.	REFS	2	6	DEFINED	1	
0	C	REAL	ARRAY	F.P.	REFS	2	6	DEFINED	1	4 6
31	I	INTEGER			REFS	4	3*6	DEFINED	3	
0	IDA	INTEGER		F.P.	REFS	2	DEFINED	1		
32	J	INTEGER			REFS	2*6	DEFINED	5		
0	NCA	INTEGER		F.P.	REFS	5	DEFINED	1		
0	NRA	INTEGER		F.P.	REFS	3	DEFINED	1		

STATEMENT LABELS

		DEF LINE	REFERENCES
0	100	6	3 5

LOOPS

	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
11	100	I	3 6	17B	NOT INNER
21	100	J	5 6	3B	INSTACK

STATISTICS

PROGRAM LENGTH 42B 34

52000B CM USED

```
1                SUBROUTINE MMULT (A,B,C,NRA,NCA,NCB,IDA,IDB,IDC)                MMULT      2
                 DIMENSION       A(IDA,1) ,     B(IDB,1) ,     C(IDC,1)          MMULT      3
                 DO 100  I=1,NRA                                                  MMULT      4
                 DO 100  J=1,NCB                                                  MMULT      5
5                C(I,J)  =  0.                                                    MMULT      6
                 DO 100  K=1,NCA                                                  MMULT      7
               100 C(I J) = C(I,J) + A(I,K)*B(K,J)                                MMULT      8
                 RETURN                                                           MMULT      9
                 END                                                              MMULT     10
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	MMULT	1	8

VARIABLES

		SN	TYPE		RELOCATION							
0	A		REAL	ARRAY	F.P.	REFS	2	7	DEFINED	1		
0	B		REAL	ARRAY	F.P.	REFS	2	7	DEFINED	1		
0	C		REAL	ARRAY	F.P.	REFS	2	7	DEFINED	1	5	7
50	I		INTEGER			REFS	5	3*7	DEFINED	3		
0	IDA		INTEGER		F.P.	REFS	2	DEFINED	1			
0	IDB		INTEGER		F.P.	REFS	2	DEFINED	1			
0	IDC		INTEGER		F.P.	REFS	2	DEFINED	1			
51	J		INTEGER			REFS	5	3*7	DEFINED	4		
52	K		INTEGER			REFS	2*7	DEFINED	6			
0	NCA		INTEGER		F.P.	REFS	6	DEFINED	1			
0	NCB		INTEGER		F.P.	REFS	4	DEFINED	1			
0	NRA		INTEGER		F.P.	REFS	3	DEFINED	1			

STATEMENT LABELS

		DEF LINE	REFERENCES		
0	100	7	3	4	6

LOOPS

	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
14	100	I	3 7	30B	NOT INNER
15	100	J	4 7	25B	NOT INNER
33	100	K	6 7	3B	INSTACK

STATISTICS

PROGRAM LENGTH 63B 51

520000B CM USED

EQUIV CLASSES	LENGTH	MEMBERS - BIAS NAME(LENGTH)			
U	1371	0 COORD	(1371)	457 V	(457)

STATISTICS

PROGRAM LENGTH	26577B	11647
CM LABELED COMMON LENGTH	3108	200

520008 CM USED

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
CPLOTS	1	0 KPLOTS (1)		
CONSTS	2	0 NO (1)	1 YES (1)	
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)
		6 NPAGEA (1)	7 ITAPET (1)	
PLACES	98	0 IUIN1 (1)	1 IUIN2 (1)	2 IUOUT1 (1)
		3 IUOUT2 (1)	4 IUGO1 (1)	5 IUGO2 (1)
		6 IUGO3 (1)	7 IUGO4 (1)	8 IUSCR (1)
		9 IFSCR (1)	10 IFS1 (1)	11 IFS2 (1)
		12 IFS3 (1)	13 IFS4 (1)	14 IUCD (1)
		15 IUPR (1)	16 IUA (1)	17 IFA (1)
		18 IUY (1)	19 IFY (1)	20 IUMEMN (1)
		21 IFMEMN (1)	22 IUSTFN (1)	23 IFSTFN (1)
		24 IUKS (1)	25 IFKS (1)	26 IUB (1)
		27 IFB (1)	28 IUDESO (1)	29 IFDESO (1)
		30 IUMDBI (1)	31 IFMDBI (1)	32 IUADDI (1)
		33 IFADDI (1)	34 IUBALI (1)	35 IFBALI (1)
		36 IUDESI (1)	37 IFDESI (1)	38 IUWTI (1)
		39 IFWTI (1)	40 IUMEMO (1)	41 IFMEMO (1)
		42 IUBT (1)	43 IFBT (1)	44 IUDESN (1)
		45 IFDESN (1)	46 IUMD (1)	47 IFMD (1)
		48 IUMEMF (1)	49 IFMEMF (1)	50 IUSTFO (1)
		51 IFSTFO (1)	52 IUMDB (1)	53 IFMDB (1)
		54 IUADD (1)	55 IFADD (1)	56 IUBAL (1)
		57 IFBAL (1)	58 IUDESF (1)	59 IFDESF (1)
		60 IUWT (1)	61 IFWT (1)	62 IUDUM1 (1)
		63 IFDUM1 (1)	64 IUDUM2 (1)	65 IFDUM2 (1)
		66 IUDUM3 (1)	67 IFDUM3 (1)	68 IUL (1)
		69 IFL (1)	70 IUYT (1)	71 IFYT (1)
		72 IUZ (1)	73 IFZ (1)	74 IUZR (1)
		75 IFZR (1)	76 IULR (1)	77 IFLR (1)
		78 IUBR (1)	79 IFBR (1)	80 IUPHTF (1)
		81 IFPHTF (1)	82 IUMODM (1)	83 IFMODM (1)
		84 IUMODK (1)	85 IFMODK (1)	86 IUPHT (1)
		87 IFPHT (1)	88 IUQT (1)	89 IFQT (1)
		90 IUQ (1)	91 IFQ (1)	92 IUPH (1)
		93 IFPH (1)	94 IUINCM (1)	95 IFINCM (1)
		96 IUINCK (1)	97 IFINCK (1)	
PLAYFF	26	0 IUMDFF (1)	1 IFMDFF (1)	2 IUDLTI (1)
		3 IFDLTI (1)	4 IUSLTI (1)	5 IFSLTI (1)
		6 IUMPLI (1)	7 IFMPLI (1)	8 IUTPGT (1)
		9 IFTPGT (1)	10 IUPATF (1)	11 IFPATF (1)
		12 IUMPL (1)	13 IFMPL (1)	14 IUSLT (1)
		15 IFSLT (1)	16 IUDLT (1)	17 IFDLT (1)
		18 IUQA (1)	19 IFQA (1)	20 IUQAT (1)
		21 IFQAT (1)	22 IUPHA (1)	23 IFPHA (1)
		24 IUPHAT (1)	25 IFPHAT (1)	
KLUFF	1	0 KFREE (1)		

EQUIV CLASSES	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
MPLOT	40	0 A (9)	0 TITLE (18)	9 B (9)
		18 C (9)		
UU	954	0 XX (954)	457 VV (457)	

STATEMENT LABELS			DEF LINE	REFERENCES					
1323	72		729	704					
0	73		724	711					
75	77		164	146					
537	90		392	403					
554	92		400	397					
7	100		95	96					
2363	9000	FMT	834	95	142				
2365	9001	FMT	835	143					
2367	9002	FMT	836	222					
2371	9003	FMT	837	274	302	307	350	351	358	359
2373	9004	FMT	838	279	286				
2405	9005	FMT	840	283					
2410	9006	FMT	841	289					
2414	9007	FMT	842	295					
2417	9008	FMT	843	306					
2421	9009	FMT	844	310					
2433	9010	FMT	846	313					
2436	9011	FMT	847	346					
2455	9012	FMT	851	354					
2465	9013	FMT	853	398					
2500	9014	FMT	856	401					
2503	9015	FMT	857	437					
2526	9016	FMT	862	150					
2534	9017	FMT	863	825					
1466	9500		827	820					

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES		
50	1	I	141 144	7B		EXT REFS	
231	10	I	260 262	15B		NOT INNER	
240	10	J	261 262	3B	INSTACK		
262	20	I	282 291	34B		EXT REFS	
325	30	I	305 329	65B		EXT REFS	
465	21	KNTR	364 813	757B		EXT REFS	NOT INNER
472	48	I	367 368	5B		EXT REFS	
532	28	IM	385 387	2B	INSTACK		
560		L	401 401	7B		EXT REFS	
603	18	II	414 417	3B	INSTACK		
612	62	I	421 585	311B		EXT REFS	NOT INNER
624	31	II	426 456	70B		EXT REFS	
726	32	II	477 483	11B		EXT REFS	
741	13	II	486 491	11B		EXT REFS	
757	41	II	501 512	25B		EXT REFS	
1016	38	II	521 526	13B		EXT REFS	
1033	16	II	529 534	13B		EXT REFS	
1055	53	M	546 549	10B		EXT REFS	
1066	56	M	554 557	10B		EXT REFS	
1163	60	I	645 801	253B		EXT REFS	NOT INNER
1176	61	M	667 670	15B		EXT REFS	
1217	71	II	678 733	113B		EXT REFS	NOT INNER
1262	73	IJ	711 724	36B		EXT REFS	
1335	63	II	751 754	15B		EXT REFS	
1354	64	K	762 798	57B		EXT REFS	NOT INNER
1355	65	J	763 797	54B		EXT REFS	

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CTAPES	50	0 ITAPES (50)		

EXTERNALS	TYPE	ARGS		REFERENCES								
MMULT		9		253	256	266						
NUMBER		6		373								
PLB		3		149	277	352	824					
PLOT		3		370	709	717	721	725	730	731	819	
PLOTS		3		161								
PROGNA		2		136								
SIN	REAL	1	LIBRARY	234	235	240	242	247	248	715	719	768
SQRT	REAL	1	LIBRARY	327	700							
TIMEB		2		829								
TITLES		1		139	284	308	345	396	436	823		

INLINE FUNCTIONS	TYPE	ARGS	DEF LINE	REFERENCES					
ABS	REAL	1	INTRIN	606	664	694	696	792	
IABS	INTEGER	1	INTRIN	366					

	STATEMENT LABELS		DEF LINE	REFERENCES				
0	1		144	141				
0	10		262	260	261			
740	11		486	460				
754	12		495	485				
0	13		491	486				
1032	14		529	516				
1050	15		537	528				
0	16		534	529				
367	17		321	318				
0	18		417	414				
0	20		291	282				
0	21		813	364				
503	22		371	369				
0	23	INACTIVE	224					
303	25		288	285				
535	27		389	384				
0	28		387	385				
344	29		312	309				
407	30		329	305	319			
711	31		456	426	442	446	450	
0	32		483	477				
662	33		443	431				
672	34		447	432				
702	35		451	433				
0	38		526	521				
510	39		375	382				
0	41		512	501				
524	44		383	380				
0	48		368	367				
0	53		549	546				
0	56		557	554				
0	60		801	645				
0	61		670	667				
1120	62		585	421	559			
0	63		754	751				
0	64		798	762				
0	65		797	763				
1402	66		773	764				
1404	67		785	772				
1162	68		614	590				
1327	71		722	678	726			

VARIABLES	SN	TYPE	RELOCATION							
5602	V	REAL	ARRAY	REFS	40	84	192	671	694	696	2*700
				2*706	709	713	725	730	731	2*765	787
				789	DEFINED	664	665	669	689	691	694
				696	753						
2660	VALU	REAL		REFS	379	DEFINED	377	378			
2054	VAPL	REAL		REFS	96	DEFINED	91				
2721	VLL	REAL		REFS	715	DEFINED	713	723			
2571	VPVAR	REAL		REFS	96	DEFINED	95				
2601	VSCALE	REAL		REFS	606	610	611	DEFINED	123		
2723	VUL	REAL		REFS	717	719	721	723	DEFINED	715	719
3710	VV	REAL	ARRAY	REFS	41	85					
17225	V1	REAL	ARRAY	REFS	42	794	DEFINED	787	789	792	793
17231	WKAREA	REAL	ARRAY	REFS	43	186	475	487	DEFINED	428	429
				430							
2630	WORD1	REAL		REFS	313	316	318	DEFINED	306	422	
2631	WORD2	REAL		REFS	313	316	318	DEFINED	306	422	
17325	WORK	REAL	ARRAY	REFS	44	368	378				
2636	XDIST	REAL		REFS	326	DEFINED	323				
2655	XMODNO	REAL		REFS	373	DEFINED	372				
17670	XPRIM	REAL	ARRAY	REFS	46	185	289	2*323	2*324	2*325	428
				429	430	439	440	441	443	444	445
				447	448	449	451	452	453	504	
				DEFINED	283						
2051	XSYM	REAL		REFS	431	DEFINED	90				
2777	XX	REAL	ARRAY	REFS	47	2*85	547	565	566		
				DEFINED	480	488	505	509	523	531	
17635	XXX	REAL	ARRAY	REFS	45	180	253	256			
24430	XX2	REAL	ARRAY	REFS	48	555	577	578	DEFINED	481	489
				506	510	524	532				
2637	YDIST	REAL		REFS	326	DEFINED	324				
1	YES	INTEGER	CONSTS	REFS	3	56	820				
26442	YMAX	REAL	ARRAY	REFS	50	566	594				
26322	YMIN	REAL	ARRAY	REFS	49	565	601				
2052	YSYM	REAL		REFS	432	DEFINED	90				
2640	ZDIST	REAL		REFS	326	DEFINED	325				
2607	ZERO	REAL		REFS	175	176	177	178	179	180	181
				182	183	184	185	186	187	188	189
				190	191	192	DEFINED	170			
26512	ZMAX	REAL	ARRAY	REFS	50	578	595				
26372	ZMIN	REAL	ARRAY	REFS	49	577	602				
2053	ZSYM	REAL		REFS	433	DEFINED	90				

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS		REFERENCES							
ARAYMN		3		565	577	601	602				
ARAYMX		3		408							
ATAN2	REAL	2	LIBRARY	708	767						
CLCORD		3		479	487	504	508	522	530		
COS	REAL	1	LIBRARY	233	236	239	243	246	249	714	718	769
DCLOSE		1		815							
DVALUE		3		175	176	177	178	179	180	181	182	183
				184	185	186	187	188	189	190	191	192
FERGCV		5		475	520						
GEDLAB		6		341							
GETROW		4		368							
LINE		6		671	794						
MAX		3		566	578	594	595				

VARIABLES	SN	TYPE		RELOCATION								
2654	NEXT	INTEGER			REFS	367	DEFINED	365				
2662	NF	INTEGER			REFS	393	394	395	401	403		
					DEFINED	391	394	395				
2646	NMODES	* INTEGER			REFS	341						
0	NO	INTEGER		CONSTS	REFS	56	146	147				
6	NPAGE	INTEGER		CLIST	REFS	57						
6	NPAGEA	INTEGER		CTABLE	REFS	59						
1	NPASS	INTEGER		CTABLE	REFS	59						
2650	NPLOTS	INTEGER			REFS	351	2*354	364	DEFINED	350		
0	NPLOTV	INTEGER	*UNUSED	F.P.	DEFINED	1						
2632	NPTBM	INTEGER			REFS	307	313	316	317	322	423	424
					426	460	467	475	500	501	516	518
					520	523	524	531	532	DEFINED	306	422
2711	NPTBMI	INTEGER			REFS	678	DEFINED	677				
2707	NPTS	INTEGER			REFS	662	663	664	665	667	671	751
					761	DEFINED	646	739				
17130	NPTSBM	INTEGER	ARRAY		REFS	36	540	677	DEFINED	424		
2724	NPTSM1	INTEGER			REFS	762	DEFINED	761				
2	NROWS	INTEGER		CTABLE	REFS	59						
2663	NS	INTEGER			REFS	401	DEFINED	393				
2667	NSUM	INTEGER			REFS	546	554	DEFINED	419	540		
2625	NUM	INTEGER			REFS	2*283	3*289	428	429	430	431	432
					433	437	439	440	441	2*443	444	445
					2*447	448	449	2*451	452	453	504	
					DEFINED	283	427	503				
2672	N1	INTEGER			REFS	475	477	505	506	509	510	523
					524	531	532	DEFINED	474	493		
2675	N2	INTEGER			REFS	520	521	DEFINED	519			
17646	PI	REAL	ARRAY		REFS	45	178	256	262			
17657	PITR	REAL	ARRAY		REFS	45	179	266	DEFINED	262		
17206	PROD	REAL	ARRAY		REFS	37	181	266	479	487	504	508
					522	530	606	664	694	696	792	
2626	RATIO	REAL			REFS	328	346	DEFINED	295			
17200	RORMV	REAL	ARRAY		REFS	37	182	266	DEFINED	195	196	
2665	RRAT	REAL			REFS	415	DEFINED	412				
17214	SCRTCH	REAL	ARRAY		REFS	38	183					
17217	SCRT2	REAL	ARRAY		REFS	38	184	479	480	481	487	488
					489	504	505	506	508	509	510	522
					523	524	530	531	532			
2706	SHIFT	REAL			REFS	664	694	696	792	DEFINED	610	611
2701	SMLSTY	REAL			REFS	601	605	662	692	693	790	
2702	SMLSTZ	REAL			REFS	602	606	664	694	696	792	
2614	THET1D	REAL			REFS	225	DEFINED	222				
2620	THET1R	REAL			REFS	233	234	235	236	DEFINED	225	
2615	THET2D	REAL			REFS	226	DEFINED	222				
2621	THET2R	REAL			REFS	239	240	242	243	DEFINED	226	
2616	THET3D	REAL			REFS	227	DEFINED	222				
2622	THET3R	REAL			REFS	246	247	248	249	DEFINED	227	
2727	TITLE	REAL	ARRAY		REFS	39	88	143	DEFINED	142		
4671	U	REAL	ARRAY		REFS	40	84	191	671	692	693	2*700
					2*707	709	712	725	730	731	2*766	786
					788	DEFINED	662	663	668	688	690	692
					693	752						
2720	ULL	REAL			REFS	714	DEFINED	712	722			
2777	UU	REAL	ARRAY		REFS	41	85					
2722	UUL	REAL			REFS	717	718	721	722	DEFINED	714	718
7221	U1	REAL	ARRAY		REFS	42	794	DEFINED	786	788	790	791

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
20	10	I	33 36	24B	EXT REFS NOT INNER
27	11	J	34 35	3B	INSTACK
45	12	J	37 39	16B	NOT INNER
53	12	I	38 39	5B	INSTACK
74	13	I	41 42	4B	INSTACK
120	14	I	44 45	4B	INSTACK
126	15	I	46 49	22B	EXT REFS NOT INNER
142	15	J	48 49	3B	INSTACK
155	16	J	51 58	55B	NOT INNER
156	17	I	52 56	45B	NOT INNER
203	17	K	55 56	14B	OPT

STATISTICS
PROGRAM LENGTH 554B 364
520000B CM USED

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      C                                                                       AFAM      2
      C45700, SUB. AFAM (AUTOMATED FLUTTER ANALYSIS MODULE)                   AFAM      3
      C                                                                       AFAM      4
      C                                                                     * AFAM      5
      C*********************************************************************** AFAM      6
      C*********************************************************************** AFAM      7
      C*********************************************************************** AFAM      8
      C*********************************************************************** AFAM      9
      C*********************************************************************** AFAM     10
      C*****                                                          ****** AFAM     11
      C*****                  AAA    FFFFF    AAA    M   M            ****** AFAM     12
      C*****                 A   A   F       A   A   MM MM            ****** AFAM     13
      C*****                 AAAAA - FFFF  - AAAAA  M M M            ****** AFAM     14
      C*****                 A   A   F       A   A  M M M            ****** AFAM     15
      C*****                 A   A   F       A   A  M M M            ****** AFAM     16
      C*****                                                          ****** AFAM     17
      C*********************************************************************** AFAM     18
      C*********************************************************************** AFAM     19
      C*********************************************************************** AFAM     20
      C*********************************************************************** AFAM     21
      C*********************************************************************** AFAM     22
      C                                                                     * AFAM     23
      C*********************************************************************** AFAM     24
      C                                                                     * AFAM     25
      C***  SUBROUTINE AFAM  ************************************************ AFAM     26
      C                                                                     * AFAM     27
      C***  COMPUTER VERSION                                                * AFAM     28
      C     ----------------                                                * AFAM     29
      C     IBM .... AS IS.                                                 * AFAM     30
      C                                                                     * AFAM     31
      C     CDC .... AS IS.                                                 * AFAM     32
      C                                                                     * AFAM     33
      C***  OBJECTIVE  ****************************************************** AFAM     34
      C     ---------                                                       * AFAM     35
      C     MAJOR PROGRAM, WHICH CALLS OTHER PROGRAMS, FOR PERFORMING       * AFAM     36
      C     FLUTTER ANALYSIS.                                               * AFAM     37
      C                                                                     * AFAM     38
      C***  INPUT/OUTPUT  *************************************************** AFAM     39
      C     ------------                                                    * AFAM     40
      C                                                                     * AFAM     41
      C***  SUMMARY OF SYMBOLS  ****************************  ************** AFAM     42
      C     ------------------                                              * AFAM     43
      C.... KLUEF(I) ..... INPUT, (I = 1,...,LKLUEF)                        * AFAM     44
      C     INPUT DATA CONTROL WORD OPTIONS TO OBTAIN VIBRATION INFORMATION  * AFAM     45
      C                                                                     * AFAM     46
      C     VALUES ENTERED AS DATA HAVE THE FOLLOWING GENERAL FUNCTION ...  * AFAM     47
      C     KLUEF( I) = 0, DO NOT PERFORM THE I'TH OPTION OF FLUTTER        * AFAM     48
      C                    ANALYSIS.                                        * AFAM     49
      C                 = I, PERFORM THE I'TH OPTION OF FLUTTER ANALYSIS.  * AFAM     50
      C                                                                     * AFAM     51
      C     WHERE THE SPECIFIC FUNCTION OF EACH VARIABLE IS.                * AFAM     52
      C     KLUEF( 1) =-1                                                   * AFAM     53
      C                                                                     * AFAM     54
      C     THE VALUES OF THE CARD INPUT DATA CONTROL WORD OPTIONS (KLUEF(I))* AFAM     55
      C     GIVEN ABOVE ARE ENTERED INTO THE PROGRAM BY THE SUBROUTINE CLUES * AFAM     56
      C     AND THEN CHANGED, WITHIN THE SUBROUTINE CLUES, TO A NEW SET OF  * AFAM     57
      C     NUMERICAL VALUES.                                               * AFAM     58
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      C     A VALUE OF ONE (CORRESPONDING TO THE ORIGINAL ZERO VALUE)        * AFAM       59
      C     INDICATES THAT THE OPTION IS TO BE DELETED WHEREAS A VALUE OF TWO* AFAM       60
60    C     (CORRESPONDING TO THE ORIGINAL I'TH VALUE) INDICATES THAT THE    * AFAM       61
      C     OPTION IS TO BE EXERCISED.                                       * AFAM       62
      C     FINALLY, FOR PROGRAMMING CONVENIENCE, A NEW SET OF OPTIONS       * AFAM       63
      C     REFERRED TO AS PROGRAM CONTROL WORD OPTIONS (KXXXXX) ARE DEFINED * AFAM       64
      C     TO BE EQUIVALENT TO THE CARD INPUT CONTROL WORD OPTIONS.         * AFAM       65
65    C                                                                      * AFAM       66
      C     KLUEF(I) = 0, IS CHANGED TO 1, AND CORRESPONDS TO  KXXXXX = 1    * AFAM       67
      C     KLUEF(I) = 1, IS CHANGED TO 2, AND CORRESPONDS TO  KXXXXX = 2    * AFAM       68
      C                                                                      * AFAM       69
      C     THE SPECIFIC RELATIONSHIP OF THE CARD INPUT DATA AND PROGRAM     * AFAM       70
70    C     CONTROL WORD OPTIONS IS GIVEN BELOW.                             * AFAM       71
      C                                                                      * AFAM       72
      C     KLUEF( 1) = KDUMMY                                               * AFAM       73
      C                                                                      * AFAM       74
      C.... KLUEF(I) ..... INTERMEDIATE, (I = LKLUEF+1,...,2*LKLUEF)         * AFAM       75
75    C     PROGRAM CONTROL WORD OPTION FOR INDICATING WHICH OF THE OPTIONS  * AFAM       76
      C     IN FLUTTER ANALYSIS HAVE BEEN PERFORMED.                         * AFAM       77
      C                                                                      * AFAM       78
      C     VALUES DEFINED WITHIN THE PROGRAM HAVE THE FOLLOWING GENERAL     * AFAM       79
      C     FUNCTION ...                                                     * AFAM       80
80    C     KLUEF(I) = 0, THE I'TH FLUTTER ANALYSIS OPTION HAS NOT           * AFAM       81
      C                    BEEN PERFORMED IN THE CURRENT RUN.               * AFAM       82
      C              = 1, THE I'TH FLUTTER ANALYSIS OPTION HAS BEEN         * AFAM       83
      C                    PERFORMED IN THE CURRENT RUN.                    * AFAM       84
      C     WHERE THE SPECIFIC FUNCTION OF EACH VARIABLE IS ASSOCIATED WITH  * AFAM       85
85    C     THE SPECIFIC FUNCTION OF THE VARIABLE KLUEF(I) FOR               * AFAM       86
      C     I = 1,...,LKLUEF.                                                * AFAM       87
      C     LC(1)    = -1  P/K FLUTTER                                         AFAM       88
      C              =  0  PRESSURES ONLY                                      AFAM       89
      C              =  1  K FLUTTER                                           AFAM       90
90    C              =  2  DIVERGENCE                                          AFAM       91
      C     LC(2)    =  NO. OF MODES                                           AFAM       92
      C     LC(3)    =  NO. OF SURFACES                                        AFAM       93
      C     LC(4)    =  NO. OF REDUCED VELOCITIES (.GE.1)                      AFAM       94
      C     LC(5)    =  NO. OF DENSITIES (.GE.1)                               AFAM       95
95    C     LC(6)    =  CLUE WORD FOR DISPLAY OF GEN. AIR FORCES AS COMPUTED   AFAM       96
      C     LC(7)    =  CLUE WORD FOR LISTING PRESSURES                        AFAM       97
      C     LC(8)    =  CLUE WORD FOR LIFT COEFFICIENTS                        AFAM       98
      C     LC(9)    =  CLUE WORD FOR ADDITIONS TO FLUTTER DETERMINANT         AFAM       99
      C     LC(10)   =  CLUE WORD FOR LISTING GEN. AIR FORCES IN QINTP         AFAM      100
100   C     LC(11)   =  REF. FREQ. INDEX  ********* K FLUTTER                  AFAM      101
      C     LC(12)   =  0  A INVERSE ,  = 1  B INVERSE ****** K FLUTTER        AFAM      102
      C     LC(13)   =  CLUE WORD FOR GEN. AIR FORCE INTERPOLATION             AFAM      103
      C     LC(14)   =  CLUE WORD FOR CALCOMP (FLUTTER)                        AFAM      104
      C     LC(15)   =  0  EQUIV. VELOCITY ,  = 1 TRUE VELOCITY  (FLUTTER)     AFAM      105
105   C     LC(16)   =  CLUE WORD FOR STRUCTURAL DAMPING INPUT (FLUTTER)       AFAM      106
      C              =  1 SAME FOR ALL MODES , = -1 AS SPECIFIED               AFAM      107
      C     LC(17)   =  CLUE WORD FOR DISPLAY OF NO. OF ITERATIONS (P/K)       AFAM      108
      C     LC(18)   =  CLUE WORD FOR ROOT INTERPOLATION ***** P/K             AFAM      109
      C     LC(19)   =  CLUE WORD FOR POST SOLUTION INTERPOLATION ***** P/K    AFAM      110
110   C     LC(20)   =  CLUE WORD FOR DISPLAY OF ITERATIONS IN FLUTTER         AFAM      111
      C                 SOLUTION ROUTINES                                      AFAM      112
      C     LC(21)   =  1  RODDEN VORTEX LATTICE PROGRAM                       AFAM      113
      C              =  2  SUPERSONIC MACH BOX PROGRAM                         AFAM      114
      C              =  3  SUPERSONIC COLLOCATION PROGRAM                      AFAM      115
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      C     LC(22)   =  CLUE WORD FOR AIC TAPE                                  AFAM      116
      C              =  0  COMPUTE          ,  -1 FOR MACH BOX AIC              AFAM      117
      C              =  1  EXISTS ON TAPE                                       AFAM      118
      C     LC(23)   =  CLUE WORD FOR DISPLAY OF MODAL INPUT DATA               AFAM      119
      C     LC(24)   =  CLUE WORD FOR DISPLAY OF MODAL INTERPOLATION OUTPUT     AFAM      120
      C     LC(25)   =  NO. OF MODE ELIMINATION CYCLES                          AFAM      121
      C     LC(26)   =  NO. OF STIFFNESS VARIATION CYCLES                       AFAM      122
      C     LC(27)   =  INDEX OF MODE FOR STIFFENSS VARIATION                   AFAM      123
      C     LC(28)   =  CLUE WORD FOR VECTORS                                   AFAM      124
      C     LC(29)   =  LIST PHYSICAL VECTORS FOR K ANALYSIS                    AFAM      125
      C     LC(30)   =  CLUE WORD FOR LISTING FLUTTER DETERMINANT               AFAM      126
      C     LC(31)   =  CLUE WORD FOR GEN. MASS ADDITIONS AND FREQ. CHANGE      AFAM      127
      C     LC(32)   =  CLUE WORD FOR ADDITIONS TO SPRING TERMS                 AFAM      128
      C     LC(33)   =  CLUE WORD FOR STEADY STATE SOLUTION                     AFAM      129
      C     LC(34)   =  CLUE WORD FOR CHANGES TO GEN. AIR FORCES                AFAM      130
      C     LC(35)   =  CLUE WORD FOR DISPLAY OF DIAPHRAGM DOWNWASH VALUES      AFAM      131
      C                 SUPERSONIC PROGRAM FOR LC(22) = 0 OR -1                 AFAM      132
      C     LC(36)   =  CLUE WORD FOR FLUTTER OPTIMIZATION DATA                 AFAM      133
      C     LC(37)   =  CLUE WORD FOR DISPLAY OF GEOMETRY DATA                  AFAM      134
      C                  IN DOUBLET LATTICE PROGRAM                             AFAM      135
      C     LC(38)   =  CLUE WORD FOR AUTOMATIC EXCLUSION OF VIBRATION          AFAM      136
      C                 MODES BASED ON RATIO OF GEN. AIR FORCES TO GEN.         AFAM      137
      C                 MASSES                                                  AFAM      138
      C                                                                         AFAM      139
      C                                                                       * AFAM      140
      C***  ERROR MESSAGES  ************************************************** AFAM      141
      C     --------------                                                    * AFAM      142
      C     NONE.                                                               AFAM      143
      C                                                                       * AFAM      144
      C************************************************************************ AFAM      145
      C                                                                         AFAM      146
            SUBROUTINE AFAM (KPLOTF)                                          AFAM      147
      C                                                                         AFAM      148
            INTEGER YES                                                       AFAM      149
            COMPLEX B, DETAD                                                  AFAM      150
      C                                                                       AFAM      151
            DIMENSION FMTA(1)                                                 AFAM      152
            DIMENSION ITAPES(50),KLUEF(20),KLUE(80)                           AFAM      153
            DIMENSION TSH(1)              ,TSHF(1)                            AFAM      154
            DIMENSION          LC(40)                                         AFAM      155
            DIMENSION B(40,40),DETAD(40,40),WW(40,40),OMGR(40)                AFAM      156
            DIMENSION NOTI(25),NINZ(40,25)                                    AFAM      157
            DIMENSION QMWT(40,5),QWT(5)                                       AFAM      158
            DIMENSION RVBO(15)           ,RHOR(10)           ,RATOM(20)       AFAM      159
            DIMENSION TITLE1(18)         ,TITLE2(18)                          AFAM      160
            DIMENSION V(25)              ,VBO(30)                             AFAM      161
      C                                                                       AFAM      162
            COMMON /CFMTA / FMTA                                              AFAM      163
            COMMON /CLUEM / LKLUE ,KLUE                                       AFAM      164
            COMMON /CLUEF / LKLUEF,KLUEF                                      AFAM      165
            COMMON /CTAPES/ ITAPES                                            AFAM      166
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              AFAM      167
            COMMON /CTABLE/ KTABLE,NPASS ,NROWS, NCOLS , NCOLST,KTABLO,NPAGEA AFAM      168
           1               ,ITAPET                                            AFAM      169
            COMMON /CTSHF / LTSHF ,TSHF                                       AFAM      170
            COMMON /CTSH  / KTSH  ,LTSH  ,TSH                                 AFAM      171
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      COMMON /COMA/ LC , BR                                                  AFAM      173
      COMMON /MODD  / B     ,DETAD ,WW    ,OMGR  ,NC                        AFAM      174
      COMMON /FLUTAN/ FMACH ,BETA  ,VBO   ,RVBO  ,NRVBO                      AFAM      175
175   COMMON /FLUTB / V     ,NV                                              AFAM      176
      COMMON /FLUTC / RHOR  ,NOTI  ,NINZ  ,RATOM                             AFAM      177
      COMMON /FLUTV / VA    ,VB    ,FLO   ,FHI   ,IE    ,NQZ   ,NVTOT       AFAM      178
      COMMON /FLUTQ / QMWT  ,QWT                                             AFAM      179
      COMMON /PRPL  / GMAX  ,GMIN  ,FRMAX ,FRMIN ,VMAX  ,VMIN               AFAM      180
180   COMMON /CALCP / TITLE1,TITLE2,DUB   ,FUB   ,VUB   ,DLB   ,FLB         AFAM      181
     1               ,VLB   ,IPLOT ,LSD   ,DSCALE,FSCALE,VSCALE,DPLEN      AFAM      182
     2               ,FRLEN ,VLEN  ,XDT                                     AFAM      183
      COMMON/KLUES/ KLUSE,KLUNAL,IRED,KLUMD,KLUBAL,MSADD,NPAS, IDNOPT,       AFAM      184
     1              VDES,EPS1,DWMAX,NBAR,NFIX,D,DEL,EPS2,NCYC,NNN,IBAND,    AFAM      185
185  2              IFIN,KLUB,KLUQ,MORBAL,DBAL                               AFAM      186
C                                                                            AFAM      187
C                                                                            AFAM      188
C INITIAL CONDITIONS                                                         AFAM      189
C.... PSN(100) TO PSN(150) ....                                              AFAM      190
190   100 CONTINUE                                                           AFAM      191
      LTSHR  =  LTSH                                                         AFAM      192
      IF (KTSH .EQ. YES) LTSHR = LTSH-2                                      AFAM      193
      DATA FAOOR  /4HFAOO/                                                   AFAM      194
      NCC    =  10                                                           AFAM      195
195   NKLUEF=LKLUEF                                                          AFAM      196
      ISAVFO =  ITAPES(24)                                                   AFAM      197
C                                                                            AFAM      198
C                                                                            AFAM      199
C PRINT TITLE FOR AUTOMATED FLUTTER ANALYSIS MODULE                          AFAM      200
200   C                                                                      AFAM      201
      CALL TAFAM                                                             AFAM      202
C                                                                            AFAM      203
C                                                                            AFAM      204
C READ INPUT DATA                                                            AFAM      205
205   C.... PSN(190) TO PSN(290) ....                                        AFAM      206
  190 REWIND ITAPER                                                          AFAM      207
  195 READ (ITAPER,5060) FAOOD                                               AFAM      208
      IF (FAOOD .NE. FAOOR) GO TO 195                                        AFAM      209
      READ (ITAPER,FMTA) (TSHF(L), L=1,LTSHR)                                AFAM      210
210   CALL CLUES (ITAPER,NCC,NKLUEF,KLUEF)                                   AFAM      211
      KDUMMY =  KLUEF(1)                                                     AFAM      212
      READ (ITAPER,50)   LC                                                  AFAM      213
      DO 210 L=1,LTSH                                                        AFAM      214
  210 TSH(L) =  TSHF(L)                                                      AFAM      215
215   C                                                                      AFAM      216
C                                                                            AFAM      217
C READ FREQUENCIES, GENERALIZED MASSES, AND MODES  FROM CARDS AND OR         AFAM      218
C TAPE.  CHOOSE APPROPRIATE MODES FOR INTERPOLATIONS                         AFAM      219
C                                                                            AFAM      220
220   CALL POOL                                                              AFAM      221
      CALL PROGNA (4H(POO, 4HL  ))                                           AFAM      222
      CALL TIMEB (23,23HFROM AFAM, AFTER POOL  )                             AFAM      223
C                                                                            AFAM      224
   70 IFTP    =  LC(21)                                                      AFAM      225
225   KPLOTF =  LC(14) + 1                                                   AFAM      226
C                                                                            AFAM      227
      GO TO (500, 600, 700), IFTP                                            AFAM      228
C                                                                            AFAM      229
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                C                                                                AFAM      230
230             C SUBSONIC AERODYNAMICS USING DOUBLET LATTICE PROCEDURE          AFAM      231
                C                                                                AFAM      232
                  500 CONTINUE                                                   AFAM      233
                      CALL RODDEN                                                AFAM      234
                      CALL PROGNA (4H(ROD, 4HDEN))                               AFAM      235
235                   CALL TIMEB (23,23HFROM AFAM, AFTER RODDEN)                 AFAM      236
                      GO TO 800                                                  AFAM      237
                C                                                                AFAM      238
                C                                                                AFAM      239
                C SUPERSONIC AERODYNAMICS USING MACH BOX PROCEDURE               AFAM      240
240             C                                                                AFAM      241
                  600 CONTINUE                                                   AFAM      242
                      CALL MACH                                                  AFAM      243
                      CALL PROGNA (4H(MAC, 4HK  ))                               AFAM      244
                      CALL TIMEB (23,23HFROM AFAM, AFTER MACH  )                 AFAM      245
245                   GO TO 800                                                  AFAM      246
                C                                                                AFAM      247
                C                                                                AFAM      248
                C SUBSONIC AERODYNAMICS USING COLLOCATION PROCEDURE              AFAM      249
                C                                                                AFAM      250
250               700 CONTINUE                                                   AFAM      251
                      CALL KERN                                                  AFAM      252
                      CALL PROGNA (4H(KER, 4HN  ))                               AFAM      253
                      CALL TIMEB (23,23HFROM AFAM, AFTER KERN  )                 AFAM      254
                  800 CONTINUE                                                   AFAM      255
255             C                                                                AFAM      256
                C                                                                AFAM      257
                C FLUTTER SOLUTION                                               AFAM      258
                C                                                                AFAM      259
                      IF (LC(1) .EQ. 0) GO TO 990                                AFAM      260
260                   CALL SOLFLT (ISAVFO)                                       AFAM      261
                  990 CONTINUE                                                   AFAM      262
                      CALL PROGNA (4H(AFA, 4HM  ))                               AFAM      263
                      CALL TIMEB (35, 35HFROM AFAM - END OF FLUTTER ANALYSIS)    AFAM      264
                C                                                                AFAM      265
265             C                                                                AFAM      266
                C                                                                AFAM      267
                C FORMATS                                                        AFAM      268
                C                                                                AFAM      269
                   50 FORMAT (10I5)                                              AFAM      270
270              5060 FORMAT (18A4)                                              AFAM      271
                C                                                                AFAM      272
                      RETURN                                                     AFAM      273
                      END                                                        AFAM      274
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

227 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS	DEF LINE	REFERENCES
3 AFAM	146	272

VARIABLES	SN	TYPE		RELOCATION								
0 B		COMPLEX	ARRAY	MODD	REFS	149	155	173				
1 BETA		REAL		FLUTAN	REFS	174						
50 BR		REAL		COMA	REFS	172						
15 D		REAL		KLUES	REFS	183						
27 DBAL		REAL		KLUES	REFS	183						
16 DEL		REAL		KLUES	REFS	183						
6200 DETAD		COMPLEX	ARRAY	MODD	REFS	149	155	173				
47 DLB		REAL		CALCP	REFS	180						
57 DPLEN		REAL		CALCP	REFS	180						
54 DSCALE		REAL		CALCP	REFS	180						
44 DUB		REAL		CALCP	REFS	180						
12 DWMAX		REAL		KLUES	REFS	183						
11 EPS1		REAL		KLUES	REFS	183						
17 EPS2		REAL		KLUES	REFS	183						
215 FAOOD		REAL			REFS	208	DEFINED	207				
162 FAOOR		REAL			REFS	208	DEFINED	193				
3 FHI		REAL		FLUTV	REFS	177						
50 FLB		REAL		CALCP	REFS	180						
2 FLO		REAL		FLUTV	REFS	177						
0 FMACH		REAL		FLUTAN	REFS	174						
0 FMTA		REAL	ARRAY	CFMTA	REFS	151	162	209				
60 FRLEN		REAL		CALCP	REFS	180						
2 FRMAX		REAL		PRPL	REFS	179						
3 FRMIN		REAL		PRPL	REFS	179						
55 FSCALE		REAL		CALCP	REFS	180						
45 FUB		REAL		CALCP	REFS	180						
0 GMAX		REAL		PRPL	REFS	179						
1 GMIN		REAL		PRPL	REFS	179						
22 IBAND		INTEGER		KLUES	REFS	183						
7 IDNOPT		INTEGER		KLUES	REFS	183						
4 IE		INTEGER		FLUTV	REFS	177						
23 IFIN		INTEGER		KLUES	REFS	183						
220 IFTP		INTEGER			REFS	227	DEFINED	224				
52 IPLOT		INTEGER		CALCP	REFS	180						
2 IRED		INTEGER		KLUES	REFS	183						
214 ISAVFO		INTEGER			REFS	260	DEFINED	196				
2 ITAPEP		INTEGER		COMRWP	REFS	166						
0 ITAPER		INTEGER		COMRWP	REFS	166	210	I/O REFS	206	207	209	212
0 ITAPES		INTEGER	ARRAY	CTAPES	REFS	152	165	196				
7 ITAPET		INTEGER		CTABLE	REFS	167						
1 ITAPEW		INTEGER		COMRWP	REFS	166						
217 KDUMMY	*	INTEGER			DEFINED	211						
24 KLUB		INTEGER		KLUES	REFS	183						
4 KLUBAL		INTEGER		KLUES	REFS	183						
1 KLUE		INTEGER	ARRAY	CLUEM	REFS	152	163					
1 KLUEF		INTEGER	ARRAY	CLUEF	REFS	152	164	210	211			
3 KLUMD		INTEGER		KLUES	REFS	183						
1 KLUNAL		INTEGER		KLUES	REFS	183						
25 KLUQ		INTEGER		KLUES	REFS	183						
0 KLUSE		INTEGER		KLUES	REFS	183						

VARIABLES	SN	TYPE		RELOCATION						
0	KPLOTF	INTEGER		F.P.	DEFINED	146	225			
0	KTABLE	INTEGER		CTABLE	REFS	167				
5	KTABLO	INTEGER		CTABLE	REFS	167				
0	KTSH	INTEGER		CTSH	REFS	170	192			
216	L	INTEGER			REFS	209	2*214	DEFINED	209	213
0	LC	INTEGER	ARRAY	COMA	REFS	154	172	224	225	259
					DEFINED	212				
0	LKLUE	INTEGER		CLUEM	REFS	163				
0	LKLUEF	INTEGER		CLUEF	REFS	164	195			
53	LSD	INTEGER		CALCP	REFS	180				
1	LTSH	INTEGER		CTSH	REFS	170	191	192	213	
0	LTSHF	INTEGER		CTSHF	REFS	169				
211	LTSHR	INTEGER			REFS	209	DEFINED	191	192	
26	MORBAL	INTEGER		KLUES	REFS	183				
5	MSADD	INTEGER		KLUES	REFS	183				
13	NBAR	INTEGER		KLUES	REFS	183				
17550	NC	INTEGER		MODD	REFS	173				
212	NCC	INTEGER			REFS	210	DEFINED	194		
3	NCOLS	INTEGER		CTABLE	REFS	167				
4	NCOLST	INTEGER		CTABLE	REFS	167				
20	NCYC	INTEGER		KLUES	REFS	183				
14	NFIX	INTEGER		KLUES	REFS	183				
43	NINZ	INTEGER	ARRAY	FLUTC	REFS	156	176			
213	NKLUEF	INTEGER			REFS	210	DEFINED	195		
21	NNN	INTEGER		KLUES	REFS	183				
0	NO	INTEGER		CONSTS	REFS	171				
12	NOTI	INTEGER	ARRAY	FLUTC	REFS	156	176			
6	NPAGEA	INTEGER		CTABLE	REFS	167				
6	NPAS	INTEGER		KLUES	REFS	183				
1	NPASS	INTEGER		CTABLE	REFS	167				
5	NQZ	INTEGER		FLUTV	REFS	177				
2	NROWS	INTEGER		CTABLE	REFS	167				
57	NRVBO	INTEGER		FLUTAN	REFS	174				
31	NV	INTEGER		FLUTB	REFS	175				
6	NVTOT	INTEGER		FLUTV	REFS	177				
17500	OMGR	REAL	ARRAY	MODD	REFS	155	173			
0	QMWT	REAL	ARRAY	FLUTQ	REFS	157	178			
310	QWT	REAL	ARRAY	FLUTQ	REFS	157	178			
2013	RATOM	REAL	ARRAY	FLUTC	REFS	158	176			
0	RHOR	REAL	ARRAY	FLUTC	REFS	158	176			
40	RVBO	REAL	ARRAY	FLUTAN	REFS	158	174			
0	TITLE1	REAL	ARRAY	CALCP	REFS	159	180			
22	TITLE2	REAL	ARRAY	CALCP	REFS	159	180			
2	TSH	REAL	ARRAY	CTSH	REFS	153	170	DEFINED	214	
1	TSHF	REAL	ARRAY	CTSHF	REFS	153	169	214	DEFINED	209
0	V	REAL	ARRAY	FLUTB	REFS	160	175			
0	VA	REAL		FLUTV	REFS	177				
1	VB	REAL		FLUTV	REFS	177				
2	VBO	REAL	ARRAY	FLUTAN	REFS	160	174			
10	VDES	REAL		KLUES	REFS	183				
51	VLB	REAL		CALCP	REFS	180				
61	VLEN	REAL		CALCP	REFS	180				
4	VMAX	REAL		PRPL	REFS	179				
5	VMIN	REAL		PRPL	REFS	179				
56	VSCALE	REAL		CALCP	REFS	180				
46	VUB	REAL		CALCP	REFS	180				
14400	WW	REAL	ARRAY	MODD	REFS	155	173			

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VARIABLES      SN  TYPE            RELOCATION
    62  XDT        REAL              CALCP        REFS       180
     1  YES        INTEGER           CONSTS       REFS       148       171       192
        VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS           TYPE    ARGS       REFERENCES
        CLUES                4            210
        KERN                 0            251
        MACH                 0            242
        POOL                 0            220
        PROGNA               2            221       234       243       252       262
        RODDEN               0            233
        SOLFLT               1            260
        TAFAM                0            201
        TIMEB                2            222       235       244       253       263

STATEMENT LABELS              DEF LINE    REFERENCES
  203  50       FMT             269         212
    0  70            INACTIVE   224
    0  100           INACTIVE   190
    0  190           INACTIVE   206
   20  195                      207         208
    0  210                      214         213
   64  500                      232         227
   72  600                      241         227
  100  700                      250         227
  105  800                      254         236       245
  110  990                      261         259
  205  5060     FMT             270         207

LOOPS  LABEL    INDEX      FROM-TO    LENGTH    PROPERTIES
   41  210      L           213 214      3B      INSTACK

COMMON BLOCKS    LENGTH     MEMBERS - BIAS NAME(LENGTH)
        CFMTA         1              0 FMTA   (1)
        CLUEM        81              0 LKLUE  (1)          1 KLUE   (80)
        CLUEF        21              0 LKLUEF (1)          1 KLUEF  (20)
        CTAPES       50              0 ITAPES (50)
        COMRWP        3              0 ITAPER (1)          1 ITAPEW (1)          2 ITAPEP (1)
        CTABLE        8              0 KTABLE (1)          1 NPASS  (1)          2 NROWS  (1)
                                     3 NCOLS  (1)          4 NCOLST (1)          5 KTABLO (1)
                                     6 NPAGEA (1)          7 ITAPET (1)
        CTSHF         2              0 LTSHF  (1)          1 TSHF   (1)
        CTSH          3              0 KTSH   (1)          1 LTSH   (1)          2 TSH    (1)
        CONSTS        2              0 NO     (1)          1 YES    (1)
        COMA         41              0 LC     (40)        40 BR     (1)
        MODD       8041              0 B      (3200)    3200 DETAD  (3200)     6400 WW     (1600)
                                  8000 OMGR   (40)      8040 NC     (1)
        FLUTAN       48              0 FMACH  (1)          1 BETA   (1)          2 VBO    (30)
                                    32 RVBO   (15)        47 NRVBO  (1)
        FLUTB        26              0 V      (25)        25 NV     (1)
        FLUTC      1055              0 RHOR   (10)        10 NOTI   (25)         35 NINZ   (1000)
                                  1035 RATOM  (20)
        FLUTV         7              0 VA     (1)          1 VB     (1)          2 FLO    (1)
                                     3 FHI    (1)          4 IE     (1)          5 NQZ    (1)
                                     6 NVTOT  (1)
        FLUTQ       205              0 QMWT   (200)      200 QWT    (5)
        PRPL          6              0 GMAX   (1)          1 GMIN   (1)          2 FRMAX  (1)
```

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
		3 FRMIN (1)	4 VMAX (1)	5 VMIN (1)			
CALCP	51	0 TITLE1 (18)	18 TITLE2 (18)	36 DUB (1)			
		37 FUB (1)	38 VUB (1)	39 DLB (1)			
		40 FLB (1)	41 VLB (1)	42 IPLOT (1)			
		43 LSD (1)	44 DSCALE (1)	45 FSCALE (1)			
		46 VSCALE (1)	47 DPLEN (1)	48 FRLEN (1)			
		49 VLEN (1)	50 XDT (1)				
KLUES	24	0 KLUSE (1)	1 KLUNAL (1)	2 IRED (1)			
		3 KLUMD (1)	4 KLUBAL (1)	5 MSADD (1)			
		6 NPAS (1)	7 IDNOPT (1)	8 VDES (1)			
		9 EPS1 (1)	10 DWMAX (1)	11 NBAR (1)			
		12 NFIX (1)	13 D (1)	14 DEL (1)			
		15 EPS2 (1)	16 NCYC (1)	17 NNN (1)			
		18 IBAND (1)	19 IFIN (1)	20 KLUB (1)			
		21 KLUQ (1)	22 MORBAL (1)	23 DBAL (1)			

STATISTICS

PROGRAM LENGTH	272B	186
CM LABELED COMMON LENGTH	22713B	9675
520008 CM USED		

```
      C                                                                      TAFAM       2
      C45700, SUB. TAFAM (TITLE FOR AUTOMATED FLUTTER ANALYSIS MODULE)       TAFAM       3
      C                                                                      TAFAM       4
      C*********************************************************************** TAFAM     5
      C                                                                     * TAFAM       6
      C***  SUBROUTINE TAFAM  ************************************************ TAFAM     7
      C                                                                     * TAFAM       8
      C***  OBJECTIVE  ******************************************************* TAFAM     9
      C     ---------                                                       * TAFAM      10
      C     PRINTS THE TITLE PAGE FOR THE AUTOMATED FLUTTER ANALYSIS        * TAFAM      11
      C     MODULE                                                          * TAFAM      12
      C                                                                     * TAFAM      13
      C*********************************************************************** TAFAM     14
      C                                                                      TAFAM      15
            SUBROUTINE TAFAM                                                 TAFAM      16
      C                                                                      TAFAM      17
            DIMENSION AFFDL(4)                                               TAFAM      18
      C                                                                      TAFAM      19
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                             TAFAM      20
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE  TAFAM      21
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                      TAFAM      22
            COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA TAFAM      23
           1               ,ITAPET                                           TAFAM      24
            COMMON /CAFFDL/ AFFDL                                            TAFAM      25
      C                                                                      TAFAM      26
      C                                                                      TAFAM      27
      C PREPARE TABLE OF CONTENTS                                            TAFAM      28
      C                                                                      TAFAM      29
            KOUNT  =  LINES                                                  TAFAM      30
            CALL TITLES (-1)                                                 TAFAM      31
            NCOLS  =  0                                                      TAFAM      32
            NROWS  =  2                                                      TAFAM      33
            KTABLE =  2                                                      TAFAM      34
            CALL PTABLE (1,60,60                                             TAFAM      35
           *   H ***    *****    ***    *   *                               )  TAFAM      36
            NROWS  =  0                                                      TAFAM      37
            KTABLE =  2                                                      TAFAM      38
            CALL PTABLE (1,60,60                                             TAFAM      39
           *   H*   *   *       *   *   ** **          AUTOMATED           )  TAFAM      40
            KTABLE =  2                                                      TAFAM      41
            CALL PTABLE (1,60,60                                             TAFAM      42
           *   H***** - ****  - ***** - * * *           FLUTTER             )  TAFAM      43
            KTABLE =  2                                                      TAFAM      44
            CALL PTABLE (1,60,60                                             TAFAM      45
           *   H*   *   *       *   *   * * *          ANALYSIS            )  TAFAM      46
            KTABLE =  2                                                      TAFAM      47
            CALL PTABLE (2,60,60                                             TAFAM      48
           *   H*   *   *       *   *   * * *           MODULE             )  TAFAM      49
            KOUNT  =  LINES                                                  TAFAM      50
      C                                                                      TAFAM      51
      C                                                                      TAFAM      52
      C LIST TITLE PAGE                                                      TAFAM      53
      C                                                                      TAFAM      54
            WRITE (ITAPEW,100)                                               TAFAM      55
            WRITE (ITAPEW,105)                                               TAFAM      56
            WRITE (ITAPEW,110)                                               TAFAM      57
```

```
                WRITE (ITAPEW,120) AFFDL                                    TAFAM      59
                WRITE (ITAPEW,125)                                          TAFAM      60
60              WRITE (ITAPEW,130)                                          TAFAM      61
                WRITE (ITAPEW,135)                                          TAFAM      62
                WRITE (ITAPEW,140)                                          TAFAM      63
                WRITE (ITAPEW,145)                                          TAFAM      64
                WRITE (ITAPEW,150)                                          TAFAM      65
65              WRITE (ITAPEW,155)                                          TAFAM      66
                WRITE (ITAPEW,160)                                          TAFAM      67
                WRITE (ITAPEW,165)                                          TAFAM      68
                WRITE (ITAPEW,170)                                          TAFAM      69
                WRITE (ITAPEW,175)                                          TAFAM      70
70          100 FORMAT (                                                    TAFAM      71
               *    5X,122(1H*)                                             TAFAM      72
               *,/, 5X,1H*,120X,1H*                                         TAFAM      73
               *,/, 5X,1H*,15X                                              TAFAM      74
               A,13H      A                                                 TAFAM      75
75             *,52X, 36H.....,4X,1H*                                       TAFAM      76
               *,/, 5X,1H*,15X                                              TAFAM      77
               A,13H     AAA                                                TAFAM      78
               *,52X, 36H.                                  .,4X,1H*        TAFAM      79
               *,/, 5X,1H*,15X                                              TAFAM      80
80             A,13H    AAAAA                                               TAFAM      81
               *,52X, 36H.          **** FASTOP ****        .,4X,1H*        TAFAM      82
               *,/, 5X,1H*,15X                                              TAFAM      83
               A,13H    AAAAA                                               TAFAM      84
               *,52X, 36H.       FLUTTER AND STRUCTURAL     .,4X,1H*        TAFAM      85
85             *,/, 5X,1H*,15X                                              TAFAM      86
               A,13H   AAA AAA                                              TAFAM      87
               *,52X, 36H.        OPTIMIZATION PROGRAM      .,4X,1H*)       TAFAM      88
            105 FORMAT (                                                    TAFAM      89
               *    5X,1H*,15X                                              TAFAM      90
90             A,13H   AAA AAA                                              TAFAM      91
               *,52X, 36H.                                  .,4X,1H*        TAFAM      92
               *,/, 5X,1H*,15X                                              TAFAM      93
               A,13H   AAA AAA                                              TAFAM      94
               *,52X, 36H.           **** FOP ****          .,4X,1H*        TAFAM      95
95             *,/, 5X,1H*,15X                                              TAFAM      96
               A,13H   AAA AAA                                              TAFAM      97
               *,52X, 36H.   FLUTTER OPTIMIZATION PACKAGE   .,4X,1H*        TAFAM      98
               *,/, 5X,1H*,15X                                              TAFAM      99
               A,13H   AAA AAA                                              TAFAM     100
100            *,52X, 36H.                                  .,4X,1H*        TAFAM     101
               *,/, 5X,1H*,15X                                              TAFAM     102
               A,13H  AAAAAAAAA                                             TAFAM     103
               *,52X, 36H.           **** AFAM ****         .,4X,1H*)       TAFAM     104
            110 FORMAT (                                                    TAFAM     105
105            *    5X,1H*,15X                                              TAFAM     106
               A,13H  AAAAAAAAA                                             TAFAM     107
               *,13X                                                        TAFAM     108
               F,13HFFFFFFFFFFFFF                                           TAFAM     109
               *,26X, 36H.             AUTOMATED            .,4X,1H*        TAFAM     110
110            *,/, 5X,1H*,15X                                              TAFAM     111
               A,13H  AAAA AAAA                                             TAFAM     112
               *,13X                                                        TAFAM     113
               F,13HFFFFFFFFFFFFF                                           TAFAM     114
               *,26X, 36H.      FLUTTER ANALYSIS MODULE      .4X,1H*        TAFAM     115
```

```
115               *,/, 5X,1H*,15X                                          TAFAM     116
                  A,13H  AAA   AAA                                         TAFAM     117
                  *,13X                                                    TAFAM     118
                  F,13H FFF     FFF                                        TAFAM     119
                  *,26X, 36H.                                ..,4X,1H*)    TAFAM     120
120            115 FORMAT (                                                TAFAM     121
                  *    5X,1H*,15X                                         TAFAM     122
                  A,13H  AAA   AAA                                         TAFAM     123
                  *,13X                                                    TAFAM     124
                  F,13H FFF     FFF                                        TAFAM     125
125               *,26X, 36H.....................................,4X,1H*    TAFAM     126
                  *,/, 5X,1H*,15X                                          TAFAM     127
                  A,13H AAA     AAA                                        TAFAM     128
                  *,13X                                                    TAFAM     129
                  F,13H FFF                                                TAFAM     130
130               *,26X, 36H.                                ..,4X,1H*     TAFAM     131
                  *,/, 5X,1H*,15X                                          TAFAM     132
                  A,13H AAA     AAA                                        TAFAM     133
                  *,13X                                                    TAFAM     134
                  F,13H FFF                                                TAFAM     135
135               *,26X, 36H.            AIR FORCE           ..,4X,1H*)    TAFAM     136
               120 FORMAT (                                                TAFAM     137
                  *    5X,1H*,15X                                         TAFAM     138
                  A,13H AAA     AAA                                        TAFAM     139
                  *,13X                                                    TAFAM     140
140               F,13H FFF                                                TAFAM     141
                  *,26X, 36H.    FLIGHT DYNAMICS LABORATORY    ..,4X,1H*   TAFAM     142
                  *,/, 5X,1H*,15X                                          TAFAM     143
                  A,13HAAA       AAA                                       TAFAM     144
                  *,13X                                                    TAFAM     145
145               F,13H FFF                                                TAFAM     146
                  *,26X, 36H.                                ..,4X,1H*     TAFAM     147
                  *,/, 5X,1H*,15X                                          TAFAM     148
                  A,13HAAA       AAA                                       TAFAM     149
                  *,13X                                                    TAFAM     150
150               F,13H FFF                                                TAFAM     151
                  *,26X, 10H.          ,4A4, 10H          ..,4X,1H*)       TAFAM     152
               125 FORMAT (                                                TAFAM     153
                  *    5X,1H*,15X                                         TAFAM     154
                  A,13HAAA       AAA                                       TAFAM     155
155               *,13X                                                    TAFAM     156
                  F,13H FFFFFFFFF                                          TAFAM     157
                  *,26X, 36H.                                ..,4X,1H*     TAFAM     158
                  *,/, 5X,1H*,41X                                          TAFAM     159
                  F,13H FFFFFFFFF                                          TAFAM     160
160               *,13X                                                    TAFAM     161
                  A,13H      A                                             TAFAM     162
                  *,     36H.....................................,4X,1H*    TAFAM     163
                  *,/, 5X,1H*,41X                                          TAFAM     164
                  F,13H FFF                                                TAFAM     165
165               *,13X                                                    TAFAM     166
                  A,13H     AAA                                            TAFAM     167
                  *,40X,1H*)                                               TAFAM     168
               130 FORMAT (                                                TAFAM     169
                  *    5X,1H*,41X                                         TAFAM     170
170               F,13H FFF                                                TAFAM     171
                  *,13X                                                    TAFAM     172
```

```
                A,13H    AAAAA                                  TAFAM     173
                *,40X,1H*                                       TAFAM     174
                *,/, 5X,1H*,41X                                 TAFAM     175
175             F,13H FFF                                       TAFAM     176
                *,13X                                           TAFAM     177
                A,13H    AAAAA                                  TAFAM     178
                *,40X, 1H*                                      TAFAM     179
                *,/, 5X,1H*,41X                                 TAFAM     180
180             F,13H FFF                                       TAFAM     181
                *,13X                                           TAFAM     182
                A,13H   AAA AAA                                 TAFAM     183
                *,40X,1H*)                                      TAFAM     184
              135 FORMAT (                                      TAFAM     185
185             *    5X,1H*,41X                                 TAFAM     186
                F,13H FFF                                       TAFAM     187
                *,13X                                           TAFAM     188
                A,13H   AAA AAA                                 TAFAM     189
                *,40X,1H*                                       TAFAM     190
190             *,/, 5X,1H*,41X                                 TAFAM     191
                F,13H FFF                                       TAFAM     192
                *,13X                                           TAFAM     193
                A,13H   AAA AAA                                 TAFAM     194
                *,40X,1H*                                       TAFAM     195
195             *,/, 5X,1H*,41X                                 TAFAM     196
                F,13H FFF                                       TAFAM     197
                *,13X                                           TAFAM     198
                A,13H   AAA AAA                                 TAFAM     199
                *,40X,1H*)                                      TAFAM     200
200           140 FORMAT (                                      TAFAM     201
                *    5X,1H*,41X                                 TAFAM     202
                F,13HFFFF                                       TAFAM     203
                *,13X                                           TAFAM     204
                A,13H   AAA AAA                                 TAFAM     205
205             *,40X,1H*                                       TAFAM     206
                *,/, 5X,1H*,41X                                 TAFAM     207
                F,13HFFFF                                       TAFAM     208
                *,13X                                           TAFAM     209
                A,13H  AAAAAAAAA                                TAFAM     210
210             *,40X,1H*                                       TAFAM     211
                *,/, 5X,1H*,67X                                 TAFAM     212
                A,13H  AAAAAAAAA                                TAFAM     213
                *,13X                                           TAFAM     214
                M,13HMMM        MMM                             TAFAM     215
215             *,14X,1H*)                                      TAFAM     216
              145 FORMAT (                                      TAFAM     217
                *    5X,1H*,2X                                  TAFAM     218
                *,65X                                           TAFAM     219
                A,13H  AAAA AAAA                                TAFAM     220
220             *,13X                                           TAFAM     221
                M,13HMMM        MMM                             TAFAM     222
                *,14X,1H*                                       TAFAM     223
                *,/, 5X,1H*,2X                                  TAFAM     224
                *,65X                                           TAFAM     225
225             A,13H  AAA   AAA                                TAFAM     226
                *,13X                                           TAFAM     227
                M,13HMMMM      MMMM                             TAFAM     228
                *,14X,1H*                                       TAFAM     229
```

```
                  675 BUFFER(I) =  QZ(J,I)                                          POOL      173
                  685 CALL RNRW (MTAP49,BUFFER,LC2)                                 POOL      174
                      REWIND MTAP49                                                 POOL      175
      175         C     STORE PERTINENT INFORMATION FOR USE IN INDIVIDUAL           POOL      176
                  C     AERODYNAMIC THEORIES                                        POOL      177
                  C                                                                 POOL      178
                  C                                                                 POOL      179
                        CALL FLINFO                                                 POOL      180
      180         C                                                                 POOL      181
                  C                                                                 POOL      182
                  C FORMATS                                                         POOL      183
                  C                                                                 POOL      184
                     20 FORMAT(10I5)                                                POOL      185
      185            40 FORMAT (7E10.3)                                            POOL      186
                    710 FORMAT(3(2I5,E10.3))                                        POOL      187
                   1000 FORMAT (10X, 42HVIBRATION DATA HAS BEEN ENTERED FROM CARDS) POOL      188
                   1100 FORMAT (10X, 56HVIBRATION DATA HAS BEEN ENTERED FROM THREE FILES O POOL 189
                       1N TAPE)                                                     POOL      190
      190              1200 FORMAT (10X, 53HVIBRATION DATA HAS BEEN ENTERED FROM ONE FILE ON T POOL 191
                          1APE)                                                     POOL      192
                   2000 FORMAT (10X,41HENTER VIBRATION DATA FOR FLUTTER ANALYSIS    POOL      193
                       1       ,/10X,41(1H-))                                     POOL      194
                  C                                                                 POOL      195
      195               RETURN                                                    POOL      196
                        END                                                         POOL      197
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

53 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
1	POOL	1	195

VARIABLES	SN	TYPE		RELOCATION								
0	B	COMPLEX	ARRAY	MODD	REFS	10	12					
50	BR	REAL		COMA	REFS	13						
755	BUFFER	REAL	ARRAY		REFS	5	38	88	92	100	105	113
						115	135	145	173	DEFINED	131	140	172
242	CSCL	REAL		FLUT	REFS	24						
6200	DETAD	COMPLEX	ARRAY	MODD	REFS	10	12					
22165	DUMMY	REAL	ARRAY		REFS	6	86	97	110			
726	I	INTEGER			REFS	63	71	85	91	92	104	105
						126	131	134	135	144	145	153	169
						2*172	DEFINED	62	65	71	85	90	103
						126	131	133	143	151	168	171	
743	IDMAS	INTEGER			REFS	97	DEFINED	84				
742	IDMODE	INTEGER			REFS	86	DEFINED	84				
744	IDOMG	INTEGER			REFS	110	DEFINED	84				

```
115                 OMG(I2)  =  BUFFER(J)                                    POOL      116
                    I2 = I2 + 1                                              POOL      117
                  680 CONTINUE                                               POOL      118
                    CALL PLB (1,1,ITAPEW)                                    POOL      119
                    WRITE (ITAPEW,1100)                                      POOL      120
120                 GO TO 600                                                POOL      121
                C                                                            POOL      122
                C                                                            POOL      123
                C READ VIBRATION DATA FROM TAPE USING ONE FILE ONLY          POOL      124
                C                                                            POOL      125
125               500 CONTINUE                                               POOL      126
                    READ (ITAPER,20) (IFLMD(I), I=1,LC2)                     POOL      127
                    CALL FSIO (6HIDVIBA,IDVIBA,JDVIBA,KDVIBA,LOCFIL,2)       POOL      128
                    REWIND IDVIBA                                            POOL      129
                    MTAP4  =  IDVIBA                                         POOL      130
130                 READ(MTAP4) NC,NM                                        POOL      131
                    READ (MTAP4) (BUFFER(I), I=1,NM)                         POOL      132
                    I1  =  1                                                 POOL      133
                    DO 3  I=1,NM                                             POOL      134
                    IF ( I .NE. IFLMD(I1) )      GO TO 3                     POOL      135
135                 OMG(I1)  =  BUFFER(I)                                    POOL      136
                    I1  =  I1 + 1                                            POOL      137
                  3 CONTINUE                                                 POOL      138
                    I2  =  1                                                 POOL      139
                    DO 5  J=1,NM                                             POOL      140
140                 READ (MTAP4)  (BUFFER(II) , II=1,NM)                     POOL      141
                    IF ( J .NE. IFLMD(I2) )      GO TO 5                     POOL      142
                    I1  =  1                                                 POOL      143
                    DO 6  I=1,NM                                             POOL      144
                    IF ( I .NE. IFLMD(I1) )      GO TO 6                     POOL      145
145                 WW (I2,I1)  =  BUFFER(I)                                 POOL      146
                    I1  =  I1 + 1                                            POOL      147
                  6 CONTINUE                                                 POOL      148
                    I2  =  I2 + 1                                            POOL      149
                  5 CONTINUE                                                 POOL      150
150                 I1  =  1                                                 POOL      151
                    DO 7  I=1,NM                                             POOL      152
                    CALL RNRW (-MTAP4,QZ(1,I1),NC)                           POOL      153
                    IF (I .EQ. IFLMD(I1)) I1 = I1+1                          POOL      154
                  7 CONTINUE                                                 POOL      155
155                 CALL FCLOSE (IDVIBA,JDVIBA,2)                            POOL      156
                    CALL PLB (1,1,ITAPEW)                                    POOL      157
                    WRITE (ITAPEW,1200)                                      POOL      158
                C                                                            POOL      159
                C                                                            POOL      160
160             C STORE SELECTED MODE SHAPES ON TAPE FOR USE IN VARIOUS AERODYNAMIC  POOL  161
                C THEORIES AND FLUTTER.                                      POOL      162
                C INFORMATION IS STORED IN THE FOLLOWING ORDER.              POOL      163
                C  1. ALL COORDINATES ARE STORED ON TAPE FOR EACH MODE.      POOL      164
                C  2. ALL MODES ARE STORED ON TAPE FOR EACH COORDINATE.      POOL      165
165             C                                                            POOL      166
                  600 CONTINUE                                               POOL      167
                    REWIND MTAP49                                            POOL      168
                    DO 655 I=1,LC2                                           POOL      169
                  655 CALL RNRW (MTAP49,QZ(1,I),NC)                          POOL      170
170                 DO 685 J=1,NC                                            POOL      171
                    DO 675 I=1,LC2                                           POOL      172
```

```
      C                                                                 POOL       59
      C READ VIBRATION DATA FROM CARDS                                  POOL       60
60    C                                                                 POOL       61
        300 READ (ITAPER,20) NC                                         POOL       62
            DO 60 I=1,LC2                                               POOL       63
         60 READ (ITAPER,40) (QZ(K,I), K=1,NC)                          POOL       64
            READ (ITAPER,20)  NCARD                                     POOL       65
65          DO 25  I=1,NCARD                                            POOL       66
            READ (ITAPER,710)  I1,J1,VALU1,I2,J2,VALU2,I3,J3,VALU3      POOL       67
            IF (I1.NE.0.AND.J1.NE.0) WW(I1,J1) = VALU1                  POOL       68
            IF (I2.NE.0.AND.J2.NE.0) WW(I2,J2) = VALU2                  POOL       69
            IF (I3.NE.0.AND.J3.NE.0) WW(I3,J3) = VALU3                  POOL       70
70          25 CONTINUE                                                 POOL       71
            READ (ITAPER,40) (OMG(I),I=1,LC2)                           POOL       72
            CALL PLB (1,1,ITAPEW)                                       POOL       73
            WRITE (ITAPEW,1000)                                         POOL       74
            GO TO 600                                                   POOL       75
75    C                                                                 POOL       76
      C                                                                 POOL       77
      C READ VIBRATION DATA FROM TAPE USING THREE FILES                 POOL       78
      C                                                                 POOL       79
        610 CONTINUE                                                    POOL       80
80    CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS POOL       81
      C     CALL DINIT (12,8HFT12F001)                                  POOL       82
      C     MTAP4  =  ITAPES(12)                                        POOL       83
      CIBM  ENDING    OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS POOL       84
            READ (ITAPER,20) IDMODE, IDMAS, IDOMG                       POOL       85
85          READ (ITAPER,20)   (IFLMD(I), I=1,LC2)                      POOL       86
            CALL GEDLAB (6HPOOL  ,MTAP4,DUMMY,IDMODE,IROW,NM)           POOL       87
            DO 630 J = 1,IROW                                           POOL       88
            CALL GETROW (MTAP4,1,BUFFER,NM)                             POOL       89
            I1 = 1                                                      POOL       90
90          DO 9  I = 1,NM                                              POOL       91
            IF ( I .NE. IFLMD(I1) )       GO TO 9                       POOL       92
            QZ(J,I1)  =  BUFFER(I)                                      POOL       93
            I1 = I1 + 1                                                 POOL       94
          9 CONTINUE                                                    POOL       95
95        630 CONTINUE                                                  POOL       96
            NC  =  IROW                                                 POOL       97
            CALL GEDLAB (6HPOOL  ,MTAP4,DUMMY,IDMAS,IROW,NM)            POOL       98
            I2  =  1                                                    POOL       99
            DO 690  J=1,IROW                                            POOL      100
100         CALL GETROW (MTAP4,1,BUFFER,NM)                             POOL      101
            IF (J.NE.IFLMD(I2)) GOTO 690                                POOL      102
            I1 = 1                                                      POOL      103
            DO 660 I=1,NM                                               POOL      104
            IF (I.NE.IFLMD(I1)) GOTO 660                                POOL      105
105         WW(I2,I1) = BUFFER(I)                                       POOL      106
            I1 = I1 + 1                                                 POOL      107
        660 CONTINUE                                                    POOL      108
            I2 = I2 + 1                                                 POOL      109
        690 CONTINUE                                                    POOL      110
110         CALL GEDLAB (6HPOOL  ,MTAP4,DUMMY,IDOMG,IROW,NM)            POOL      111
            I2 = 1                                                      POOL      112
            DO 680 J=1,IROW                                             POOL      113
            CALL GETROW (MTAP4,1,BUFFER,NM)                             POOL      114
            IF (I.NE.IFLMD(I2)) GOTO 680                                POOL      115
```

```
      SUBROUTINE POOL                                                   POOL      2
C     INPUT FUSELAGE POINTS LAST IN EACH MODE                           POOL      3
C                                                                       POOL      4
C                                                                       POOL      5
      DIMENSION BUFFER(40),IFLMD(40),QZ(220,40),WW(40,40),OMG(40)       POOL      6
      DIMENSION       DUMMY(2)                                          POOL      7
      DIMENSION ITAPES(50),IPOS(20),IFILES(50)                          POOL      8
      DIMENSION TSHF(1)           ,TITLE(18,2)                          POOL      9
C                                                                       POOL     10
      COMPLEX   B(40,40),DETAD(40,40),UMOD(40),VMOD(40)                 POOL     11
C                                                                       POOL     12
      COMMON /MODD  / B, DETAD, WW, OMG, NC                             POOL     13
      COMMON /COMA  / LC(40), BR                                        POOL     14
      COMMON / CTAPES/ ITAPES                                           POOL     15
      COMMON / FILE / IPOS                                              POOL     16
      COMMON /CTITLE/ LTITLE,TITLE                                      POOL     17
      COMMON /CTSHF / LTSHF ,TSHF                                       POOL     18
      COMMON /CFILES/ KFILES,IFILES                                     POOL     19
      COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE   POOL     20
     1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                       POOL     21
      COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA  POOL     22
     1               ,ITAPET                                            POOL     23
      COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              POOL     24
      COMMON /FLUT  / UMOD,VMOD,VF,WW1,CSCL,LC2,IFLMD                   POOL     25
C                                                                       POOL     26
C                                                                       POOL     27
C INITIAL CONDITIONS                                                    POOL     28
C                                                                       POOL     29
      MTAP4  =  ITAPES(24)                                              POOL     30
      MTAP49 =  ITAPES(49)                                              POOL     31
      LC2    =  LC(2)                                                   POOL     32
      ZERO   =  0.0                                                     POOL     33
      NMD = 40                                                          POOL     34
      NCD = 220                                                         POOL     35
      KOUNT  =  LINES                                                   POOL     36
      CALL DVALUE (WW    ,ZERO,NMD*NMD)                                 POOL     37
      CALL DVALUE (QZ    ,ZERO,NCD*NMD)                                 POOL     38
      CALL DVALUE (BUFFER,ZERO,NMD)                                     POOL     39
      CALL PROGNA (4H(POO, 4HL  ))                                      POOL     40
      CALL TITLES (2)                                                   POOL     41
      CALL PLB (1,1,ITAPEW)                                             POOL     42
      WRITE (ITAPEW,2000)                                               POOL     43
      CALL PLB (1,1,ITAPEW)                                             POOL     44
      KOUNT  =  KOUNT + 4                                               POOL     45
      NROWS  =  1                                                       POOL     46
      NCOLS  =  0                                                       POOL     47
      KTABLE =  2                                                       POOL     48
      CALL PTABLE (2,41,41HENTER VIBRATION DATA FOR FLUTTER ANALYSIS)   POOL     49
      KOUNT  =  KOUNT + 2                                               POOL     50
C                                                                       POOL     51
      READ (ITAPER,20) IN                                               POOL     52
C                                                                       POOL     53
      GO TO ( 300 , 610 , 500 ) , IN                                    POOL     54
C     IN = 1  MODAL DATA ON CARDS                                       POOL     55
C     IN = 2  MODAL DATA ON VIBRATION TAPE ------ CALLED BY FILE        POOL     56
C     IN = 3  MODAL DATA ON BINARY TAPE FROM VIBRATION DECK             POOL     57
C                                                                       POOL     58
```

```
EXTERNALS          TYPE   ARGS      REFERENCES
      DCMPLF     COMPLEX    2            3        32

STATEMENT LABELS              DEF LINE   REFERENCES
    0  310                       28         25
   36  320                       32         13

LOOPS  LABEL    INDEX      FROM-TO    LENGTH    PROPERTIES
   26  310      J          25 28         7B      INSTACK

STATISTICS
  PROGRAM LENGTH                 56B       46
          520000B CM USED
```

```
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS      COMSCA      2
            COMPLEX FUNCTION COMSCA (W,Z,SS,NN,IW,IZ)                         COMSCA      3
            COMPLEX DCMPLF                                                    COMSCA      4
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS        COMSCA      5
      C                                                                       COMSCA      6
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS     COMSCA      7
      C     COMPLEX FUNCTION COMSCA*16 (W,Z,SS,NN,IW,IZ)                      COMSCA      8
      C     DOUBLE PRECISION SS                                               COMSCA      9
      C     COMPLEX*16 DCMPLF                                                 COMSCA     10
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS        COMSCA     11
      C                                                                       COMSCA     12
            DIMENSION     W(2,IW,1) , Z(2,IZ,1), SS(2)                        COMSCA     13
            IF ( NN .LE. 0 )   GO TO 320                                      COMSCA     14
      C                                                                       COMSCA     15
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS     COMSCA     16
      C     DO 310  J = 1,NN                                                  COMSCA     17
      C     SS(1)  =  SS(1) + DBLE(W(1,1,J))*DBLE(Z(1,1,J))                   COMSCA     18
      C    1                - DBLE(W(2,1,J))*DBLE(Z(2,1,J))                   COMSCA     19
      C 310 SS(2)  =  SS(2) + DBLE(W(1,1,J))*DBLE(Z(2,1,J))                   COMSCA     20
      C    1                + DBLE(W(2,1,J))*DBLE(Z(1,1,J))                   COMSCA     21
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS        COMSCA     22
      C                                                                       COMSCA     23
      C                                                                       COMSCA     24
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS     COMSCA     25
            DO 310  J=1,NN                                                    COMSCA     26
            SS(1)   =   SS(1) + W(1,1,J) * Z(1,1,J)                           COMSCA     27
           1                  - W(2,1,J) * Z(2,1,J)                           COMSCA     28
        310 SS(2)   =   SS(2) + W(1,1,J) * Z(2,1,J)                           COMSCA     29
           1                  + W(2,1,J) * Z(1,1,J)                           COMSCA     30
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS        COMSCA     31
      C                                                                       COMSCA     32
        320 COMSCA  =  DCMPLF (SS(1),SS(2))                                   COMSCA     33
            RETURN                                                            COMSCA     34
            END                                                               COMSCA     35
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
5	COMSCA	2	33

VARIABLES

		SN	TYPE		RELOCATION								
51	COMSCA		COMPLEX			DEFINED	32						
0	IW		INTEGER		F.P.	REFS	12	DEFINED	2				
0	IZ		INTEGER		F.P.	REFS	12	DEFINED	2				
53	J		INTEGER			REFS	4*26	4*28	DEFINED	25			
0	NN		INTEGER		F.P.	REFS	13	25	DEFINED	2			
0	SS		REAL	ARRAY	F.P.	REFS	12	26	28	2*32	DEFINED	2	26
						28							
0	W		REAL	ARRAY	F.P.	REFS	12	2*26	2*28	DEFINED	2		
0	Z		REAL	ARRAY	F.P.	REFS	12	2*26	2*28	DEFINED	2		

ENTRY POINTS		DEF LINE	REFERENCES
4	DSCAPR	24	49

VARIABLES	SN	TYPE	RELOCATION							
31	DSCAPR	REAL			DEFINED	47				
0	IX	INTEGER		F.P.	REFS	45	DEFINED	24		
0	IY	INTEGER		F.P.	REFS	46	DEFINED	24		
34	J	* INTEGER			DEFINED	35				
32	JX	INTEGER			REFS	38	45	DEFINED	33	45
33	JY	INTEGER			REFS	38	46	DEFINED	34	46
0	N	INTEGER		F.P.	REFS	32	35	DEFINED	24	
0	S	REAL		F.P.	REFS	38	47	DEFINED	24	38
0	X	REAL	ARRAY	F.P.	REFS	26	38	DEFINED	24	
0	Y	REAL	ARRAY	F.P.	REFS	26	38	DEFINED	24	

STATEMENT LABELS			DEF LINE	REFERENCES
0	100	INACTIVE	33	32
0	110		46	35
27	120		47	2*32

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
21	110	J	35 46	4B	INSTACK

STATISTICS

PROGRAM LENGTH 40B 32

520000B CM USED

```
      C45700, FUN. DSCAPR                                                    DSCAPR      2
      C                                                                      DSCAPR      3
      C*************************************************************************DSCAPR      4
      C                                                                     * DSCAPR      5
      C***  FUNCTION   DSCAPR  ***********************************************DSCAPR      6
      C                                                                     * DSCAPR      7
      C***  OBJECTIVE  ***************************************************** DSCAPR      8
      C     ---------                                                       * DSCAPR      9
      C     ACCUMULATES PRODUCTS OF ROW AND COLUMN ELEMENTS OF MATRICES.    * DSCAPR     10
      C                                                                     * DSCAPR     11
      C***  INPUT/OUTPUT  ************************************************** DSCAPR     12
      C     ------------                                                    * DSCAPR     13
      C                                                                     * DSCAPR     14
      C***  SUMMARY OF SYMBOLS  ******************************************** DSCAPR     15
      C     ------------------                                              * DSCAPR     16
      C                                                                     * DSCAPR     17
      C***  ERROR MESSAGES  ************************************************DSCAPR     18
      C     --------------                                                  * DSCAPR     19
      C     NONE.                                                           * DSCAPR     20
      C                                                                     * DSCAPR     21
      C*************************************************************************DSCAPR     22
      C                                                                      DSCAPR     23
      C                                                                      DSCAPR     24
            FUNCTION DSCAPR(X,Y,S,N,IX,IY)                                   DSCAPR     25
      C                                                                      DSCAPR     26
            DIMENSION X(1),Y(1)                                              DSCAPR     27
      C                                                                      DSCAPR     28
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS    DSCAPR     29
      C     DOUBLE PRECISION S,DSCAPR                                        DSCAPR     30
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS       DSCAPR     31
      C                                                                      DSCAPR     32
            IF (N) 120,120,100                                               DSCAPR     33
        100 JX = 1                                                           DSCAPR     34
            JY = 1                                                           DSCAPR     35
            DO 110  J = 1,N                                                  DSCAPR     36
      C                                                                      DSCAPR     37
      CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS    DSCAPR     38
            S = S + X(JX)*Y(JY)                                              DSCAPR     39
      CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS       DSCAPR     40
      C                                                                      DSCAPR     41
      CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS    DSCAPR     42
      C     S = S + DBLE(X(JX)) * DBLE(Y(JY))                                DSCAPR     43
      CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS       DSCAPR     44
      C                                                                      DSCAPR     45
            JX = JX + IX                                                     DSCAPR     46
        110 JY = JY + IY                                                     DSCAPR     47
        120 DSCAPR = S                                                       DSCAPR     48
      C                                                                      DSCAPR     49
            RETURN                                                           DSCAPR     50
            END                                                              DSCAPR     51
```

SYMBOLIC REFERENCE MAP (R=3)

```
      1                SUBROUTINE CNRW (IU, A, MID)                          CNRW        2
                     C                                                      CNRW        3
                       COMPLEX            A(MID)                            CNRW        4
                     C                                                      CNRW        5
      5                IF (IU .LT. 0)   GO TO 10                             CNRW        6
                       WRITE (IU) A                                          CNRW        7
                       RETURN                                                CNRW        8
                    10 IB = IABS (IU)                                        CNRW        9
                       READ (IB)  A                                          CNRW       10
     10                RETURN                                                CNRW       11
                       END                                                   CNRW       12
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

SN	ENTRY POINTS	DEF LINE	REFERENCES
3	CNRW	1	7 10

VARIABLES

SN	VARIABLES	TYPE	RELOCATION									
0	A	COMPLEX	ARRAY	F.P.	REFS	3	6	DEFINED	1	9		
34	IB	INTEGER			DEFINED	8	I/O REFS	9				
0	IU	INTEGER		F.P.	REFS	5	8	DEFINED	1	I/O REFS	6	
0	MID	INTEGER		F.P.	REFS	3	DEFINED	1				

VARIABLES USED AS FILE NAMES, SEE ABOVE

INLINE FUNCTIONS

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
IABS	INTEGER	1	INTRIN		8

STATEMENT LABELS

SN	STATEMENT LABELS	DEF LINE	REFERENCES
15	10	8	5

STATISTICS

PROGRAM LENGTH	358	29
52000B CM USED		

```
      SUBROUTINE RNRW       74/74   OPT=1                    FTN 4.8+577       85/01/23. 08.10.44       PAGE      1

      1                SUBROUTINE RNRW (IU, A, MID)                                RNRW        2
                     C                                                            RNRW        3
                       DIMENSION          A(MID)                                  RNRW        4
                     C                                                            RNRW        5
      5                IF (IU .LT. 0)   GO TO 10                                   RNRW        6
                       WRITE (IU) A                                                RNRW        7
                       RETURN                                                      RNRW        8
                    10 IB  =  IABS(IU)                                             RNRW        9
                       READ (IB) A                                                 RNRW       10
      10               RETURN                                                      RNRW       11
                       END                                                         RNRW       12


      SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS     DEF LINE     REFERENCES
    3  RNRW            1          7        10

VARIABLES     SN  TYPE           RELOCATION
    0  A          REAL       ARRAY     F.P.        REFS        3        6    DEFINED        1         9
   34  IB         INTEGER                          DEFINED     8   I/O REFS       9
    0  IU         INTEGER              F.P.        REFS        5        8    DEFINED        1    I/O REFS       6
    0  MID        INTEGER              F.P.        REFS        3   DEFINED        1
       VARIABLES USED AS FILE NAMES, SEE ABOVE

INLINE FUNCTIONS   TYPE    ARGS        DEF LINE  REFERENCES
       IABS       INTEGER    1  INTRIN                8

STATEMENT LABELS              DEF LINE   REFERENCES
   15  10                         8          5

STATISTICS
  PROGRAM LENGTH                  35B       29
         520008 CM USED
```

COMMON BLOCKS LENGTH MEMBERS - BIAS NAME(LENGTH)

		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)
		9 KOUNTH (1)	10 KOUNTI (1)	
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)
		6 NPAGEA (1)	7 ITAPET (1)	
CAFFDL	4	0 AFFDL (4)		

STATISTICS

PROGRAM LENGTH	1104B	580
CM LABELED COMMON LENGTH	32B	26

52000B CM USED

ENTRY POINTS DEF LINE REFERENCES
1 TAFAM 15 333

VARIABLES	SN	TYPE		RELOCATION								
0	AFFDL	REAL	ARRAY	CAFFDL	REFS	17	24	58				
2	ITAPEP	INTEGER		COMRWP	REFS	19						
0	ITAPER	INTEGER		COMRWP	REFS	19						
7	ITAPET	INTEGER		CTABLE	REFS	22						
1	ITAPEW	INTEGER		COMRWP	REFS	19	I/O REFS	54	55	56	57	58
					59	60	61	62	63	64	65	66
					67	68	69					
7	KBPAGE	INTEGER		CLIST	REFS	20						
4	KLABEL	INTEGER		CLIST	REFS	20						
0	KOUNT	INTEGER		CLIST	REFS	20	DEFINED	29	49			
11	KOUNTH	INTEGER		CLIST	REFS	20						
12	KOUNTI	INTEGER		CLIST	REFS	20						
1	KPAGE	INTEGER		CLIST	REFS	20						
0	KTABLE	INTEGER		CTABLE	REFS	22	DEFINED	33	37	40	43	46
5	KTABLO	INTEGER		CTABLE	REFS	22						
5	KTPAGE	INTEGER		CLIST	REFS	20						
2	LINES	INTEGER		CLIST	REFS	20	29	49				
10	LINESG	INTEGER		CLIST	REFS	20						
3	LINEST	INTEGER		CLIST	REFS	20						
3	NCOLS	INTEGER		CTABLE	REFS	22	DEFINED	31				
4	NCOLST	INTEGER		CTABLE	REFS	22						
6	NPAGE	INTEGER		CLIST	REFS	20						
6	NPAGEA	INTEGER		CTABLE	REFS	22						
1	NPASS	INTEGER		CTABLE	REFS	22						
2	NROWS	INTEGER		CTABLE	REFS	22	DEFINED	32	36			

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES					
PTABLE		3	34	38	41	44	47	
TITLES		1	30					

STATEMENT LABELS			DEF LINE	REFERENCES
201	100	FMT	70	54
251	105	FMT	88	55
317	110	FMT	104	56
354	115	FMT	120	57
411	120	FMT	136	58
445	125	FMT	152	59
475	130	FMT	168	60
516	135	FMT	184	61
537	140	FMT	200	62
560	145	FMT	216	63
601	150	FMT	235	64
627	155	FMT	254	65
666	160	FMT	273	66
726	165	FMT	292	67
766	170	FMT	311	68
1032	175	FMT	331	69

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)

```
                *,/, 5X,1H*,2X                                                  TAFAM    287
                *,5X,  15H.   GRUMMAN    .,4X                                  TAFAM    288
                *,           40H  GGGGGGGGGGGGGG                    ,1X         TAFAM    289
                *,26X                                                           TAFAM    290
290             M,13HMMM  MMM  MMM                                              TAFAM    291
                *,14X,1H*)                                                      TAFAM    292
              165 FORMAT (                                                      TAFAM    293
                *    5X,1H*,2X                                                  TAFAM    294
                *,5X,  15H.  AEROSPACE  .,4X                                    TAFAM    295
295             *,           40H  GGGGGGGGGGG                       ,1X         TAFAM    296
                *,26X                                                           TAFAM    297
                M,13HMMM  MMM  MMM                                              TAFAM    298
                *,14X,1H*                                                       TAFAM    299
                *,/, 5X,1H*,2X                                                  TAFAM    300
300             *,5X,  15H. CORPORATION .,4X                                    TAFAM    301
                *,           40H  GGGGGGGGGG                        ,1X         TAFAM    302
                *,26X                                                           TAFAM    303
                M,13HMMM  MMM  MMM                                              TAFAM    304
                *,14X,1H*                                                       TAFAM    305
305             *,/, 5X,1H*,2X                                                  TAFAM    306
                *,5X,  15H.              .,4X                                   TAFAM    307
                *,           40H  GGGGGGGG                          ,1X         TAFAM    308
                *,26X                                                           TAFAM    309
                M,13HMMM  MMM  MMM                                              TAFAM    310
310             *,14X,1H*)                                                      TAFAM    311
              170 FORMAT (  5X, 1H*, 2X                                         TAFAM    312
                *,5X,  15H.............,4X                                     TAFAM    313
                *,           40H  GGGGGG                            ,1X         TAFAM    314
                *,26X                                                           TAFAM    315
315             M,13HMMM  MMM  MMM                                              TAFAM    316
                *,14X,1H*                                                       TAFAM    317
                *,/, 5X,1H*,2X                                                  TAFAM    318
                *,24X,       40H  GGGG                              ,1X         TAFAM    319
                *,26X                                                           TAFAM    320
320             M,13HMMM  MMM  MMM                                              TAFAM    321
                *,14X,1H*                                                       TAFAM    322
                *,/, 5X,1H*,2X                                                  TAFAM    323
                *,24X,       40H  GG                                ,1X         TAFAM    324
                *,26X                                                           TAFAM    325
325             M,13HMMM  MMM  MMM                                              TAFAM    326
                *,14X,1H*                                                       TAFAM    327
                *,/, 5X,1H*,2X                                                  TAFAM    328
                *,24X,       40H  G                                 ,1X         TAFAM    329
                *,26X                                                           TAFAM    330
330             M,13HMMM  MMM  MMM      ,14X,1H*)                               TAFAM    331
              175 FORMAT ( 5X,1H*,120X,1H*,/,5X,122(1H*))                       TAFAM    332
            C                                                                   TAFAM    333
                RETURN                                                          TAFAM    334
                END                                                             TAFAM    335
```

SYMBOLIC REFERENCE MAP (R=3)

```
                *,/, 5X,1H*,2X                                                                                                  TAFAM  230
230             *,65X                                                                                                           TAFAM  231
                A,13H  AAA    AAA                                                                                               TAFAM  232
                *,13X                                                                                                           TAFAM  233
                M,13HMMMM      MMMM                                                                                             TAFAM  234
                *,14X, 1H*)                                                                                                     TAFAM  235
235           150 FORMAT (                                                                                                      TAFAM  236
                *     5X,1H*,2X                                                                                                 TAFAM  237
                *,65X                                                                                                           TAFAM  238
                A,13H AAA      AAA                                                                                              TAFAM  239
                *,13X                                                                                                           TAFAM  240
240             M,13HMMMMM    MMMMM                                                                                             TAFAM  241
                *,14X,1H*                                                                                                       TAFAM  242
                *,/, 5X,1H*,2X                                                                                                  TAFAM  243
                *,65X                                                                                                           TAFAM  244
                A,13H AAA      AAA                                                                                              TAFAM  245
245             *,13X                                                                                                           TAFAM  246
                M,13HMMMMM    MMMMM                                                                                             TAFAM  247
                *,14X,1H*                                                                                                       TAFAM  248
                *,/, 5X,1H*,2X                                                                                                  TAFAM  249
                *,8(3HGGG), 4OHGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG,1X                                              TAFAM  250
250             A,13H AAA      AAA                                                                                              TAFAM  251
                *,13X                                                                                                           TAFAM  252
                M,13HMMMMM    MMMMM                                                                                             TAFAM  253
                *,14X,1H*)                                                                                                      TAFAM  254
              155 FORMAT (                                                                                                      TAFAM  255
255             *     5X,1H*,2X                                                                                                 TAFAM  256
                *,8(3HGGG), 4OHGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG        ,1X                                  TAFAM  257
                A,13HAAA        AAA                                                                                             TAFAM  258
                *,13X                                                                                                           TAFAM  259
                M,13HMMMMMM MMMMMM                                                                                              TAFAM  260
260             *,14X,1H*                                                                                                       TAFAM  261
                *,/, 5X,1H*,2X                                                                                                  TAFAM  262
                *,24X,       4OH  GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG          ,1X                                TAFAM  263
                A,13HAAA        AAA                                                                                             TAFAM  264
                *,13X                                                                                                           TAFAM  265
265             M,13HMMM MM MM MMM                                                                                              TAFAM  266
                *,14X,1H*                                                                                                       TAFAM  267
                *,/, 5X,1H*,2X                                                                                                  TAFAM  268
                *,24X,       4OH   GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG          ,1X                                TAFAM  269
                A,13HAAA        AAA                                                                                             TAFAM  270
270             *,13X                                                                                                           TAFAM  271
                M,13HMMM MM MM MMM                                                                                              TAFAM  272
                *,14X,1H*)                                                                                                      TAFAM  273
              160 FORMAT (                                                                                                      TAFAM  274
                *     5X,1H*,2X                                                                                                 TAFAM  275
275             *,5X,  15H.....,4X                                                                                              TAFAM  276
                *,           4OH    GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG          ,1X                                TAFAM  277
                *,26X                                                                                                           TAFAM  278
                M,13HMMM MMMMM MMM                                                                                              TAFAM  279
                *,14X,1H*                                                                                                       TAFAM  280
280             *,/, 5X,1H*,2X                                                                                                  TAFAM  281
                *,5X,  15H.          ,4X                                                                                        TAFAM  282
                *,           4OH   GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG          ,1X                                TAFAM  283
                *,26X                                                                                                           TAFAM  284
                M,13HMMM MMMMM MMM                                                                                              TAFAM  285
```

VARIABLES	SN	TYPE	RELOCATION								
750	IDVIBA	INTEGER			REFS	127	129	155	I/O PEFS	128	
1	IFILES	INTEGER	ARRAY	CFILES	REFS	7	18				
244	IFLMD	INTEGER	ARRAY	FLUT	REFS	5	24	91	101	104	114	134
						141	144	153	DEFINED	85	126	
754	II	INTEGER			REFS	140	DEFINED	140				
725	IN	INTEGER			REFS	53	DEFINED	51				
0	IPOS	INTEGER	ARRAY	FILE	REFS	7	15					
745	IROW	INTEGER			REFS	86	87	96	97	99	110	112
2	ITAPEP	INTEGER		COMRWP	REFS	23						
0	ITAPER	INTEGER		COMRWP	REFS	23	I/O REFS	51	61	63	64	66
						71	84	85	126			
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	7	14	29	30			
7	ITAPET	INTEGER		CTABLE	REFS	21						
1	ITAPEW	INTEGER		COMRWP	REFS	23	41	43	72	118	156	
					I/O REFS	42	73	119	157			
731	I1	INTEGER			REFS	2*67	91	92	93	104	105	106
						134	135	136	144	145	146	152	2*153
					DEFINED	66	89	93	102	106	132	136
						142	146	150	153			
734	I2	INTEGER			REFS	2*68	101	105	108	114	115	116
						141	145	148	DEFINED	66	98	108	111
						116	138	148				
737	I3	INTEGER			REFS	2*69	DEFINED	66				
747	J	INTEGER			REFS	92	101	114	115	141	172	
					DEFINED	87	99	112	139	170		
751	JDVIBA	INTEGER			REFS	127	155					
732	J1	INTEGER			REFS	2*67	DEFINED	66				
735	J2	INTEGER			REFS	2*68	DEFINED	66				
740	J3	INTEGER			REFS	2*69	DEFINED	66				
727	K	INTEGER			REFS	63	DEFINED	63				
7	KBPAGE	INTEGER		CLIST	REFS	19						
752	KDVIBA	* INTEGER			REFS	127						
0	KFILES	INTEGER		CFILES	REFS	18						
4	KLABEL	INTEGER		CLIST	REFS	19						
0	KOUNT	INTEGER		CLIST	REFS	19	44	49	DEFINED	35	44	49
11	KOUNTH	INTEGER		CLIST	REFS	19						
12	KOUNTI	INTEGER		CLIST	REFS	19						
1	KPAGE	INTEGER		CLIST	REFS	19						
0	KTABLE	INTEGER		CTABLE	REFS	21	DEFINED	47				
5	KTABLO	INTEGER		CTABLE	REFS	21						
5	KTPAGE	INTEGER		CLIST	REFS	19						
0	LC	INTEGER	ARRAY	COMA	REFS	13	31					
243	LC2	INTEGER		FLUT	REFS	24	62	71	85	126	168	171
						173	DEFINED	31				
2	LINES	INTEGER		CLIST	REFS	19	35					
10	LINESG	INTEGER		CLIST	REFS	19						
3	LINEST	INTEGER		CLIST	REFS	19						
753	LOCFIL	* INTEGER			REFS	127						
0	LTITLE	INTEGER		CTITLE	REFS	16						
0	LTSHF	INTEGER		CTSHF	REFS	17						
720	MTAP4	INTEGER			REFS	86	88	97	100	110	113	152
					DEFINED	29	129	I/O REFS	130	131	140	
721	MTAP49	INTEGER			REFS	169	173	DEFINED	30	I/O REFS	167	174
17550	NC	INTEGER		MODD	REFS	12	63	152	169	170		
					DEFINED	61	96	130				
730	NCARD	INTEGER			REFS	65	DEFINED	64				
724	NCD	INTEGER			REFS	27	DEFINED	21				

VARIABLES	SN	TYPE		RELOCATION								
3	NCOLS	INTEGER		CTABLE	REFS	21	DEFINED	46				
4	NCOLST	INTEGER		CTABLE	REFS	21						
746	NM	INTEGER			REFS	86	88	90	97	100	103	110
						113	131	133	139	140	143	151
					DEFINED	130						
723	NMD	INTEGER			REFS	2*36	37	38	DEFINED	33		
6	NPAGE	INTEGER		CLIST	REFS	19						
6	NPAGEA	INTEGER		CTABLE	REFS	21						
1	NPASS	INTEGER		CTABLE	REFS	21						
2	NROWS	INTEGER		CTABLE	REFS	21	DEFINED	45				
17500	OMG	REAL	ARRAY	MODD	REFS	5	12	DEFINED	71	115	135	
1025	QZ	REAL	ARRAY		REFS	5	37	152	169	172		
					DEFINED	63	92					
1	TITLE	REAL	ARRAY	CTITLE	REFS	8	16					
1	TSHF	REAL	ARRAY	CTSHF	REFS	8	17					
0	UMOD	COMPLEX	ARRAY	FLUT	REFS	10	24					
733	VALU1	REAL			REFS	67	DEFINED	66				
736	VALU2	REAL			REFS	68	DEFINED	66				
741	VALU3	REAL			REFS	69	DEFINED	66				
240	VF	REAL		FLUT	REFS	24						
120	VMOD	COMPLEX	ARRAY	FLUT	REFS	10	24					
14400	WW	REAL	ARRAY	MODD	REFS	5	12	36	DEFINED	67	68	69
						105	145					
241	WW1	REAL		FLUT	REFS	24						
722	ZERO	REAL			REFS	36	37	38	DEFINED	32		

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES					
DVALUE		3	36	37	38			
FCLOSE		3	155					
FLINFO		0	179					
FSIO		6	127					
GEDLAB		6	86	97	110			
GETROW		4	88	100	113			
PLB		3	41	43	72	118	156	
PROGNA		2	39					
PTABLE		3	48					
RNRW		3	152	169	173			
TITLES		1	40					

STATEMENT LABELS			DEF LINE	REFERENCES					
303	3		137	133	134				
335	5		149	139	141				
331	6		147	143	144				
0	7		154	151					
171	9		94	90	91				
651	20	FMT	184	51	61	64	84	85	126
0	25		70	65					
653	40	FMT	185	63	71				
0	60		63	62					
57	300		61	53					
252	500		125	53					
362	600		166	74	120				
142	610		79	53					
0	630		95	87					
0	655		169	168					
222	660		107	103	104				

STATEMENT LABELS			DEF LINE	REFERENCES	
0	675		172	171	
243	680		117	112	114
0	685		173	170	
226	690		109	99	101
655	710	FMT	186	66	
660	1000	FMT	187	73	
666	1100	FMT	188	119	
676	1200	FMT	190	157	
706	2000	FMT	192	42	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES		
62	60	I	62 63	12B	EXT REFS		
76	25	I	65 70	32B	EXT REFS		
154	630	J	87 95	22B	EXT REFS	NOT INNER	
165	9	I	90 94	5B	INSTACK		
203	690	J	99 109	26B	EXT REFS	NOT INNER	
216	660	I	103 107	5B	INSTACK		
234	680	J	112 117	12B	EXT REFS		
300	3	I	133 137	4B	INSTACK		
307	5	J	139 149	31B	EXT REFS	NOT INNER	
325	6	I	143 147	5B	INSTACK		
341	7	I	151 154	14B	EXT REFS		
365	655	I	168 169	7B	EXT REFS		
375	685	J	170 173	15B	EXT REFS	NOT INNER	
402	675	I	171 172	3B	INSTACK		

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)								
MODD	8041	0	B	(3200)	3200	DETAD	(3200)	6400	WW	(1600)
		8000	OMG	(40)	8040	NC	(1)			
COMA	41	0	LC	(40)	40	BR	(1)			
CTAPES	50	0	ITAPES	(50)						
FILE	20	0	IPOS	(20)						
CTITLE	37	0	LTITLE	(1)	1	TITLE	(36)			
CTSHF	2	0	LTSHF	(1)	1	TSHF	(1)			
CFILES	51	0	KFILES	(1)	1	IFILES	(50)			
CLIST	11	0	KOUNT	(1)	1	KPAGE	(1)	2	LINES	(1)
		3	LINEST	(1)	4	KLABEL	(1)	5	KTPAGE	(1)
		6	NPAGE	(1)	7	KBPAGE	(1)	8	LINESG	(1)
		9	KOUNTH	(1)	10	KOUNTI	(1)			
CTABLE	8	0	KTABLE	(1)	1	NPASS	(1)	2	NROWS	(1)
		3	NCOLS	(1)	4	NCOLST	(1)	5	KTABLC	(1)
		6	NPAGEA	(1)	7	ITAPET	(1)			
COMRWP	3	0	ITAPER	(1)	1	ITAPEW	(1)	2	ITAPEP	(1)
FLUT	204	0	UMOD	(80)	80	VMOD	(80)	160	VF	(1)
		161	WW1	(1)	162	CSCL	(1)	163	LC2	(1)
		164	IFLMD	(40)						

STATISTICS

PROGRAM LENGTH	22211B	9353
CM LABELED COMMON LENGTH	20424B	8468

520000B CM USED

```
      SUBROUTINE FLINFO                                                 FLINFO     2
C                                                                       FLINFO     3
      COMPLEX   B(40,40),DETAD(40,40)                                   FLINFO     4
      COMPLEX   DELB                                                    FLINFO     5
C                                                                       FLINFO     6
      DIMENSION ITAPES(50)                                              FLINFO     7
      DIMENSION OMGC(40),OMGR(40),NQA(40),GDP(40),WW(40,40)             FLINFO     8
      DIMENSION NOTI(25),NINZ(40,25),RATOM(20),QMWT(40,5),QWT(5)        FLINFO     9
      DIMENSION          LC(40)                                         FLINFO    10
      DIMENSION RVBO(15), VBO(30), RHOR(10)                             FLINFO    11
      DIMENSION          V(25) ,   TITLE1(18) ,   TITLE2(18)            FLINFO    12
      DIMENSION TSHF(1)                                                 FLINFO    13
      DIMENSION DELK(3,3),DELOM(3,3), OMRBSQ(3)                         FLINFO    14
C                                                                       FLINFO    15
      COMMON /CTAPES/ ITAPES                                            FLINFO    16
      COMMON /COMA/ LC , BR                                             FLINFO    17
      COMMON /MODD  / B      ,DETAD ,WW     ,OMGR   ,NC                FLINFO    18
      COMMON /FLUTAN/ FMACH ,BETA   ,VBO    ,RVBO   ,NRVBO             FLINFO    19
      COMMON /FLUTB/ V,NV,DV                                            FLINFO    20
      COMMON /FLUTC/ RHOR,NOTI,NINZ,RATOM                               FLINFO    21
      COMMON /FLUTV/ VA,VB,FLO,FHI,IE,NQZ,NVTOT                         FLINFO    22
      COMMON /FLUTQ/ QMWT,QWT                                           FLINFO    23
      COMMON /CALCP/ TITLE1,TITLE2,DUB,FUB,VUB,DLB,FLB,VLB,IPLOT,LSD,   FLINFO    24
     1         DSCALE,FSCALE,VSCALE,DPLEN,FRLEN,VLEN,XDT                FLINFO    25
      COMMON /PRPL/ GMAX,GMIN,FRMAX,FRMIN,VMAX,VMIN                     FLINFO    26
      COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE   FLINFO    27
     1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                      FLINFO    28
      COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA  FLINFO    29
     1               ,ITAPET                                           FLINFO    30
      COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              FLINFO    31
      COMMON /REPORT/ KREPOR                                            FLINFO    32
      COMMON /CHEAD / KHEAD,KRETUR,KOLUMN,IR,JCL,JCU,LSUB,LSKIP         FLINFO    33
      COMMON /CTSHF / LTSHF, TSHF                                       FLINFO    34
      COMMON /QELIM / QDW, VQDW, LC38                                   FLINFO    35
C                                                                       FLINFO    36
      EQUIVALENCE(OMGC(1), OMGR(1))                                     FLINFO    37
C                                                                       FLINFO    38
      LC38 = LC(38)                                                     FLINFO    39
      MTAP1=ITAPES(37)                                                  FLINFO    40
      ZERO   =  0.0                                                     FLINFO    41
      ONE    =  1.0                                                     FLINFO    42
      NQED   =  5                                                       FLINFO    43
      NMD = 40                                                          FLINFO    44
      CALL DVALUE (GDP   ,ZERO,NMD)                                     FLINFO    45
      CALL DVALUE (QWT   ,ONE ,NQED)                                    FLINFO    46
      CALL DVALUE (QMWT  ,ONE ,NMD*NQED)                                FLINFO    47
      TWOPI  =  6.283184                                                FLINFO    48
      KOLUMN =  8                                                       FLINFO    49
      IF (KREPOR .EQ. 2) KOLUMN = 4                                     FLINFO    50
      CALL PROGNA (4H(FLI, 4HNFO))                                      FLINFO    51
C                                                                       FLINFO    52
      READ (ITAPER,1)  BR , FMACH                                       FLINFO    53
      BR  =  BR / 12.0                                                  FLINFO    54
      NM     =  LC(2)                                                   FLINFO    55
      ARG    =  ABS(FMACH*FMACH - 1.0)                                  FLINFO    56
      BETA   =  SQRT(ARG)                                               FLINFO    57
C                                                                       FLINFO    58
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                IF(LC(1).EQ.1) LC(33)=0                                          FLINFO     59
                IF(LC(1).EQ.-1) LC(33)=0                                         FLINFO     60
60              IF (LC(1) .EQ. 2)  LC(13) = 0                                    FLINFO     61
                IF (LC(1) .EQ. 2) LC(33)=1                                       FLINFO     62
                IF (LC(1) .EQ. 2) GO TO 21                                       FLINFO     63
                IF(LC(33).EQ.1) GO TO 73                                         FLINFO     64
                IF (LC(1) .EQ.-1) GO TO 29                                       FLINFO     65
65          C                                                                    FLINFO     66
            C REDUCED VELOCITIES                                                 FLINFO     67
            C                                                                    FLINFO     68
              300 NVBO= LC(4)                                                    FLINFO     69
                READ(ITAPER,1) (VBO(I), I= 1,NVBO)                               FLINFO     70
70              IF(LC(1).EQ.0) GO TO 73                                          FLINFO     71
                IF (LC(13).EQ. 1) GO TO 10                                       FLINFO     72
                GO TO 11                                                         FLINFO     73
            C                                                                    FLINFO     74
            C PK DATA                                                            FLINFO     75
75          C                                                                    FLINFO     76
               29 LC(13)= 1                                                      FLINFO     77
                READ(ITAPER,49) NV, V1, DV                                       FLINFO     78
                V(1) = V1                                                        FLINFO     79
                DO 51 I= 2,NV                                                    FLINFO     80
80             51 V(I)= V(I-1) + DV                                              FLINFO     81
            C                                                                    FLINFO     82
            C REFERENCE REDUCED VELOCITIES                                       FLINFO     83
            C                                                                    FLINFO     84
               10 READ (ITAPER,9) NRVBO                                          FLINFO     85
85              READ (ITAPER,1) (RVBO(I` I=1,NRVBO)                              FLINFO     86
                IF ((LINES-KOUNT) .LT. 4) KOUNT = LINES                          FLINFO     87
                CALL TITLES (3)                                                  FLINFO     88
                CALL PLB (1,1,ITAPEW)                                            FLINFO     89
                KOUNT   =  KOUNT + 4                                             FLINFO     90
90              WRITE (ITAPEW,4000)                                              FLINFO     91
                CALL PLB (1,1,ITAPEW)                                            FLINFO     92
                KOUNT   =  KOUNT + 4                                             FLINFO     93
                WRITE (ITAPEW,43) (RVBO(I),I=1,NRVBO)                            FLINFO     94
                NROWS   = 1                                                      FLINFO     95
95              NCOLS   = 0                                                      FLINFO     96
                KTABLE = 2                                                       FLINFO     97
                CALL PTABLE (2,58,58                                             FLINFO     98
               1   HREDUCED VELOCITIES FOR INTERPOLATION OF GENERALIZED FORCES)   FLINFO     99
            C                                                                    FLINFO    100
100         C READ FROM CARDS CHANGES FOR THE GENERALIZED MASS AND FREQUENCIES    FLINFO    101
            C                                                                    FLINFO    102
               11 IF (LC(31) .EQ. 0) GO TO 7                                     FLINFO    103
                READ (ITAPER,50)   MADD , IADD , MSYM                            FLINFO    104
                IF (MADD .EQ. 0)   GO TO 3                                       FLINFO    105
105             DO 4  II = 1,MADD                                                FLINFO    106
                4 READ (ITAPER,5)  I,J,WW(I,J)                                   FLINFO    107
                IF  (MSYM .EQ. 1) GOTO 3                                         FLINFO    108
                DO 6  I = 1,NM                                                   FLINFO    109
                DO 6  J = 1,NM                                                   FLINFO    110
110             IF ( J .GE. I )    GO TO 6                                       FLINFO    111
                WW(I,J)  =  WW(J,I)                                              FLINFO    112
                6 CONTINUE                                                       FLINFO    113
                3 IF ( IADD .EQ. 0 ) GO TO 7                                     FLINFO    114
                DO 8  I = 1,IADD                                                 FLINFO    115
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115            8 READ (ITAPER,9) II,  OMGC(II)                                  FLINFO   116
               7 CONTINUE                                                       FLINFO   117
              C                                                                 FLINFO   118
              C READ STRUCTURAL DAMPING AND CALCULATE UPPER TRIANGLE OF COMPLEX  FLINFO   119
              C STIFFNESS MATRIX (SPRING TERMS)                                 FLINFO   120
120           C                                                                 FLINFO   121
                  IF ( LC(16) .EQ. 0 )    GO TO 21                            FLINFO   122
                  IF ( LC(16) .LT. 0 )    GO TO 22                            FLINFO   123
                  READ (ITAPER,1)    GDD                                      FLINFO   124
                  DO 23  I = 1,NM                                             FLINFO   125
125            23 GDP(I)   =  GDD                                             FLINFO   126
                  GO TO 24                                                    FLINFO   127
               22 READ (ITAPER,50)  NCD                                       FLINFO   128
                  DO 25  I = 1,NCD                                            FLINFO   129
               25 READ (ITAPER,9) I1, GDP(I1)                                 FLINFO   130
130            24 CONTINUE                                                    FLINFO   131
               21 IF (LC(1).EQ.-1) GOTO 28                                    FLINFO   132
                  IREF     =  LC(11)                                          FLINFO   133
                  OMGR2  =  (OMGC(IREF)*TWOPI)**2                             FLINFO   134
                  OREF   =  1.0/OMGR2                                         FLINFO   135
135            28 DO 31  I=1,NM                                               FLINFO   136
                  DO 31  J = 1,NM                                             FLINFO   137
                  B(I,J)   =  CMPLX (0.0,0.0)                                 FLINFO   138
                  IF ( I .NE. J )    GO TO 31                                 FLINFO   139
                  OMGR2  =  (OMGC(I)*TWOPI)**2                                FLINFO   140
140               BB     =  WW(I,J)*OMGR2                                     FLINFO   141
                  IF (LC(1) .NE. -1 )     BB = BB * OREF                      FLINFO   142
                  BD       =  BB * GDP(I)                                     FLINFO   143
                  B(I,J)   =  CMPLX ( BB , BD )                               FLINFO   144
               31 CONTINUE                                                    FLINFO   145
145           C                                                                 FLINFO   146
              C IF BOTH RIGID-BODY TRANSLATION MODES AND RIGID-BODY ROTATION MODES FLINFO   147
              C ARE INCLUDED IN FLUTTER ANALYSIS, AND IF AN ARTIFICIAL NONZERO  FLINFO   148
              C FREQUENCY HAS BEEN SPECIFIED FOR A RIGID-BODY TRANSLATION MODE, FLINFO   149
              C CALCULATE INCREMENTAL RIGID-BODY GENERALIZED STIFFNESS TERMS.    FLINFO   150
150           C RESULTS ARE DEVELOPED FROM OFF-DIAGONAL GENERALIZED-MASS TERMS,  FLINFO   151
              C AND WILL BE ZERO IF PLUG LOCATION AT WHICH RIGID-BODY MODES      FLINFO   152
              C ARE SPECIFIED IS COINCIDENT WITH AIRPLANE CG.                    FLINFO   153
              C                                                                 FLINFO   154
                  READ (ITAPER,50) NRBTR, NRBTOT                              FLINFO   155
155               IF (NRBTR.EQ.0)  GO TO 115                                  FLINFO   156
                  SUMOMG = 0.0                                                FLINFO   157
                  DO 87 I=1,NRBTR                                             FLINFO   158
                  SUMOMG = SUMOMG + OMGC(I)                                   FLINFO   159
               87 CONTINUE                                                    FLINFO   160
160               IF (SUMOMG.EQ.0.0)  GO TO 115                               FLINFO   161
                  NRBROT = NRBTOT - NRBTR                                     FLINFO   162
                  IF (NRBROT.EQ.0)  GO TO 115                                 FLINFO   163
                  NROT1 = NRBTR + 1                                           FLINFO   164
                  TWPISQ = TWOPI*TWOPI                                        FLINFO   165
165               DO 90 I=1,NRBTOT                                            FLINFO   166
                  OMRBSQ(I) = OMGC(I)*OMGC(I)*TWPISQ                          FLINFO   167
                  DO 89 J=1,NRBTOT                                            FLINFO   168
                  DELK(I,J) = 0.0                                             FLINFO   169
                  DELOM(I,J) = 0.0                                            FLINFO   170
170            89 CONTINUE                                                    FLINFO   171
               90 CONTINUE                                                    FLINFO   172
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                  DO 93 I=1,NRBTR                                                    FLINFO   173
                  DO 92 J=NROT1,NRBTOT                                               FLINFO   174
                  DELK(I,J) = WW(I,J)*OMRBSQ(I)                                      FLINFO   175
175               DELK(J,I) = DELK(I,J)                                              FLINFO   176
                92 CONTINUE                                                          FLINFO   177
                93 CONTINUE                                                          FLINFO   178
                  IF (NRBROT.NE.2)  GO TO 95                                         FLINFO   179
                  DELK(2,3) = WW(2,3)*OMRBSQ(1)                                      FLINFO   180
180               DELK(3,2) = DELK(2,3)                                              FLINFO   181
                95 CONTINUE                                                          FLINFO   182
                  DO 96 J=NROT1,NRBTOT                                               FLINFO   183
                  DELK(J,J) = 0.0                                                    FLINFO   184
                96 CONTINUE                                                          FLINFO   185
185               DO 98 I=1,NRBTR                                                    FLINFO   186
                  DO 97 J=NROT1,NRBTOT                                               FLINFO   187
                  DELOM(I,J) = OMRBSQ(I) - OMRBSQ(J)                                 FLINFO   188
                  DELK(J,J) = DELK(J,J) + DELOM(I,J)*WW(I,J)*WW(I,J)/WW(I,I)         FLINFO   189
                97 CONTINUE                                                          FLINFO   190
190               98 CONTINUE                                                        FLINFO   191
                  DO 110 I=1,NRBTOT                                                  FLINFO   192
                  DO 109 J=1,NRBTOT                                                  FLINFO   193
                  IF (LC(1).NE.-1)  DELK(I,J) = DELK(I,J) * OREF                     FLINFO   194
                  IF (I.NE.J)  GO TO 108                                             FLINFO   195
195               DELD = DELK(I,J)*GDP(I)                                            FLINFO   196
                  DELB = CMPLX(DELK(I,J),DELD)                                       FLINFO   197
                  B(I,J) = B(I,J) + DELB                                             FLINFO   198
                  GO TO 109                                                          FLINFO   199
                108 CONTINUE                                                         FLINFO   200
200               B(I,J) = B(I,J) + DELK(I,J)                                        FLINFO   201
                109 CONTINUE                                                         FLINFO   202
                110 CONTINUE                                                         FLINFO   203
                115 CONTINUE                                                         FLINFO   204
                  IF (LC(1) .EQ. 2) GO TO 42                                         FLINFO   205
205             C                                                                    FLINFO   206
                C PREPARE INFORMATION FOR PLOTTING FLUTTER RESULTS                   FLINFO   207
                C                                                                    FLINFO   208
                C     PRINT PLOT SPECIFICATIONS                                      FLINFO   209
                C                                                                    FLINFO   210
210             VMIN     =  0.0                                                      FLINFO   211
                FRMIN    =  0.0                                                      FLINFO   212
                READ (ITAPER,1) GMAX,GMIN,VMAX,FRMAX                                FLINFO   213
                IF ( LC(14) .EQ. 0 )    GO TO 42                                    FLINFO   214
                C                                                                    FLINFO   215
215             C     CALCOMP SPECIFICATIONS                                         FLINFO   216
                C                                                                    FLINFO   217
                C                                                                    FLINFO   218
                C     READ TITLES                                                    FLINFO   219
                C                                                                    FLINFO   220
220             CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS  FLINFO   221
                C     LTITLE =  18                                                   FLINFO   222
                CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS     FLINFO   223
                CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS  FLINFO   224
                      LTITLE =  8                                                    FLINFO   225
225             CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS     FLINFO   226
                      READ (ITAPER,30) (TITLE1(I), I=1,LTITLE)                       FLINFO   227
                      READ (ITAPER,30) (TITLE2(I), I=1 LTITLE)                       FLINFO   228
                C                                                                    FLINFO   229
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      C     READ TYPE PLOTS AND LIMITS OF PLOTTED VARIABLES                    FLINFO   230
230   C                                                                        FLINFO   231
            READ (ITAPER,55) LSD , DUB , FUB , VUB , DLB                       FLINFO   232
            FLB= 0.0                                                           FLINFO   233
            VLB= 0.0                                                           FLINFO   234
      C                                                                        FLINFO   235
235   C     READ SCALING INFORMATION                                           FLINFO   236
      C                                                                        FLINFO   237
            READ (ITAPER,1) DSCALE , FSCALE , VSCALE                           FLINFO   238
            DEL=0.0001                                                         FLINFO   239
            IDPLEN=((DUB-DLB)/DSCALE) + DEL                                    FLINFO   240
240         IFRLEN=(FUB/FSCALE)       + DEL                                    FLINFO   241
            IVLEN =(VUB/VSCALE)       + DEL                                    FLINFO   242
            IDPLEN  =  MAXO (1,IDPLEN)                                         FLINFO   243
            IFRLEN  =  MAXO (1,IFRLEN)                                         FLINFO   244
            IVLEN   =  MAXO (1,IVLEN)                                          FLINFO   245
245         DPLEN   =  IDPLEN                                                  FLINFO   246
            FRLEN   =  IFRLEN                                                  FLINFO   247
            VLEN    =  IVLEN                                                   FLINFO   248
            FUB     =  FSCALE * FRLEN                                          FLINFO   249
            VUB     =  VSCALE * VLEN                                           FLINFO   250
250         IDUB=(DUB/DSCALE) + DEL                                            FLINFO   251
            IF ( IDUB .EQ. 0 )      IDUB = SIGN (1.0,DUB)                      FLINFO   252
            DUB     =  IDUB                                                    FLINFO   253
            DUB     =  DUB * DSCALE                                            FLINFO   254
            DLB     =  DUB - DPLEN * DSCALE                                    FLINFO   255
255         IF ( ABS(DLB)/DSCALE .LT. 1.0 )    DLB = SIGN(1.0,DLB) * DSCALE    FLINFO   256
            DPLEN   =  (DUB - DLB) / DSCALE                                    FLINFO   257
            GO TO (101, 102, 103), LSD                                         FLINFO   258
          101 XDT     =  VLEN + 1.0                                            FLINFO   259
            VLN     =  FRLEN + DPLEN + 0.5                                     FLINFO   260
260         IF ( VLN .GT. 9.0 )     GO TO 60                                   FLINFO   261
            GO TO 42                                                           FLINFO   262
          102 XDT     =  DPLEN + FRLEN + 3.5                                   FLINFO   263
            IF (VLEN  .GT. 9.0) GOTO 60                                        FLINFO   264
            GO TO 42                                                           FLINFO   265
265         103 XDT     =  VLEN + 0.5                                          FLINFO   266
            TEST    =  AMAX1 (DPLEN , FRLEN) + 0.5                             FLINFO   267
            IF ( TEST .LE. 9.0 )    GO TO 42                                   FLINFO   268
           60 LC(14)  =  0                                                     FLINFO   269
            WRITE (ITAPEW,62)                                                  FLINFO   270
270   C                                                                        FLINFO   271
      C DENSITIES                                                              FLINFO   272
      C                                                                        FLINFO   273
           42 NRO= LC(5)                                                       FLINFO   274
            READ(ITAPER,1) (RHOR(I), I= 1,NRO)                                 FLINFO   275
275   C                                                                        FLINFO   276
      C CHANGES TO THE GENERALIZED AIR FORCES                                  FLINFO   277
      C                                                                        FLINFO   278
            IF (LC(34) .EQ. 0) GOTO 70                                         FLINFO   279
                                                                               FLINFO   280
280         READ (ITAPER,50)   NQWT , NQE                                      FLINFO   281
      C     NQWT     =  NO. OF SURFACES FOR AERO MODAL ELIMINATION             FLINFO   282
      C     NQE      =  NO. OF SURFACES FOR WHICH AERO. WT. FUNCTION NE 1      FLINFO   283
            IF ( NQWT .EQ. 0 )      GO TO 80                                   FLINFO   284
            DO 72  I = 1,NQWT                                                  FLINFO   285
285         READ (ITAPER,50)  ISE , NISE , (NOA(J),J=1,NISE)                   FLINFO   286
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                  DO 72  K = 1,NISF                                                FLINFO   287
                  NQAK = NQA(K)                                                    FLINFO   288
               72 QMWT(NQAK,ISF) = 0.                                              FLINFO   289
               80 IF (NQE.EQ.0) GOTO 70                                            FLINFO   290
290               DO 82  J = 1,NQE                                                 FLINFO   291
               82 READ (ITAPER,83)   1 , QWT(I)                                    FLINFO   292
               70 CONTINUE                                                         FLINFO   293
            C                                                                      FLINFO   294
            C MODIFY DETERMINANT (MAYBE)                                           FLINFO   295
295         C                                                                      FLINFO   296
                  DO 32 I=1,NMD                                                    FLINFO   297
                  DO 32 J=1,NMD                                                    FLINFO   298
               32 DETAD(I,J) = CMPLX (0.0,0.0)                                     FLINFO   299
                  IF (LC(9) .EQ. 0) GO TO 48                                       FLINFO   300
300               READ (ITAPER,50)   NADD , NSYM                                   FLINFO   301
                  DO 45  II = 1,NADD                                               FLINFO   302
               45 READ (ITAPER,46) I , J , DETAD(I,J)                              FLINFO   303
                  IF (NSYM .NE.  0) GO TO 48                                       FLINFO   304
                  DO 47  I = 1,NM                                                  FLINFO   305
305               DO 47  J = 1,NM                                                  FLINFO   306
                  IF ( J .GE. I )    GO TO 47                                      FLINFO   307
                  DETAD(I,J)  =  DETAD(J,I)                                        FLINFO   308
               47 CONTINUE                                                         FLINFO   309
               48 CONTINUE                                                         FLINFO   310
310         C                                                                      FLINFO   311
            C READ FROM CARDS CHANGES TO THE COMPLEX STIFFNESS MATRIX AND CALCULATE FLINFO   312
            C LOWER TRIANGLE BASED UPON SYMMETRY OPTION                            FLINFO   313
            C                                                                      FLINFO   314
                  IF (LC(32) .EQ. 0) GOTO 35                                       FLINFO   315
315               READ (ITAPER,50)   NADD , NSYM                                   FLINFO   316
                  DO 33  K = 1,NADD                                                FLINFO   317
               33 READ (ITAPER,34) I , J , B(I,J)                                  FLINFO   318
            C     FOR SYMMETRIC CONDITIONS SPECIFY TRIANGLE OF B MATRIX            FLINFO   319
                  IF ( NSYM .NE. 0 ) GO TO 35                                      FLINFO   320
320               DO 36 I = 1,NM                                                   FLINFO   321
                  DO 36 J = 1,NM                                                   FLINFO   322
                  IF ( J .GE. I )    GO TO 36                                      FLINFO   323
                  B(I,J)   =  B(J,I)                                               FLINFO   324
               36 CONTINUE                                                         FLINFO   325
325            35 CONTINUE                                                         FLINFO   326
            C                                                                      FLINFO   327
            C DEFINE NUMBER OF STIFFNESS VARIATION CYCLES                          FLINFO   328
            C                                                                      FLINFO   329
                  IF(LC(26).EQ.0) GO TO 66                                         FLINFO   330
330               NOMA     =  LC(26)                                               FLINFO   331
                  READ (ITAPER,1 )   (RATOM(I) , I=1,NOMA)                         FLINFO   332
               66 CONTINUE                                                         FLINFO   333
            C                                                                      FLINFO   334
            C                                                                      FLINFO   335
335         C DEFINE MODE ELIMINATION CYCLES                                       FLINFO   336
            C                                                                      FLINFO   337
                  IF(LC(25).EQ.0) GO TO 63                                         FLINFO   338
                  NMIT     =  LC(25)                                               FLINFO   339
                  DO 64  IIT = 1,NMIT                                              FLINFO   340
340               READ (ITAPER,50) NOTIR, (NINZ(J,IIT), J=1,NOTIR)                FLINFO   341
               64 NOTI(IIT)  =  NOTIR                                              FLINFO   342
               63 CONTINUE                                                         FLINFO   343
```

```
                C                                                                FLINFO    344
                C AUTOMATIC EXCLUSION OF MODES BASED ON RATIOS OF                FLINFO    345
345             C GENERALZED FORCES TO GENERALIZED MASSES                        FLINFO    346
                C                                                                FLINFO    347
                      IF (LC(1).NE.-1.OR.LC(38).NE.1)  GO TO 65                  FLINFO    348
                      READ (ITAPER,1) QDW, VQDW                                  FLINFO    349
                   65 CONTINUE                                                   FLINFO    350
350             C                                                                FLINFO    351
                C RANGE IN WHICH EIGENVECTORS ARE DESIRED                        FLINFO    352
                C                                                                FLINFO    353
                      IF(LC(28).EQ.O) GO TO 67                                   FLINFO    354
                      IF (LC(1) .EQ. 2)  GO TO 67                                FLINFO    355
355                   READ (ITAPER,1) VA , VB                                    FLINFO    356
                      IF (LC(1) .LT. O .AND. VA .LT. V(1))   VA = V(1)           FLINFO    357
                      IF (LC(1) .LT. O .AND. VB .LT. V(NV))  VB = V(NV)          FLINFO    358
                      IF ( LC(1)  .EQ. -1 )   GO TO 67                           FLINFO    359
                      READ (ITAPER,1)  FLO , FHI                                 FLINFO    360
360                67 CONTINUE                                                   FLINFO    361
                C                                                                FLINFO    362
                C LIST GENERALIZED MASSES, FREQUENCIES, DAMPING, AND COMPLEX STIFFNESS   FLINFO    363
                C                                                                FLINFO    364
                      CALL PLB (1,1,ITAPEW)                                      FLINFO    365
365                   WRITE (ITAPEW,4100)                                        FLINFO    366
                      CALL PLB (1,1,ITAPEW)                                      FLINFO    367
                      KOUNT  =  KOUNT + 4                                        FLINFO    368
                      NROWS  =  1                                                FLINFO    369
                      NCOLS  =  O                                                FLINFO    370
370                   KTABLE =  2                                                FLINFO    371
                      CALL PTABLE (2,60,60                                       FLINFO    372
                     1   HGENERALIZED MASS, FREQUENCY, AND GENERALIZED MODAL STIFFNESS)  FLINFO    373
                      LSKIP  =  1                                                FLINFO    374
                      LSUB   =  4                                                FLINFO    375
375                   KRETUR =  O                                                FLINFO    376
                   215 CALL HEAD (LTSHF,TSHF,NM,NM)                              FLINFO    377
                      GO TO (216, 217, 218), KHEAD                               FLINFO    378
                   216 WRITE (ITAPEW,1000)                                       FLINFO    379
                   217 CALL PLB (1,1,ITAPEW)                                     FLINFO    380
380                   WRITE (ITAPEW,1001) (JC, JC=JCL,JCU)                       FLINFO    381
                   218 WRITE (ITAPEW,1002)  IR, (WW(IR,JC), JC=JCL,JCU)          FLINFO    382
                      IF (KRETUR .LT. 3) GO TO 215                               FLINFO    383
                C                                                                FLINFO    384
                      LSUB   =  5                                                FLINFO    385
385                235 CALL HEAD (LTSHF,TSHF,NM,3)                               FLINFO    386
                      GO TO (236, 237, 238), KHEAD                               FLINFO    387
                   236 WRITE (ITAPEW,2000)                                       FLINFO    388
                   237 CALL PLB (1,1,ITAPEW)                                     FLINFO    389
                   238 OMGRAD = OMGC(IR)*TWOPI                                   FLINFO    390
390                   WRITE (ITAPEW,1002) IR, OMGC(IR), OMGRAD, GDP(IR)          FLINFO    391
                      OMGR(IR) =  OMGRAD                                         FLINFO    392
                      IF (KRETUR .LT. 3) GO TO 235                               FLINFO    393
                C                                                                FLINFO    394
                      KSAVE  =  KOLUMN                                           FLINFO    395
395                   KOLUMN =  KOLUMN/2                                         FLINFO    396
                      LSUB   =  4                                                FLINFO    397
                   315 CALL HEAD (LTSHF,TSHF,NM,NM)                              FLINFO    398
                      GO TO (316, 317, 318), KHEAD                               FLINFO    399
                   316 WRITE (ITAPEW,3000)                                       FLINFO    400
```

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400             317 CALL PLB (1,1,ITAPEW)                                       FLINFO   401
                    WRITE (ITAPEW,3001) (JC, JC=JCL,JCU)                        FLINFO   402
                318 WRITE (ITAPEW,3002)  IR, (B(IR,JC), JC=JCL,JCU)             FLINFO   403
                    IF (KRETUR .LT. 3) GO TO 315                                FLINFO   404
                    KOLUMN =  KSAVE                                             FLINFO   405
405              73 CONTINUE                                                    FLINFO   406
              C                                                                 FLINFO   407
              C     WRITE OUT NECESSARY COMMON BLOCKS TO ENABLE PROGRAM TO PLOT FLINFO   408
              C     ALL CALCOMPS FOLLOWING CALCULATIONS                         FLINFO   409
                    IF(LC(14).EQ.0) GO TO 71                                    FLINFO   410
410                 REWIND MTAP1                                                FLINFO   411
                    WRITE (MTAP1) (LC(I),I=1,40), BR, GMAX, GMIN, FRMAX, FRMIN, FLINFO   412
                   1              VMAX, VMIN, FMACH, BETA, VBO, RVBO, NRVBO,   FLINFO   413
                   2              (TITLE1(J),J=1,18), (TITLE2(J),J=1,18),      FLINFO   414
                   3              DUB, FUB, VUB, DLB, FLB, VLB, IPLOT, LSD,    FLINFO   415
415                4              DSCALE, FSCALE, VSCALE, DPLEN, FRLEN, VLEN, XDT FLINFO   416
              C                                                                 FLINFO   417
              C FORMATS                                                         FLINFO   418
              C                                                                 FLINFO   419
                  1 FORMAT (7E10.3)                                             FLINFO   420
420               5 FORMAT (2I5,E10.3)                                          FLINFO   421
                  9 FORMAT (I5,E10.3)                                           FLINFO   422
              CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS FLINFO   423
              C  30 FORMAT (18A4)                                               FLINFO   424
              CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS   FLINFO   425
425           CCDC  BEGINNING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS FLINFO   426
                 30 FORMAT (7A10, 1A2)                                          FLINFO   427
              CCDC  ENDING OF STATEMENTS ASSOCIATED WITH CDC COMPUTER PROGRAMS   FLINFO   428
                 34 FORMAT (2I5,2E10.3)                                         FLINFO   429
                 43 FORMAT (10X,1P8E13.4)                                       FLINFO   430
430              46 FORMAT (2I5,2E10.3)                                         FLINFO   431
                 49 FORMAT (I5,2E10.3)                                          FLINFO   432
                 50 FORMAT (10I5)                                               FLINFO   433
                 55 FORMAT (I5,4E10.3)                                          FLINFO   434
                 62 FORMAT (1H1,//20X, 53H***** VERTICAL PLOT IS GREATER THAN NINE INC FLINFO   435
435               1HES *****,//20X, 57HCALCOMP COMMAND CANCELLED ****** REVISE INPUT FLINFO   436
                  2DATA ******,////)                                            FLINFO   437
                 83 FORMAT (I5,E10.3)                                           FLINFO   438
               1000 FORMAT ( 10X, 20HGENERALIZED MASS, LB)                      FLINFO   439
               1001 FORMAT (10X,1X,4HMODE,2X,5HMODE=,1(  1I3,1X, 3(1H-))       FLINFO   440
440                1                                  ,7(  1I4,1X, 9(1H-)))     FLINFO   441
               1002 FORMAT ( 10X, I5, 1P8E14.6)                                 FLINFO   442
               2000 FORMAT (10X,1X,4HMODE,2X,9HFREQUENCY,5X,9HFREQUENCY,5X,8HDAMPING FLINFO   443
                   1     ,/,10X,5X       ,2X,9HCYC/SEC  ,5X,9HRAD/SEC  ,5X,8HNO UNITS) FLINFO   444
               3000 FORMAT (10X,56HCOMPLEX GENERALIZED MODAL STIFFNESS, (REAL, IMAG), FLINFO   445
445                1LB/IN)                                                      FLINFO   446
               3001 FORMAT (10X,1X,4HMODE,2X,5HMODE=,1(  1I3,1X,17(1H-))       FLINFO   447
                   1                                  ,3(  1I4,1X,23(1H-)))     FLINFO   448
               3002 FORMAT (10X,I5,4(2X,1H(,1P1E11.4,1H,1X,1P1E11.4,1H)))       FLINFO   449
               4000 FORMAT (10X,58                                              FLINFO   450
450                1   HREDUCED VELOCITIES FOR INTERPOLATION OF GENERALIZED FORCES FLINFO   451
                   2      ,/10X,58(1H-))                                        FLINFO   452
               4100 FORMAT (10X,60                                              FLINFO   453
                   1   HGENERALIZED MASS, FREQUENCY, AND GENERALIZED MODAL STIFFNESS FLINFO   454
                   2      ,/10X,60(1H-))                                        FLINFO   455
455           C                                                                 FLINFO   456
                 71 RETURN                                                      FLINFO   457
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                    END                                                    FLINFO    458


CARD NR. SEVERITY  DETAILS    DIAGNOSIS OF PROBLEM

     257    I              AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
     377    I              AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
     386    I              AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
     398    I              AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.



      SYMBOLIC REFERENCE MAP (R=3)

 ENTRY POINTS      DEF LINE      REFERENCES
     1  FLINFO          1       456

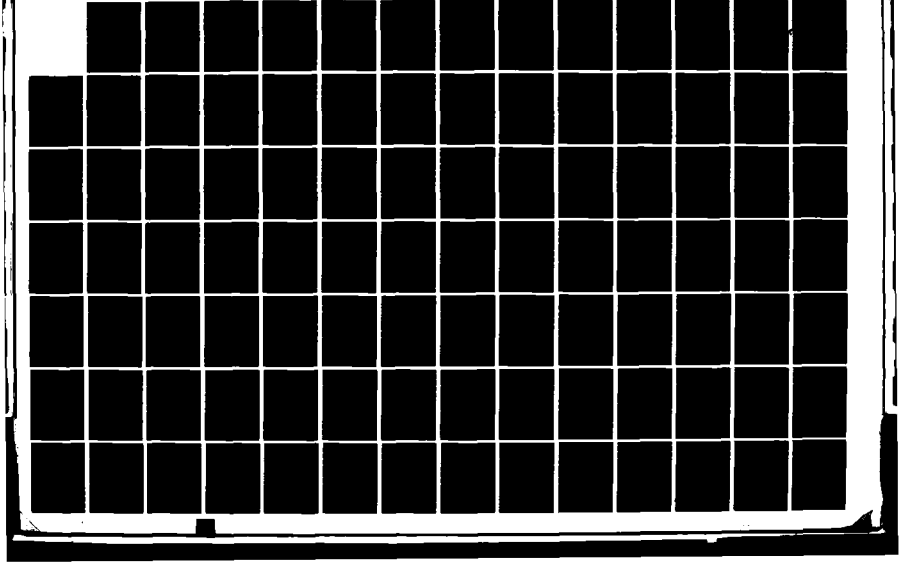
 VARIABLES      SN  TYPE            RELOCATION
  2201  ARG       REAL                          REFS        56    DEFINED       55
     0  B         COMPLEX     ARRAY     MODD    REFS         3         17      197       200       323       402
                                                DEFINED    137        143      197       200       317       323
  2220  BB        REAL                          REFS       141        142      143    DEFINED      140       141
  2221  BD        REAL                          REFS       143    DEFINED      142
     1  BETA      REAL                FLUTAN    REFS        18        411    DEFINED       56
    50  BR        REAL                COMA      REFS        16         53      411    DEFINED        52        53
  2232  DEL       REAL                          REFS       239        240      241       250    DEFINED       238
  2170  DELB      COMPLEX                       REFS         4        197    DEFINED       196
  2230  DELD      REAL                          REFS       196    DEFINED      195
  2401  DELK      REAL        ARRAY             REFS        13        175      180       188       193       195       196
                                                200        DEFINED  168      174       175       179       180       183
                                                188        193
  2412  DELOM     REAL        ARRAY             REFS        13        188    DEFINED       169       187
  6200  DETAD     COMPLEX     ARRAY     MODD    REFS         3         17      307    DEFINED       298       302       307
    47  DLB       REAL                CALCP     REFS        23        239     2*255      256       411
                                                DEFINED    231        254      255
    57  DPLEN     REAL                CALCP     REFS        23        254      259       262       266       411
                                                DEFINED    245        256
    54  DSCALE    REAL                CALCP     REFS        23        239      250       253       254      2*255      256
                                                411        DEFINED  237
    44  DUB       REAL                CALCP     REFS        23        239      250       251       253       254       256
                                                411        DEFINED  231      252       253
    32  DV        REAL                FLUTB     REFS        19         80    DEFINED        77
     3  FHI       REAL                FLUTV     REFS        21    DEFINED      359
    50  FLB       REAL                CALCP     REFS        23        411    DEFINED       232
     2  FLO       REAL                FLUTV     REFS        21    DEFINED      359
     0  FMACH     REAL                FLUTAN    REFS        18       2*55      411    DEFINED        52
    60  FRLEN     REAL                CALCP     REFS        23        248      259       262       266       411
                                                DEFINED    246
     2  FRMAX     REAL                PRPL      REFS        25        411    DEFINED       212
     3  FRMIN     REAL                PRPL      REFS        25        411    DEFINED       211
    55  FSCALE    REAL                CALCP     REFS        23        240      248       411    DEFINED       237
    45  FUB       REAL                CALCP     REFS        23        240      411    DEFINED       231       248
```

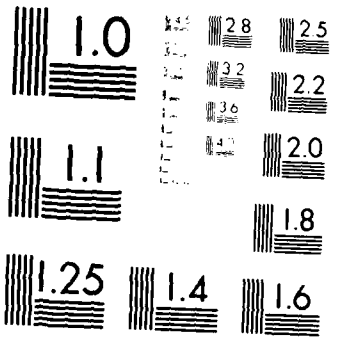
VARIABLES	SN	TYPE		RELOCATION							
2331	GDP	REAL	ARRAY		REFS	7	44	142	195	390	
					DEFINED	125	129				
0	GMAX	REAL		PRPL	REFS	25	411	DEFINED	212		
1	GMIN	REAL		PRPL	REFS	25	411	DEFINED	212		
2203	I	INTEGER			REFS	69	2*80	85	93	106	110	2*111
					125	137	138	139	140	142	143	158
					3*166	168	169	3*174	2*175	2*187	5*188	2*193
					194	2*195	196	2*197	3*200	226	227	274
					291	298	302	306	2*307	317	322	2*323
					331	411	DEFINED	69	79	85	93	106
					108	114	124	128	135	157	165	172
					185	191	226	227	274	284	291	296
					302	304	317	320	331	411		
2206	IADO	INTEGER			REFS	113	114	DEFINED	103			
2233	IDPLEN	INTEGER			REFS	242	245	DEFINED	239	242		
2236	IDUB	INTEGER			REFS	251	252	DEFINED	250	251		
4	IE	INTEGER		FLUTV	REFS	21						
2234	IFRLEN	INTEGER			REFS	243	246	DEFINED	240	243		
2210	II	INTEGER			REFS	115	DEFINED	105	115	301		
2254	IIT	INTEGER			REFS	340	341	DEFINED	339			
52	IPLOT	INTEGER		CALCP	REFS	23	411					
3	IR	INTEGER		CHEAD	REFS	32	2*381	389	3*390	391	2*402	
2215	IREF	INTEGER			REFS	133	DEFINED	132				
2244	ISF	INTEGER			REFS	288	DEFINED	285				
2	ITAPEP	INTEGER		COMRWP	REFS	30						
0	ITAPER	INTEGER		COMRWP	REFS	30	I/O REFS	52	69	77	84	85
					103	106	115	123	127	129	154	212
					226	227	231	237	274	280	285	291
					300	302	315	317	331	340	348	355
					359							
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	6	15	39				
7	ITAPET	INTEGER		CTABLE	REFS	28						
1	ITAPEW	INTEGER		COMRWP	REFS	30	88	91	364	366	379	388
					400	I/O REFS	90	93	269	365	378	380
					381	387	390	399	401	402		
2235	IVLEN	INTEGER			REFS	244	247	DEFINED	241	244		
2214	I1	INTEGER			REFS	129	DEFINED	129				
2211	J	INTEGER			REFS	106	110	2*111	137	138	140	143
					168	169	2*174	2*175	2*183	2*187	7*188	2*193
					194	195	196	2*197	3*200	285	298	302
					306	2*307	317	322	2*323	340	2*411	
					DEFINED	106	109	136	167	173	182	186
					192	285	290	297	302	305	317	321
					340	2*411						
2256	JC	INTEGER			REFS	380	381	401	402	DEFINED	380	381
					401	402						
4	JCL	INTEGER		CHEAD	REFS	32	380	381	401	402		
5	JCU	INTEGER		CHEAD	REFS	32	380	381	401	402		
2246	K	INTEGER			REFS	287	DEFINED	286	316			
7	KBPAGE	INTEGER		CLIST	REFS	26						
0	KHEAD	INTEGER		CHEAD	REFS	32	377	386	398			
4	KLABEL	INTEGER		CLIST	REFS	26						
2	KOLUMN	INTEGER		CHEAD	REFS	32	394	395	DEFINED	48	49	395
					404							
0	KOUNT	INTEGER		CLIST	REFS	26	86	89	92	367		
					DEFINED	86	89	92	367			
11	KOUNTH	INTEGER		CLIST	REFS	26						

VARIABLES	SN	TYPE		RELOCATION								
12	KOUNTI	INTEGER		CLIST	REFS	26						
1	KPAGE	INTEGER		CLIST	REFS	26						
0	KREPOR	INTEGER		REPORT	REFS	31	49					
1	KRETUR	INTEGER		CHEAD	REFS	32	382	392	403	DEFINED	375	
2260	KSAVE	INTEGER			REFS	404	DEFINED	394				
0	KTABLE	INTEGER		CTABLE	REFS	28	DEFINED	96	370			
5	KTABLO	INTEGER		CTABLE	REFS	28						
5	KTPAGE	INTEGER		CLIST	REFS	26						
0	LC	INTEGER	ARRAY	COMA	REFS	9	16	38	54	58	59	60
						61	62	63	64	68	70	71	102
						121	122	131	132	141	193	204	213
						273	278	299	314	329	330	337	338
						2*347	353	354	356	357	358	409	411
					DEFINED	58	59	60	61	76	268	
2	LC38	INTEGER		QELIM	REFS	34	DEFINED	38				
2	LINES	INTEGER		CLIST	REFS	26	2*86					
10	LINESG	INTEGER		CLIST	REFS	26						
3	LINEST	INTEGER		CLIST	REFS	26						
53	LSD	INTEGER		CALCP	REFS	23	257	411	DEFINED	231		
7	LSKIP	INTEGER		CHEAD	REFS	32	DEFINED	373				
6	LSUB	INTEGER		CHEAD	REFS	32	DEFINED	374	384	396		
2231	LTITLE	INTEGER			REFS	226	227	DEFINED	224			
0	LTSHF	INTEGER		CTSHF	REFS	33	376	385	397			
2205	MADD	INTEGER			REFS	104	105	DEFINED	103			
2207	MSYM	INTEGER			REFS	107	DEFINED	103				
2172	MTAP1	INTEGER			DEFINED	39	I/O REFS	410	411			
2250	NADD	INTEGER			REFS	301	316	DEFINED	300	315		
17550	NC	INTEGER		MODD	REFS	17						
2213	NCD	INTEGER			REFS	128	DEFINED	127				
3	NCOLS	INTEGER		CTABLE	REFS	28	DEFINED	95	369			
4	NCOLST	INTEGER		CTABLE	REFS	28						
43	NINZ	INTEGER	ARRAY	FLUTC	REFS	8	20	DEFINED	340			
2245	NISF	INTEGER			REFS	285	286	DEFINED	285			
2200	NM	INTEGER			REFS	108	109	124	135	136	304	305
						320	321	2*376	385	2*397	DEFINED	54	
2176	NMD	INTEGER			REFS	44	46	296	297	DEFINED	43	
2253	NMIT	INTEGER			REFS	339	DEFINED	338				
2252	NOMA	INTEGER			REFS	331	DEFINED	330				
12	NOTI	INTEGER	ARRAY	FLUTC	REFS	8	20	DEFINED	341			
2255	NOTIR	INTEGER			REFS	340	341	DEFINED	340			
6	NPAGE	INTEGER		CLIST	REFS	26						
6	NPAGEA	INTEGER		CTABLE	REFS	28						
1	NPASS	INTEGER		CTABLE	REFS	28						
2261	NQA	INTEGER	ARRAY		REFS	7	287	DEFINED	285			
2247	NQAK	INTEGER			REFS	288	DEFINED	287				
2243	NQE	INTEGER			REFS	289	290	DEFINED	280			
2175	NQED	INTEGER			REFS	45	46	DEFINED	42			
2242	NQWT	INTEGER			REFS	283	284	DEFINED	280			
5	NQZ	INTEGER		FLUTV	REFS	21						
2225	NRBROT	INTEGER			REFS	162	178	DEFINED	161			
2223	NRBTOT	INTEGER			REFS	161	165	167	173	182	186	191
						192	DEFINED	154				
2222	NRBTR	INTEGER			REFS	155	157	161	163	172	185	
					DEFINED	154						
2241	NRO	INTEGER			REFS	274	DEFINED	273				
2226	NROT1	INTEGER			REFS	173	182	186	DEFINED	163		
2	NROWS	INTEGER		CTABLE	REFS	28	DEFINED	94	368			

AD-A152 270 ESP (EXTERNAL-STORES PROGRAM) - A PILOT COMPUTER PROGRAM FOR DETERMINING.. (U) GRUMMAN AEROSPACE CORP BETHPAGE NY J B SMEDFJELD FEB 85 ADCR-85-1-VOL-3-PT-1 6/8

UNCLASSIFIED N00019-81-C-0395 F/G 9/2 NL





MICROCOPY RESOLUTION TEST CHART

VARIABLES	SN	TYPE		RELOCATION							
57	NRVBO	INTEGER		FLUTAN	REFS	18	85	93	411	DEFINED	84
2251	NSYM	INTEGER			REFS	303	319	DEFINED	300	315	
31	NV	INTEGER		FLUTB	REFS	19	79	2*357	DEFINED	77	
2202	NVBO	INTEGER			REFS	69	DEFINED	68			
6	NVTOT	INTEGER		FLUTV	REFS	21					
17500	OMGC	REAL	ARRAY	MODD	REFS	7	36	133	139	158	2*166	389
					390	DEFINED	115				
17500	OMGR	REAL	ARRAY	MODD	REFS	7	17	36	DEFINED	391	
2257	OMGRAD	REAL			REFS	390	391	DEFINED	389		
2216	OMGR2	REAL			REFS	134	140	DEFINED	133	139	
2424	OMRBSQ	REAL	ARRAY		REFS	13	174	179	2*187	DEFINED	166
2174	ONE	REAL			REFS	45	46	DEFINED	41		
2217	OREF	REAL			REFS	141	193	DEFINED	134		
0	QDW	REAL		QELIM	REFS	34	DEFINED	348			
0	QMWT	REAL	ARRAY	FLUTQ	REFS	8	22	46	DEFINED	288	
310	QWT	REAL	ARRAY	FLUTQ	REFS	8	22	45	DEFINED	291	
2013	RATOM	REAL	ARRAY	FLUTC	REFS	8	20	DEFINED	331		
0	RHOR	REAL	ARRAY	FLUTC	REFS	10	20	DEFINED	274		
40	RVBO	REAL	ARRAY	FLUTAN	REFS	10	18	93	411	DEFINED	85
2224	SUMOMG	REAL			REFS	158	160	DEFINED	156	158	
2240	TEST	REAL			REFS	267	DEFINED	266			
0	TITLE1	REAL	ARRAY	CALCP	REFS	11	23	411	DEFINED	226	
22	TITLE2	REAL	ARRAY	CALCP	REFS	11	23	411	DEFINED	227	
1	TSHF	REAL	ARRAY	CTSHF	REFS	12	33	376	385	397	
2177	TWOPI	REAL			REFS	133	139	2*164	389	DEFINED	47
2227	TWPISQ	REAL			REFS	166	DEFINED	164			
0	V	REAL	ARRAY	FLUTB	REFS	11	19	80	2*356	2*357	
					DEFINED	78	80				
0	VA	REAL		FLUTV	REFS	21	356	DEFINED	355	356	
1	VB	REAL		FLUTV	REFS	21	357	DEFINED	355	357	
2	VBO	REAL	ARRAY	FLUTAN	REFS	10	18	411	DEFINED	69	
51	VLB	REAL		CALCP	REFS	23	411	DEFINED	233		
61	VLEN	REAL		CALCP	REFS	23	249	258	263	265	411
					DEFINED	247					
2237	VLN	REAL			REFS	260	DEFINED	259			
4	VMAX	REAL		PRPL	REFS	25	411	DEFINED	212		
5	VMIN	REAL		PRPL	REFS	25	411	DEFINED	210		
1	VQDW	REAL		QELIM	REFS	34	DEFINED	348			
56	VSCALE	REAL		CALCP	REFS	23	241	249	411	DEFINED	237
46	VUB	REAL		CALCP	REFS	23	241	411	DEFINED	231	249
2204	V1	REAL			REFS	78	DEFINED	77			
14400	WW	REAL	ARRAY	MODD	REFS	7	17	111	140	174	179	3*188
					381	DEFINED	106	111			
62	XDT	REAL		CALCP	REFS	23	411	DEFINED	258	262	265
2173	ZERO	REAL			REFS	44	DEFINED	40			

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS		REFERENCES						
DVALUE		3		44	45	46				
HEAD		4		376	385	397				
PLB		3		88	91	364	366	379	388	400
PROGNA		2		50						
PTABLE		3		97	371					
SQRT	REAL	1	LIBRARY	56						
TITLES		1		87						

INLINE FUNCTIONS	TYPE	ARGS	DEF LINE	REFERENCES							
ABS	REAL	1	INTRIN	55	255						
AMAX1	REAL	0	INTRIN	266							
CMPLX	COMPLEX	2	INTRIN	137	143	196	298				
MAXO	INTEGER	0	INTRIN	242	243	244					
SIGN	REAL	2	INTRIN	251	255						

STATEMENT LABELS			DEF LINE	REFERENCES							
2001	1	FMT	419	52	69	85	123	212	237	274	331	348
				355	359							
210	3		113	104	107							
0	4		106	105								
2003	5	FMT	420	106								
203	6		112	108	109	110						
223	7		116	102	113							
0	8		115	114								
2006	9	FMT	421	84	115	129						
107	10		84	71								
146	11		102	72								
252	21		131	62	121							
236	22		127	122								
0	23		125	124								
252	24		130	126								
0	25		129	128								
260	28		135	131								
74	29		76	64								
2010	30	FMT	426	226	227							
304	31		144	135	136	138						
0	32		298	296	297							
0	33		317	316								
2012	34	FMT	428	317								
1021	35		325	314	319							
1013	36		324	320	321	322						
625	42		273	204	213	261	264	267				
2015	43	FMT	429	93								
0	45		302	301								
2020	46	FMT	430	302								
750	47		308	304	305	306						
756	48		309	299	303							
2023	49	FMT	431	77								
2026	50	FMT	432	103	127	154	280	285	300	315	340	
0	51		80	79								
2030	55	FMT	433	231								
622	60		268	260	263							
2033	62	FMT	434	269								
1050	63		342	337								
0	64		341	339								
1056	65		349	347								
1030	66		332	329								
1077	67		360	353	354	358						
677	70		292	278	289							
1301	71		456	409								
0	72		288	284	286							
1274	73		405	63	70							
664	80		289	283								
0	82		291	290								
2052	83	FMT	437	291								

STATEMENT LABELS			DEF LINE	REFERENCES		
0	87		159	157		
0	89		170	167		
0	90		171	165		
0	92		176	173		
0	93		177	172		
400	95		181	178		
0	96		184	182		
0	97		189	186		
0	98		190	185		
576	101		258	257		
605	102		262	257		
613	103		265	257		
463	108		199	194		
465	109		201	192	198	
0	110		202	191		
473	115		203	155	160	162
1117	215		376	382		
1131	216		378	377		
1133	217		379	377		
1146	218		381	377		
1167	235		385	392		
1201	236		387	386		
1203	237		388	386		
1205	238		389	386		
0	300	INACTIVE	68			
1223	315		397	403		
1235	316		399	398		
1237	317		400	398		
1252	318		402	398		
2054	1000	FMT	438	378		
2060	1001	FMT	439	380		
2067	1002	FMT	441	381	390	
2072	2000	FMT	442	387		
2105	3000	FMT	444	399		
2115	3001	FMT	446	401		
2124	3002	FMT	448	402		
2132	4000	FMT	449	90		
2143	4100	FMT	452	365		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
103	51	I	79 80	3B	INSTACK	
153	4	II	105 106	13B		EXT REFS
170	6	I	108 112	20B		NOT INNER
200	6	J	109 112	5B	INSTACK	
212	8	I	114 115	11B		EXT REFS
232	23	I	124 125	3B	INSTACK	
241	25	I	128 129	11B		EXT REFS
261	31	I	135 144	31B		NOT INNER
272	31	J	136 144	14B	OPT	
320	87	I	157 159	3B	INSTACK	
332	90	I	165 171	16B		NOT INNER
341	89	J	167 170	3B	INSTACK	
351	93	I	172 177	22B		NOT INNER
364	92	J	173 176	4B	INSTACK	
404	96	J	182 184	2B	INSTACK	
410	98	I	185 190	26B		NOT INNER
423	97	J	186 189	7B	INSTACK	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
437	110	I	191 202	34B	NOT INNER
451	109	J	192 201	16B	OPT
640	72	I	284 288	24B	EXT REFS NOT INNER
654	72	K	286 288	4B	INSTACK
666	82	J	290 291	11B	EXT REFS
700	32	I	296 298	14B	NOT INNER
706	32	J	297 298	2B	INSTACK
717	45	II	301 302	13B	EXT REFS
734	47	I	304 308	22B	NOT INNER
744	47	J	305 308	6B	INSTACK
762	33	K	316 317	13B	EXT REFS
777	36	I	320 324	22B	NOT INNER
1007	36	J	321 324	6B	INSTACK
1033	64	III	339 341	15B	EXT REFS
1141		JC	380 380	4B	EXT REFS
1152		JC	381 381	11B	EXT REFS
1245		JC	401 401	4B	EXT REFS
1256		JC	402 402	11B	EXT REFS

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)								
CTAPES	50	0	ITAPES	(50)						
COMA	41	0	LC	(40)	40	BR	(1)			
MODD	8041	0	B	(3200)	3200	DETAD	(3200)	6400	WW	(1600)
		8000	OMGR	(40)	8040	NC	(1)			
FLUTAN	48	0	FMACH	(1)	1	BETA	(1)	2	VBO	(30)
		32	RVBO	(15)	47	NRVBO	(1)			
FLUTB	27	0	V	(25)	25	NV	(1)	26	DV	(1)
FLUTC	1055	0	RHOR	(10)	10	NOTI	(25)	35	NINZ	(1000)
		1035	RATOM	(20)						
FLUTV	7	0	VA	(1)	1	VB	(1)	2	FLO	(1)
		3	FHI	(1)	4	IE	(1)	5	NQZ	(1)
		6	NVTOT	(1)						
FLUTQ	205	0	QMWT	(200)	200	QWT	(5)			
CALCP	51	0	TITLE1	(18)	18	TITLE2	(18)	36	DUB	(1)
		37	FUB	(1)	38	VUB	(1)	39	DLB	(1)
		40	FLB	(1)	41	VLB	(1)	42	IPLOT	(1)
		43	LSD	(1)	44	DSCALE	(1)	45	FSCALE	(1)
		46	VSCALE	(1)	47	DPLEN	(1)	48	FRLEN	(1)
		49	VLEN	(1)	50	XDT	(1)			
PRPL	6	0	GMAX	(1)	1	GMIN	(1)	2	FRMAX	(1)
		3	FRMIN	(1)	4	VMAX	(1)	5	VMIN	(1)
CLIST	11	0	KOUNT	(1)	1	KPAGE	(1)	2	LINES	(1)
		3	LINEST	(1)	4	KLABEL	(1)	5	KTPAGE	(1)
		6	NPAGE	(1)	7	KBPAGE	(1)	8	LINESG	(1)
		9	KOUNTH	(1)	10	KOUNTI	(1)			
CTABLE	8	0	KTABLE	(1)	1	NPASS	(1)	2	NROWS	(1)
		3	NCOLS	(1)	4	NCOLST	(1)	5	KTABLO	(1)
		6	NPAGEA	(1)	7	ITAPET	(1)			
COMRWP	3	0	ITAPER	(1)	1	ITAPEW	(1)	2	ITAPEP	(1)
REPORT	1	0	KREPOR	(1)						
CHEAD	8	0	KHEAD	(1)	1	KRETUR	(1)	2	KOLUMN	(1)
		3	IR	(1)	4	JCL	(1)	5	JCU	(1)
		6	LSUB	(1)	7	LSKIP	(1)			
CTSHF	2	0	LTSHF	(1)	1	TSHF	(1)			
QELIM	3	0	QDW	(1)	1	VQDW	(1)	2	LC38	(1)

```
 EQUIV CLASSES    LENGTH      MEMBERS - BIAS NAME(LENGTH)
B        OMGR         40              0 OMGC    (40)

 STATISTICS
   PROGRAM LENGTH                 24508     1320
   CM LABELED COMMON LENGTH       22537B    9567
          52000B CM USED
```

```
      C                                                                 MOVIS      2
            SUBROUTINE MOVIS (IS,IM,ID,NBOXS,IFB,KLUE,XI)               MOVIS      3
      C                                                                 MOVIS      4
      C        ROUTINE PRESENTS A VISUALIZATION OF THE MODE SHAPES      MOVIS      5
      C        OF A SURFACE BY PRINTING DEFLECTIONS IN DIGITAL          MOVIS      6
      C        FORMAT AT THE COLLOCATION POINTS ON THE PLANFORM.        MOVIS      7
      C        BOTH H AND ALPHA ARE PRINTED.                            MOVIS      8
      C        R. CHIPMAN 1973.                                         MOVIS      9
      C                                                                 MOVIS     10
      C                                                                 MOVIS     11
      CIBM                                                              MOVIS     12
      C     DIMENSION TITLE(18)                                         MOVIS     13
      CIBM                                                              MOVIS     14
      CCDC                                                              MOVIS     15
            DIMENSION TITLE(8)                                          MOVIS     16
      CCDC                                                              MOVIS     17
      C                                                                 MOVIS     18
            COMMON /MODV/ X(400) , Y(400) , ZZ(400)                     MOVIS     19
            COMMON / CTAPES / ITAPES                                    MOVIS     20
            DIMENSION XI(NBOXS) ,YV(200),IPRINT(33)                     MOVIS     21
            DIMENSION DEF(400)                                          MOVIS     22
            DIMENSION YZ(800)                                           MOVIS     23
            DIMENSION BLANK(37), FMT(37)                                MOVIS     24
            COMMON /COMRWP/ ITAPER ,ITAPEW,ITAPEP                       MOVIS     25
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE  MOVIS  26
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                 MOVIS     27
            COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA MOVIS  28
           1               ,ITAPET                                      MOVIS     29
            DIMENSION ITAPES(50)                                        MOVIS     30
            EQUIVALENCE (YZ(1),Y(1))                                    MOVIS     31
            DATA WORD /4H,1I3/                                          MOVIS     32
            DATA BLANK /4H(2X,,4HG10.,4H4,8X,     33*4H,03X,4H,1X)/     MOVIS     33
            DATA KLU  /4HKERN/                                          MOVIS     34
      C                                                                 MOVIS     35
      C INITIAL CONDITIONS                                              MOVIS     36
      C                                                                 MOVIS     37
            KOUNT  =  LINES                                             MOVIS     38
            ITAP18 =  ITAPES(18)                                        MOVIS     39
            IF (IS .GT. 1 .OR. IM .GT. 1 .OR. ID .GT. 2) GO TO 100      MOVIS     40
            CALL TITLES(2)                                              MOVIS     41
            CALL PLB (1,2,ITAPEW)                                       MOVIS     42
            WRITE (ITAPEW,4000)                                         MOVIS     43
            CALL PLB (1,1,ITAPEW)                                       MOVIS     44
            KOUNT  =  KOUNT + 5                                         MOVIS     45
            NROWS  =  1                                                 MOVIS     46
            NCOLS  =  0                                                 MOVIS     47
            KTABLE =  2                                                 MOVIS     48
            CALL PTABLE (2,46,46                                        MOVIS     49
           1   HGRAPHICAL REPRESENTATION OF INTERPOLATED MODES)          MOVIS     50
            KOUNT  =  LINES                                             MOVIS     51
        100 CONTINUE                                                    MOVIS     52
      C                                                                 MOVIS     53
      C        FIND MAXIMUMS AND MINIMUMS                               MOVIS     54
      C                                                                 MOVIS     55
            ILB= IFB + NBOXS - 1                                        MOVIS     56
            IH = 0                                                      MOVIS     57
            DU = 0                                                      MOVIS     58
```

```
                  XU = X(IFB)                                          MOVIS      59
                  YU = Y(IFB)                                          MOVIS      60
60                ZU =ZZ(IFB)                                          MOVIS      61
                  DL = 0.                                              MOVIS      62
                  XL = XU                                              MOVIS      63
                  YL = YU                                              MOVIS      64
                  ZL = ZU                                              MOVIS      65
65                DO 1 I= IFB,ILB                                      MOVIS      66
                  IH = 1 + IH                                          MOVIS      67
                  D = XI(IH)                                           MOVIS      68
                  X1 = X(I)                                            MOVIS      69
                  Y1 = Y(I)                                            MOVIS      70
70                Z1 =ZZ(I)                                            MOVIS      71
                  IF(D.LT.DL) DL = D                                   MOVIS      72
                  IF (X1.LT.XL) XL=X1                                  MOVIS      73
                  IF (Y1.LT.YL) YL=Y1                                  MOVIS      74
                  IF (Z1.LT.ZL) ZL=Z1                                  MOVIS      75
75                IF (D.GT.DU) DU = D                                  MOVIS      76
                  IF (X1.GT.XU) XU=X1                                  MOVIS      77
                  IF (Y1.GT.YU) YU=Y1                                  MOVIS      78
                  IF (Z1.GT.ZU) ZU=Z1                                  MOVIS      79
                1 CONTINUE                                             MOVIS      80
80          C                                                          MOVIS      81
            C        SCALE DEFLECTIONS AND SET EXPONENT                MOVIS      82
            C                                                          MOVIS      83
                  DL = ABS(DL)                                         MOVIS      84
                  IF (DL.GT.DU) DU = DL                                MOVIS      85
85                IEX = 0                                              MOVIS      86
                  IF (DU.GT.1.0) GO TO 2                               MOVIS      87
                  IF(DU.GT.0.1) GO TO 3                                MOVIS      88
                  DO 4 I    = 1,10                                     MOVIS      89
                  IEX = - I                                            MOVIS      90
90                DU = 10.*DU                                          MOVIS      91
                  IF (DU.GT.0.1) GO TO 3                               MOVIS      92
                4 CONTINUE                                             MOVIS      93
                  GO TO 3                                              MOVIS      94
                2 DO 6 I = 1,10                                        MOVIS      95
95                IEX = I                                              MOVIS      96
                  DU = DU/10.                                          MOVIS      97
                  IF (DU.LE.1.0) GO TO 3                               MOVIS      98
                6 CONTINUE                                             MOVIS      99
                3 DO 10 I = 1,NBOXS                                    MOVIS     100
100            10 DEF(I) = XI(I) * (10.0**(-IEX))                      MOVIS     101
                  IEX = IEX - 2                                        MOVIS     102
                  IEXX  =  -IEX                                        MOVIS     103
                  GO TO (600,400,500), ID                              MOVIS     104
            C                                                          MOVIS     105
105           400 CONTINUE                                             MOVIS     106
                  REWIND ITAP18                                        MOVIS     107
                  WRITE (ITAP 18,1000) IEXX, IS, IM                    MOVIS     108
                  REWIND ITAP18                                        MOVIS     109
                  READ (ITAP18,3000) TITLE                             MOVIS     110
110               CALL TITLES (-1)                                     MOVIS     111
                  CALL PLB (1,1,ITAPEW)                                MOVIS     112
                  WRITE (ITAPEW,2000) IEXX, IS, IM                     MOVIS     113
                  CALL PLB (1,1,ITAPEW)                                MOVIS     114
                  KOUNT  =  KOUNT +4                                   MOVIS     115
```

```
115                NROWS  =  0                                                MOVIS     116
                   NCOLS  =  2                                                MOVIS     117
                   KTABLE = 2                                                 MOVIS     118
                   CALL PTABLE (2,58,TITLE)                                   MOVIS     119
                   GO TO 600                                                  MOVIS     120
120           C                                                               MOVIS     121
                500 CONTINUE                                                  MOVIS     122
                   REWIND ITAP18                                              MOVIS     123
                   WRITE (ITAP18,1100) IEXX, IS, IM                           MOVIS     124
                   REWIND ITAP18                                              MOVIS     125
125                READ (ITAP18,3000) TITLE                                   MOVIS     126
                   CALL TITLES (-1)                                           MOVIS     127
                   CALL PLB (1,1,ITAPEW)                                      MOVIS     128
                   WRITE (ITAPEW,2100) IEXX, IS,IM                            MOVIS     129
                   CALL PLB (1,1,ITAPEW)                                      MOVIS     130
130                KOUNT  =  KOUNT +4                                         MOVIS     131
                   NROWS  =  0                                                MOVIS     132
                   NCOLS  =  2                                                MOVIS     133
                   KTABLE = 2                                                 MOVIS     134
                   CALL PTABLE (2,58,TITLE)                                   MOVIS     135
135           C                                                               MOVIS     136
                600 CONTINUE                                                  MOVIS     137
              C                                                               MOVIS     138
              C        X-Y OR X-Z PLANE ?                                     MOVIS     139
              C                                                               MOVIS     140
140                CMAX  = XU-XL                                              MOVIS     141
                   SY = YU-YL                                                 MOVIS     142
                   SZ = ZU-ZL                                                 MOVIS     143
                   SPAN  = SY                                                 MOVIS     144
                   IB1 = 0                                                    MOVIS     145
145                IF (SY.LT.SZ) IB1=400                                      MOVIS     146
                   IF (SY.LT.SZ) YL =ZL                                       MOVIS     147
                   IF (SY.LT.SZ) SPAN=SZ                                      MOVIS     148
                   SCALE = 6.*SPAN/5.                                         MOVIS     149
                   IF (CMAX.GT.SPAN) SCALE= 6.*CMAX/5.                        MOVIS     150
150           C                                                               MOVIS     151
                   NSB = 0                                                    MOVIS     152
                   R       = 0.0                                              MOVIS     153
                   IU = 1                                                     MOVIS     154
                   YV(1) = 0.0                                                MOVIS     155
155                IY = -1                                                    MOVIS     156
                   DO 120 I = 1,NBOXS                                         MOVIS     157
                   MBOX    = IFB + I - 1                                      MOVIS     158
                   MBOX  =  MBOX + IB1                                        MOVIS     159
                   YS      = YZ(MBOX)                                         MOVIS     160
160                IF (YS.EQ.R) GO TO 120                                     MOVIS     161
                   DO 301 NU = 1,IU                                           MOVIS     162
                   RU = YV(NU)                                                MOVIS     163
                   IF (YS.EQ. RU) GO TO 120                                   MOVIS     164
                301 CONTINUE                                                  MOVIS     165
165                IU = IU + 1                                                MOVIS     166
                   YV(IU) = YS                                                MOVIS     167
                   NSB = NSB + 1                                              MOVIS     168
                   R       = YS                                               MOVIS     169
              C                                                               MOVIS     170
170           C        IS THIS R SIGNIFICANTLY DIFFERENT FROM THE LAST ?      MOVIS     171
              C                                                               MOVIS     172
```

```
                IYL = IY                                                        MOVIS     173
                IY = 60.*(R - YL) / SCALE                                       MOVIS     174
                IF (KLUE.EQ.KLU)  IY = 60.*(YU-R) / SCALE                       MOVIS     175
175             IF (IY.EQ.IYL) GO TO 120                                        MOVIS     176
      C                                                                         MOVIS     177
      C         CLEAR THE PRINT RECORD                                        MOVIS     178
      C                                                                         MOVIS     179
                DO 5 J = 1,37                                                   MOVIS     180
180           5 FMT(J) = BLANK(J)                                               MOVIS     181
      C                                                                         MOVIS     182
      C     SEARCH ALL PANELS, SELECTING  THOSE WHERE Y=R. THESE BECOME THE     MOVIS     183
      C     BOXES TO BE PLOTTED CHORDWISE. NFB COUNTS THESE.                    MOVIS     184
      C                                                                         MOVIS     185
185             NFB = 0                                                         MOVIS     186
                IX  =  -1                                                       MOVIS     187
                DO 8 II   = 1,NBOXS                                             MOVIS     188
                J = IFB + II - 1                                                MOVIS     189
                J  =  J + IB1                                                   MOVIS     190
190             IF  (YZ(J) .NE. R) GO TO 8                                      MOVIS     191
      C                                                                         MOVIS     192
      C         DIGITIZE DEFLECTIONS AND COORDINATES TO FIT PAGE               MOVIS     193
      C                                                                         MOVIS     194
                IXL = IX                                                        MOVIS     195
195             IX = 33.*( X(J) - XL) / SCALE                                   MOVIS     196
                IF(IX.EQ.IXL) GO TO 8                                           MOVIS     197
                FMT(IX+4) = WORD                                                MOVIS     198
             35 NFB = NFB + 1                                                   MOVIS     199
                IPRINT(NFB) = 100.*DEF(II)                                      MOVIS     200
200           8 CONTINUE                                                        MOVIS     201
      C                                                                         MOVIS     202
      C     PRINTOUT                                                          MOVIS     203
      C                                                                         MOVIS     204
                IYDIF = IY - IYL - 1                                            MOVIS     205
205             IF (IYDIF.LT.1) GO TO 9                                         MOVIS     206
                DO 7 J = 1,IYDIF                                                MOVIS     207
              7 WRITE (ITAPEW,701)                                              MOVIS     208
            701 FORMAT (1H )                                                    MOVIS     209
              9 CONTINUE                                                        MOVIS     210
210             WRITE (ITAPEW,FMT) R, (IPRINT(J), J= 1,NFB)                     MOVIS     211
            120 CONTINUE                                                        MOVIS     212
                KOUNT   =  LINES                                                MOVIS     213
      C                                                                         MOVIS     214
      C                                                                         MOVIS     215
215   C     FORMATS                                                           MOVIS     216
      C                                                                         MOVIS     217
           1000 FORMAT (    32HMODAL DEFLECTIONS     TIMES 1.0E,I3,10H, SURFACE=  MOVIS     218
               1         ,I2, 8H, MODE =,I3,14X)                                MOVIS     219
           1100 FORMAT (    32HMODAL SLOPES (RAD/FT) TIMES 1.0E,I3,10H, SURFACE=  MOVIS     220
220            1         ,I2, 8H, MODE =,I3,14X)                                MOVIS     221
           2000 FORMAT (10X,32HMODAL DEFLECTIONS     TIMES 1.0E,I3,11H, SURFACE =  MOVIS     222
               1         ,I2, 8H, MODE =,I3,/,10X,58(1H-))                      MOVIS     223
           2100 FORMAT (10X,32HMODAL SLOPES (RAD/FT) TIMES 1.0E,I3,11H, SURFACE =  MOVIS     224
               1         ,I2, 8H, MODE =,I3,/,10X,58(1H-))                      MOVIS     225
225   CIBM                                                                      MOVIS     226
      C3000 FORMAT (18A4)                                                       MOVIS     227
      CIBM                                                                      MOVIS     228
      CCDC                                                                      MOVIS     229
```

```
                3000 FORMAT (7A10,1A2)                                                  MOVIS     230
    230         CCDC                                                                    MOVIS     231
                4000 FORMAT (10X,46                                                     MOVIS     232
                     1   HGRAPHICAL REPRESENTATION OF INTERPOLATED MODES./,10X,46(1H-)) MOVIS     233
                C                                                                       MOVIS     234
                      RETURN                                                            MOVIS     235
    235               END                                                               MOVIS     236
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

103 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 MOVIS 2 234

VARIABLES	SN	TYPE		RELOCATION								
2076	BLANK	REAL	ARRAY		REFS	23	180	DEFINED	32			
650	CMAX	REAL			REFS	2*149	DEFINED	140				
642	D	REAL			REFS	2*71	2*75	DEFINED	67			
1256	DEF	REAL	ARRAY		REFS	21	199	DEFINED	100			
635	DL	REAL			REFS	71	83	2*84	DEFINED	61	71	83
631	DU	REAL			REFS	75	84	86	87	90	91	96
						97	DEFINED	57	75	84	90	96
2143	FMT	REAL	ARRAY		REFS	23	210	DEFINED	180	197		
641	I	INTEGER			REFS	68	69	70	89	95	2*100	157
					DEFINED	65	88	94	99	156		
654	IB1	INTEGER			REFS	158	189	DEFINED	144	145		
0	ID	INTEGER		F.P.	REFS	39	103	DEFINED	2			
646	IEX	INTEGER			REFS	100	101	102	DEFINED	85	89	95
						101						
647	IEXX	INTEGER			REFS	107	112	123	128	DEFINED	102	
0	IFB	INTEGER		F.P.	REFS	55	58	59	60	65	157	188
					DEFINED	2						
630	IH	INTEGER			REFS	66	67	DEFINED	56	66		
672	II	INTEGER			REFS	188	199	DEFINED	187			
627	ILB	INTEGER			REFS	65	DEFINED	55				
0	IM	INTEGER		F.P.	REFS	39	107	112	123	128		
					DEFINED	2						
1215	IPRINT	INTEGER	ARRAY		REFS	20	210	DEFINED	199			
0	IS	INTEGER		F.P.	REFS	39	107	112	123	128		
					DEFINED	2						
2	ITAPEP	INTEGER		COMRWP	REFS	24						
0	ITAPER	INTEGER		COMRWP	REFS	24						
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	19	29	38				
7	ITAPET	INTEGER		CTABLE	REFS	27						
1	ITAPEW	INTEGER		COMRWP	REFS	24	41	43	111	113	127	129
					I/O REFS	42	112	128	207	210		
626	ITAP1R	INTEGER			DEFINED	38	I/O REFS	106	107	108	109	122

VARIABLES	SN	TYPE		RELOCATION								
					123	124	125					
660	IU	INTEGER			REFS	161	165	166	DEFINED	153	165	
671	IX	INTEGER			REFS	194	196	197	DEFINED	186	195	
673	IXL	INTEGER			REFS	196	DEFINED	194				
661	IY	INTEGER			REFS	172	175	204	DEFINED	155	173	174
674	IYDIF	INTEGER			REFS	205	206	DEFINED	204			
666	IYL	INTEGER			REFS	175	204	DEFINED	172			
667	J	INTEGER			REFS	2*180	189	190	195	210		
					DEFINED	179	188	189	206	210		
7	KBPAGE	INTEGER		CLIST	REFS	25						
4	KLABEL	INTEGER		CLIST	REFS	25						
446	KLU	INTEGER			REFS	174	DEFINED	33				
0	KLUE	INTEGER		F.P.	REFS	174	DEFINED	2				
0	KOUNT	INTEGER		CLIST	REFS	25	44	114	130	DEFINED	37	44
					50	114	130	212				
11	KOUNTH	INTEGER		CLIST	REFS	25						
12	KOUNTI	INTEGER		CLIST	REFS	25						
1	KPAGE	INTEGER		CLIST	REFS	25						
0	KTABLE	INTEGER		CTABLE	REFS	27	DEFINED	47	117	133		
5	KTABLO	INTEGER		CTABLE	REFS	27						
5	KTPAGE	INTEGER		CLIST	REFS	25						
2	LINES	INTEGER		CLIST	REFS	25	37	50	212			
10	LINESG	INTEGER		CLIST	REFS	25						
3	LINEST	INTEGER		CLIST	REFS	25						
662	MBOX	INTEGER			REFS	158	159	DEFINED	157	158		
0	NBOXS	INTEGER		F.P.	REFS	20	55	99	156	187		
					DEFINED	2						
3	NCOLS	INTEGER		CTABLE	REFS	27	DEFINED	46	116	132		
4	NCOLST	INTEGER		CTABLE	REFS	27						
670	NFB	INTEGER			REFS	198	199	210	DEFINED	185	198	
6	NPAGE	INTEGER		CLIST	REFS	25						
6	NPAGEA	INTEGER		CTABLE	REFS	27						
1	NPASS	INTEGER		CTABLE	REFS	27						
2	NROWS	INTEGER		CTABLE	REFS	27	DEFINED	45	115	131		
656	NSB	INTEGER			REFS	167	DEFINED	151	167			
664	NU	INTEGER			REFS	162	DEFINED	161				
657	R	REAL			REFS	160	173	174	190	210		
					DEFINED	152	168					
665	RU	REAL			REFS	163	DEFINED	162				
655	SCALE	REAL			REFS	173	174	195	DEFINED	148	149	
653	SPAN	REAL			REFS	148	149	DEFINED	143	147		
651	SY	REAL			REFS	143	145	146	147	DEFINED	141	
652	SZ	REAL			REFS	145	146	2*147	DEFINED	142		
675	TITLE	REAL	ARRAY		REFS	15	118	134	DEFINED	109	125	
445	WORD	REAL			REFS	197	DEFINED	31				
0	X	REAL	ARRAY	MODV	REFS	18	58	68	195			
0	XI	REAL	ARRAY	F.P.	REFS	20	67	100	DEFINED	2		
636	XL	REAL			REFS	72	140	195	DEFINED	62	72	
632	XU	REAL			REFS	62	76	140	DEFINED	58	76	
643	X1	REAL			REFS	2*72	2*76	DEFINED	68			
620	Y	REAL	ARRAY	MODV	REFS	18	30	59	69			
637	YL	REAL			REFS	73	141	173	DEFINED	63	73	146
663	YS	REAL			REFS	160	163	166	168	DEFINED	159	
633	YU	REAL			REFS	63	77	141	174	DEFINED	59	77
705	YV	REAL	ARRAY		REFS	20	162	DEFINED	154	166		
620	YZ	REAL	ARRAY	MODV	REFS	22	30	159	190			
644	Y1	REAL			REFS	2*73	2*77	DEFINED	69			

VARIABLES	SN	TYPE	RELOCATION							
640	ZL	REAL			REFS	74	142	146	DEFINED	64	74
634	ZU	REAL			REFS	64	78	142	DEFINED	60	78
1440	ZZ	REAL	ARRAY	MODV	REFS	18	60	70			
645	Z1	REAL			REFS	2*74	2*78	DEFINED	70		

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES					
PLB		3	41	43	111	113	127	129
PTABLE		3	48	118	134			
TITLES		1	40	110	126			

INLINE FUNCTIONS	TYPE	ARGS	DEF LINE	REFERENCES
ABS	REAL	1	INTRIN	83

STATEMENT LABELS			DEF LINE	REFERENCES			
0	1		79	65			
136	2		94	86			
146	3		99	87	91	93	97
0	4		92	88			
0	5		180	179			
0	6		98	94			
0	7		207	206			
372	8		200	187	190	196	
406	9		209	205			
0	10		100	99			
0	35	INACTIVE	198				
37	100		51	39			
413	120		211	156	160	163	175
0	301		164	161			
167	400		105	103			
217	500		121	103			
246	600		136	103	119		
523	701	FMT	208	207			
532	1000	FMT	217	107			
543	1100	FMT	219	123			
554	2000	FMT	221	112			
566	2100	FMT	223	128			
600	3000	FMT	229	109	125		
602	4000	FMT	231	42			

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES		
57	1	I	65 79	35B	OPT		
127	4	I	88 92	7B	INSTACK	EXITS	
137	6	I	94 98	7B	INSTACK	EXITS	
147	10	I	99 100	6B		EXT REFS	
301	120	I	156 211	115B		EXT REFS	NOT INNER
310	301	NU	161 164	6B	INSTACK	EXITS	
341	5	J	179 180	3B	INSTACK		
355	8	II	187 200	16B	OPT		
401	7	J	206 207	5B		EXT REFS	

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
MODV	1200	0 X (400)	400 Y (400)	800 ZZ (400)
CTAPES	50	0 ITAPES (50)		
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)

```
                    DO 360 I=2,NHTIC                                    PICTUR     59
                360 HLAB(I)=HLAB(I-1)+HEXTRA/HSCL                       PICTUR     60
60                  WRITE (ITAPEW,800) BCDH,IHSCL                       PICTUR     61
                    WRITE (ITAPEW,810)(HLAB(LL),LL=1,NHTIC)             PICTUR     62
                    DO 700 I=1,140                                      PICTUR     63
                700 B(I)=BLANK                                          PICTUR     64
                    DO 710 I=1,NCELL,10                                 PICTUR     65
65              710 B(I)=DOT                                            PICTUR     66
                    WRITE (ITAPEW,841)(B(I),I=1,NCELL)                  PICTUR     67
                C   WRITE (ITAPEW,841) (B(I), I=1,NCELL)                PICTUR     68
                    VNOW=VORG- 5*VPERL                                  PICTUR     69
                    VLABT=VORG-.5*VPERL                                 PICTUR     70
70                  HORG=HORG-.5*HPERC                                  PICTUR     71
                    K=1                                                 PICTUR     72
                    DO 1000 I=1,NLINE                                   PICTUR     73
                    IVLAB=0                                             PICTUR     74
                    NPOINT=0                                            PICTUR     75
75                  VNEXT=VNOW+VPERL                                    PICTUR     76
                    IF (MOD(I-1,10).EQ.0) IVLAB=3                       PICTUR     77
               1010 J=ITRANS(K)                                         PICTUR     78
                    IF(NV GE.0) GO TO 1020                              PICTUR     79
                    GO TO 1120                                          PICTUR     80
80             1020 IF(VVAL(J).GE.VNOW) GO TO 1040                      PICTUR     81
                    GO TO 1030                                          PICTUR     82
               1120 IF(VNOW.GE.VVAL(J)) GO TO 1140                      PICTUR     83
                    GO TO 1030                                          PICTUR     84
               1030 IF(K.GE.NDATA) GO TO 1300                           PICTUR     85
85                  K=K+1                                               PICTUR     86
                    GO TO 1010                                          PICTUR     87
               1040 IF(VNEXT.GE.VVAL(J)) GO TO 1050                     PICTUR     88
                    GO TO 1300                                          PICTUR     89
               1140 IF(VVAL(J).GE.VNEXT) GO TO 1050                     PICTUR     90
90                  GO TO 1300                                          PICTUR     91
               1050 NPOINT=NPOINT+1                                     PICTUR     92
                    IF(NPOINT.GE.100) GO TO 1300                        PICTUR     93
                    VTEMP(NPOINT)=VVAL(J)                               PICTUR     94
                    HTEMP(NPOINT)=HVAL(J)                               PICTUR     95
95                  JSAVE(NPOINT)=J                                     PICTUR     96
                    GO TO 1030                                          PICTUR     97
               1300 IF(NPOINT.LE.1) GO TO 1319                          PICTUR     98
                    NPT=NPOINT*NH                                       PICTUR     99
                    CALL AORDER(HTEMP,NPT,IP,1)                         PICTUR    100
100                 JJ=IP(1)                                            PICTUR    101
                    JJ=IP(NPOINT)                                       PICTUR    102
                    GO TO 1320                                          PICTUR    103
               1319 IP(1)=1                                             PICTUR    104
               1320 DO 1330 II=1,140                                    PICTUR    105
105            1330 B(II)=BLANK                                         PICTUR    106
                    IF(I-10)1400,1400,1410                              PICTUR    107
               1410 IF(I-23)1420,1400,1400                              PICTUR    108
               1420 ISYM=I-10                                           PICTUR    109
                    ASYM=BCDV(ISYM)                                     PICTUR    110
110                 GO TO 1430                                          PICTUR    111
               1400 ASYM=BLANK                                          PICTUR    112
               1430 CONTINUE                                            PICTUR    113
                    IF(IVLAB)1340,1340,1350                             PICTUR    114
               1350 DO 1351 II=1,140,2                                  PICTUR    115
```

```
      SUBROUTINE PICTUR (VVAL,HVAL,NDATA,BCDV,BCDH,XCELL ,HON ,HTW ,XLIN PICTUR      2
     1E,VON,VTW,NPTS,NORD,ITRANS)                                        PICTUR      3
C                                                                        PICTUR      4
      DIMENSION        VVAL(1) ,      HVAL(1) ,      BCDV(1)            PICTUR      5
      DIMENSION        BCDH(12) ,     NPTS(1) ,    ITRANS(1)            PICTUR      6
      DIMENSION        PLTS(40) ,    HLAB(40)                            PICTUR      7
      DIMENSION          B(150) ,  HTEMP(100)                           PICTUR      8
      DIMENSION      VTEMP(100) ,  JSAVE(100) ,      IP(100)           PICTUR      9
      DIMENSION        MPTS(40) ,    BCDS(40)                          PICTUR     10
      DIMENSION ITAPES(50)                                             PICTUR     11
C                                                                        PICTUR     12
C                                                                        PICTUR     13
      COMMON / CTAPES / ITAPES                                         PICTUR     14
C                                                                        PICTUR     15
C                                                                        PICTUR     16
      DATA BLANK /1H / , DOT /1H./ , ASTRIC /1H*/                      PICTUR     17
      DATA  BCDS/1H1,1H2,1H3,1H4,1H5,1H6,1H7,1H8,1H9,1HA,              PICTUR     18
     1          1HB,1HC,1HD,1HE,1HF,1HG,1HH,1HI,1HJ,1HK,               PICTUR     19
     2          1HL,1HM,1HN,1HO,1HP,1HQ,1HR,1HS,1HT,1HU,               PICTUR     20
     3          1HV,1HW,1HX,1HY,1HZ,1H+,1H=,1H$,1H&,1H%/               PICTUR     21
      ITAPEW = ITAPES(6)                                               PICTUR     22
      HONE=HON                                                         PICTUR     23
      HTWO=HTW                                                         PICTUR     24
      VONE=VON                                                         PICTUR     25
      VTWO=VTW                                                         PICTUR     26
      NV=1                                                             PICTUR     27
      NH=1                                                             PICTUR     28
      MID = 40                                                         PICTUR     29
      DO 1 I=1,MID                                                     PICTUR     30
    1 MPTS(I)=NPTS(I)                                                  PICTUR     31
      DO 5 I=2,MID                                                     PICTUR     32
    5 MPTS(I)=MPTS(I)+MPTS(I-1)                                        PICTUR     33
      DO 8  I=1,MID                                                    PICTUR     34
    8 PLTS(I)=BCDS(I)                                                  PICTUR     35
    9 CONTINUE                                                         PICTUR     36
      IF(VONE.GT.VTWO)NV=-1                                            PICTUR     37
      IF(HONE.GT.HTWO)NH=-1                                            PICTUR     38
      IF(NORD.NE.1) GO TO 10                                           PICTUR     39
      NDAT=NV*NDATA                                                    PICTUR     40
      CALL AORDER(VVAL,NDAT,ITRANS,1)                                  PICTUR     41
   10 CONTINUE                                                         PICTUR     42
      XCON=SIGN(1.,XLINE )                                             PICTUR     43
      XLINES  =  ABS(XLINE)                                            PICTUR     44
      CALL SCLMAX(VVAL,NDATA,IVSCL,VONE,VTWO,XCON,NV)                  PICTUR     45
      CALL SCLINC(VONE,VTWO,XLINES,VEXTRA,VORG,0)                      PICTUR     46
      XCON=SIGN(1.,XCELL )                                             PICTUR     47
      XCELLS  =  ABS(XCELL)                                            PICTUR     48
      CALL SCLMAX(HVAL,NDATA,IHSCL,HONE,HTWO,XCON,NH)                  PICTUR     49
      CALL SCLINC(HONE,HTWO,XCELLS,HEXTRA,HORG,1)                      PICTUR     50
      NHTIC=.1*(XCELLS+1.)+1.                                          PICTUR     51
      HSCL=10.**IHSCL                                                  PICTUR     52
      VSCL=10.**IVSCL                                                  PICTUR     53
      HPERC=HEXTRA/10.                                                 PICTUR     54
      VPERL=VEXTRA/5.                                                  PICTUR     55
      NCELL=XCELLS+1.                                                  PICTUR     56
      NLINE=XLINES+1.                                                  PICTUR     57
      HLAB(1)=HORG/HSCL                                                PICTUR     58
```

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
12	5	I	25 27	13B	NOT INNER
20	5	J	26 27	2B	INSTACK
26	250	LL	28 120	277B	NOT INNER
71	20	I	47 49	6B	INSTACK EXITS
137	200	K	68 116	151B	NOT INNER
146	90	J	71 74	6B	INSTACK
170	120	J	81 84	6B	INSTACK
213	145	J	90 93	13B	OPT
271	195	J	109 113	10B	OPT

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)
CHSP	1	0 KDEG (1)

STATISTICS

PROGRAM LENGTH	431B	281
CM LABELED COMMON LENGTH	1B	1

520000B CM USED

VARIABLES	SN	TYPE		RELOCATION								
0	OPA	INTEGER		F.P.	REFS	11	29	39	DEFINED	1		
333	OPD	INTEGER			REFS	11	31	52	55	76	79	97
					100	102	DEFINED	29	41			
0	OPH	INTEGER		F.P.	REFS	11	56	75	85	DEFINED	1	
345	PROL	REAL			REFS	73	77	83	99	101	2*103	
					DEFINED	70	73					
346	PROLP	REAL			REFS	83	86	103	DEFINED	80	83	95
					114							
0	X	REAL	ARRAY	F.P.	REFS	4	2*35	2*37	2*38	2*43	46	48
					3*73	83	2*92	99	2*111	2*112	2*118	
					DEFINED	1						

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
MINO	INTEGER	0	INTRIN		43

STATEMENT LABELS			DEF LINE	REFERENCES			
0	5		27	25	26		
63	10		44	34	35	39	42
0	15	INACTIVE	47	46			
0	20		49	47	48		
101	25		52	46	48		
0	30	INACTIVE	53	2*52			
106	40		56	52	2*55		
0	45	INACTIVE	57	2*56			
115	55		59	56			
120	60		62	46			
122	65		64	48			
127	70		66	61			
134	75		67	51	63		
0	80	INACTIVE	70	69			
0	85	INACTIVE	73	2*72			
153	90		74	71	72		
0	95	INACTIVE	76	75			
0	100	INACTIVE	77	2*76			
164	110		80	76	2*79	2*97	
0	115	INACTIVE	83	2*82			
175	120		84	81	82		
200	125		86	85	96	115	
206	135		89	2*75	106		
0	140	INACTIVE	92	2*91			
225	145		93	90	91		
0	150	INACTIVE	95	2*94			
232	155		97	94			
233	160		98	2*85	97		
0	165	INACTIVE	101	2*100			
250	170		103	100	2*102		
257	175		104	102			
260	180		106	2*69			
0	185	INACTIVE	107	2*106			
300	195		113	109	110		
305	200		116	68	79	88	105
322	250		120	28	55	117	118
54	300		43	36			
310	350		117	58			

```
115                GO TO 125                                                    HELGA    116
                200 CONTINUE                                                    HELGA    117
                350 IF (KDEG.NE.0) GOTO 250                                     HELGA    118
                    IF (ARC(LL).GE.X(1).AND.ARC(LL).LE.X(NX)) GOTO 250          HELGA    119
                    ANS(LL,1) = ANS(LL,1) + (ARC(LL)-ARG)*ANS(LL,2)             HELGA    120
120             250 CONTINUE                                                    HELGA    121
                    RETURN                                                      HELGA    122
                    END                                                         HELGA    123
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	HELGA	1	121

VARIABLES

		SN	TYPE		RELOCATION							
350	A		REAL			REFS	99	103	112	114	DEFINED	98	107
							112						
0	ANS		REAL	ARRAY	F.P.	REFS	4	77	86	101	103	2*119	
						DEFINED	1	27	53	57	77	86	101
							103	119					
0	ARC		REAL	ARRAY	F.P.	REFS	5	32	2*118	119	DEFINED	1	
337	ARG		REAL			REFS	2*35	37	38	2*43	46	48	73
							83	99	119	DEFINED	32	37	38
351	B		REAL			REFS	101	103	111	114	DEFINED	99	108
							111						
332	DA		INTEGER			REFS	11	57	2*86	2*103	DEFINED	30	31
							40						
0	F		REAL	ARRAY	F.P.	REFS	5	53	57	77	86	2*98	99
						DEFINED	1						
347	HERLP		REAL			REFS	92	95	98	DEFINED	89	92	
334	I		INTEGER			REFS	27	48	53	57	60	64	106
						2*112	DEFINED	25	45	47			
341	INC		INTEGER			REFS	69	94	DEFINED	44	59		
335	J		INTEGER			REFS	27	72	2*73	82	83	91	92
							110	111	2*112	DEFINED	26	71	81	90
							109						
343	K		INTEGER			REFS	3*65	2*66	72	73	77	82	86
							91	92	2*98	2*99	106	110	111
						DEFINED	60	64	65	68			
0	KDEG		INTEGER		CHSP	REFS	3	34	36	117			
0	L		INTEGER		F.P.	REFS	33	DEFINED	1				
336	LL		INTEGER			REFS	32	53	57	2*77	2*86	2*101	2*103
						2*118	4*119	DEFINED	28				
342	LS		INTEGER			REFS	67	68	71	81	90	109	
						DEFINED	50	62	66				
344	M		INTEGER			REFS	68	71	81	90	109		
						DEFINED	67						
340	N		INTEGER			REFS	43	50	66	67	DEFINED	33	43
0	NDF		INTEGER		F.P.	REFS	4	DEFINED	1				
0	NDX		INTEGER		F.P.	REFS	5	DEFINED	1				
0	NF		INTEGER		F.P.	REFS	26	28	DEFINED	1			
0	NX		INTEGER		F.P.	REFS	35	2*37	43	47	50	65	66
							118	DEFINED	1				

```
                GOTO 350                                                        HELGA     59
             55 INC=1                                                           HELGA     60
60              K=I                                                             HELGA     61
                GO TO 70                                                        HELGA     62
             60 LS=1                                                            HELGA     63
                GO TO 75                                                        HELGA     64
             65 K=I                                                             HELGA     65
65              IF(K+K.LE.NX+1) K=K-1                                           HELGA     66
             70 LS=K-((K-1)*(N+1))/NX                                           HELGA     67
             75 M=LS+N                                                          HELGA     68
                DO 200 K=LS,M                                                   HELGA     69
                IF(INC)180,80,180                                               HELGA     70
70           80 PROL=1.DO                                                       HELGA     71
                DO 90 J=LS,M                                                    HELGA     72
                IF(K-J)85,90,85                                                 HELGA     73
             85 PROL=(ARG-X(J))*(PROL/(X(K)-X(J)))                              HELGA     74
             90 CONTINUE                                                        HELGA     75
75              IF(OPH)135,95,135                                               HELGA     76
             95 IF(OPD)110,100,100                                              HELGA     77
            100 ANS(LL,1) = PROL * F(K,1) + ANS(LL,1)                           HELGA     78
C                                                                               HELGA     79
                IF(OPD)110,200,110                                              HELGA     80
80          110 PROLP=0.                                                        HELGA     81
                DO 120 J=LS,M                                                   HELGA     82
                IF(K-J)115,120,115                                              HELGA     83
            115 PROLP=PROL/(ARG-X(J))+PROLP                                     HELGA     84
            120 CONTINUE                                                        HELGA     85
85              IF(OPH)160,125,160                                              HELGA     86
            125 ANS(LL,DA) = PROLP * F(K,1) + ANS(LL,DA)                        HELGA     87
C                                                                               HELGA     88
                GO TO 200                                                       HELGA     89
            135 HERLP=0.                                                        HELGA     90
90              DO 145 J=LS,M                                                   HELGA     91
                IF(K-J)140,145,140                                              HELGA     92
            140 HERLP=1.DO/(X(K)-X(J))+HERLP                                    HELGA     93
            145 CONTINUE                                                        HELGA     94
                IF(INC)150,155,150                                              HELGA     95
95          150 PROLP=HERLP                                                     HELGA     96
                GO TO 125                                                       HELGA     97
            155 IF(OPD)110,160,110                                              HELGA     98
            160 A = F(K,2) - 2.0 * HERLP * F(K,1)                               HELGA     99
                B =(F(K,1) + A * (ARG - X(K))) * PROL                           HELGA    100
100             IF(OPD)170,165,165                                              HELGA    101
            165 ANS(LL,1) = PROL * B + ANS(LL,1)                                HELGA    102
                IF(OPD)170,175,170                                              HELGA    103
            170 ANS(LL,DA) = 2.0 * PROLP * B + A * PROL * PROL + ANS (LL,DA)    HELGA    104
            175 CONTINUE                                                        HELGA    105
105             GO TO 200                                                       HELGA    106
            180 IF(K-I)185,135,185                                              HELGA    107
            185 A=1.DO                                                          HELGA    108
                B=1.DO                                                          HELGA    109
                DO 195 J=LS,M                                                   HELGA    110
110             IF(J.EQ.K)GO TO 195                                             HELGA    111
                B=(X(K)-X(J))*B                                                 HELGA    112
                IF(J.NE.I)A=(X(I)-X(J))*A                                       HELGA    113
            195 CONTINUE                                                        HELGA    114
                PROLP=A/B                                                       HELGA    115
```

```
      SUBROUTINE HELGA (ARC,ANS,NF,NDF,X,F,NX,L,NDX,OPH,OPA)
C
      COMMON /CHSP/ KDEG
      DIMENSION     ANS(NDF,1) ,          X(1)
      DIMENSION       F(NDX,1) ,        ARC(1)
C
CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
C     DOUBLE PRECISION PROL,PROLP,HERLP,A,B
CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS
C
      INTEGER   DA , OPH , OPD , OPA
C     REVISED ROUTINE FOR ONE SET OF FUNCTIONS AND MULTIPLE ARGUMENTS
C     ARC       ARGUMENTS
C     ANS       DBL. DIM. ARRAY OF INTERPOLATION RESULTS
C     NF        NO. OF ARGUMENTS
C     NDF       DIMENSION FOR ARGUMENTS
C     X         ARRAY OF ARGUMENTS OF TABLES
C     F         DBL. DIM. ARRAY OF GIVEN FUNCTION VALUES
C     NX        NO. OF VALUES IN TABLE
C     L         MAX. NO. VALUES USED FOR INTERPOLATION
C     NDX       DIMENSION FOR TABLE
C     OPH       = 0 LAGRANGE ,  = 1 HERMITE
C     OPD       = -1 DERIVATIVE , = 0 FUNCTION , = 1 BOTH
C
      DO 5 I=1,2
      DO 5 J=1,NF
    5 ANS(J,I)=0.
      DO 250  LL = 1,NF
      OPD = OPA
      DA  = 1
      IF (OPD.EQ.1) DA=2
      ARG = ARC(LL)
         N  =  L  -  1
      IF (KDEG.GT.1) GO TO 10
      IF ( ARG .GE. X(1) .AND. ARG .LE. X(NX) )  GO TO 10
      IF  ( KDEG .EQ. 1 )          GO TO 300
      IF (ARG.GT.X(NX)) ARG=X(NX)
      IF (ARG.LT.X(1))  ARG=X(1)
      IF (OPA.LT.0)  GOTO 10
      DA  = 2
      OPD = 1
            GO TO 10
  300 IF ( ARG .LT. X(1) .OR. ARG .GT. X(NX) )  N = MINO (2,N)
   10 INC=0
      I=1
      IF(ARG-X(1))60,25,15
   15 DO 20 I=2,NX
      IF(ARG-X(I))65,25,20
   20 CONTINUE
      LS=NX-N
      GO TO 75
   25 IF(OPD)40,30,30
   30 ANS(LL,1) = F(I,1)
C
      IF(OPD)40,250,40
   40 IF(OPH)45,55,45
```

VARIABLES	SN	TYPE		RELOCATION						
0	NGPI	INTEGER		F.P.	REFS	25	DEFINED	1	24	
0	NGPTOT	INTEGER		F.P.	REFS	12	DEFINED	1	12	
63	NLIN	INTEGER			REFS	17	18	DEFINED	13	
0	NLINES	INTEGER		F.P.	REFS	13	14	DEFINED	1	14
0	XGP	REAL	ARRAY	F.P.	REFS	5	26	DEFINED	1	26
0	XTERM1	REAL	ARRAY	JUNK	REFS	2	4	20	DEFINED	20
24	XTERM2	REAL	ARRAY	JUNK	REFS	2	4	21	DEFINED	21
0	YGP	REAL	ARRAY	F.P.	REFS	5	27	DEFINED	1	27
50	YTERM1	REAL	ARRAY	JUNK	REFS	2	4	22	DEFINED	22
74	YTERM2	REAL	ARRAY	JUNK	REFS	2	4	23	DEFINED	23

VARIABLES USED AS FILE NAMES, SEE ABOVE

STATEMENT LABELS			DEF LINE	REFERENCES
0	40		28	17
60	60	FMT	33	15
0	80		27	25

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
16	40	I	17 28	34B	NOT INNER
43	80	J	25 27	4B	INSTACK

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
JUNK	81	0 XTERM1 (20)	20 XTERM2 (20)	40 YTERM1 (20)
		60 YTERM2 (20)	80 DIST (1)	
CTAPES	50	0 ITAPES (50)		

STATISTICS

PROGRAM LENGTH	1008	64
CM LABELED COMMON LENGTH	2038	131

520008 CM USED

```
      SUBROUTINE FORM (NLINES,KEL,NGPTOT,NGPI,XGP,YGP,NGP)                FORM     2
      COMMON/JUNK/XTERM1,XTERM2,YTERM1,YTERM2,DIST                        FORM     3
      COMMON / CTAPES / ITAPES                                            FORM     4
      DIMENSION  XTERM1(20), XTERM2(20), YTERM1(20), YTERM2(20)           FORM     5
      DIMENSION  XGP(12,20), YGP(12,20), NGP(20)                          FORM     6
      DIMENSION ITAPES(50)                                                FORM     7
C                                                                         FORM     8
C                                                                         FORM     9
      ITAPER = ITAPES(5)                                                  FORM    10
C                                                                         FORM    11
C                                                                         FORM    12
      NGPTOT = 2*NGPTOT                                                   FORM    13
      NLIN = NLINES                                                       FORM    14
      NLINES = 2*NLINES                                                   FORM    15
      READ (ITAPER,60) DIST                                               FORM    16
      KEL=1                                                               FORM    17
      DO 40 I=1,NLIN                                                      FORM    18
      IJ = I + NLIN                                                       FORM    19
      NGP(IJ) = NGP(I)                                                    FORM    20
      XTERM1(IJ) = XTERM1(I) + DIST                                       FORM    21
      XTERM2(IJ) = XTERM2(I) + DIST                                       FORM    22
      YTERM1(IJ) = YTERM1(I)                                              FORM    23
      YTERM2(IJ) = YTERM2(I)                                              FORM    24
      NGPI = NGP(I)                                                       FORM    25
      DO 80 J=1,NGPI                                                      FORM    26
      XGP(J,IJ) = XGP(J,I) + DIST                                         FORM    27
   80 YGP(J,IJ) = YGP(J,I)                                                FORM    28
   40 CONTINUE                                                            FORM    29
C                                                                         FORM    30
C                                                                         FORM    31
C FORMATS                                                                 FORM    32
C                                                                         FORM    33
   60 FORMAT(E10.2)                                                       FORM    34
C                                                                         FORM    35
      RETURN                                                              FORM    36
      END                                                                 FORM    37
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	FORM	1	35

VARIABLES		SN	TYPE		RELOCATION								
120	DIST		REAL		JUNK	REFS	2	20	21	26	DEFINED	15	
64	I		INTEGER			REFS	18	19	20	21	22	23	24
							26	27	DEFINED	17			
65	IJ		INTEGER			REFS	19	20	21	22	23	26	27
						DEFINED	18						
62	ITAPER		INTEGER			DEFINED	9	I/O REFS	15				
0	ITAPES		INTEGER	ARRAY	CTAPES	REFS	3	6	9				
66	J		INTEGER			REFS	2*26	2*27	DEFINED	25			
0	KEL		INTEGER		F.P.	DEFINED	1	16					
0	NGP		INTEGER	ARRAY	F.P.	REFS	5	19	24	DEFINED	1	19	

STATEMENT LABELS			DEF LINE	REFERENCES			
150	90		49	46	47		
0	95	INACTIVE	51	50			
0	100	INACTIVE	52	2*51			
0	105		53	52			
170	110		55	51	2*54	2*72	
0	115	INACTIVE	58	2*57			
201	120		59	56	57		
204	125		61	60	71	93	
0	130		62	61			
221	135		64	2*50	84		
0	140	INACTIVE	67	2*66			
233	145		68	65	66		
0	150	INACTIVE	70	2*69			
240	155		72	69			
241	160		73	2*60	72		
0	165	INACTIVE	79	2*78			
274	170		81	78	2*80		
301	175		82	74	80		
304	180		84	2*44			
0	185	INACTIVE	85	2*84			
324	195		91	87	88		
331	200		94	43	54	63	83
334	250		95	27	33		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
17	5	I	13 15	13B		NOT INNER
25	5	J	14 15	2B	INSTACK	
40	20	I	19 21	6B	INSTACK	EXITS
61	35	J	25 26	2B	INSTACK	
104	50	J	30 32	4B	INSTACK	
134	200	K	43 94	200B		NOT INNER
143	90	J	46 49	6B	INSTACK	
162	105	J	52 53	4B	INSTACK	
174	120	J	56 59	6B	INSTACK	
214	130	J	61 62	4B	INSTACK	
226	145	J	65 68	6B	INSTACK	
262	175	J	74 82	21B	OPT	
315	195	J	87 91	10B	OPT	

STATISTICS

PROGRAM LENGTH 423B 275

520000B CM USED

VARIABLES	SN	TYPE		RELOCATION								
361	B	REAL			REFS	79	81	89	92	DEFINED	77	86
					89							
344	DA	INTEGER			REFS	9	13	32	2*62	2*81		
					DEFINED	11	12					
0	F	REAL	ARRAY	F.P.	REFS	8	26	32	53	62	2*76	77
					DEFINED	1						
357	HERLP	REAL			REFS	67	70	76	DEFINED	64	67	
346	I	INTEGER			REFS	15	20	26	32	35	39	84
					2*90	DEFINED	13	17	19			
350	INC	INTEGER			REFS	44	69	DEFINED	16	34		
347	J	INTEGER			REFS	15	2*26	32	47	2*48	3*53	57
					58	3*62	66	67	76	77	2*79	2*81
					88	89	2*90	DEFINED	14	25	30	46
					52	56	61	65	74	87		
352	JJ	INTEGER			REFS	31	32	75	76	DEFINED	29	31
					73	75						
353	K	INTEGER			REFS	3*40	2*41	47	48	53	57	62
					66	67	2*76	2*77	84	88	89	
					DEFINED	35	39	40	43			
0	L	INTEGER		F.P.	REFS	10	DEFINED	1				
351	LS	INTEGER			REFS	42	43	46	56	65	87	
					DEFINED	22	37	41				
354	M	INTEGER			REFS	43	46	56	65	87		
					DEFINED	42						
345	N	INTEGER			REFS	22	41	42	DEFINED	10		
0	NDF	INTEGER		F.P.	REFS	8	DEFINED	1				
0	NDX	INTEGER		F.P.	REFS	8	DEFINED	1				
0	NF	INTEGER		F.P.	REFS	14	25	29	30	52	61	73
					74	DEFINED	1					
0	NX	INTEGER		F.P.	REFS	19	22	40	41	DEFINED	1	
0	OPD	INTEGER		F.P.	REFS	9	12	24	27	51	54	72
					78	80	DEFINED	1				
0	OPH	INTEGER		F.P.	REFS	9	28	50	60	DEFINED	1	
355	PROL	REAL			REFS	48	53	58	77	79	2*81	
					DEFINED	45	48					
356	PROLP	REAL			REFS	58	62	81	DEFINED	55	58	70
					92							
0	X	REAL	ARRAY	F.P.	REFS	8	18	20	3*48	58	2*67	77
					2*89	2*90	DEFINED	1				

STATEMENT LABELS			DEF LINE	REFERENCES	
0	5		15	13	14
0	15	INACTIVE	19	18	
0	20		21	19	20
50	25		24	18	20
0	30	INACTIVE	25	2*24	
0	35		26	25	
66	40		28	24	2*27
0	45	INACTIVE	29	2*28	
0	50		32	30	
111	55		34	28	
114	60		37	18	
116	65		39	20	
123	70		41	36	
131	75		42	23	38
0	80	INACTIVE	45	44	
0	85	INACTIVE	48	2*47	

```
                  115 PROLP=PROL/(ARG-X(J))+PROLP                                  HELGX      59
                  120 CONTINUE                                                     HELGX      60
60                    IF(OPH)160,125,160                                           HELGX      61
                  125 DO 130 J=1,NF                                                HELGX      62
                  130 ANS(J,DA)=PROLP*F(K,J)+ANS(J,DA)                             HELGX      63
                      GO TO 200                                                    HELGX      64
                  135 HERLP=0.                                                     HELGX      65
65                    DO 145 J=LS,M                                                HELGX      66
                      IF(K-J)140,145,140                                           HELGX      67
                  140 HERLP = 1. /(X(K)-X(J)) + HERLP                              HELGX      68
                  145 CONTINUE                                                     HELGX      69
                      IF(INC)150,155,150                                           HELGX      70
70                150 PROLP=HERLP                                                  HELGX      71
                      GO TO 125                                                    HELGX      72
                  155 IF(OPD)110,160,110                                           HELGX      73
                  160 JJ=NF                                                        HELGX      74
                      DO 175 J=1,NF                                                HELGX      75
75                    JJ=JJ+1                                                      HELGX      76
                      A=F(K,JJ)-2.*HERLP*F(K,J)                                    HELGX      77
                      B=(F(K,J)+A*(ARG-X(K)))*PROL                                 HELGX      78
                      IF(OPD)170,165,165                                           HELGX      79
                  165 ANS(J,1)=PROL*B+ANS(J,1)                                     HELGX      80
80                    IF(OPD)170,175,170                                           HELGX      81
                  170 ANS(J,DA)=2.*PROLP*B+A*PROL*PROL+ANS(J,DA)                   HELGX      82
                  175 CONTINUE                                                     HELGX      83
                      GO TO 200                                                    HELGX      84
                  180 IF(K-I)185,135,185                                           HELGX      85
85                185 A = 1.                                                       HELGX      86
                      B  = 1.                                                      HELGX      87
                      DO 195 J=LS,M                                                HELGX      88
                      IF(J.EQ.K)GO TO 195                                          HELGX      89
                      B=(X(K)-X(J))*B                                              HELGX      90
90                    IF(J.NE.I)A=(X(I)-X(J))*A                                    HELGX      91
                  195 CONTINUE                                                     HELGX      92
                      PROLP=A/B                                                    HELGX      93
                      GO TO 125                                                    HELGX      94
                  200 CONTINUE                                                     HELGX      95
95                250 RETURN                                                       HELGX      96
                      END                                                          HELGX      97
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	HELGX	1	95

VARIABLES

		SN	TYPE		RELOCATION							
360	A		REAL			REFS	77	81	90	92	DEFINED	76	85
							90						
0	ANS		REAL	ARRAY	F.P.	REFS	8	53	62	79	81		
						DEFINED	1	15	26	32	53	62	79
							81						
0	ARG		REAL		F.P.	REFS	18	20	48	58	77		
						DEFINED	1						

```
      SUBROUTINE HELGX( ARG ,ANS,X,F, NX , NF , L , NDF , NDX , OPH , OP HELGX     2
     1D )                                                                HELGX     3
C                                                                        HELGX     4
CIBM  BEGINNING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS      HELGX     5
C     DOUBLE PRECISION PROL   ,PROLP ,HERLP ,A       ,B                 HELGX     6
CIBM  ENDING OF STATEMENTS ASSOCIATED WITH IBM COMPUTER PROGRAMS         HELGX     7
C                                                                        HELGX     8
      DIMENSION ANS(NDF,1),X(1),F(NDX,1)                                 HELGX     9
      INTEGER DA,OPH,OPD                                                 HELGX    10
      N=L-1                                                              HELGX    11
      DA=1                                                               HELGX    12
      IF(OPD.EQ.1)DA=2                                                   HELGX    13
      DO 5 I=1,DA                                                        HELGX    14
      DO 5 J=1,NF                                                        HELGX    15
    5 ANS(J,I)=0.                                                        HELGX    16
      INC  =  0                                                          HELGX    17
      I=1                                                                HELGX    18
      IF(ARG-X(1))60,25,15                                               HELGX    19
   15 DO 20 I=2,NX                                                       HELGX    20
      IF(ARG-X(I))65,25,20                                               HELGX    21
   20 CONTINUE                                                           HELGX    22
      LS=NX-N                                                            HELGX    23
      GO TO 75                                                           HELGX    24
   25 IF(OPD)40,30,30                                                    HELGX    25
   30 DO 35 J=1,NF                                                       HELGX    26
   35 ANS(J,1)=F(I,J)                                                    HELGX    27
      IF(OPD)40,250,40                                                   HELGX    28
   40 IF(OPH)45,55,45                                                    HELGX    29
   45 JJ=NF                                                              HELGX    30
      DO 50 J=1,NF                                                       HELGX    31
      JJ=JJ+1                                                            HELGX    32
   50 ANS(J,DA)=F(I,JJ)                                                  HELGX    33
      GO TO 250                                                          HELGX    34
   55 INC=1                                                              HELGX    35
      K=I                                                                HELGX    36
      GO TO 70                                                           HELGX    37
   60 LS=1                                                               HELGX    38
      GO TO 75                                                           HELGX    39
   65 K=I                                                                HELGX    40
      IF(K+K.LE.NX+1) K=K-1                                              HELGX    41
   70 LS=K-((K-1)*(N+1))/NX                                              HELGX    42
   75 M=LS+N                                                             HELGX    43
      DO 200 K=LS,M                                                      HELGX    44
      IF(INC)180,80,180                                                  HELGX    45
   80 PROL  = 1.                                                         HELGX    46
      DO 90 J=LS,M                                                       HELGX    47
      IF(K-J)85,90,85                                                    HELGX    48
   85 PROL=(ARG-X(J))*(PROL/(X(K)-X(J)))                                 HELGX    49
   90 CONTINUE                                                           HELGX    50
      IF(OPH)135,95,135                                                  HELGX    51
   95 IF(OPD)110,100,100                                                 HELGX    52
  100 DO 105 J=1,NF                                                      HELGX    53
  105 ANS(J,1)=PROL*F(K,J)+ANS(J,1)                                      HELGX    54
      IF(OPD)110,200,110                                                 HELGX    55
  110 PROLP=0.                                                           HELGX    56
      DO 120 J=LS,M                                                      HELGX    57
      IF(K-J)115,120,115                                                 HELGX    58
```

COMMON BLOCKS LENGTH MEMBERS - BIAS NAME(LENGTH)

		6	NPAGE (1)	7	KBPAGE (1)	8	LINESG (1)
		9	KOUNTH (1)	10	KOUNTI (1)		
CTABLE	8	0	KTABLE (1)	1	NPASS (1)	2	NROWS (1)
		3	NCOLS (1)	4	NCOLST (1)	5	KTABLO (1)
		6	NPAGEA (1)	7	ITAPET (1)		

EQUIV CLASSES LENGTH MEMBERS - BIAS NAME(LENGTH)

X	Y	800	0	YZ (800)	400	ZZ (400)	

STATISTICS

PROGRAM LENGTH	2226B	1174
CM LABELED COMMON LENGTH	2370B	1272

52000B CM USED

```
115          1351 B(II)=DOT                                                    PICTUR  116
                  VLAB=(VLABT+.5*VPERL)/VSCL                                   PICTUR  117
                  VLABT=VLABT+10.*VPERL                                        PICTUR  118
                  GO TO 1342                                                   PICTUR  119
               1340 DO 1341  II=1,140,20                                       PICTUR  120
120            1341 B(II)=DOT                                                  PICTUR  121
               1342 CONTINUE                                                   PICTUR  122
                  IF(NPOINT-1) 890,1380,1360                                   PICTUR  123
                890 IPRIT=1                                                    PICTUR  124
                  GO TO 1890                                                   PICTUR  125
125            1360 VVALV=0.                                                   PICTUR  126
                  IPRIT=3                                                      PICTUR  127
                  FPT=NPOINT                                                   PICTUR  128
                  DO 1370 II=1,NPOINT                                          PICTUR  129
               1370 VVALV=VVALV+VTEMP(II)                                      PICTUR  130
130               VVALV=VVALV/(VSCL*FPT)                                       PICTUR  131
                  GO TO 860                                                    PICTUR  132
               1380 VVALV=VTEMP(1)/VSCL                                        PICTUR  133
                  IPRIT=2                                                      PICTUR  134
                860 CONTINUE                                                   PICTUR  135
135               BSYMO=BCDS(MID)                                              PICTUR  136
                  JPTO=-1                                                      PICTUR  137
                  DO 2500 II=1,NPOINT                                          PICTUR  138
                  JJ=IP(II)                                                    PICTUR  139
                  JJJ=JSAVE(JJ)                                                PICTUR  140
140               FJPT=(HTEMP(JJ)-HORG)/HPERC                                  PICTUR  141
                  IF(FJPT.LT.0.) GO TO 2500                                    PICTUR  142
                  IF(FJPT.GT.(XCELLS+2.)) GO TO 2500                           PICTUR  143
                  JPT=FJPT+1.                                                  PICTUR  144
                  IF(JPT.GE.102) GO TO 2500                                    PICTUR  145
145               DO 2540 III=1,MID                                            PICTUR  146
                  IF(MPTS(III).GE.JJJ) GO TO 2541                              PICTUR  147
               2540 CONTINUE                                                   PICTUR  148
                  III=5                                                        PICTUR  149
               2541 BSYM=PLTS(III)                                             PICTUR  150
150               IF(JPT.NE.JPTO) GO TO 2550                                   PICTUR  151
                  IF(BSYM.NE.BSYMO) BSYM=ASTRIC                                PICTUR  152
               2550 BSYMO=BSYM                                                 PICTUR  153
                  JPTO=JPT                                                     PICTUR  154
                  B(JPT)=BSYM                                                  PICTUR  155
155            2500 CONTINUE                                                   PICTUR  156
               1890 IFORM=IVLAB+IPRIT                                          PICTUR  157
                  GO TO (1500,1500,1500,1800,1800,1800),IFORM                  PICTUR  158
               1500 WRITE (ITAPEW,1501)       ASYM,(B(LL),LL=1,NCELL)          PICTUR  159
                  GO TO 2100                                                   PICTUR  160
160            1800 WRITE (ITAPEW,1801)ASYM,VLAB,IVSCL,(B(LL),LL=1,NCELL)      PICTUR  161
               2100 CONTINUE                                                   PICTUR  162
                  VNOW=VNEXT                                                   PICTUR  163
               1000 CONTINUE                                                   PICTUR  164
              C                                                                PICTUR  165
165           C                                                                PICTUR  166
              C FORMATS                                                        PICTUR  167
              C                                                                PICTUR  168
                800 FORMAT(43X,12A1,2X,3H(/E13,1H))                            PICTUR  169
                810 FORMAT (11X,11(4X,F6.2))                                   PICTUR  170
170             841 FORMAT(18X,102A1)                                          PICTUR  171
               1501 FORMAT (2X,A1,11X,102A1)                                   PICTUR  172
```

```
 1801 FORMAT (3X,A1,1X,F6.2,2H E13,2H. ,102A1)                          PICTUR    173
C                                                                       PICTUR    174
      RETURN                                                            PICTUR    175
175   END                                                               PICTUR    176
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	PICTUR	1	174

VARIABLES, SN, TYPE, RELOCATION

526	ASTRIC	REAL			REFS	151	DEFINED	16					
656	ASYM	REAL			REFS	158	160	DEFINED	109	111			
1013	B	REAL	ARRAY		REFS	7	66	158	160	DEFINED	63	65	
						105	115	120	154				
0	BCDH	REAL	ARRAY	F.P.	REFS	5	60	DEFINED	1				
2131	BCDS	REAL	ARRAY		REFS	9	34	135	DEFINED	17			
0	BCDV	REAL	ARRAY	F.P.	REFS	4	109	DEFINED	1				
524	BLANK	REAL			REFS	63	105	111	DEFINED	16			
671	BSYM	REAL			REFS	151	152	154	DEFINED	149	151		
663	BSYMO	REAL			REFS	151	DEFINED	135	152				
525	DOT	REAL			REFS	65	115	120	DEFINED	16			
666	FUPT	REAL			REFS	141	142	143	DEFINED	140			
662	FPT	REAL			REFS	130	DEFINED	127					
631	HEXTRA	REAL			REFS	49	53	59					
743	HLAB	REAL	ARRAY		REFS	6	59	61	DEFINED	57	59		
0	HON	REAL		F.P.	REFS	22	DEFINED	1					
611	HONE	REAL			REFS	37	48	49	DEFINED	22			
632	HORG	REAL			REFS	49	57	70	140	DEFINED	70		
636	HPERC	REAL			REFS	70	140	DEFINED	53				
634	HSCL	REAL			REFS	57	59	DEFINED	51				
1241	HTEMP	REAL	ARRAY		REFS	7	99	140	DEFINED	94			
0	HTW	REAL		F.P.	REFS	23	DEFINED	1					
612	HTWO	REAL			REFS	37	48	49	DEFINED	23			
0	HVAL	REAL	ARRAY	F.P.	REFS	4	48	94	DEFINED	1			
620	I	INTEGER			REFS	2*30	3*32	2*34	2*59	63	65	66	
						76	106	107	108	DEFINED	29	31	33
						58	62	64	66	72			
672	IFORM	INTEGER			REFS	157	DEFINED	156					
630	IHSCL	INTEGER			REFS	48	51	60					
654	II	INTEGER			REFS	105	115	120	129	138			
					DEFINED	104	114	119	128	137			
670	III	INTEGER			REFS	146	149	DEFINED	145	148			
1715	IP	INTEGER	ARRAY		REFS	8	99	100	101	138			
					DEFINED	103							
660	IPRIT	INTEGER			REFS	156	DEFINED	123	126	133			
655	ISYM	INTEGER			REFS	109	DEFINED	108					
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	10	13	21					
610	ITAPEW	INTEGER			DEFINED	21	I/O REFS	60	61	66	158	160	
0	ITRANS	INTEGER	ARRAY	F.P.	REFS	5	40	77	DEFINED	1			
646	IVLAB	INTEGER			REFS	113	156	DEFINED	73	76			
624	IVSCL	INTEGER			REFS	44	52	160					
651	J	INTEGER			REFS	80	82	87	89	93	94	95	

VARIABLES	SN	TYPE		RELOCATION								
					DEFINED	77						
653	JJ	INTEGER			REFS	139	140	DEFINED	100	101	138	
665	JJJ	INTEGER			REFS	146	DEFINED	139				
667	JPT	INTEGER			REFS	144	150	153	154	DEFINED	143	
664	JPTO	INTEGER			REFS	150	DEFINED	136	153			
1551	JSAVE	INTEGER	ARRAY		REFS	8	139	DEFINED	95			
645	K	INTEGER			REFS	77	84	85	DEFINED	71	85	
642	LL	INTEGER			REFS	61	158	160	DEFINED	61	158	160
617	MID	INTEGER			REFS	29	31	33	135	145		
					DEFINED	28						
2061	MPTS	INTEGER	ARRAY		REFS	9	2*32	146	DEFINED	30	32	
640	NCELL	INTEGER			REFS	64	66	158	160	DEFINED	55	
621	NDAT	INTEGER			REFS	40	DEFINED	39				
0	NDATA	INTEGER		F.P.	REFS	39	44	48	84	DEFINED	1	
616	NH	INTEGER			REFS	48	98	DEFINED	27	37		
633	NHTIC	INTEGER			REFS	58	61	DEFINED	50			
641	NLINE	INTEGER			REFS	72	DEFINED	56				
0	NORD	INTEGER		F.P.	REFS	38	DEFINED	1				
647	NPOINT	INTEGER			REFS	91	92	93	94	95	97	98
					101	122	127	128	137	DEFINED	74	91
652	NPT	INTEGER			REFS	99	DEFINED	98				
0	NPTS	INTEGER	ARRAY	F.P.	REFS	5	30	DEFINED	1			
615	NV	INTEGER			REFS	39	44	78	DEFINED	26	36	
673	PLTS	REAL	ARRAY		REFS	6	149	DEFINED	34			
625	VEXTRA	REAL			REFS	45	54					
657	VLAB	REAL			REFS	160	DEFINED	116				
644	VLABT	REAL			REFS	116	117	DEFINED	69	117		
650	VNEXT	REAL			REFS	87	89	162	DEFINED	75		
643	VNOW	REAL			REFS	75	80	82	DEFINED	68	162	
0	VON	REAL		F.P.	REFS	24	DEFINED	1				
613	VONE	REAL			REFS	36	44	45	DEFINED	24		
626	VORG	REAL			REFS	45	68	69				
637	VPERL	REAL			REFS	68	69	75	116	117		
					DEFINED	54						
635	VSCL	REAL			REFS	116	130	132	DEFINED	52		
1405	VTEMP	REAL	ARRAY		REFS	8	129	132	DEFINED	93		
0	VTW	REAL		F.P.	REFS	25	DEFINED	1				
614	VTWO	REAL			REFS	36	44	45	DEFINED	25		
0	VVAL	REAL	ARRAY	F.P.	REFS	4	40	44	80	82	87	89
					93	DEFINED	1					
661	VVALV	REAL			REFS	129	130	DEFINED	125	129	130	132
0	XCELL	REAL		F.P.	REFS	46	47	DEFINED	1			
627	XCELLS	REAL			REFS	49	50	55	142	DEFINED	47	
622	XCON	REAL			REFS	44	48	DEFINED	42	46		
0	XLINE	REAL		F.P.	REFS	42	43	DEFINED	1			
623	XLINES	REAL			REFS	45	56	DEFINED	43			

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES	
AORDER		4	40	99
SCLINC		6	45	49
SCLMAX		7	44	48

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES	
ABS	REAL	1	INTRIN		43	47
MOD	INTEGER	2	INTRIN		76	
SIGN	REAL	2	INTRIN		42	46

STATEMENT LABELS			DEF LINE	REFERENCES			
0	1		30	29			
0	5		32	31			
0	8		34	33			
0	9	INACTIVE	35				
62	10		41	38			
0	360		59	58			
0	700		63	62			
0	710		65	64			
560	800	FMT	168	60			
564	810	FMT	169	61			
567	841	FMT	170	66			
352	860		134	131			
0	890	INACTIVE	123	122			
0	1000		163	72			
214	1010		77	86			
220	1020		80	78			
226	1030		84	81	83	96	
232	1040		87	80			
240	1050		91	87	89		
223	1120		82	79			
235	1140		89	82			
250	1300		97	84	88	90	92
261	1319		103	97			
262	1320		104	102			
0	1330		105	104			
316	1340		119	2*113			
0	1341		120	119			
325	1342		121	118			
0	1350	INACTIVE	114	113			
0	1351		115	114			
331	1360		125	122			
0	1370		129	128			
347	1380		132	122			
277	1400		111	2*106	2*107		
0	1410	INACTIVE	107	106			
0	1420	INACTIVE	108	107			
301	1430		112	110			
433	1500		158	3*157			
571	1501	FMT	171	158			
441	1800		160	3*157			
574	1801	FMT	172	160			
417	1890		156	124			
446	2100		161	159			
414	2500		155	137	141	142	144
0	2540		147	145			
403	2541		149	146			
411	2550		152	150			

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
24	1	I	29 30	2B	INSTACK
32	5	I	31 32	3B	INSTACK
40	8	I	33 34	3B	INSTACK
136	360	I	58 59	3B	INSTACK
154	700	I	62 63	3B	INSTACK
162	710	I	64 65	3B	INSTACK
203	1000	I	72 163	247B	EXT REFS NOT INNER

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
265	1330	II	104 105	3B	INSTACK	
305	1351	II	114 115	3B	INSTACK	
321	1341	II	119 120	3B	INSTACK	
340	1370	II	128 129	3B	INSTACK	
356	2500	II	137 155	41B		NOT INNER
374	2540	III	145 147	6B	INSTACK	EXITS

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)
CTAPES	50	0 ITAPES (50)

STATISTICS

PROGRAM LENGTH	2213B	1163
CM LABELED COMMON LENGTH	62B	50

520000B CM USED

```
      1                SUBROUTINE AORDER (A,N,IPERM,NCON)                    AORDER     2
                     C                                                      AORDER     3
                       DIMENSION A(1),IPERM(1)                              AORDER     4
                       K = 1                                                AORDER     5
      5                M1 = IABS(N)                                         AORDER     6
                       DO 10 I=1,M1                                         AORDER     7
                    10 IPERM(I)=I                                           AORDER     8
                   100 L = K                                                AORDER     9
                       K = K + 1                                            AORDER    10
     10                IF (K - M1) 110,110,170                              AORDER    11
                   110 DO 140  I = 1,L                                      AORDER    12
                       INDI=IPERM(I)                                        AORDER    13
                       IF(NCON)180,180,200                                  AORDER    14
                   180 IF(N)120,170,130                                     AORDER    15
     15            120 IF(A(K)-A(I))140,140,150                             AORDER    16
                   130 IF (A(K) - A(I)) 150,140,140                         AORDER    17
                   200 IF(N)220,270,230                                     AORDER    18
                   220 IF(A(K)    .GT.A(INDI)) GO TO 250                    AORDER    19
                       GO TO 140                                            AORDER    20
     20            230 IF(A(K)    .LT.A(INDI)) GO TO 250                    AORDER    21
                   140 CONTINUE                                             AORDER    22
                       GO TO 100                                            AORDER    23
                   150 X = A(K)                                             AORDER    24
                       J = K                                                AORDER    25
     25                DO 160  M = I,L                                      AORDER    26
                       A(J) = A(J-1)                                        AORDER    27
                   160 J = J - 1                                            AORDER    28
                       A(I) = X                                             AORDER    29
                       GO TO 100                                            AORDER    30
     30            250 J=K                                                  AORDER    31
                       DO 260 M=I,L                                         AORDER    32
                       IPERM(J)=IPERM(J-1)                                  AORDER    33
                   260 J=J-1                                                AORDER    34
                       IPERM(I)=K                                           AORDER    35
     35                GO TO 100                                            AORDER    36
                   270 CONTINUE                                             AORDER    37
                   170 RETURN                                               AORDER    38
                       END                                                  AORDER    39
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	AORDER	1	37

VARIABLES

		SN	TYPE		RELOCATION							
0	A		REAL	ARRAY	F.P.	REFS	3	2*15	2*16	2*18	2*20	23	26
						DEFINED	1	26	28				
115	I		INTEGER			REFS	2*7	12	15	16	25	28	31
						34	DEFINED	6	11				
117	INDI		INTEGER			REFS	18	20	DEFINED	12			
0	IPERM		INTEGER	ARRAY	F.P.	REFS	3	12	32	DEFINED	1	7	32
						34							
121	J		INTEGER			REFS	2*26	27	2*32	33	DEFINED	24	27

VARIABLES	SN	TYPE	RELOCATION								
				30	33						
113	K	INTEGER		REFS	8	9	10	15	16	18	20
				23	24	30	34	DEFINED	4	9	
116	L	INTEGER		REFS	11	25	31	DEFINED	8		
122	M	INTEGER		DEFINED	25	31					
114	M1	INTEGER		REFS	6	10	DEFINED	5			
0	N	INTEGER	F.P.	REFS	5	14	17	DEFINED	1		
0	NCON	INTEGER	F.P.	REFS	13	DEFINED	1				
120	X	REAL		REFS	28	DEFINED	23				

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
IABS	INTEGER	1	INTRIN		5

STATEMENT LABELS			DEF LINE	REFERENCES			
0	10		7	6			
17	100		8	22	29	35	
0	110	INACTIVE	11	2*10			
0	120	INACTIVE	15	14			
35	130		16	14			
51	140		21	11	2*15	2*16	19
54	150		23	15	16		
0	160		27	25			
112	170		37	10	14		
0	180	INACTIVE	14	2*13			
41	200		17	13			
0	220	INACTIVE	18	17			
46	230		20	17			
74	250		30	18	20		
0	260		33	31			
112	270		36	17			

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
14	10	I	6 7	28	INSTACK	
24	140	I	11 21	308	OPT	EXITS
65	160	M	25 27	28	INSTACK	
103	260	M	31 33	28	INSTACK	

STATISTICS

PROGRAM LENGTH	1408	96

520008 CM USED

```
      SUBROUTINE SCLMAX(A,N,ISCL,AONE,ATWO,XCON,NN)                    SCLMAX     2
C                                                                      SCLMAX     3
      DIMENSION A(1)                                                   SCLMAX     4
      IF(XCON.LT.0.)GO TO 101                                          SCLMAX     5
      AMIN=A(1)                                                        SCLMAX     6
      AMAX=AMIN                                                        SCLMAX     7
      DO 100 I=2,N                                                     SCLMAX     8
      AMAX     =  AMAX1 (AMAX,A(I))                                    SCLMAX     9
      AMIN     =  AMIN1(AMIN,A(I))                                     SCLMAX    10
  100 CONTINUE                                                         SCLMAX    11
      AONE=.5*(AMAX+AMIN-NN*(AMAX-AMIN))                               SCLMAX    12
      ATWO=AONE+NN*(AMAX-AMIN)                                         SCLMAX    13
  101 KOUNT=0                                                          SCLMAX    14
      KOUNT2=0                                                         SCLMAX    15
      ABONE=ABS(AONE)                                                  SCLMAX    16
      ABTWO=ABS(ATWO)                                                  SCLMAX    17
      ZMAX=ABONE                                                       SCLMAX    18
      ZMIN=ABTWO                                                       SCLMAX    19
      IF(ABTWO.GT.ABONE) GO TO  10                                     SCLMAX    20
      GO TO 11                                                         SCLMAX    21
   10 KOUNT=1                                                          SCLMAX    22
      ZMAX=ABTWO                                                       SCLMAX    23
      ZMIN=ABONE                                                       SCLMAX    24
   11 SN1=AONE*ATWO                                                    SCLMAX    25
      IF(SN1.LT.0.0) GO TO 13                                          SCLMAX    26
      AD=ZMAX                                                          SCLMAX    27
      GO TO 15                                                         SCLMAX    28
   13 DO 14 J=1,2                                                      SCLMAX    29
      ZN=J                                                             SCLMAX    30
      AD=(ZMAX/(5.-ZN))                                                SCLMAX    31
      AZ=ZN*AD                                                         SCLMAX    32
      IF(AZ-ZMIN) 14,15,15                                             SCLMAX    33
   14 CONTINUE                                                         SCLMAX    34
      ZN=3.                                                            SCLMAX    35
      AD=(ZMIN/2.)                                                     SCLMAX    36
   15 IF(AD.GE.1.0.AND.AD.LT.10.0)  AA=1.0                             SCLMAX    37
      IF (AD.LT.1.0.OR.AD.GE.10.0) AA = ALOG10(AD)                     SCLMAX    38
      ISCL = INT(AA)                                                   SCLMAX    39
      IF (SIGN(1.0,AA).GT.0.0.AND.FLOAT(ISCL).EQ.AA) ISCL = ISCL - 1   SCLMAX    40
      IF (SIGN(1.0,AA).LT.0.0.AND.FLOAT(ISCL).NE.AA) ISCL = ISCL - 1   SCLMAX    41
      IF(XCON.LT.0.0.AND.SN1.GE.0.0) GO TO 18                          SCLMAX    42
      IF(KOUNT2.EQ.1) GO TO 18                                         SCLMAX    43
      AD= ROUND(AD,ISCL)                                               SCLMAX    44
      KOUNT2=1                                                         SCLMAX    45
      IF(SN1.GE.0.0) GO TO 16                                          SCLMAX    46
      IF(KOUNT.EQ.1) GO TO 19                                          SCLMAX    47
      SN2=SIGN(1.0,ATWO)                                               SCLMAX    48
      IF(ZN.EQ.3.0) GO TO 20                                           SCLMAX    49
      ATWO =SN2*ZN*AD                                                  SCLMAX    50
      AONE=-SN2*(5.-ZN)*AD                                             SCLMAX    51
      GO TO 21                                                         SCLMAX    52
   20 ATWO=SN2*2.*AD                                                   SCLMAX    53
      AONE=-SN2*3.*AD                                                  SCLMAX    54
   21 AD=ABS(AONE)                                                     SCLMAX    55
      GO TO 15                                                         SCLMAX    56
   19 SN2=SIGN(1.0,AONE)                                               SCLMAX    57
      IF(ZN.EQ.3.0) GO TO 20                                           SCLMAX    58
```

```
                     AONE=SN2*ZN*AD                                          SCLMAX     59
                     ATWO=-SN2*(5.-ZN)*AD                                    SCLMAX     60
   60                GO TO 23                                                SCLMAX     61
                  22 AONE=SN2*2.*AD                                          SCLMAX     62
                     ATWO=-SN2*3.*AD                                         SCLMAX     63
                  23 AD=ABS(ATWO)                                            SCLMAX     64
                     GO TO 15                                                SCLMAX     65
   65             16 IF(KOUNT.EQ.1) GO TO 17                                 SCLMAX     66
                     ATWO=0.0                                                SCLMAX     67
                     SN3=SIGN(1.0,AONE)                                      SCLMAX     68
                     AONE=SN3*AD                                             SCLMAX     69
                     GO TO 18                                                SCLMAX     70
   70             17 AONE=0.0                                                SCLMAX     71
                     SN3=SIGN(1.0,ATWO)                                      SCLMAX     72
                     ATWO=SN3*AD                                             SCLMAX     73
                  18 CONTINUE                                                SCLMAX     74
                     RETURN                                                  SCLMAX     75
   75                END                                                     SCLMAX     76
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	SCLMAX	1	74

VARIABLES

		SN	TYPE	RELOCATION									
0	A		REAL	ARRAY	F.P.	REFS	3	5	8	9	DEFINED	1	
243	AA		REAL			REFS	38	2*39	2*40	DEFINED	36	37	
232	ABONE		REAL			REFS	17	19	23	DEFINED	15		
233	ABTWO		REAL			REFS	18	19	22	DEFINED	16		
237	AD		REAL			REFS	31	2*36	3*37	43	49	50	52
							53	58	59	61	62	68	72
						DEFINED	26	30	35	43	54	63	
226	AMAX		REAL			REFS	8	2*11	12	DEFINED	6	8	
225	AMIN		REAL			REFS	6	9	2*11	12	DEFINED	5	9
0	AONE		REAL		F.P.	REFS	12	15	24	54	56	67	
						DEFINED	1	11	50	53	58	61	68
						70							
0	ATWO		REAL		F.P.	REFS	16	24	47	63	71		
						DEFINED	1	12	49	52	59	62	66
						72							
242	AZ		REAL			REFS	32	DEFINED	31				
227	I		INTEGER			REFS	8	9	DEFINED	7			
0	ISCL		INTEGER		F.P.	REFS	2*39	2*40	43	DEFINED	1	38	39
						40							
240	J		INTEGER			REFS	29	DEFINED	28				
230	KOUNT		INTEGER			REFS	46	65	DEFINED	13	21		
231	KOUNT2		INTEGER			REFS	42	DEFINED	14	44			
0	N		INTEGER		F.P.	REFS	7	DEFINED	1				
0	NN		INTEGER		F.P.	REFS	11	12	DEFINED	1			
236	SN1		REAL			REFS	25	41	45	DEFINED	24		
244	SN2		REAL			REFS	49	50	52	53	58	59	61
							62	DEFINED	47	56			
245	SN3		REAL			REFS	68	72	DEFINED	67	71		

VARIABLES	SN	TYPE	RELOCATION								
0	XCON	REAL	F.P.	REFS	4	41	DEFINED	1			
234	ZMAX	REAL		REFS	26	30	DEFINED	17	22		
235	ZMIN	REAL		REFS	32	35	DEFINED	18	23		
241	ZN	REAL		REFS	30	31	48	49	50	57	58
				59	DEFINED	29	34				

EXTERNALS	TYPE	ARGS		REFERENCES
ALOG10	REAL	1	LIBRARY	37
ROUND	REAL	2		43

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES				
ABS	REAL	1	INTRIN	15	16	54	63		
AMAX1	REAL	0	INTRIN	8					
AMIN1	REAL	0	INTRIN	9					
FLOAT	REAL	1	INTRIN	39	40				
INT	INTEGER	1	INTRIN	38					
SIGN	REAL	2	INTRIN	39	40	47	56	67	71

STATEMENT LABELS		DEF LINE	REFERENCES			
43	10	21	19			
47	11	24	20			
54	13	28	25			
0	14	33	28	32		
71	15	36	27	2*32	55	64
177	16	65	45			
206	17	70	65			
213	18	73	41	42	69	
156	19	56	46			
146	20	52	48			
153	21	54	51			
167	22	61	57			
174	23	63	60			
0	100	10	7			
33	101	13	4			

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
15	100	I	7 10	68	INSTACK	
55	14	J	28 33	118	OPT	EXITS

STATISTICS

PROGRAM LENGTH 246B 166

520008 CM USED

```
      1                FUNCTION  ROUND (X,ISCL)                                  ROUND       2
                C                                                                ROUND       3
                C             ROUND OFF ROUTINE FOR SCALING                      ROUND       4
                C                                                                ROUND       5
      5                 ISSL  =  ISCL  -  1                                      ROUND       6
                        AX = X/10.0**ISSL                                        ROUND       7
                        BX      =  IFIX (AX)                                     ROUND       8
                        DX      =  ABS(AX) - ABS(BX)                             ROUND       9
                        RDX = ABS(DX) / ABS(AX)                                  ROUND      10
     10                 IF (RDX  GT  0.01)      GO TO 5                          ROUND      11
                        DX = 0.0                                                 ROUND      12
                        GO TO 10                                                 ROUND      13
                      5 CONTINUE                                                 ROUND      14
                        IF ( DX  LE  0.5 )      DX = SIGN (0.5,X)                ROUND      15
     15                 IF ( DX  GT  0.5 )      DX = SIGN (1.0,X)                ROUND      16
                     10 ROUND = (BX + DX)*10.0**ISSL                             ROUND      17
                                RETURN                                           ROUND      18
                                END                                              ROUND      19
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
4	ROUND	1	17

VARIABLES	SN	TYPE	RELOCATION									
50	AX	REAL		REFS	7	8	9	DEFINED	6			
51	BX	REAL		REFS	8	16	DEFINED	7				
52	DX	REAL		REFS	9	14	15	16	DEFINED	8	11	
				14	15							
0	ISCL	INTEGER	F.P.	REFS	5	DEFINED	1					
47	ISSL	INTEGER		REFS	6	16	DEFINED	5				
53	RDX	REAL		REFS	10	DEFINED	9					
46	ROUND	REAL		DEFINED	16							
0	X	REAL	F.P.	REFS	6	14	15	DEFINED	1			

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES	
ABS	REAL	1	INTRIN		2*8	2*9
IFIX	INTEGER	1	INTRIN		7	
SIGN	REAL	2	INTRIN		14	15

STATEMENT LABELS		DEF LINE	REFERENCES
24	5	13	10
35	10	16	12

STATISTICS

PROGRAM LENGTH 54B 44

52000B CM USED

```
      1                SUBROUTINE SCLINC(AONE,ATWO,XX,EXTRA,AORG,IA)                    SCLINC      2
                     C                                                                 SCLINC      3
                       IF(IA)110,110,120                                               SCLINC      4
                   120 XINCH=XX/10.                                                    SCLINC      5
      5                GO TO 100                                                       SCLINC      6
                   110 XINCH =XX/5.                                                    SCLINC      7
                   100 AORG=AONE                                                       SCLINC      8
                       EXTRA=    (ATWO-AONE)/XINCH                                     SCLINC      9
                       RETURN                                                          SCLINC     10
     10                END                                                           SCLINC     11
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	SCLINC	1	9

VARIABLES	SN	TYPE	RELOCATION						
0	AONE	REAL	F.P.	REFS	7	8	DEFINED	1	
0	AORG	REAL	F.P.	DEFINED	1	7			
0	ATWO	REAL	F.P.	REFS	8	DEFINED	1		
0	EXTRA	REAL	F.P.	DEFINED	1	8			
0	IA	INTEGER	F.P.	REFS	3	DEFINED	1		
23	XINCH	REAL		REFS	8	DEFINED	4	6	
0	XX	REAL	F.P.	REFS	4	6	DEFINED	1	

STATEMENT LABELS			DEF LINE	REFERENCES
14	100		7	5
12	110		6	2*3
0	120	INACTIVE	4	3

STATISTICS

PROGRAM LENGTH 24B 20

520008 CM USED

```
      1              FUNCTION FATAN (X,Y)                                          FATAN       2
                C    PROGRAM TO ASSIGN QUADRANT FOR PHASE ANGLE ********************* FATAN       3
                     C = 1.0E+06                                                   FATAN       4
                     A = ABS (X*C)                                                 FATAN       5
      5              B = ABS (Y*C)                                                 FATAN       6
                     AX = ABS (X)                                                  FATAN       7
                     AY = ABS (Y)                                                  FATAN       8
                     IF (A.LE.AY) GO TO 1                                          FATAN       9
                     IF (AX.GE.B) GO TO 2                                          FATAN      10
     10              FATAN = ATAN2 (X,Y)                                           FATAN      11
                     GO TO 3                                                       FATAN      12
                   1 FATAN = 0.0                                                   FATAN      13
                     GO TO 3                                                       FATAN      14
                   2 FATAN = 1.570796 * SIGN(1.0,X) * SIGN(1.0,Y)                  FATAN      15
     15            3 RETURN                                                        FATAN      16
                     END                                                           FATAN      17
```

SYMBOLIC REFERENCE MAP (R=3)

```
ENTRY POINTS      DEF LINE      REFERENCES
    4  FATAN            1        15

VARIABLES      SN  TYPE            RELOCATION
   37  A          REAL                              REFS        8    DEFINED        4
   41  AX         REAL                              REFS        9    DEFINED        6
   42  AY         REAL                              REFS        8    DEFINED        7
   40  B          REAL                              REFS        9    DEFINED        5
   36  C          REAL                              REFS        4          5    DEFINED        3
   35  FATAN      REAL                            DEFINED      10         12         14
    0  X          REAL                  F.P.        REFS        4          6         10         14    DEFINED        1
    0  Y          REAL                  F.P.        REFS        5          7         10         14    DEFINED        1

EXTERNALS           TYPE    ARGS       REFERENCES
       ATAN2        REAL       2 LIBRARY      10

INLINE FUNCTIONS    TYPE    ARGS         DEF LINE  REFERENCES
       ABS          REAL       1  INTRIN                4          5          6          7
       SIGN         REAL       2  INTRIN              2*14

STATEMENT LABELS              DEF LINE    REFERENCES
   22  1                          12          8
   24  2                          14          9
   31  3                          15         11         13

STATISTICS
  PROGRAM LENGTH                  43B        35
         52000B CM USED
```

```
      SUBROUTINE RODDEN                                                 RODDEN     2
C                                                                       RODDEN     3
      COMPLEX  B(40,40), DETAD(40,40), GENFM(40,40)                     RODDEN     4
      COMPLEX  AUGM(530), WQ(130)                                       RODDEN     5
      COMPLEX GENFT                                                     RODDEN     6
C                                                                       RODDEN     7
      DIMENSION QMWT(40,5), QWT(5)                                      RODDEN     8
      DIMENSION VBO(30), RVBO(15)                                       RODDEN     9
      DIMENSION LC(40)                                                  RODDEN    10
      DIMENSION LIM(50,3)                                               RODDEN    11
      DIMENSION WW(40,40), OMG(40)                                      RODDEN    12
      DIMENSION      COEFP(50) ,    COEFB(20) ,      VIN(50)            RODDEN    13
      DIMENSION        ZIN(50)                                          RODDEN    14
      DIMENSION ITAPES(50),IFILES(50)                                   RODDEN    15
      DIMENSION TSHF(1)                                                 RODDEN    16
      DIMENSION NAMDUB(2), NAME(2)                                      RODDEN    17
C                                                                       RODDEN    18
      COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IR,JSPECS,        RODDEN    19
     1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,  RODDEN    20
     2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),  RODDEN    21
     3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),       RODDEN    22
     4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),    RODDEN    23
     5                 XO(50),YO(50),ZO(50),GGMA(50)                    RODDEN    24
      COMMON /XYZ/YS(50),DELYS(50),ZS(50),DELZS(50),FGAMMA(50),CWIG(50) RODDEN    25
     1          ,DUMMY(50)                                             RODDEN    26
      COMMON /YZY/   X1A(50), X3A(50), X5A(50),X7A(50),X2A(50)          RODDEN    27
      COMMON  /XXZ/  XOC(400),XIJ(50)                                   RODDEN    28
      COMMON  /P1GW/  CT1(50),CT2(50),TS(50)                            RODDEN    29
      COMMON  /NTPS/  NTP1,NTP2,NTP3,NTP4,NTP5,NTP6,NTP7,NTP8,NTP9,NTP10 RODDEN    30
      COMMON/BODY/ RO(100), ROP(100), NBEA(20), BGMA(20), MRK(20,2),    RODDEN    31
     1             XBO(20), YBO(20), ZBO(20)                          RODDEN    32
C                                                                       RODDEN    33
      REAL   K1O,K2O,K1RT1,K1IT1,K2RT2P,K2IT2P,K1OT1,K2OT2P             RODDEN    34
      REAL   KR,KRDBR                                                   RODDEN    35
C                                                                       RODDEN    36
      COMMON  /DLM/  K1O,K2O,K1RT1,K1IT1,K2RT2P,K2IT2P,K1OT1,K2OT2P,E2  RODDEN    37
      COMMON /MODD  / B, DETAD, WW, OMG, NC                             RODDEN    38
      COMMON /FLUTAN/ FMACH ,BETA  ,VBO   ,RVBO  ,NRVBO                 RODDEN    39
      COMMON / FLUTQ / QMWT, QWT                                        RODDEN    40
      COMMON/COMA  / LC,CR                                              RODDEN    41
      COMMON / CTAPES / ITAPES                                          RODDEN    42
      COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                              RODDEN    43
      COMMON /CTSHF / LTSHF ,TSHF                                       RODDEN    44
      COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE   RODDEN    45
     1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                       RODDEN    46
      COMMON /CTABLE/ KTABLE,NPASS ,NROWS, NCOLS , NCOLST,KTABLO,NPAGEA RODDEN    47
     1               ,ITAPET                                            RODDEN    48
      COMMON /CFILES/ KFILES,IFILES                                     RODDEN    49
C                                                                       RODDEN    50
      INTEGER RHSTAP                                                    RODDEN    51
C                                                                       RODDEN    52
      LOGICAL KQINT                                                     RODDEN    53
C                                                                       RODDEN    54
      DATA NAMDUB /4HDOUB,4H-AIC/                                       RODDEN    55
C INITIAL CONDITIONS                                                    RODDEN    56
C                                                                       RODDEN    57
      CALL PROGNA (4H(ROD,4HDEN))                                       RODDEN    58
```

```
                COEF   =  1.0                                                    PART1   173
                YDIF   = YCAP(2) - YCAP(1)                                       PART1   174
                ZDIF   = ZCAP(2) - ZCAP(1)                                       PART1   175
175             IF (ABS(YDIF).LT.SMALL) GO TO 540                                PART1   176
                CALL        ATAN3(ZDIF,YDIF,ATANA)                               PART1   177
                GMA(ILOOP) = ATANA                                               PART1   178
                GO TO 550                                                        PART1   179
              540 GMA(ILOOP) = PI/2.0                                            PART1   180
180             IF (ZDIF.LT.0.0) GMA(ILOOP)=-PI/2.0                              PART1   181
              550 GMAS(ILOOP)=(GMA(ILOOP)*180.0)/PI                              PART1   182
                FOUR = XCAP(4) - XCAP(3) - XCAP(2) + XCAP(1)                     PART1   183
                DIFF31 = XCAP(3) - XCAP(1)                                       PART1   184
                DIFF21 = XCAP(2) - XCAP(1)                                       PART1   185
185             DEL1 = DIFF21                                                    PART1   186
                DO 560 M = NCRUN,NCEND                                           PART1   187
                DO 560 N = NSRUN,NSEND                                           PART1   188
                J = M + NC * (N-1)                                               PART1   189
              C ***                                                              PART1   190
190           C   INDEX -J- EQUALS SUBSCRIPT(M,N)                                PART1   191
              C ***                                                              PART1   192
                K =(M+1) +  NC * (N-1)                                           PART1   193
              C ***                                                              PART1   194
              C   INDEX -K- EQUALS SUBSCRIPT (M+1, N)                            PART1   195
195           C ***                                                              PART1   196
                L = M + NC * N                                                   PART1   197
              C ***                                                              PART1   198
              C   INDEX -L- EQUALS SUBSCRIPT (M, N+1)                            PART1   199
              C ***                                                              PART1   200
200             KL = (M+1) + NC * N                                              PART1   201
              C ***                                                              PART1   202
              C   INDEX -KL- EQUALS SUBSCRIPT (M+1, N+1)                         PART1   203
              C ***                                                              PART1   204
                ZETA(J)=COEF*(TAU(N)*((TH(M)*FOUR) +DIFF31) + TH(M)*DEL1 + X1)   PART1   205
205             PNUP = YDIF*TAU(N)                                               PART1   206
                PNU(J) = Y1 + PNUP                                               PART1   207
                ZEEP = ZDIF*TAU(N)                                               PART1   208
                ZEE(J) = ZEE1 + ZEEP                                             PART1   209
              560 CONTINUE                                                       PART1   210
210             JLIMIT = NC * NS                                                 PART1   211
                LIM1 = 1                                                         PART1   212
                LIM2 = JLIMIT                                                    PART1   213
                J = JBEGIN                                                       PART1   214
                DO 570 I = LIM1,LIM2,NC                                          PART1   215
215             IPNC = I+NC                                                      PART1   216
                XIJ(J) = (ZETA(I) + ZETA(IPNC)) / 2.                             PART1   217
              570 J = J + 1                                                      PART1   218
              C                                                                  PART1   219
                JCU    =  LIM1 - 1                                               PART1   220
220             IR     = -1                                                      PART1   221
                KRETUR = -3                                                      PART1   222
              525 CALL HEAD (LTSHF,TSHF,IROWS,JLIMIT)                            PART1   223
                GO TO (526, 527, 528), KHEAD                                     PART1   224
              526 WRITE(ITAPEW,200) ILOOP,NCNSM1,JLIMIT                          PART1   225
225           527 CALL PLB (1,1,ITAPEW)                                          PART1   226
              528 WRITE (ITAPEW,172) JCL, (  ZETA(JC), JC=JCL,JCU)               PART1   227
                IF (KRETUR .LT. 3) GO TO 525                                     PART1   228
              C                                                                  PART1   229
```

```
115                NSOFAR = 0                                                    PART1    116
                   DO 630 LOOP = 1,NOPAN                                         PART1    117
                   CALL TITLES (2)                                               PART1    118
                   ILOOP = LOOP                                                  PART1    119
                   WRITE (ITAPEW,60) ILOOP                                       PART1    120
120                KOUNT  =  KOUNT + 2                                           PART1    121
                   CALL PLB (1,1,ITAPEW)                                         PART1    122
                   READ (ITAPER,10) XO(LOOP), YO(LOOP), ZO(LOOP), GGMAS          PART1    123
                   GGMA (LOOP) = GGMAS*PI/180.0                                  PART1    124
                   READ (ITAPER,10) XCAP(1),XCAP(2),XCAP(3),XCAP(4),YCAP(1),YCAP(2)  PART1  125
125                READ (ITAPER,25) ZCAP(1),ZCAP(2),NS,NC,COEFF                  PART1    126
                   COEFP(ILOOP)=COEFF                                            PART1    127
                   IF (COEFF.EQ.0.0)  COEFP(ILOOP)=1.0                           PART1    128
                   X1 = XCAP(1)                                                  PART1    129
                   Y1 = YCAP(1)                                                  PART1    130
130                YIN(ILOOP)= Y1                                                PART1    131
                   ZEE1 = ZCAP(1)                                                PART1    132
                   ZIN(ILOOP)= ZEE1                                              PART1    133
                   CT1(ILOOP)= XCAP(2)-XCAP(1)                                   PART1    134
                   CT2(ILOOP)= XCAP(4)-XCAP(3)                                   PART1    135
135                KOUNT  =  KOUNT + 5                                           PART1    136
                   CALL PLB (1,1,ITAPEW)                                         PART1    137
                   WRITE (ITAPEW,30) XCAP(1), YCAP(1), NC,   XCAP(2), YCAP(2), NS  PART1  138
                  1                  ,XCAP(3), ZCAP(1), NDELT,XCAP(4), ZCAP(2), NOPAN  PART1  139
                   NCNSM1 = (NC-1) * (NS-1)                                      PART1    140
140                NCARAY(ILOOP) = NC                                            PART1    141
                   NSARAY(ILOOP) = NS                                            PART1    142
                   NCRUN = 1                                                     PART1    143
                   NCEND = NC                                                    PART1    144
                   NSRUN = 1                                                     PART1    145
145                NSEND = NS                                                    PART1    146
             C   INPUT CHORDWISE DIVISIONS *****                                 PART1    147
                   READ (ITAPER, 10) (TH(I), I = 1,NC)                           PART1    148
             C   INPUT SPANWISE DIVISIONS *****                                  PART1    149
                   READ (ITAPER, 10) (TAU(I),I = 1,NS)                           PART1    150
150          C                                                                   PART1    151
                   LSKIP  =  1                                                   PART1    152
                   LSUB   =  3                                                   PART1    153
                   JCU    =  NCRUN - 1                                           PART1    154
                   IR     = -1                                                   PART1    155
156                KRETUR = -3                                                   PART1    156
                 505 CALL HEAD (LTSHF,TSHF,IROWS,NCEND )                         PART1    157
                   GO TO (506, 507, 508), KHEAD                                  PART1    158
                 506 WRITE (ITAPEW,180) ILOOP, NC                                PART1    159
                 507 CALL PLB (1,1,ITAPEW)                                       PART1    160
160              508 WRITE (ITAPEW,172) JCL, (    TH(JC), JC=JCL,JCU)            PART1    161
                   IF (KRETUR .LT. 3) GO TO 505                                  PART1    162
             C                                                                   PART1    163
                   JCU    =  NSRUN - 1                                           PART1    164
                   IR     = -1                                                   PART1    165
165                KRETUR = -3                                                   PART1    166
                 515 CALL HEAD (LTSHF,TSHF,IROWS,NSEND )                         PART1    167
                   GO TO (516, 517, 518), KHEAD                                  PART1    168
                 516 WRITE (ITAPEW,190) ILOOP, NS                                PART1    169
                 517 CALL PLB (1,1,ITAPEW)                                       PART1    170
170              518 WRITE (ITAPEW,172) JCL, (   TAU(JC), JC=JCL,JCU)            PART1    171
                   IF (KRETUR .LT. 3) GO TO 515                                  PART1    172
```

```
                IVAR( 5) = 2                                                    PART1      59
                IVAR( 6) = 11                                                   PART1      60
60              IVAR( 7) = 5                                                    PART1      61
                IVAR( 8) = 8                                                    PART1      62
                IVAR( 9) = 3                                                    PART1      63
                IVAR(10) = 12                                                   PART1      64
                IVAR(11) = 6                                                    PART1      65
65              IVAR(12) = 9                                                    PART1      66
                IVAR(13) =13                                                    PART1      67
                IVAR(14) = 14                                                   PART1      68
                ITAPER = ITAPES(5)                                              PART1      69
                ITAPEW = ITAPES(6)                                              PART1      70
70              PI = 3.1415926                                                  PART1      71
             450 DO 460  I = 1, 50                                              PART1      72
                TH(I) = 0.                                                      PART1      73
                TAU(I)= 0.                                                      PART1      74
                GMA(I) = 0.                                                     PART1      75
75              GMAS(I)= 0.0                                                    PART1      76
             460 F(I) = 0.                                                      PART1      77
                DO 470  I = 1,400                                               PART1      78
                ZETA(I) = 0.                                                    PART1      79
                PNU(I) = 0.                                                     PART1      80
80              ZEE(I)= 0.                                                      PART1      81
                DELZ(I) = 0.                                                    PART1      82
             470 CONTINUE                                                       PART1      83
                DO 480 I = 1,50                                                 PART1      84
             480 CWIG(I) = 0.0                                                  PART1      85
85              DO 490   I = 1,50                                               PART1      86
                FGAMMA(I)= 0.                                                   PART1      87
                YS(I)    = 0.                                                   PART1      88
                ZS(I)    = 0.                                                   PART1      89
                DELZS(I) = 0.                                                   PART1      90
90           490 DELYS(I) = 0.                                                  PART1      91
                NSOFAR = 0                                                      PART1      92
                JBEGIN = 1                                                      PART1      93
                JCUM = 0                                                        PART1      94
                CALL PROGNA (4H(PAR, 4HT1 ))                                    PART1      95
95              IF ((LINES-KOUNT) .LT. 4) KOUNT = LINES                         PART1      96
                CALL TITLES (3)                                                 PART1      97
                CALL PLB (1,1,ITAPEW)                                           PART1      98
                WRITE (ITAPEW,2000)                                             PART1      99
                CALL PLB (1,1,ITAPEW)                                           PART1     100
100             KOUNT  =  KOUNT + 4                                             PART1     101
                NROWS  =  1                                                     PART1     102
                NCOLS  =  0                                                     PART1     103
                KTABLE =  2                                                     PART1     104
                CALL PTABLE (2,51,51                                            PART1     105
105            1   HSURFACE AND BODY GEOMETRY AND ASSOCIATED PARAMETERS)        PART1     106
                KOLUMN =  8                                                     PART1     107
                IF (KREPOR .EQ. 2) KOLUMN = 4                                   PART1     108
             C   *****                                                          PART1     109
             C  *** REFSPN = B = B2 IS THE REFERENCE SEMI-SPAN ***              PART1     110
110          C  *** REFCHD = REFERENCE CHORD = FL IN PROG. CALC.                PART1     111
                WRITE (ITAPEW,40) FL, B2, ACAP, FMACH, BETA                     PART1     112
                KOUNT =  KOUNT + 6                                              PART1     113
                CALL PLB (1,1,ITAPEW)                                           PART1     114
                SMALL = 0.0001                                                  PART1     115
```

```
      SUBROUTINE PART1(JCUM,COEFP,COEFB,YIN,ZIN)                        PART1      2
C                                                                       PART1      3
      REAL    KR,KRDBR                                                  PART1      4
C                                                                       PART1      5
      DIMENSION IVAR(14)                                                PART1      6
      DIMENSION TSHF(1)                                                 PART1      7
      DIMENSION VAR(400,14)                                             PART1      8
      DIMENSION    LC(40)                                               PART1      9
C                                                                       PART1     10
      COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IRD,JSPECS,       PART1     11
     1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,  PART1     12
     2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),  PART1     13
     3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),       PART1     14
     4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),    PART1     15
     5                 XO(50),YO(50),ZO(50),GGMA(50)                    PART1     16
      COMMON/XYZ/ YS(50), DELYS(50), ZS(50), DELZS(50),                 PART1     17
     1            FGAMMA(50), CWIG(50), FGGAM(50)                       PART1     18
      COMMON  /XXZ/  XOC(400),XIJ(50)                                   PART1     19
      COMMON  /P1GW/  CT1(50),CT2(50),TS(50)                            PART1     20
      COMMON /FLUTAN/ FMACH ,BETA  ,VBO   ,RVBO  ,NRVBO                 PART1     21
      COMMON /MODV/  XA(400) , YA(400) , ZA(400)                        PART1     22
C                                                                       PART1     23
      DIMENSION VBO(30), RVBO(15)                                       PART1     24
      DIMENSION  XCAP(4),YCAP(2),ZCAP(2),GMAS(50),                      PART1     25
     1 ZETA(400),PNU(400),ZEE(400),TH(50),TAU(50),DELZ(400) ,RAD(50)    PART1     26
      DIMENSION      COEFP(50) ,    COEFB(20) ,        F(50)           PART1     27
      DIMENSION        YIN(50) ,      ZIN(50)                          PART1     28
      DIMENSION ITAPES(50)                                              PART1     29
C                                                                       PART1     30
      COMMON/BODY/ RO(100), ROP(100), NBEA(20), BGMA(20), MRK(20,2),    PART1     31
     1             XBO(20), YBO(20), ZBO(20)                            PART1     32
      COMMON /COMA  / LC, BR                                            PART1     33
      COMMON / CTAPES / ITAPES                                          PART1     34
      COMMON /CTSHF / LTSHF ,TSHF                                       PART1     35
      COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE   PART1     36
     1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                       PART1     37
      COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA  PART1     38
     1               ,ITAPET                                            PART1     39
      COMMON /REPORT/ KREPOR                                            PART1     40
      COMMON /CHEAD / KHEAD,KRETUR,KOLUMN,IR,JCL,JCU,LSUB,LSKIP         PART1     41
C                                                                       PART1     42
      EQUIVALENCE (VAR(1,1), X(1))                                      PART1     43
C                                                                       PART1     44
C FUNCTION DEFINITION                                                   PART1     45
C                                                                       PART1     46
      MINOF(I,J)    =  MINO(I,J)                                        PART1     47
C                                                                       PART1     48
C INITIAL CONDITIONS                                                    PART1     49
C                                                                       PART1     50
      ZERO   =  0.0                                                     PART1     51
      NLISTD =  14                                                      PART1     52
      NELEMD =  400                                                     PART1     53
      CALL DVALUE (VAR   ,ZERO,NELEMD*NLISTD)                           PART1     54
      IVAR( 1) = 1                                                      PART1     55
      IVAR( 2) = 10                                                     PART1     56
      IVAR( 3) = 4                                                      PART1     57
      IVAR( 4) = 7                                                      PART1     58
```

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)							
		6	K1OT1 (1)	7	K2OT2P (1)	8	E2 (1)		
MODD	8041	0	B (3200)	3200	DETAD (3200)	6400	WW (1600)		
		8000	OMG (40)	8040	NC (1)				
FLUTAN	48	0	FMACH (1)	1	BETA (1)	2	VBO (30)		
		32	RVBO (15)	47	NRVBO (1)				
FLUTQ	205	0	QMWT (200)	200	QWT (5)				
COMA	41	0	LC (40)	40	CR (1)				
CTAPES	50	0	ITAPES (50)						
COMRWP	3	0	ITAPER (1)	1	ITAPEW (1)	2	ITAPEP (1)		
CTSHF	2	0	LTSHF (1)	1	TSHF (1)				
CLIST	11	0	KOUNT (1)	1	KPAGE (1)	2	LINES (1)		
		3	LINEST (1)	4	KLABEL (1)	5	KTPAGE (1)		
		6	NPAGE (1)	7	KBPAGE (1)	8	LINESG (1)		
		9	KOUNTH (1)	10	KOUNTI (1)				
CTABLE	8	0	KTABLE (1)	1	NPASS (1)	2	NROWS (1)		
		3	NCOLS (1)	4	NCOLST (1)	5	KTABLO (1)		
		6	NPAGEA (1)	7	ITAPET (1)				
CFILES	51	0	KFILES (1)	1	IFILES (50)				

STATISTICS

PROGRAM LENGTH	12506B	5446
CM LABELED COMMON LENGTH	37241B	16033
52000B CM USED		

STATEMENT LABELS			DEF LINE	REFERENCES		
213	42		157	152	155	
212	43		156	153		
234	46		169	165		
754	47	FMT	255	130		
236	48		171	168		
756	55	FMT	256	89	129	144
0	109		86	85		
253	152		184	177		
450	160		246	161	219	
0	200		242	240		
0	202		243	239		
0	203		245	244		
312	450		207	217		
760	1000	FMT	257	106		
323	8000		210	198	205	209
335	9002		218	209		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
52	109	K	85 86	2B	INSTACK	
144		I	130 130	11B		EXT REFS
214	160	J	161 246	237B		EXT REFS NOT INNER
343	6	I	229 234	24B		NOT INNER
355	6	III	231 234	6B	INSTACK	
406	202	I	239 243	21B		NOT INNER
415	200	II	240 242	7B	INSTACK	
430	203	I	244 245	20B		EXT REFS NOT INNER
433		II	245 245	11B		EXT REFS

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
VARBLS	6014	0 NCNSM1 (1)	1 NB (1)	2 NDELT (1)			
		3 NDATA (1)	4 NOPAN (1)	5 IQ (1)			
		6 IR (1)	7 JSPECS (1)	8 NCARAY (50)			
		58 NSARAY (50)	108 NBARAY (50)	158 ACAP (1)			
		159 B2 (1)	160 FL (1)	161 PI (1)			
		162 KR (1)	163 KRDBR (1)	164 GMA (50)			
		214 X (400)	614 Y (400)	1014 ZZ (400)			
		1414 Z1 (400)	1814 P1 (400)	2214 ZZ1 (400)			
		2614 Z2 (400)	3014 P2 (400)	3414 ZZ2 (400)			
		3814 EV (400)	4214 PV (400)	4614 ZV (400)			
		5014 SDELX (400)	5414 DELY (400)	5814 XO (50)			
		5864 YO (50)	5914 ZO (50)	5964 GGMA (50)			
XYZ	350	0 YS (50)	50 DELYS (50)	100 ZS (50)			
		150 DELZS (50)	200 FGAMMA (50)	250 CWIG (50)			
		300 DUMMY (50)					
YZY	250	0 X1A (50)	50 X3A (50)	100 X5A (50)			
		150 X7A (50)	200 X2A (50)				
XXZ	450	0 XOC (400)	400 XIJ (50)				
P1GW	150	0 CT1 (50)	50 CT2 (50)	100 TS (50)			
NTPS	10	0 NTP1 (1)	1 NTP2 (1)	2 NTP3 (1)			
		3 NTP4 (1)	4 NTP5 (1)	5 NTP6 (1)			
		6 NTP7 (1)	7 NTP8 (1)	8 NTP9 (1)			
		9 NTP10 (1)					
BODY	340	0 RO (100)	100 ROP (100)	200 NBEA (20)			
		220 BGMA (20)	240 MRK (40)	280 XBO (20)			
		300 YBO (20)	320 ZBO (20)				
DLM	9	0 K10 (1)	1 K20 (1)	2 K1RT1 (1)			

VARIABLES	SN	TYPE	RELOCATION								
1	TSHF	REAL	ARRAY	CTSHF	REFS	15	43				
2	VBO	REAL	ARRAY	FLUTAN	REFS	8	38	167	250	DEFINED	170
11350	WQ	COMPLEX	*UNDEF		REFS	4					
14400	WW	REAL	ARRAY	MODD	REFS	11	37				
326	X	REAL	ARRAY	VARBLS	REFS	18	222				
430	XBO	REAL	ARRAY	BODY	REFS	30					
620	XIJ	REAL	ARRAY	XXZ	REFS	27	222				
0	XOC	REAL	ARRAY	XXZ	REFS	27	222				
13266	XO	REAL	ARRAY	VARBLS	REFS	18					
0	X1A	REAL	ARRAY	YZY	REFS	26					
310	X2A	REAL	ARRAY	YZY	REFS	26					
62	X3A	REAL	ARRAY	YZY	REFS	26					
144	X5A	REAL	ARRAY	YZY	REFS	26					
226	X7A	REAL	ARRAY	YZY	REFS	26					
1146	Y	REAL	ARRAY	VARBLS	REFS	18	222				
454	YBO	REAL	ARRAY	BODY	REFS	30					
12310	YIN	REAL	ARRAY		REFS	12	122	175			
0	YS	REAL	ARRAY	XYZ	REFS	24					
13350	YO	REAL	ARRAY	VARBLS	REFS	18					
500	ZBO	REAL	ARRAY	BODY	REFS	30					
12372	ZIN	REAL	ARRAY		REFS	13	122	175			
144	ZS	REAL	ARRAY	XYZ	REFS	24					
11006	ZV	REAL	ARRAY	VARBLS	REFS	18					
1766	ZZ	REAL	ARRAY	VARBLS	REFS	18	222				
4246	ZZ1	REAL	ARRAY	VARBLS	REFS	18					
6526	ZZ2	REAL	ARRAY	VARBLS	REFS	18					
13432	ZO	REAL	ARRAY	VARBLS	REFS	18					
2606	Z1	REAL	ARRAY	VARBLS	REFS	18					
5066	Z2	REAL	ARRAY	VARBLS	REFS	18					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES	
BIDI		3	139	
DCLOSE		1	204	
FUTSOL		12	215	
GEDLAB		6	212	
GENF		20	222	
GENQ		15	175	
GLOBAL		1	146	
MERGE		2	140	
MIDI		3	135	
PART1		5	122	
PLB		3	105	107
PROGNA		2	57	
PRT2		2	182	
PTABLE		3	112	116
PUDLAB		6	202	
QINTP		7	250	
QUAS		12	203	
TIMEB		2	123	
TITLES		1	104	

STATEMENT LABELS		DEF LINE	REFERENCES	
455	2	261	247	
167	5	141	136	
0	6	234	229	231
752	20 FMT	254	88	

VARIABLES	SN	TYPE		RELOCATION								
2	NDELT	INTEGER		VARBLS	REFS	18	222	DEFINED	89			
1057	NF	INTEGER			REFS	162	211	212	215	DEFINED	149	162
1060	NFILE	INTEGER			REFS	201	202	203	DEFINED	150	201	
1067	NI	INTEGER			REFS	203	215	DEFINED	185	I/O REFS	193	
1052	NM	INTEGER			REFS	135	139	140	DEFINED	131		
1021	NMD	INTEGER			REFS	175	206	216	222	DEFINED	81	132
1065	NMTB	* INTEGER			REFS	175						
1064	NMTP	* INTEGER			REFS	175						
1073	NO	INTEGER			REFS	203	215	DEFINED	190			
4	NOPAN	INTEGER		VARBLS	REFS	18	DEFINED	101				
1025	NP	INTEGER			REFS	101	DEFINED	89				
6	NPAGE	INTEGER		CLIST	REFS	44						
6	NPAGEA	INTEGER		CTABLE	REFS	46						
1	NPASS	INTEGER		CTABLE	REFS	46						
1053	NPOINT	INTEGER			REFS	135	139					
1045	NPR1	INTEGER			REFS	203	215	DEFINED	129			
1061	NRF	INTEGER			REFS	161	175	DEFINED	151	154	156	
2	NROWS	INTEGER		CTABLE	REFS	46	DEFINED	109	114			
57	NRVBO	INTEGER		FLUTAN	REFS	38	154	250				
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	18						
1042	NSTRIP	INTEGER			REFS	130	222	DEFINED	125	129		
1046	NSV	INTEGER			REFS	222	DEFINED	129				
1054	NTBOX	INTEGER			REFS	135	139	140				
1044	NTOT	INTEGER			REFS	222	DEFINED	128				
0	NTP1	INTEGER		NTPS	REFS	29	185	DEFINED	60	I/O REFS	178	
11	NTP10	INTEGER		NTPS	REFS	29	DEFINED	69				
1	NTP2	INTEGER		NTPS	REFS	29	73	DEFINED	61			
2	NTP3	INTEGER		NTPS	REFS	29	191	DEFINED	62			
3	NTP4	INTEGER		NTPS	REFS	29	192	DEFINED	63			
4	NTP5	INTEGER		NTPS	REFS	29	DEFINED	64				
5	NTP6	INTEGER		NTPS	REFS	29	DEFINED	65				
6	NTP7	INTEGER		NTPS	REFS	29	DEFINED	66				
7	NTP8	INTEGER		NTPS	REFS	29	189	DEFINED	67			
10	NTP9	INTEGER		NTPS	REFS	29	190	DEFINED	68			
1074	NW	INTEGER			REFS	203	215	DEFINED	191	I/O REFS	208	
1050	NYAW	INTEGER			REFS	182	DEFINED	129				
1032	N1	INTEGER			REFS	177	198	DEFINED	94			
1027	N3	INTEGER			REFS	100	DEFINED	89				
1030	N4	INTEGER			REFS	175	DEFINED	89				
1033	N5	INTEGER			REFS	175	DEFINED	95	96			
1034	N6	INTEGER			REFS	175	DEFINED	97				
1031	N7	INTEGER			REFS	219	DEFINED	89				
17500	OMG	REAL	ARRAY	MODD	REFS	11	37					
241	PI	REAL		VARBLS	REFS	18	DEFINED	82				
10166	PV	REAL	ARRAY	VARBLS	REFS	18						
3426	P1	REAL	ARRAY	VARBLS	REFS	18						
5706	P2	REAL	ARRAY	VARBLS	REFS	18						
0	QMWT	REAL	ARRAY	FLUTQ	REFS	7	39	2*241				
310	QWT	REAL	ARRAY	FLUTQ	REFS	7	39	241				
1010	RHSTAP	INTEGER			REFS	50	203	215	DEFINED	192		
					I/O REFS	195						
40	RVBO	REAL	ARRAY	FLUTAN	REFS	8	38	166	250			
0	RO	REAL	ARRAY	BODY	REFS	30						
144	ROP	REAL	ARRAY	BODY	REFS	30						
1036	S	REAL			REFS	237	238	DEFINED	99			
11626	SDELX	REAL	ARRAY	VARBLS	REFS	18	222					
144	TS	REAL	ARRAY	P1GW	REFS	28						

VARIABLES	SN	TYPE		RELOCATION								
1	KPAGE	INTEGER		CLIST	REFS	44						
1011	KQINT	LOGICAL			REFS	52	166	167	247	DEFINED	76	77
					78							
242	KR	REAL		VARBLS	REFS	18	34	172	222	2*238		
					DEFINED	166	167	169				
243	KRDBR	REAL		VARBLS	REFS	18	34	DEFINED	172			
0	KTABLE	INTEGER		CTABLE	REFS	46	DEFINED	111	115			
5	KTABLO	INTEGER		CTABLE	REFS	46						
5	KTPAGE	INTEGER		CLIST	REFS	44						
3	K1IT1	REAL		DLM	REFS	33	36					
2	K1RT1	REAL		DLM	REFS	33	36					
0	K1O	REAL		DLM	REFS	33	36					
6	K1OT1	REAL		DLM	REFS	33	36					
5	K2IT2P	REAL		DLM	REFS	33	36					
4	K2RT2P	REAL		DLM	REFS	33	36					
1	K2O	REAL		DLM	REFS	33	36					
7	K2OT2P	REAL		DLM	REFS	33	36					
0	LC	INTEGER	ARRAY	COMA	REFS	9	40	77	78	94	96	102
					131	132	151	152	2*153	154	2*165	2*236
					250							
1056	LC12	INTEGER			REFS	146	DEFINED	145				
1037	LC2	INTEGER			REFS	229	239	240	244	245	250	
					DEFINED	102						
1102	LC8	INTEGER			REFS	237	238	DEFINED	235	236		
11754	LIM	INTEGER	ARRAY		REFS	10	222	DEFINED	3*130			
2	LINES	INTEGER		CLIST	REFS	44	103					
10	LINESG	INTEGER		CLIST	REFS	44						
3	LINEST	INTEGER		CLIST	REFS	44						
1014	LTAPE	INTEGER			REFS	202	203	204	211	212	215	
					DEFINED	70						
0	LTSHF	INTEGER		CTSHF	REFS	43						
1071	M	INTEGER			REFS	203	205	206	215	216		
					DEFINED	188						
1020	MD	* INTEGER			DEFINED	80						
1072	MM	INTEGER			REFS	203	215	DEFINED	189	I/O REFS	194	
360	MRK	INTEGER	ARRAY	BODY	REFS	30						
1016	MTAP	INTEGER			REFS	250	DEFINED	72	I/O REFS	75	148	245
1015	MTAP16	INTEGER			DEFINED	71	I/O REFS	74	228			
12454	NAMDUB	INTEGER	ARRAY		REFS	16	202	DEFINED	54			
12456	NAME	INTEGER	ARRAY		REFS	16	212					
1017	NAT	INTEGER			REFS	203	215	DEFINED	73	I/O REFS	196	
1	NB	INTEGER		VARBLS	REFS	18	2*127	136	179	222		
					DEFINED	89	183					
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	18	DEFINED	86				
1043	NBE	INTEGER			REFS	128	175	DEFINED	126	127		
310	NBEA	INTEGER	ARRAY	BODY	REFS	30	127					
1066	NBODY	INTEGER			REFS	183	DEFINED	179				
1041	NBOX	INTEGER			REFS	128	187	222	DEFINED	124		
1047	NBV	INTEGER			REFS	162	222	DEFINED	129			
17550	NC	INTEGER		MODD	REFS	37						
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	18						
0	NCNSM1	INTEGER		VARBLS	REFS	18	124					
3	NCOLS	INTEGER		CTABLE	REFS	46	DEFINED	110				
4	NCOLST	INTEGER		CTABLE	REFS	46						
1026	NCORE	INTEGER			REFS	175	DEFINED	89				
1070	ND	INTEGER			REFS	203	215	DEFINED	187			
3	NDATA	INTEGER		VARBLS	REFS	18	DEFINED	100				

VARIABLES		SN	TYPE		RELOCATION							
334	BGMA		REAL	ARRAY	BODY	REFS	30					
1035	BR		REAL			REFS	172	2*238	DEFINED	98		
237	B2		REAL		VARBLS	REFS	18	99	222	DEFINED	93	
12264	COEFB		REAL	ARRAY		REFS	12	122	175			
12202	COEFP		REAL	ARRAY		REFS	12	122	175			
50	CR		REAL		COMA	REFS	40	98				
0	CT1		REAL	ARRAY	P1GW	REFS	28					
62	CT2		REAL	ARRAY	P1GW	REFS	28					
372	CWIG		REAL	ARRAY	XYZ	REFS	24					
12446	DELY		REAL	ARRAY	VARBLS	REFS	18					
62	DELYS		REAL	ARRAY	XYZ	REFS	24					
226	DELZS		REAL	ARRAY	XYZ	REFS	24					
6200	DETAD		COMPLEX	ARRAY	MODD	REFS	3	37				
454	DUMMY		REAL	ARRAY	XYZ	REFS	24					
7346	EV		REAL	ARRAY	VARBLS	REFS	18	222				
10	E2		REAL		DLM	REFS	36					
310	FGAMMA		REAL	ARRAY	XYZ	REFS	24					
240	FL		REAL		VARBLS	REFS	18	222	DEFINED	88		
0	FMACH		REAL		FLUTAN	REFS	38	250				
1104	GENFM		COMPLEX	ARRAY		REFS	3	232	233	241	245	
						DEFINED	228	233	234	241		
1006	GENFT		COMPLEX			REFS	5	234	DEFINED	232		
13514	GGMA		REAL	ARRAY	VARBLS	REFS	18					
244	GMA		REAL	ARRAY	VARBLS	REFS	18					
1051	I		INTEGER			REFS	3*130	230	232	2*233	234	3*241	245
						DEFINED	130	229	239	244			
1	IFILES		INTEGER	ARRAY	CFILES	REFS	14	48	DEFINED	211			
1100	II		INTEGER			REFS	231	3*241	245	DEFINED	230	240	245
1101	III		INTEGER			REFS	232	2*233	234	DEFINED	231		
5	IQ		INTEGER		VARBLS	REFS	18	DEFINED	79	164			
6	IR		INTEGER		VARBLS	REFS	18						
1076	IRD	*	INTEGER			REFS	212						
1012	IRDU		INTEGER			REFS	202	DEFINED	58				
2	ITAPEP		INTEGER		COMRWP	REFS	42						
0	ITAPER		INTEGER		COMRWP	REFS	42	64	I/O REFS	88	89	129	130
						144							
0	ITAPES		INTEGER	ARRAY	CTAPES	REFS	14	41	60	61	62	63	66
						67	68	69	70	71	72		
7	ITAPET		INTEGER		CTABLE	REFS	46						
1	ITAPEW		INTEGER		COMRWP	REFS	42	65	105	107	I/O REFS	106	
1075	IWHICH		INTEGER			REFS	209	DEFINED	197	206	216		
1062	J		INTEGER			REFS	163	166	167	DEFINED	161		
1077	JCD	*	INTEGER			REFS	212						
1013	JCDU		INTEGER			REFS	202	DEFINED	59				
1040	JCUM		INTEGER			REFS	122	125					
1063	JRF		INTEGER			REFS	175	DEFINED	163				
7	JSPECS		INTEGER		VARBLS	REFS	18	DEFINED	129				
1024	K		INTEGER			REFS	86	DEFINED	85				
7	KBPAGE		INTEGER		CLIST	REFS	44						
1022	KD		INTEGER			REFS	203	215	DEFINED	83	186		
1023	KDO2		INTEGER			REFS	175	DEFINED	84				
0	KFILES		INTEGER		CFILES	REFS	48						
4	KLABEL		INTEGER		CLIST	REFS	44						
1055	KLUGLB		INTEGER			REFS	145	DEFINED	144				
0	KOUNT		INTEGER		CLIST	REFS	44	108	DEFINED	103	108		
11	KOUNTH		INTEGER		CLIST	REFS	44						

```
                      DO 6 I=2,LC2                                                    RODDEN    230
     230              II= I-1                                                         RODDEN    231
                      DO 6 III= 1,II                                                  RODDEN    232
                      GENFT= GENFM(I,III)                                             RODDEN    233
                      GENFM(I,III)= GENFM(III,I)                                      RODDEN    234
                    6 GENFM(III,I)= GENFT                                             RODDEN    235
     235              LC8  = 0                                                        RODDEN    236
                      IF (LC(1).EQ.2   OR   LC(33).NE.0)   LC8 = 1                    RODDEN    237
                      IF (LC8.NE.0) ACON = -S/24.                                     RODDEN    238
                      IF (LC8.EQ.0) ACON = -(S/12 )*(BR/12 )*(BR/12.)/(KR*KR*2.)      RODDEN    239
                      DO 202 I = 1,LC2                                                RODDEN    240
     240              DO 200  II=1,LC2                                                RODDEN    241
                      GENFM(I,II) = ACON * GENFM(I,II) * QMWT(II,1) * QMWT(I,1) * QWT(1) RODDEN  242
                  200 CONTINUE                                                        RODDEN    243
                  202 CONTINUE                                                        RODDEN    244
                      DO 203 I = 1,LC2                                                RODDEN    245
     245              203 WRITE (MTAP) (GENFM(I,II),II=1,LC2)                         RODDEN    246
                      160 CONTINUE                                                    RODDEN    247
                      IF(.NOT.KQINT) GO TO 2                                          RODDEN    248
                C                                                                     RODDEN    249
                C                          ********* QINTP *********                  RODDEN    250
     250              CALL QINTP (MTAP,LC2,LC(4),RVBO,NRVBO,FMACH,VBO)                RODDEN    251
                C                                                                     RODDEN    252
                C FORMATS                                                             RODDEN    253
                C                                                                     RODDEN    254
                   20 FORMAT  (4F10.0)                                                RODDEN    255
     255           47 FORMAT  (6(1X,3I3))                                           RODDEN    256
                   55 FORMAT  (10I5)                                                  RODDEN    257
                 1000 FORMAT (10X,51HSUBSONIC UNSTEADY AERODYNAMICS USING DOUBLET LATTIC RODDEN  258
                     1           ,19HE PROCEDURE                                      RODDEN    259
                     2       ,/10X,62(1H-))                                           RODDEN    260
     260         C                                                                    RODDEN    261
                     2 RETURN                                                         RODDEN    262
                       END                                                            RODDEN    263
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

209 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
1	RODDEN	1	261

VARIABLES	SN	TYPE		RELOCATION					
236	ACAP	REAL		VARBLS	REFS	18	222	DEFINED	88
1103	ACON	REAL			REFS	241	DEFINED	237	238
7304	AUGM	COMPLEX	*UNDEF		REFS	4			
0	B	COMPLEX	ARRAY	MODD	REFS	3	37		
1	BETA	REAL		FLUTAN	REFS	38			

```
                KRDBR = KR / BR                                                  RODDEN   173
          C                                                                      RODDEN   174
          C                          ********* GENQ  *********                  RODDEN   175
      175       CALL        GENQ(N4,N5,N6,NRF,JRF,NBE,      NMD,NMTP,NMTB,NCORE,  RODDEN   176
               1            KD02,YIN,ZIN,COEFP,COEFB)                           RODDEN   177
                IF (N1 EQ.1)  GO TO 152                                          RODDEN   178
                REWIND  NTP1                                                     RODDEN   179
                NBODY= NB                                                        RODDEN   180
      180       C                                                                RODDEN   181
          C                          ********* PART2 *********                  RODDEN   182
                CALL   PRT2 (NYAW,NBV)                                           RODDEN   183
                NB    = NBODY                                                    RODDEN   184
              152 CONTINUE                                                       RODDEN   185
      185       NI    = NTP1                                                     RODDEN   186
                KD = 2000                                                        RODDEN   187
                ND    = NBOX                                                     RODDEN   188
                M     = 0                                                        RODDEN   189
                MM    = NTP8                                                     RODDEN   190
      190       NO    = NTP9                                                     RODDEN   191
                NW    = NTP3                                                     RODDEN   192
                RHSTAP=NTP4                                                      RODDEN   193
                REWIND NI                                                        RODDEN   194
                REWIND MM                                                        RODDEN   195
      195       REWIND RHSTAP                                                    RODDEN   196
                REWIND NAT                                                       RODDEN   197
                IWHICH = 1                                                       RODDEN   198
                IF (N1.NE.0) GO TO 8000                                          RODDEN   199
          C                                                                      RODDEN   200
      200 C                          ********* QUAS  *********                  RODDEN   201
                NFILE  =  NFILE + 1                                              RODDEN   202
                CALL PUDLAB (8HRODDENO1,LTAPE,NAMDUB,NFILE,IRDU,JCDU)            RODDEN   203
                CALL QUAS (ND,M,KD,NI,MM,NO,NAT,NW,LTAPE,RHSTAP,NPR1,NFILE)      RODDEN   204
                CALL DCLOSE (LTAPE)                                              RODDEN   205
      205       IF( M .EQ. 0 ) GO TO 8000                                        RODDEN   206
                IF (M.EQ.NMD)      IWHICH=2                                      RODDEN   207
              450 CONTINUE                                                       RODDEN   208
                REWIND NW                                                        RODDEN   209
                GO TO (8000,9002),IWHICH                                         RODDEN   210
      210     8000 CONTINUE                                                      RODDEN   211
                IFILES(LTAPE)  =  NF + 1                                         RODDEN   212
                CALL GEDLAB (8HRODDENO1,LTAPE,NAME,NF,IRD,JCD)                   RODDEN   213
          C                                                                      RODDEN   214
          C                          ********* FUTSOL*********                  RODDEN   215
      215       CALL FUTSOL (ND,M,KD,NI,MM,NO,NAT,NW,LTAPE,NF,RHSTAP,NPR1)     RODDEN   216
                IF (M.EQ NMD)  IWHICH=2                                          RODDEN   217
                GO TO 450                                                        RODDEN   218
             9002 CONTINUE                                                       RODDEN   219
                IF (N7 EQ 0)  GO TO 160                                          RODDEN   220
      220       C                                                                RODDEN   221
          C                          ********* GENF  *********                  RODDEN   222
                CALL        GENF(NDELT,NB,NSTRIP,NBOX,NTOT,NBV,NSV,NMD,LIM,ACAP,FL, RODDEN   223
               1            B2,EV,Y,ZZ,SDELX,XIU,XOC,X,KR)                      RODDEN   224
          C                                                                      RODDEN   225
      225 C     TRANSPOSE GEN  AERO FORCES                                       RODDEN   226
          C     SCALE THE GEN  AERO  FORCES FROM AGARD CONVENTION TO THAT OF EIGM RODDEN   227
          C                                                                      RODDEN   228
                READ (MTAP16) GENFM                                              RODDEN   229
```

```
115                KTABLE =  2                                                    RODDEN   116
                   CALL PTABLE (2,18,18                                           RODDEN   117
                  1   HPROCEDURE (RODDEN))                                       RODDEN   118
                C                                                                 RODDEN   119
                C                                                                 RODDEN   120
120             C BASIC DATA CALCULATIONS                                         RODDEN   121
                C                                                                 RODDEN   122
                      CALL       PART1(JCUM,COEFP,COEFB,YIN,ZIN)                  RODDEN   123
                      CALL TIMEB (25,25HFROM RODDEN, AFTER PART1 )                RODDEN   124
                      NBOX = NCNSM1                                               RODDEN   125
125                   NSTRIP=JCUM                                                 RODDEN   126
                      NBE  = 0                                                    RODDEN   127
                      IF (NB.NE.0)  NBE=NBEA(NB)                                  RODDEN   128
                      NTOT = NBOX+NBE                                             RODDEN   129
                      READ (ITAPER,55)  NSTRIP, NPR1, JSPECS, NSV, NBV, NYAW      RODDEN   130
130                   READ (ITAPER,47)  (LIM(I,1), LIM(I,2), LIM(I,3),  I=1,NSTRIP)  RODDEN   131
                      NM = LC(2)                                                  RODDEN   132
                      NMD  =  LC(2)                                               RODDEN   133
                C                                                                 RODDEN   134
                C                          ********* MIDI ********                 RODDEN   135
135                   CALL MIDI (NM,NPOINT,NTBOX)                                 RODDEN   136
                      IF (NB.EQ.0) GO TO 5                                        RODDEN   137
                C                                                                 RODDEN   138
                C                          ********* BIDI *********               RODDEN   139
                      CALL BIDI (NM,NPOINT,NTBOX)                                 RODDEN   140
140                   CALL MERGE (NM,NTBOX)                                       RODDEN   141
                    5 CONTINUE                                                    RODDEN   142
                C                                                                 RODDEN   143
                C                          ********* GLOBAL ********              RODDEN   144
                      READ (ITAPER,55  ) KLUGLB                                   RODDEN   145
145                   LC12 = KLUGLB                                               RODDEN   146
                      CALL GLOBAL (LC12)                                          RODDEN   147
                C                                                                 RODDEN   148
                      REWIND MTAP                                                 RODDEN   149
                      NF = 0                                                      RODDEN   150
150                   NFILE = 0                                                   RODDEN   151
                      NRF = LC(4)                                                 RODDEN   152
                      IF(LC(1) .EQ. -1) GO TO 42                                  RODDEN   153
                      IF(LC(1) .EQ. 2  OR  LC(33) .EQ. 1) GO TO 43                RODDEN   154
                      IF (LC(13) EQ.1)  NRF = NRVBO                               RODDEN   155
155                   GO TO 42                                                    RODDEN   156
                   43 NRF = 1                                                     RODDEN   157
                   42 CONTINUE                                                    RODDEN   158
                C                                                                 RODDEN   159
                C     ****************** REDUCED FREQUENCY LOOP  ******************  RODDEN   160
160             C                                                                 RODDEN   161
                      DO 160  J=1,NRF                                             RODDEN   162
                      NF = NF + 1                                                 RODDEN   163
                      JRF  = J                                                    RODDEN   164
                      IQ   = 0                                                    RODDEN   165
165                   IF (LC(33) NE 0.OR.LC(1).EQ.2) GOTO 46                      RODDEN   166
                      IF (KQINT) KR = 1.0/RVBO(J)                                 RODDEN   167
                      IF (.NOT.KQINT) KR= 1.0/VBO(J)                              RODDEN   168
                      GO TO 48                                                    RODDEN   169
                   46 KR = 0.0                                                    RODDEN   170
170                   VBO(1) = 1.0E+10                                            RODDEN   171
                   48 CONTINUE                                                    RODDEN   172
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```
                      IRDU = 99999                                                    RODDEN     59
                      JCDU = 99999                                                    RODDEN     60
   60                 NTP1   =  ITAPES(21)                                            RODDEN     61
                      NTP2   =  ITAPES(32)                                            RODDEN     62
                      NTP3   =  ITAPES(23)                                            RODDEN     63
                      NTP4   =  ITAPES(22)                                            RODDEN     64
                      NTP5   =  ITAPER                                                RODDEN     65
   65                 NTP6   =  ITAPEW                                                RODDEN     66
                      NTP7   =  ITAPES(33)                                            RODDEN     67
                      NTP8   =  ITAPES(28)                                            RODDEN     68
                      NTP9   =  ITAPES(29)                                            RODDEN     69
                      NTP10  =  ITAPES(30)                                            RODDEN     70
   70                 LTAPE  =  ITAPES(31)                                            RODDEN     71
                      MTAP16 =  ITAPES(36)                                            RODDEN     72
                      MTAP   =  ITAPES(50)                                            RODDEN     73
                      NAT  = NTP2                                                     RODDEN     74
                      REWIND MTAP16                                                   RODDEN     75
   75                 REWIND MTAP                                                     RODDEN     76
                      KQINT = .FALSE.                                                 RODDEN     77
                      IF (LC(13).NE.0)  KQINT= .TRUE.                                 RODDEN     78
                      IF (LC(1).EQ.-1) KQINT = .TRUE.                                 RODDEN     79
                      IQ = 0                                                          RODDEN     80
   80                 MD   = 0                                                        RODDEN     81
                      NMD  = 0                                                        RODDEN     82
                      PI   = 3.14159265                                               RODDEN     83
                      KD   = 8000                                                     RODDEN     84
                      KD02  =  4000                                                   RODDEN     85
   85                 DO 109 K=1,50                                                   RODDEN     86
                  109 NBARAY(K)= 0                                                    RODDEN     87
                C                                                                     RODDEN     88
                      READ (ITAPER,20)  FL, ACAP                                      RODDEN     89
                      READ (ITAPER,55)  NDELT,NP,NB,NCORE,N3,N4,N7                    RODDEN     90
   90           C     FL = REFERENCE CHORD                                            RODDEN     91
                C     B2 = REFERENCE SEMI-SPAN                                        RODDEN     92
                C     ACAP = REFERENCE AREA                                           RODDEN     93
                      B2  =  12.                                                      RODDEN     94
                      N1  =  LC(22)                                                   RODDEN     95
   95                 N5  =  0                                                        RODDEN     96
                      IF (LC(22) .EQ.0)  N5  = 1                                      RODDEN     97
                      N6  = 1                                                         RODDEN     98
                      BR = 12. * CR                                                   RODDEN     99
                      S    = B2                                                       RODDEN    100
  100                 NDATA= N3                                                       RODDEN    101
                      NOPAN= NP                                                       RODDEN    102
                      LC2 = LC(2)                                                     RODDEN    103
                      KOUNT  =  LINES                                                 RODDEN    104
                      CALL TITLES (2)                                                 RODDEN    105
  105                 CALL PLB (1,1,ITAPEW)                                           RODDEN    106
                      WRITE (ITAPEW,1000)                                             RODDEN    107
                      CALL PLB (1,1,ITAPEW)                                           RODDEN    108
                      KOUNT  =  KOUNT + 4                                             RODDEN    109
                      NROWS  =  1                                                     RODDEN    110
  110                 NCOLS  =  0                                                     RODDEN    111
                      KTABLE =  2                                                     RODDEN    112
                      CALL PTABLE (1,52,52                                            RODDEN    113
                     1   HSUBSONIC UNSTEADY AERODYNAMICS USING DOUBLET LATTICE)      RODDEN    114
                      NROWS  =  0                                                     RODDEN    115
```

```
                535 CALL HEAD (LTSHF,TSHF,IROWS,JLIMIT)                          PART1  230
230                 GO TO (536, 537, 538), KHEAD                                 PART1  231
                536 WRITE(ITAPEW,210) ILOOP,NCNSM1,JLIMIT                        PART1  232
                537 CALL PLB (1,1,ITAPEW)                                        PART1  233
                538 WRITE (ITAPEW,172) JCL, (   PNU(JC), JC=JCL,JCU)             PART1  234
                    IF (KRETUR .LT. 3) GO TO 535                                 PART1  235
235             C                                                                PART1  236
                545 CALL HEAD (LTSHF,TSHF,IROWS,JLIMIT)                          PART1  237
                    GO TO (546, 547, 548), KHEAD                                 PART1  238
                546 WRITE(ITAPEW,215) ILOOP,NCNSM1,JLIMIT                        PART1  239
                547 CALL PLB (1,1,ITAPEW)                                        PART1  240
240             548 WRITE (ITAPEW,172) JCL, (   ZEE(JC), JC=JCL,JCU)             PART1  241
                    IF (KRETUR .LT. 3) GO TO 545                                 PART1  242
                    JCOUNT = J - JBEGIN - 1                                      PART1  243
                    JEND = J - 2                                                 PART1  244
                C                                                                PART1  245
245                 JCU    =  JBEGIN - 1                                         PART1  246
                    J3=1                                                         PART1  247
                    IR     = -1                                                  PART1  248
                    KRETUR = -3                                                  PART1  249
                555 CALL HEAD (LTSHF,TSHF,IROWS,JEND  )                          PART1  250
250                 GO TO (556, 557, 558), KHEAD                                 PART1  251
                556 WRITE(ITAPEW,390)ILOOP,JCOUNT                                PART1  252
                557 CALL PLB (1,1,ITAPEW)                                        PART1  253
                558 WRITE(ITAPEW,172)J3,(XIJ(JC),JC=JCL,JCU)                     PART1  254
                    J3=J3+KOLUMN                                                 PART1  255
255                 IF (KRETUR .LT. 3) GO TO 555                                 PART1  256
                C                                                                PART1  257
                    JBEGIN = JBEGIN + (NS-1)                                     PART1  258
                    NCM1   =  NCEND - 1                                          PART1  259
                    NSM1 = NSEND - 1                                             PART1  260
260                 DO 604 M = NCRUN,NCM1                                        PART1  261
                    DO 604 N = NSRUN,NSM1                                        PART1  262
                    J = M + NC * (N-1)                                           PART1  263
                    J1 = M + (NC-1) * (N-1)   NSOFAR                             PART1  264
                C ***                                                            PART1  265
265             C   INDEX J1 USED TO DISTINGUISH (NC BY NS) ARRAYS FROM (NC-1)X(NS-1)A-S PART1  266
                C ***                                                            PART1  267
                C     FINAL ARRAY SINGLE DIMENSION VALUES ARE STORED BY COLUMNS  PART1  268
                    K = (M+1) + NC * (N-1)                                       PART1  269
                    L = M + NC * N                                               PART1  270
270                 KL = (M+1) + NC * N                                          PART1  271
                    X(J1)=(1  / 8.) * (ZETA(J) + 3. * ZETA(K) + 3. * ZETA(KL)+ZETA(L)) PART1  272
                    Y(J1)= (1. / 2.) * (PNU(J) + PNU(L))                         PART1  273
                    ZZ(J1) = (ZEE(J)+ZEE(L))/2.                                  PART1  274
                    XA(J1)    =   X(J1)                                          PART1  275
275                 YA(J1)    =   Y(J1)                                          PART1  276
                    ZA(J1)    =  ZZ(J1)                                          PART1  277
                    Z1(J1)=(3./ 4.)* ZETA(J) + (1. / 4.) * ZETA(K)               PART1  278
                    Z2(J1)=(3./ 4.)* ZETA(L) + (1. / 4.) * ZETA(KL)              PART1  279
                    P1(J1)= PNU(J)                                               PART1  280
280                 P2(J1)= PNU(L)                                               PART1  281
                    ZZ1(J1)= ZEE(J)                                              PART1  282
                    ZZ2(J1)= ZEE(L)                                              PART1  283
                    EV(J1)= (Z1(J1)+ Z2(J1))/ 2.                                 PART1  284
                    PV(J1)= (P1(J1)+ P2(J1))/ 2.                                 PART1  285
285                 ZV(J1) = ZZ(J1)                                              PART1  286
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```
                DELY(J1)= ABS( P2(J1)- P1(J1))                                  PART1    287
                DELZ(J1) = ABS(ZZ2(J1)-ZZ1(J1))                                 PART1    288
                FNUM = ZETA(K) + ZETA(KL) - ZETA(J) - ZETA(L)                   PART1    289
                SDELX(J1)= FNUM / 2.                                            PART1    290
290           604 CONTINUE                                                      PART1    291
                J1 = JCUM + 1                                                   PART1    292
                J2 = JCUM + NSM1                                                PART1    293
                M = NSOFAR + 1                                                  PART1    294
                N = NSOFAR + NCM1                                               PART1    295
295             KT    = 0                                                       PART1    296
                JIX   = 0                                                       PART1    297
                DO 620 J = J1,J2                                                PART1    298
                JIX   = JIX+1                                                   PART1    299
                KT    = KT+1                                                    PART1    300
300             KTP1  = KT+1                                                    PART1    301
                TS(J) =(TAU(KT)+TAU(KTP1))/2.0                                  PART1    302
                DO 603 I=M,N                                                    PART1    303
                DELYS(J)= DELY(I)                                               PART1    304
                YS(J) = Y(I)                                                    PART1    305
305             DELZS(J)= DELZ(I)                                               PART1    306
                ZS(J) = ZZ(I)                                                   PART1    307
              603 CWIG(J) = CWIG(J) + SDELX(I)                                  PART1    308
                DO 610  IC= M, N                                                PART1    309
              610 XOC(IC) = (EV(IC)-XIJ(J  ))/CWIG(J)                           PART1    310
310             M = N + 1                                                       PART1    311
                FGAMMA(J)=GMA(ILOOP)                                            PART1    312
                FGGAM (J) = GGMA(ILOOP)                                         PART1    313
              620 N = N + NCM1                                                  PART1    314
                JCUM = J2                                                       PART1    315
315           C                                                                 PART1    316
                J3=1                                                            PART1    317
                JCU    =  J1 - 1                                                PART1    318
                IR     = -1                                                     PART1    319
                KRETUR = -3                                                     PART1    320
320           605 CALL HEAD (LTSHF,TSHF,IROWS,JCUM  )                           PART1    321
                GO TO (606, 607, 608), KHEAD                                    PART1    322
              606   WRITE(ITAPEW,330)ILOOP,NSM1                                 PART1    323
              607 CALL PLB (1,1,ITAPEW)                                         PART1    324
              608   WRITE(ITAPEW,172)J3,(CWIG(JC),JC=JCL,JCU)                   PART1    325
325             J3=J3+KOLUMN                                                    PART1    326
                IF (KRETUR .LT. 3) GO TO 605                                    PART1    327
              C                                                                 PART1    328
              630 NSOFAR = NSOFAR + NCNSM1                                      PART1    329
                DO 640 JY = 1,NSOFAR                                            PART1    330
330           640 DELY(JY) = SQRT(DELY(JY)**2 + DELZ(JY)**2)                    PART1    331
                NBA  = 0                                                        PART1    332
                DO 660  IX = 1,NOPAN                                            PART1    333
                NBARAY(IX) = NBA +(NCARAY(IX)-1)* (NSARAY(IX)-1)                PART1    334
              660 NBA = NBARAY(IX)                                              PART1    335
335             IF (LC(37) .EQ. 0) GOTO 11                                      PART1    336
              C                                                                 PART1    337
                KSAVE  =  KOLUMN                                                PART1    338
                KOLUMN =  KOLUMN*3                                              PART1    339
                KRETUR = -1                                                     PART1    340
340           615 CALL HEAD (LTSHF,TSHF,IROWS,NOPAN )                           PART1    341
                GO TO (616, 617, 618), KHEAD                                    PART1    342
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                  617 CALL PLB (1,1,ITAPEW)                                          PART1   344
                  618 WRITE (ITAPEW,173) JCL, (NBARAY(JC), JC=JCL,JCU)               PART1   345
345                   IF (KRETUR .LT. 3) GO TO 615                                   PART1   346
                      KOLUMN = KSAVE                                                 PART1   347
                C                                                                    PART1   348
                  625 CALL HEAD (LTSHF,TSHF,IROWS,NOPAN )                            PART1   349
                      GO TO (626, 627, 628), KHEAD                                   PART1   350
350               626 WRITE (ITAPEW,110) NOPAN                                       PART1   351
                  627 CALL PLB (1,1,ITAPEW)                                          PART1   352
                  628 WRITE (ITAPEW,172) JCL, (  GMAS(JC), JC=JCL,JCU)               PART1   353
                      IF (KRETUR .LT. 3) GO TO 625                                   PART1   354
                C                                                                    PART1   355
355                11 CONTINUE                                                       PART1   356
                      JLIMIT = NSOFAR                                                PART1   357
                      NCNSM1 = NSOFAR                                                PART1   358
                C                                                                    PART1   359
                      IF (LC(37) .EQ. 0) GOTO 12                                     PART1   360
360                   LSUB   =  20                                                   PART1   361
                      IF (KOUNT .GT. (LINES-LSUB)) KOUNT = LINES                     PART1   362
                      CALL TITLES (2)                                                PART1   363
                      KOUNT  =  KOUNT + LSUB                                         PART1   364
                      CALL PLB (1,1,ITAPEW)                                          PART1   365
365                   WRITE (ITAPEW,220) JLIMIT                                      PART1   366
                      CALL PLB (1,1,ITAPEW)                                          PART1   367
                C                                                                    PART1   368
                      LSUB   =  5                                                    PART1   369
                      IROWS  =  JLIMIT                                               PART1   370
370                   JCOLS  =  NLISTD + 1                                           PART1   371
                      KRETUR =  0                                                    PART1   372
                  635 CALL HEAD (LTSHF,TSHF,IROWS,JCOLS )                            PART1   373
                      GO TO (636, 637, 638), KHEAD                                   PART1   374
                  636 WRITE (ITAPEW,1000)                                            PART1   375
375               637 CALL PLB (1,1,ITAPEW)                                          PART1   376
                      WRITE (ITAPEW,1001) (JC, JC=JCL,JCU)                           PART1   377
                  638 CONTINUE                                                       PART1   378
                      IF (JCU .LT. JCOLS)                                            PART1   379
                     1WRITE (ITAPEW,1002) IR, (VAR(IR,IVAR(JC)), JC=JCL,JCU)         PART1   380
380                   JCU1   =  JCU - 1                                              PART1   381
                      JCU2   =  JCU - 2                                              PART1   382
                      IF (JCU .EQ. JCOLS)                                            PART1   383
                     1WRITE (ITAPEW,1002) IR, (VAR(IR,IVAR(JC)), JC=JCL,JCU2), XOC(IR)  PART1   384
                     2                      , VAR(IR,IVAR(JCU1))                    PART1   385
385                   IF (KRETUR .LT. 3) GO TO 635                                   PART1   386
                C                                                                    PART1   387
                   12 CONTINUE                                                       PART1   388
                C                                                                    PART1   389
                      IF (NB .EQ. 0) GO TO 910                                       PART1   390
390             C    INPUT BODY GEOMETRY                                             PART1   391
                      IY   = 0                                                       PART1   392
                      NBOX = JLIMIT                                                  PART1   393
                      I    = 0                                                       PART1   394
                      IP1  = 0                                                       PART1   395
395                   KCUM = 0                                                       PART1   396
                      JL1  = NBOX+1                                                  PART1   397
                      KL1  = NBOX+1                                                  PART1   398
                      DO 908 K=1,NB                                                  PART1   399
                      READ (ITAPER,10) XBO(K), YBO(K), ZBO(K)                        PART1   400
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400               READ (ITAPER,35)  ZSC,YSC,NF,NZ,NY,COEFF,MRK(K,1),MRK(K,2)          PART1    401
                  WRITE (ITAPEW,45)  K, YSC, ZSC, NY, NZ, COEFF,MRK(K,1),MRK(K,2)    PART1    402
                  NFM1 = NF-1                                                        PART1    403
                  READ (ITAPER, 10) (F(I),  I = 1,NF)                                PART1    404
                  READ (ITAPER, 10) (RAD(I),I = 1,NF)                                PART1    405
405               WRITE (ITAPEW,115) NF, K                                           PART1    406
                  WRITE (ITAPEW,170) ( F(I),  I = 1,NF)                              PART1    407
                  WRITE (ITAPEW,125) NF, K                                           PART1    408
                  WRITE (ITAPEW,170) (RAD(I), I = 1,NF)                              PART1    409
                  BGMA(K) = 0.0                                                      PART1    410
410               IF (NY.NE.0)  BGMA(K) = -PI/2.0                                    PART1    411
                  IF (NZ.NE.0.AND.NY.NE.0)  BGMA(K) = 0.0                            PART1    412
                  COEFB(K) = COEFF                                                   PART1    413
                  I    = 0                                                           PART1    414
                  IP1  = 0                                                           PART1    415
415               JL2  = JL1 + NFM1 - 1                                              PART1    416
                  KL2  = JL2                                                         PART1    417
                  DO 900 J=JL1,JL2                                                   PART1    418
                  KF   = J-NBOX                                                      PART1    419
                  I    = I+1                                                         PART1    420
420               IP1  = I+1                                                         PART1    421
                  X(J) = 0.5*(F(I) + F(IP1))                                         PART1    422
                  XA(J)    =   X(J)                                                  PART1    423
                  EV(J)= X(J)                                                        PART1    424
                  Y(J) = YSC                                                         PART1    425
425               YA(J)    =   Y(J)                                                  PART1    426
                  PV(J)= YSC                                                         PART1    427
                  ZZ(J)= ZSC                                                         PART1    428
                  ZA(J)    =  ZZ(J)                                                  PART1    429
                  ZV(J)= ZSC                                                         PART1    430
430               SDELX(J)= ABS(F(IP1)-F(I))                                         PART1    431
                  DELY(J) = 0.5*(RAD(I) + RAD(IP1))                                  PART1    432
                  RO(KF)  = DELY(J)                                                  PART1    433
                  ROP(KF) = (RAD(IP1) - RAD(I))/SDELX(J)                             PART1    434
              900 CONTINUE                                                           PART1    435
435               JL1  = JL2+1                                                       PART1    436
                  KCUM = KCUM + NFM1                                                 PART1    437
                  NBEA(K) = KCUM                                                     PART1    438
              908 CONTINUE                                                           PART1    439
                  WRITE (ITAPEW,135)  KCUM                                           PART1    440
440               WRITE (ITAPEW,170) (X( KL),    KL=KL1,KL2)                         PART1    441
                  WRITE (ITAPEW,145)  KCUM                                           PART1    442
                  WRITE (ITAPEW,170) (EV(KL),    KL=KL1,KL2)                         PART1    443
                  WRITE (ITAPEW,155)  KCUM                                           PART1    444
                  WRITE (ITAPEW,170) (Y( KL),    KL=KL1,KL2)                         PART1    445
445               WRITE (ITAPEW,165)  KCUM                                           PART1    446
                  WRITE (ITAPEW,170) (ZZ(KL),    KL=KL1,KL2)                         PART1    447
                  WRITE (ITAPEW,175)  KCUM                                           PART1    448
                  WRITE (ITAPEW,170) (SDELX(KL), KL=KL1,KL2)                         PART1    449
                  WRITE (ITAPEW,185)  KCUM                                           PART1    450
450               WRITE (ITAPEW,170) (DELY(KL),  KL=KL1,KL2)                         PART1    451
                  WRITE (ITAPEW,195) KCUM                                            PART1    452
                  WRITE (ITAPEW,170) (ROP(KF), KF = 1,KCUM)                          PART1    453
                  WRITE (ITAPEW,430)                                                 PART1    454
              910 CONTINUE                                                           PART1    455
455               NCNSM1 = JLIMIT                                                    PART1    456
              C                                                                      PART1    457
```

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      C                                                                       PART1    458
      C FORMATS                                                               PART1    459
      C                                                                       PART1    460
460       10 FORMAT  (6F10.0)                                                 PART1    461
          25 FORMAT  (2F10.0,1X,2I3,3X,F10.0)                                 PART1    462
          30 FORMAT (                                                         PART1    463
            1 10X,9HXCAP(1) =,F10.5,1H,,2X,9HYCAP(1) =,F10.5,1H,,2X,7HNC    =  PART1    464
            A,I3,/                                                            PART1    465
465         2,10X,9HXCAP(2) =,F10.5,1H,,2X,9HYCAP(2) =,F10.5,1H,,2X,7HNS    =  PART1    466
            B,I3,/                                                            PART1    467
            3,10X,9HXCAP(3) =,F10.5,1H,,2X,9HZCAP(1) =,F10.5,1H,,2X,7HNDELT =  PART1    468
            C,I3,/                                                            PART1    469
            4,10X,9HXCAP(4) =,F10.5,1H,,2X,9HZCAP(2) =,F10.5,1H,,2X,7HNOPAN =  PART1    470
470         5,I3)                                                             PART1    471
          35 FORMAT (2F10.0,1X,3I2,3X,F10.0,2I3)                              PART1    472
          40 FORMAT (10X,21HREFERENCE CHORD      = F10.5,2X,2HIN              PART1    473
            1      ./,10X,21HREFERENCE SEMI-SPAN = F10.5,2X,2HIN              PART1    474
            2      ./,10X,21HREFERENCE AREA      = F10.5,2X,5HIN**2           PART1    475
475         3      ./,10X,21HMACH NUMBER         = F10.5,                     PART1    476
            4      ./,10X,21HBETA                = F10.5 )                    PART1    477
          45 FORMAT (1HO,25X,12H*** BODY NO.,I4,18H  INPUT VALUES ***// 15X,  PART1    478
            1 32HCENTER OF BODY COORDINATES   Y =, F16.6,5X, 3HZ =, F16.6//15X, PART1    479
            2 7HYFLAG =,I3, 9H  ZFLAG =,I3,10X, 24HMODE SHAPE COEFFICIENT =,  PART1    480
480         3 F16.6//15X,17HBODY BOX LIMITS =,2I5//)                          PART1    481
          60 FORMAT (10X,22HINPUT VALUES FOR PANEL,I5)                        PART1    482
          80 FORMAT ( 10X,33HNUMBER OF ELEMENTS FOR ALL PANELS)               PART1    483
         110 FORMAT (10X,I4,2X30HDIHEDRAL ANGLES FOR ALL PANELS )             PART1    484
         115 FORMAT (1HO,40X,I4,27H BODY ELEMENTS FOR BODY NO., I4/)          PART1    485
485      120 FORMAT (10X, 5HPANEL,I4,2X,3HHAS,I4,22HZEE ELEMENTS - ZEE(I) )   PART1    486
         125 FORMAT (1HO,42X,I4,25H BODY RADII  FOR BODY NO.,   I4/)          PART1    487
         135 FORMAT (1HO,45X,I4,28H  X  ELEMENTS FOR ALL BODIES//)            PART1    488
         145 FORMAT (1HO,45X,I4,28H XIV ELEMENTS FOR ALL BODIES//)            PART1    489
         155 FORMAT (1HO,45X,I4,28H  Y  ELEMENTS FOR ALL BODIES//)            PART1    490
490      165 FORMAT (1HO,45X,I4,28H  Z  ELEMENTS FOR ALL BODIES//)            PART1    491
         170 FORMAT (1HO,6E20.8)                                              PART1    492
         172 FORMAT (10X, I5, 1P8E14.6 )                                      PART1    493
         173 FORMAT ( 10X, I5, 24I4)                                          PART1    494
         175 FORMAT (1HO,45X,I4,28H DX  ELEMENTS FOR ALL BODIES//)            PART1    495
495      180 FORMAT (10X, 5HPANEL,I4,2X,3HHAS,I4,28H CHORDWISE DIVISIONS - TH(I PART1    496
            1))                                                               PART1    497
         185 FORMAT (1HO,45X,I4,28H RAD ELEMENTS FOR ALL BODIES//)            PART1    498
         190 FORMAT (10X, 5HPANEL,I4,2X,3HHAS,I4,28H SPANWISE DIVISIONS - TAU(I PART1    499
            1))                                                               PART1    500
500      195 FORMAT (1HO,45X,I4,30H X-DERIV OF RAD FOR ALL BODIES//)          PART1    501
         200 FORMAT (10X,5HPANEL,I4,5H  HAS,I4,15H  ELEMENTS WITH,I4,         PART1    502
            1 10H VERTICES.,/,10X,40HTHE X COORDINATES OF THESE VERTICES ARE  ) PART1    503
         210 FORMAT (10X,5HPANEL,I4,5H  HAS,I4,15H  ELEMENTS WITH,I4,         PART1    504
            1 10H VERTICES.,/,10X,40HTHE Y COORDINATES OF THESE VERTICES ARE  ) PART1    505
505      215 FORMAT (10X,5HPANEL,I4,5H  HAS,I4,15H  ELEMENTS WITH,I4,         PART1    506
            1 10H VERTICES.,/,10X,40HTHE Z COORDINATES OF THESE VERTICES ARE  ) PART1    507
         220 FORMAT (10X,50HTHE FOLLOWING FIFTEEN VARIABLES ARE LISTED IN COLU PART1    508
            X           ,22HMN FORMAT AND CONTAIN                             PART1    509
            Y      ./,10X,17HTHE SAME NUMBER (,I3,10H) OF ITEMS               PART1    510
510         1      ./,10X,50HCOLUMN  1, X ELEMENTS FOR ALL PANELS - X(I)      PART1    511
            2      ./,10X,50HCOLUMN  2, XI-V ELEMENTS FOR ALL PANELS - EV(I)  PART1    512
            3      ./,10X,50HCOLUMN  3, XI-1 ELEMENTS FOR ALL PANELS - Z1(I)  PART1    513
            4      ./,10X,50HCOLUMN  4, XI-2 ELEMENTS FOR ALL PANELS - Z2(I)  PART1    514
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                5     ./,10X,50HCOLUMN  5, Y ELEMENTS FOR ALL PANELS - V(I)          PART1     515
515             6     ./,10X,50HCOLUMN  6, ETAV ELEMENTS FOR ALL PANELS   PV(I)     PART1     516
                7     ./,10X,50HCOLUMN  7, ETA1 ELEMENTS FOR ALL PANELS - P1(I)     PART1     517
                8     ./,10X,50HCOLUMN  8, ETA2 ELEMENTS FOR ALL PANELS - P2(I)     PART1     518
                9     ./,10X,50HCOLUMN  9, Z ELEMENTS FOR ALL PANELS - ZZ(I)        PART1     519
                A     ./,10X,50HCOLUMN 10, Z-V ELEMENTS FOR ALL PANELS - ZV(I)      PART1     520
520             B     ./,10X,50HCOLUMN 11, Z-1 ELEMENTS FOR ALL PANELS - ZZ1(I)     PART1     521
                C     ./,10X,50HCOLUMN 12, Z-2 ELEMENTS FOR ALL PANELS - ZZ2(I)     PART1     522
                D     ./,10X,51HCOLUMN 13, SDELX ELEMENTS FOR ALL PANELS - SDELX(I) PART1     523
                E     ./,10X,50HCOLUMN 14, XOC ELEMENTS FOR ALL PANELS - XOC(I)     PART1     524
                F     ./,10X,50HCOLUMN 15, BOX WIDTHS FOR ALL PANELS - DELY(I)    ) PART1     525
525          330 FORMAT (10X, 5HPANEL,I4,2X,3HHAS,I4,2X,22HC.WIGGLES - CWIG(I)   )  PART1     526
             350 FORMAT (10X,51HTHE FOLLOWING FIVE VARIABLES ARE LISTED IN COLUMN F PART1     527
                X           17HORMAT AND CONTAIN                                   PART1     528
                Y     ./,10X,17HTHE SAME NUMBER (,I3, 1OH) OF ITEMS                PART1     529
                1     ./,10X,41HCOLUMN 1,    Y-S FOR ALL STRIPS, YS(I)             PART1     530
530             2     ./,10X,41HCOLUMN 2, DELY-S FOR ALL STRIPS, DELYS(I)           PART1     531
                3     ./,10X,41HCOLUMN 3,    Z-S FOR ALL STRIPS, ZS(I)             PART1     532
                4     ./,10X,41HCOLUMN 4, DELZ-S FOR ALL STRIPS, DELZS(I)          PART1     533
                5     ./,10X,41HCOLUMN 5,    T-S FOR ALL STRIPS, TS(I)    )        PART1     534
             390 FORMAT (10X, 5HPANEL,I4,2X,3HHAS,I4,2X,22HXI-J ELEMENTS - XIJ(I)) PART1     535
535          430 FORMAT (10X,38HEND OF PART1 - BASIC DATA CALCULATIONS )            PART1     536
            1000 FORMAT (10X,61HBASIC GEOMETRIC DATA ASSOCIATED WITH ALL AERODYNAMI PART1     537
                1C ELEMENTS)                                                       PART1     538
            1001 FORMAT (10X,1X,4H ROW,2X,5HCOL =,1(  1I3,1X, 3(1H-))              PART1     539
                1                                 ,7(  1I4,1X, 9(1H-)))            PART1     540
540         1002 FORMAT (10X, I5, 1P8E14.6)                                        PART1     541
            2000 FORMAT (10X,51                                                    PART1     542
                1   HSURFACE AND BODY GEOMETRY AND ASSOCIATED PARAMETERS           PART1     543
                2      ,/10X,51(1H-))                                              PART1     544
               C                                                                   PART1     545
545             RETURN                                                             PART1     546
                END                                                                PART1     547
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CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

157	I		AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
167	I		AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
223	I		AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
230	I		AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
237	I		AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
250	I		AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
321	I		AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
341	I		AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
349	I		AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
373	I		AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 PART1 1 545

VARIABLES		SN	TYPE		RELOCATION								
236	ACAP		REAL		VARBLS	REFS	10	111					
3205	ATANA		REAL			REFS	176	177					
1	BETA		REAL		FLUTAN	REFS	20	111					
334	BGMA		REAL	ARRAY	BODY	REFS	30	DEFINED	409	410	411		
50	BR		REAL		COMA	REFS	32						
237	B2		REAL		VARBLS	REFS	10	111					
3202	COEF		REAL			REFS	204	DEFINED	172				
0	COEFB		REAL	ARRAY	F.P.	REFS	26	DEFINED	1	412			
3170	COEFF		REAL			REFS	126	127	401	412	DEFINED	125	400
0	COEFP		REAL	ARRAY	F.P.	REFS	26	DEFINED	1	126	127		
0	CT1		REAL	ARRAY	P1GW	REFS	19	DEFINED	133				
62	CT2		REAL	ARRAY	P1GW	REFS	19	DEFINED	134				
372	CWIG		REAL	ARRAY	XYZ	REFS	16	307	309	324	DEFINED	84	307
12446	DELY		REAL	ARRAY	VARBLS	REFS	10	303	330	432	450		
						DEFINED	286	330	431				
62	DELYS		REAL	ARRAY	XYZ	REFS	16	DEFINED	90	303			
6024	DELZ		REAL	ARRAY		REFS	24	305	330	DEFINED	81	287	
226	DELZS		REAL	ARRAY	XYZ	REFS	16	DEFINED	89	305			
3211	DEL1		REAL			REFS	204	DEFINED	185				
3210	DIFF21		REAL			REFS	185	DEFINED	184				
3207	DIFF31		REAL			REFS	204	DEFINED	183				
7346	EV		REAL	ARRAY	VARBLS	REFS	10	309	442	DEFINED	283	423	
6726	F		REAL	ARRAY		REFS	26	406	2*421	2*430	DEFINED	76	403
310	FGAMMA		REAL	ARRAY	XYZ	REFS	16	DEFINED	86	311			
454	FGGAM		REAL	ARRAY	XYZ	REFS	16	DEFINED	312				
240	FL		REAL		VARBLS	REFS	10	111					
0	FMACH		REAL		FLUTAN	REFS	20	111					
3234	FNUM		REAL			REFS	289	DEFINED	288				
3206	FOUR		REAL			REFS	204	DEFINED	182				
13514	GGMA		REAL	ARRAY	VARBLS	REFS	10	312	DEFINED	123			
3165	GGMAS		REAL			REFS	123	DEFINED	122				
244	GMA		REAL	ARRAY	VARBLS	REFS	10	181	311	DEFINED	74	177	179
						180							
3316	GMAS		REAL	ARRAY		REFS	24	352	DEFINED	75	181		
3157	I		INTEGER			REFS	72	73	74	75	76	78	79
						80	81	84	86	87	88	89	90
						147	149	215	216	303	304	305	306
						307	403	404	406	408	419	420	421
						430	431	433	DEFINED	71	77	83	85
						147	149	214	302	393	403	404	406
						408	413	419					
3241	IC		INTEGER			REFS	2*309	DEFINED	308				
3164	ILOOP		INTEGER			REFS	119	126	127	130	132	133	134
						140	141	158	168	177	179	180	2*181
						224	231	238	251	311	312	322	
						DEFINED	118						
3225	IPNC		INTEGER			REFS	216	DEFINED	215				
3253	IP1		INTEGER			REFS	421	430	431	433	DEFINED	394	414
						420							
5	IQ		INTEGER		VARBLS	REFS	10						
3	IR		INTEGER		CHEAD	REFS	40	2*378	4*382	DEFINED	154	164	220
						247	318						
6	IRD		INTEGER		VARBLS	REFS	10						

VARIABLES	SN	TYPE		RELOCATION							
3200 IROWS		INTEGER			REFS	156	166	222	229	236	249	320
						340	348	372	DEFINED	369		
3155 ITAPER		INTEGER			DEFINED	68	I/O REFS	122	124	125	147	149
						399	400	403	404			
0 ITAPES		INTEGER	ARRAY	CTAPES	REFS	28	33	68	69			
7 ITAPET		INTEGER		CTABLE	REFS	37						
3156 ITAPEW		INTEGER			REFS	97	99	113	121	136	159	169
						225	232	239	252	323	343	351	364
						366	375	DEFINED	69	I/O REFS	98	111	119
						137	158	160	168	170	224	226	231
						233	238	240	251	253	322	324	342
						344	350	352	365	374	376	378	382
						401	405	406	407	408	439	440	441
						442	443	444	445	446	447	448	449
						450	451	452	453				
3270 IVAR		INTEGER	ARRAY		REFS	5	378	2*382	DEFINED	54	55	56
						57	58	59	60	61	62	63	64
						65	66	67					
3244 IX		INTEGER			REFS	3*333	334	DEFINED	332				
3251 IY	*	INTEGER			DEFINED	391							
3214 J		INTEGER			REFS	204	206	208	216	217	242	243
						271	272	273	277	279	281	288	301
						303	304	305	306	2*307	2*309	311	312
						418	421	2*422	2*423	424	2*425	426	427
						2*428	429	430	431	432	433		
					DEFINED	188	213	217	262	297	417		
3161 JBEGIN		INTEGER			REFS	213	242	245	257	DEFINED	92	257	
3201 JC		INTEGER			REFS	160	170	226	233	240	253	324	
						344	352	376	378	382	DEFINED	160	170
						226	233	240	253	324	344	352	376
						378	382						
4 JCL		INTEGER		CHEAD	REFS	40	2*160	2*170	2*226	2*233	2*240	253	
						324	2*344	2*352	376	378	382		
3246 JCOLS		INTEGER			REFS	372	378	382	DEFINED	370			
3226 JCOUNT		INTEGER			REFS	251	DEFINED	242					
5 JCU		INTEGER		CHEAD	REFS	40	160	170	226	233	240	253	
						324	344	352	376	2*378	380	381	382
					DEFINED	153	163	219	245	317			
0 JCUM		INTEGER		F.P.	REFS	291	292	320	DEFINED	1	93	314	
3247 JCU1		INTEGER			REFS	382	DEFINED	380					
3250 JCU2		INTEGER			REFS	382	DEFINED	381					
3227 JEND		INTEGER			REFS	249	DEFINED	243					
3237 JIX		INTEGER			REFS	298	DEFINED	296	298				
3222 JLIMIT		INTEGER			REFS	212	222	224	229	231	236	238	
						365	369	392	455	DEFINED	210	356	
3255 JL1		INTEGER			REFS	415	417	DEFINED	396	435			
3265 JL2		INTEGER			REFS	416	417	435	DEFINED	415			
7 JSPECS		INTEGER		VARBLS	REFS	10							
3242 JY		INTEGER			REFS	3*330	DEFINED	329					
3233 J1		INTEGER			REFS	271	272	273	2*274	2*275	2*276	277	
						278	279	280	281	282	3*283	3*284	2*285
						3*286	3*287	289	297	317	DEFINED	263	291
3235 J2		INTEGER			REFS	297	314	DEFINED	292				
3230 J3		INTEGER			REFS	253	254	324	325	DEFINED	246	254	
						316	325						
3215 K		INTEGER			REFS	271	277	288	3*399	2*400	3*401	405	
						407	409	410	411	412	437		

VARIABLES	SN	TYPE		RELOCATION							
					DEFINED	192	268	398			
7	KBPAGE	INTEGER		CLIST	REFS	35					
3254	KCUM	INTEGER			REFS	436	437	439	441	443	445	447
					449	451	452	DEFINED	395	436		
3267	KF	INTEGER			REFS	432	433	452	DEFINED	418	452	
0	KHEAD	INTEGER		CHEAD	REFS	40	157	167	223	230	237	250
					321	341	349	373				
3217	KL	INTEGER			REFS	271	278	288	440	442	444	446
					448	450	DEFINED	200	270	440	442	444
					446	448	450					
4	KLABEL	INTEGER		CLIST	REFS	35						
3256	KL1	INTEGER			REFS	440	442	444	446	448	450	
					DEFINED	397						
3266	KL2	INTEGER			REFS	440	442	444	446	448	450	
					DEFINED	416						
2	KOLUMN	INTEGER		CHEAD	REFS	40	254	325	337	338		
					DEFINED	106	107	338	346			
0	KOUNT	INTEGER		CLIST	REFS	35	95	100	112	120	135	361
					363	DEFINED	95	100	112	120	135	361
					363							
11	KOUNTH	INTEGER		CLIST	REFS	35						
12	KOUNTI	INTEGER		CLIST	REFS	35						
1	KPAGE	INTEGER		CLIST	REFS	35						
242	KR	REAL		VARBLS	REFS	3	10					
243	KRDBR	REAL		VARBLS	REFS	3	10					
0	KREPOR	INTEGER		REPORT	REFS	39	107					
1	KRETUR	INTEGER		CHEAD	REFS	40	161	171	227	234	241	255
					326	345	353	385	DEFINED	155	165	221
					248	319	339	371				
3245	KSAVE	INTEGER			REFS	346	DEFINED	337				
3236	KT	INTEGER			REFS	299	300	301	DEFINED	295	299	
0	KTABLE	INTEGER		CTABLE	REFS	37	DEFINED	103				
5	KTABLO	INTEGER		CTABLE	REFS	37						
5	KTPAGE	INTEGER		CLIST	REFS	35						
3240	KTP1	INTEGER			REFS	301	DEFINED	300				
3216	L	INTEGER			REFS	271	272	273	278	280	282	288
					DEFINED	196	269					
0	LC	INTEGER	ARRAY	COMA	REFS	8	32	335	359			
3223	LIM1	INTEGER			REFS	214	219	DEFINED	211			
3224	LIM2	INTEGER			REFS	214	DEFINED	212				
2	LINES	INTEGER		CLIST	REFS	35	2*95	2*361				
10	LINESG	INTEGER		CLIST	REFS	35						
3	LINEST	INTEGER		CLIST	REFS	35						
3163	LOOP	INTEGER			REFS	118	3*122	123	DEFINED	116		
7	LSKIP	INTEGER		CHEAD	REFS	40	DEFINED	151				
6	LSUB	INTEGER		CHEAD	REFS	40	361	363	DEFINED	152	360	368
0	LTSHF	INTEGER		CTSHF	REFS	34	156	166	222	229	236	249
					320	340	348	372				
3212	M	INTEGER			REFS	188	192	196	200	2*204	262	263
					268	269	270	302	308	DEFINED	186	260
					293	310						
360	MRK	INTEGER	ARRAY	BODY	REFS	30	2*401	DEFINED	2*400			
3213	N	INTEGER			REFS	188	192	196	200	204	205	207
					262	263	268	269	270	302	308	310
					313	DEFINED	187	261	294	313		
1	NB	INTEGER		VARBLS	REFS	10	389	398				
3242	NBA	INTEGER			REFS	322	DEFINED	321	324			

VARIABLES	SN	TYPE		RELOCATION								
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	10	334	344	DEFINED	333		
310	NBEA	INTEGER	ARRAY	BODY	REFS	30	DEFINED	437				
3252	NBOX	INTEGER			REFS	396	397	418	DEFINED	392		
3167	NC	INTEGER			REFS	137	139	140	143	147	158	188
						192	196	200	210	214	215	262	263
						268	269	270	DEFINED	125		
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	10	333	DEFINED	140			
3175	NCEND	INTEGER			REFS	156	186	258	DEFINED	143		
3231	NCM1	INTEGER			REFS	260	294	313	DEFINED	258		
0	NCNSM1	INTEGER		VARBLS	REFS	10	224	231	238	328		
					DEFINED	139	357	455				
3	NCOLS	INTEGER		CTABLE	REFS	37	DEFINED	102				
4	NCOLST	INTEGER		CTABLE	REFS	37						
3174	NCRUN	INTEGER			REFS	153	186	260	DEFINED	142		
3	NDATA	INTEGER		VARBLS	REFS	10						
2	NDELT	INTEGER		VARBLS	REFS	10	137					
3154	NELEMD	INTEGER			REFS	53	DEFINED	52				
3261	NF	INTEGER			REFS	402	403	404	405	406	407	408
					DEFINED	400						
3264	NFM1	INTEGER			REFS	415	436	DEFINED	402			
3153	NLISTD	INTEGER			REFS	53	370	DEFINED	51			
4	NOPAN	INTEGER		VARBLS	REFS	10	116	137	332	340	348	350
6	NPAGE	INTEGER		CLIST	REFS	35						
6	NPAGEA	INTEGER		CTABLE	REFS	37						
1	NPASS	INTEGER		CTABLE	REFS	37						
2	NROWS	INTEGER		CTABLE	REFS	37	DEFINED	101				
57	NRVBO	INTEGER		FLUTAN	REFS	20						
3166	NS	INTEGER			REFS	137	139	141	145	149	168	210
					257	DEFINED	125					
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	10	333	DEFINED	141			
3177	NSEND	INTEGER			REFS	166	187	259	DEFINED	145		
3232	NSM1	INTEGER			REFS	261	292	322	DEFINED	259		
3160	NSOFAR	INTEGER			REFS	263	293	294	328	329	356	357
					DEFINED	91	115	328				
3176	NSRUN	INTEGER			REFS	163	187	261	DEFINED	144		
3263	NY	INTEGER			REFS	401	410	411	DEFINED	400		
3262	NZ	INTEGER			REFS	401	411	DEFINED	400			
241	PI	REAL		VARBLS	REFS	10	123	179	180	181	410	
					DEFINED	70						
4220	PNU	REAL	ARRAY		REFS	24	233	2*272	279	280		
					DEFINED	79	206					
3220	PNUP	REAL			REFS	206	DEFINED	205				
10166	PV	REAL	ARRAY	VARBLS	REFS	10	DEFINED	284	426			
3426	P1	REAL	ARRAY	VARBLS	REFS	10	284	286	DEFINED	279		
5706	P2	REAL	ARRAY	VARBLS	REFS	10	284	286	DEFINED	280		
6644	RAD	REAL	ARRAY		REFS	24	408	2*431	2*433	DEFINED	404	
40	RVBO	REAL	ARRAY	FLUTAN	REFS	20	23					
0	RO	REAL	ARRAY	BODY	REFS	30	DEFINED	432				
144	ROP	REAL	ARRAY	BODY	REFS	30	452	DEFINED	433			
11626	SDELX	REAL	ARRAY	VARBLS	REFS	10	307	433	448	DEFINED	289	430
3162	SMALL	REAL			REFS	175	DEFINED	114				
5742	TAU	REAL	ARRAY		REFS	24	170	204	205	207	2*301	
					DEFINED	73	149					
5660	TH	REAL	ARRAY		REFS	24	160	2*204	DEFINED	72	147	
144	TS	REAL	ARRAY	P1GW	REFS	19	DEFINED	301				
1	TSHF	REAL	ARRAY	CTSHF	REFS	6	34	156	166	222	229	236
					249	320	340	348	372			

VARIABLES	SN	TYPE	RELOCATION								
326	VAR	REAL	ARRAY	VARBLS	REFS	7	42	53	378	2*382	
2	VBO	REAL	ARRAY	FLUTAN	REFS	20	23				
326	X	REAL	ARRAY	VARBLS	REFS	10	42	274	422	423	440
					DEFINED	271	421				
0	XA	REAL	ARRAY	MODV	REFS	21	DEFINED	274	422		
430	XBO	REAL	ARRAY	BODY	REFS	30	DEFINED	399			
3306	XCAP	REAL	ARRAY		REFS	24	128	2*133	2*134	4*137	4*182 2*183
					2*184	DEFINED	4*124				
620	XIJ	REAL	ARRAY	XXZ	REFS	18	253	309	DEFINED	216	
0	XOC	REAL	ARRAY	XXZ	REFS	18	382	DEFINED	309		
13266	XO	REAL	ARRAY	VARBLS	REFS	10	DEFINED	122			
3171	X1	REAL			REFS	204	DEFINED	128			
1146	Y	REAL	ARRAY	VARBLS	REFS	10	275	304	425	444	
					DEFINED	272	424				
620	YA	REAL	ARRAY	MODV	REFS	21	DEFINED	275	425		
454	YBO	REAL	ARRAY	BODY	REFS	30	DEFINED	399			
3312	YCAP	REAL	ARRAY		REFS	24	129	2*137	2*173	DEFINED	2*124
3203	YDIF	REAL			REFS	175	176	205	DEFINED	173	
0	YIN	REAL	ARRAY	F.P.	REFS	27	DEFINED	1	130		
0	YS	REAL	ARRAY	XYZ	REFS	16	DEFINED	87	304		
3260	YSC	REAL			REFS	401	424	426	DEFINED	400	
13350	YO	REAL	ARRAY	VARBLS	REFS	10	DEFINED	122			
3172	Y1	REAL			REFS	130	206	DEFINED	129		
1440	ZA	REAL	ARRAY	MODV	REFS	21	DEFINED	276	428		
500	ZBO	REAL	ARRAY	BODY	REFS	30	DEFINED	399			
3314	ZCAP	REAL	ARRAY		REFS	24	131	2*137	2*174	DEFINED	2*125
3204	ZDIF	REAL			REFS	176	180	207	DEFINED	174	
5040	ZEE	REAL	ARRAY		REFS	24	240	2*273	281	282	
					DEFINED	80	208				
3221	ZEEP	REAL			REFS	208	DEFINED	207			
3173	ZEE1	REAL			REFS	132	208	DEFINED	131		
3152	ZERO	REAL			REFS	53	DEFINED	50			
3400	ZETA	REAL	ARRAY		REFS	24	2*216	226	4*271	2*277	2*278 4*288
					DEFINED	78	204				
0	ZIN	REAL	ARRAY	F.P.	REFS	27	DEFINED	1	132		
144	ZS	REAL	ARRAY	XYZ	REFS	16	DEFINED	88	306		
3257	ZSC	REAL			REFS	401	427	429	DEFINED	400	
11006	ZV	REAL	ARRAY	VARBLS	REFS	10	DEFINED	285	429		
1766	ZZ	REAL	ARRAY	VARBLS	REFS	10	276	285	306	428	446
					DEFINED	273	427				
4246	ZZ1	REAL	ARRAY	VARBLS	REFS	10	287	DEFINED	281		
6526	ZZ2	REAL	ARRAY	VARBLS	REFS	10	287	DEFINED	282		
13432	ZO	REAL	ARRAY	VARBLS	REFS	10	DEFINED	122			
2606	Z1	REAL	ARRAY	VARBLS	REFS	10	283	DEFINED	277		
5066	Z2	REAL	ARRAY	VARBLS	REFS	10	283	DEFINED	278		

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES							
ATAN3		3	176							
DVALUE		3	53							
HEAD		4	156	166	222	229	236	249	320	340 348
			372							
PLB		3	97	99	113	121	136	159	169	225 232
			239	252	323	343	351	364	366	375
PROGNA		2	94							
PTABLE		3	104							
SQRT	REAL	1 LIBRARY	330							

EXTERNALS TYPE ARGS REFERENCES

TITLES		1	96	117	362

INLINE FUNCTIONS TYPE ARGS DEF LINE REFERENCES

ABS	REAL	1	INTRIN	175	286	287	430
MINOF	INTEGER	2	SF	46			

STATEMENT LABELS DEF LINE REFERENCES

2316	10	FMT		460	122	124	147	149	399	403	404		
1137	11			355	335								
1267	12			387	359								
2320	25	FMT		461	125								
2324	30	FMT		462	137								
2355	35	FMT		471	400								
2361	40	FMT		472	111								
2406	45	FMT		477	401								
2434	60	FMT		481	119								
2441	80	FMT		482	342								
2447	110	FMT		483	350								
2455	115	FMT		484	405								
2463	120	FMT	NO REFS	485									
2471	125	FMT		486	407								
2477	135	FMT		487	439								
2505	145	FMT		488	441								
2513	155	FMT		489	443								
2521	165	FMT		490	445								
2527	170	FMT		491	406	408	440	442	444	446	448	450	452
2532	172	FMT		492	160	170	226	233	240	253	324	352	
2535	173	FMT		493	344								
2540	175	FMT		494	447								
2546	180	FMT		495	158								
2555	185	FMT		497	449								
2563	190	FMT		498	168								
2572	195	FMT		500	451								
2600	200	FMT		501	224								
2614	210	FMT		503	231								
2630	215	FMT		505	238								
2644	220	FMT		507	365								
3007	330	FMT		525	322								
3016	350	FMT	NO REFS	526									
3063	390	FMT		534	251								
3072	430	FMT		535	453								
0	450		INACTIVE	71									
0	460			76	71								
0	470			82	77								
0	480			84	83								
0	490			90	85								
234	505			156	161								
246	506			158	157								
250	507			159	157								
252	508			160	157								
266	515			166	171								
300	516			168	167								
302	517			169	167								
304	518			170	167								
437	525			222	227								
451	526			224	223								
453	527			225	223								

STATEMENT LABELS			DEF LINE	REFERENCES	
455	528		226	223	
466	535		229	234	
500	536		231	230	
502	537		232	230	
504	538		233	230	
332	540		179	175	
515	545		236	241	
527	546		238	237	
531	547		239	237	
533	548		240	237	
336	550		181	178	
553	555		249	255	
565	556		251	250	
567	557		252	250	
571	558		253	250	
0	560		209	186	187
0	570		217	214	
0	603		307	302	
0	604		290	260	261
773	605		320	326	
1006	606		322	321	
1010	607		323	321	
1012	608		324	321	
0	610		309	308	
1057	615		340	345	
1071	616		342	341	
1073	617		343	341	
1075	618		344	341	
0	620		313	297	
1110	625		348	353	
1122	626		350	349	
1124	627		351	349	
1126	628		352	349	
0	630		328	116	
1164	635		372	385	
1176	636		374	373	
1200	637		375	373	
1213	638		377	373	
0	640		330	329	
0	660		334	332	
0	900		434	417	
0	908		438	398	
1532	910		454	389	
3100	1000	FMT	536	374	
3110	1001	FMT	538	376	
3117	1002	FMT	540	378	382
3122	2000	FMT	541	98	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
41	460	I	71 76	4B	INSTACK	
51	470	I	77 82	4B	INSTACK	
60	480	I	83 84	2B	INSTACK	
66	490	I	85 90	4B	INSTACK	
135	630	LOOP	116 328	674B		EXT REFS NOT INNER
352	560	M	186 209	41B		NOT INNER
366	560	N	187 209	22B	OPT	

LOOPS	LABEL	INDEX	FROM	TO	LENGTH	PROPERTIES
612	604	M	260	290	738	NOT INNER
624	604	N	261	290	558	OPT
715	620	J	297	313	518	NOT INNER
731	603	I	302	307	108	OPT
750	610	IC	308	309	48	INSTACK
1032	640	JY	329	330	78	EXT REFS
1045	660	IX	332	334	58	INSTACK
1206		JC	376	376	48	EXT REFS
1221		JC	378	378	128	EXT REFS
1244		JC	382	382	128	EXT REFS
1276	908	K	398	438	1368	EXT REFS NOT INNER
1401	900	J	417	434	238	OPT

COMMON BLOCKS	LENGTH	MEMBERS - BIAS	NAME	(LENGTH)							
VARBLS	6014	0	NCNSM1	(1)	1	NB	(1)	2	NDELT	(1)	
		3	NDATA	(1)	4	NOPAN	(1)	5	IQ	(1)	
		6	IRD	(1)	7	JSPECS	(1)	8	NCARAY	(50)	
		58	NSARAY	(50)	108	NBARAY	(50)	158	ACAP	(1)	
		159	B2	(1)	160	FL	(1)	161	PI	(1)	
		162	KR	(1)	163	KRDBR	(1)	164	GMA	(50)	
		214	X	(400)	614	Y	(400)	1014	ZZ	(400)	
		1414	Z1	(400)	1814	P1	(400)	2214	ZZ1	(400)	
		2614	Z2	(400)	3014	P2	(400)	3414	ZZ2	(400)	
		3814	EV	(400)	4214	PV	(400)	4614	ZV	(400)	
		5014	SDELX	(400)	5414	DELY	(400)	5814	XO	(50)	
		5864	YO	(50)	5914	ZO	(50)	5964	GGMA	(50)	
XYZ	350	0	YS	(50)	50	DELYS	(50)	100	ZS	(50)	
		150	DELZS	(50)	200	FGAMMA	(50)	250	CWIG	(50)	
		300	FGGAM	(50)							
XXZ	450	0	XOC	(400)	400	XIJ	(50)				
P1GW	150	0	CT1	(50)	50	CT2	(50)	100	TS	(50)	
FLUTAN	48	0	FMACH	(1)	1	BETA	(1)	2	VBO	(30)	
		32	RVBO	(15)	47	NRVBO	(1)				
MODV	1200	0	XA	(400)	400	YA	(400)	800	ZA	(400)	
BODY	340	0	RO	(100)	100	ROP	(100)	200	NBEA	(20)	
		220	BGMA	(20)	240	MRK	(40)	280	XBO	(20)	
		300	YBO	(20)	320	ZBO	(20)				
COMA	41	0	LC	(40)	40	BR	(1)				
CTAPES	50	0	ITAPES	(50)							
CTSHF	2	0	LTSHF	(1)	1	TSHF	(1)				
CLIST	11	0	KOUNT	(1)	1	KPAGE	(1)	2	LINES	(1)	
		3	LINEST	(1)	4	KLABEL	(1)	5	KTPAGE	(1)	
		6	NPAGE	(1)	7	KBPAGE	(1)	8	LINESG	(1)	
		9	KOUNTH	(1)	10	KOUNTI	(1)				
CTABLE	8	0	KTABLE	(1)	1	NPASS	(1)	2	NROWS	(1)	
		3	NCOLS	(1)	4	NCOLST	(1)	5	KTABLG	(1)	
		6	NPAGEA	(1)	7	ITAPET	(1)				
REPORT	1	0	KREPOR	(1)							
CHEAD	8	0	KHEAD	(1)	1	KRETUR	(1)	2	KOLUMN	(1)	
		3	IR	(1)	4	JCL	(1)	5	JCU	(1)	
		6	LSUB	(1)	7	LSKIP	(1)				

EQUIV CLASSES	LENGTH	MEMBERS - BIAS	NAME	(LENGTH)							
NCNSM1 X	5600	0	VAR	(5600)	400	Y	(400)	800	ZZ	(400)	
		1200	Z1	(400)	1600	P1	(400)	2000	ZZ1	(400)	
		2400	Z2	(400)	2800	P2	(400)	3200	ZZ2	(400)	
		3600	EV	(400)	4000	PV	(400)	4400	ZV	(400)	

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      C                                                                 MODAL   344
            YY(NFB) =  X(J)                                             MODAL   345
345         B(NFB) = EV(J)                                              MODAL   346
            LL(NFB) = J                                                 MODAL   347
          8 CONTINUE                                                    MODAL   348
            IF (NFB.EQ.0)  GO TO 120                                    MODAL   349
            CALL HELGA (B,AN,NFB,50,XAT,DEFL,NPT,NPL,50,0,0)            MODAL   350
350         DO 99 J = 1,NFB                                             MODAL   351
            LLL = LL(J)                                                 MODAL   352
            IF (ABS(AN(J,1)) .LE. 1.0E-05) AN(J,1) = 0.0                MODAL   353
            L1L = LLL - NTBOX                                           MODAL   354
         99 BQ(L1L) = SDELX(LLL)*DELY(LLL)*AN(J,1) / B22                MODAL   355
355         CALL HELGA (YY,AN,NFB,50,XAT,DEFL,NPT,NPL,50,0.1)           MODAL   356
            DO 9 J = 1,NFB                                              MODAL   357
            LLL = LL(J)                                                 MODAL   358
            IF (ABS(AN(J,1)) .LE. 1.0E-05) AN(J,1) = 0.0                MODAL   359
            IF (ABS(AN(J,2)) .LE  1.0E-07) AN(J,2) = 0.0                MODAL   360
360         L1L = LLL - NTBOX                                           MODAL   361
            H(L1L)  = AN(J,1)                                           MODAL   362
            DH1(L1L)= AN(J,2) * B2                                      MODAL   363
      C                                                                 MODAL   364
      C LIST INTERPOLATED MODE SHAPES                                   MODAL   365
365   C                                                                 MODAL   366
            IF (KLNN .EQ. 0) GO TO 310                                  MODAL   367
            CALL TITLES (2)                                             MODAL   368
            IF (KOUNT .EQ. KOUNTS) GO TO 200                            MODAL   369
            IF (KOUNT .GT. KOUNTH) GO TO 250                            MODAL   370
370       200 CONTINUE                                                  MODAL   371
            KOUNTS = -1                                                 MODAL   372
            IF ((LINES-KOUNT) .LT. 4) KOUNT = LINES                     MODAL   373
            CALL TITLES (2)                                             MODAL   374
            WRITE (ITAPEW,2300)                                         MODAL   375
375         CALL PLB (1,1,ITAPEW)                                       MODAL   376
            KOUNT  =  KOUNT + 3                                         MODAL   377
          250 CONTINUE                                                  MODAL   378
            KOUNT  =  KOUNT + 1                                         MODAL   379
            WRITE (ITAPEW,2500) LLL, X(LLL), Y(LLL), H(L1L), DH1(L1L)   MODAL   380
380       310 CONTINUE                                                  MODAL   381
            9 CONTINUE                                                  MODAL   382
          120 CONTINUE                                                  MODAL   383
      C                                                                 MODAL   384
            CALL RNRW (ITAPE, BQ,NBOXS)                                 MODAL   385
385         CALL RNRW (ITAPE,  H,NBOXS)                                 MODAL   386
          570 CALL RNRW (ITAPE,DH1,NBOXS)                               MODAL   387
            REWIND MTAP16                                               MODAL   388
      C                                                                 MODAL   389
      C                                                                 MODAL   390
390   C FORMATS                                                         MODAL   391
      C                                                                 MODAL   392
      C                                                                 MODAL   393
         50 FORMAT (20X,16HCONTROL SURFACES/)                           MODAL   394
         51 FORMAT (//3X,24HTERMINAL POINTS OF LINE ,I5,2X,13HIN INCHES ARE/ MODAL   395
395        1          6X,4HX(1),9X,4HY(1),9X,4HX(2),9X,4HY(2)/         MODAL   396
           2          4(2X,E12.5)/)                                    MODAL   397
         52 FORMAT ( 3X,23HNO. OF POINTS ON LINE =,I5/                  MODAL   398
           1         3X,37HCOORDINATES OF POINTS (IN INCHES) ARE/      MODAL   399
           2         3X,5HINDEX,9X,4HX,15X,4HY/)                       MODAL   400
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```
                      CALL PLB (1,1,ITAPEW)                                    MODAL    287
                      KOUNT  =  KOUNT +4                                       MODAL    288
                      KOUNTS = KOUNT                                           MODAL    289
                      NROWS  =  0                                              MODAL    290
290                   NCOLS  =  2                                              MODAL    291
                      KTABLE =  2                                              MODAL    292
                      CALL PTABLE (2,58,TITLE)                                 MODAL    293
                    100 CONTINUE                                               MODAL    294
                     11 CALL RNRW (-MTAP16,A,LPT)                              MODAL    295
295                 C                                                          MODAL    296
                    C     SEARCH ALL NEW KNOWN POINTS, SELECTING THOSE WITH THE SAME Y AS  MODAL    297
                    C     THE PANEL IN QUESTION.  THESE BECOME THE KNOWN POINTS CHORDWISE.  MODAL    298
                    C                                                          MODAL    299
                      NSB = 0                                                  MODAL    300
300                   R = 0.0                                                  MODAL    301
                      IU = 1                                                   MODAL    302
                      YU(1) = 0.0                                              MODAL    303
                      DO 120 I = 1,NBOXS                                       MODAL    304
                      MBOX    = NTBOX + I                                      MODAL    305
305                   YS      = Y(MBOX)                                        MODAL    306
                      IF (YS.EQ.R) GO TO 120                                   MODAL    307
                      DO 301 NU = 1,IU                                         MODAL    308
                      RU = YU(NU)                                              MODAL    309
                      IF (YS.EQ.RU) GO TO 120                                  MODAL    310
310                  301 CONTINUE                                              MODAL    311
                      IU = IU + 1                                              MODAL    312
                      YU(IU) = YS                                              MODAL    313
                      NSB = NSB + 1                                            MODAL    314
                      R       = YS                                             MODAL    315
315                   IF ( .NOT. WILK )       GO TO 36                         MODAL    316
                      DO 32 II = 1,NCF                                         MODAL    317
                      IF (R.GE.Y1(II).AND.R.LE.Y2(II)) GO TO 36                MODAL    318
                     32 CONTINUE                                               MODAL    319
                      GO TO 120                                                MODAL    320
320                   36 NPT      =  0                                         MODAL    321
                      DO 5 J = 1,LPT                                           MODAL    322
                      IF (YX(J) .NE. R) GO TO 5                                MODAL    323
                      NPT = NPT + 1                                            MODAL    324
                      XAT(NPT) = XX(J)                                         MODAL    325
325                   DEFL (NPT,1) =  A(J)                                     MODAL    326
                      5 CONTINUE                                               MODAL    327
                      NGPI = NPT                                               MODAL    328
                      NPL = MINO (4,NPT)                                       MODAL    329
                    C                                                          MODAL    330
330                 C     SEARCH ALL PANELS, SELECTING  THOSE WHERE Y=R. THESE BECOME THE  MODAL    331
                    C     UNKNOWNS CHORDWISE.  NFB COUNTS THESE UNKNOWNS.      MODAL    332
                    C                                                          MODAL    333
                      NFB = 0                                                  MODAL    334
                      DO 8 II    = 1,NBOXS                                     MODAL    335
335                   J = NTBOX + II                                           MODAL    336
                      IF  (Y(J) .NE. R) GO TO 8                                MODAL    337
                       IF  (.NOT.WILK)   GO TO 35                              MODAL    338
                      IF (X(J) .LT. XC(NSB)) GO TO 8                           MODAL    339
                     35 NFB = NFB + 1                                          MODAL    340
340                 C                                                          MODAL    341
                    C     YY - RECEIVING POINT                                 MODAL    342
                    C     R - SENDING POINT                                    MODAL    343
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                  DO 30 II= 1,NCF                                                  MODAL     230
230               IF (YS.GE.Y1(II).AND.YS.LE Y2(II)) GO TO 31                      MODAL     231
                 30 CONTINUE                                                       MODAL     232
                  GO TO 876                                                        MODAL     233
                 31 NFP     = NFP + 1                                             MODAL     234
                  YY(NFP) = YS                                                     MODAL     235
235              876 R       = YS                                                 MODAL     236
                  IF ( NFP  EQ. 0 )  GO TO 875                                     MODAL     237
                  CALL HELGA (YY,AN,NFP,50,XAT,DEFL,NGPI,NGPL,50,0,0)              MODAL     238
               C                                                                   MODAL     239
               C     THE INTERPOLATION IS DONE; THE RESULTING DEFLECTIONS ARE AN.  MODAL     240
240            C     NPT IS THE SUM OF NFP OVER ALL NLINES.                       MODAL     241
               C     THESE POINTS NOW BECOME THE KNOWN POINTS. X'S ARE CALCULATED.MODAL     242
               C                                                                  MODAL     243
                  DO 6 LM = 1,NFP                                                  MODAL     244
                  NPT = NPT + 1                                                    MODAL     245
245               IF (M.GT.1) GO TO 7                                              MODAL     246
                  YX(NPT) = YY(LM)                                                 MODAL     247
                   R      =    YX (NPT)                                          MODAL     248
                  XX(NPT) = XTERM1(KL) + (R-YTERM1(KL))*ZEL(KL)                    MODAL     249
                 7 A(NPT) = AN(LM,1)                                               MODAL     250
250               IF (ABS( A(NPT))  .LE. 1.0E-07)  A(NPT)   = 0.0                  MODAL     251
                 6 CONTINUE                                                        MODAL     252
               875 CONTINUE                                                        MODAL     253
                  LPT    =    NPT                                                 MODAL     254
                  CALL RNRW(MTAP16,A,LPT)                                          MODAL     255
255              150 CONTINUE                                                      MODAL     256
                  REWIND MTAP49                                                    MODAL     257
                  REWIND MTAP16                                                    MODAL     258
               C                                                                   MODAL     259
               C     CHORDWISE INTERPLOATION                                       MODAL     260
260            C                                                                   MODAL     261
                  KDEG = NICH                                                      MODAL     262
                  IF (KLNN .EQ. 0) GO TO 123                                       MODAL     263
                  CALL TITLES(2)                                                   MODAL     264
                  CALL PLB (1,2,ITAPEW)                                            MODAL     265
265               WRITE (ITAPEW,4000)                                              MODAL     266
                  CALL PLB (1,1,ITAPEW)                                            MODAL     267
                  KOUNT  =  KOUNT + 5                                              MODAL     268
                  NROWS  =  1                                                      MODAL     269
                  NCOLS  =  0                                                      MODAL     270
270               KTABLE =  2                                                      MODAL     271
                  CALL PTABLE (2,51,51                                             MODAL     272
                 1   HINTERPOLATED MODES FOR PRIMARY AND CONTROL SURFACES)        MODAL     273
               123 CONTINUE                                                        MODAL     274
                  DO 570 M=1,NMODES                                                MODAL     275
275               IF (KLNN .EQ. 0) GO TO 100                                       MODAL     276
                  REWIND ITAP18                                                    MODAL     277
                  IF (KSURFT .EQ. 1) WRITE (ITAP18,2000) NSURF, M                  MODAL     278
                  IF (KSURFT .EQ. 2) WRITE (ITAP18,2050) NSURF, M                  MODAL     279
                  REWIND ITAP18                                                    MODAL     280
280               READ (ITAP18,3000) TITLE                                         MODAL     281
                  IF ((LINES-KOUNT)  .LT. 4) KOUNT = LINES                         MODAL     282
                  CALL TITLES (2)                                                  MODAL     283
                  CALL PLB (1,2,ITAPEW)                                            MODAL     284
                  IF (KSURFT .EQ. 1) WRITE (ITAPEW,2100) NSURF, M                  MODAL     285
285               IF (KSURFT .EQ. 2) WRITE (ITAPEW,2150) NSURF, M                  MODAL     286
```

```
                17 CONTINUE                                                          MODAL    173
                24 IF  (M.NE.NMODES) JB = JB - NGPO                                  MODAL    174
                   NPOINT = JB                                                       MODAL    175
175                IF (NMPT.EQ.0) GO TO 20                                           MODAL    176
              C                                                                      MODAL    177
              C     PRINTOUT DEFLECTIONS AT GIVEN POINTS.                            MODAL    178
              C                                                                      MODAL    179
              C                                                                      MODAL    180
180           C                                                                      MODAL    181
                   DO 60 J = 1,NLINES                                                MODAL    182
                   NGPI = NGP(J)                                                     MODAL    183
                   DO 60 K = 1,NGPI                                                  MODAL    184
              C                                                                      MODAL    185
185                LINE = LINE + 1                                                   MODAL    186
                   IF (LINE.GT.50) LINE = 0                                          MODAL    187
                   IF (LINE.NE.0) GO TO 60                                           MODAL    188
                   WRITE (ITAPEW,400) NF                                             MODAL    189
                   WRITE (ITAPEW,450) M                                              MODAL    190
190             60 WRITE (ITAPEW,82) J , K , DEF(K,J)                                MODAL    191
              C                                                                      MODAL    192
              C                                                                      MODAL    193
                20 NPT = 0                                                           MODAL    194
              C                                                                      MODAL    195
195           C     SPANWISE INTERPOLATION ALONG GIVEN LINES                         MODAL    196
              C                                                                      MODAL    197
                   DO 875 KL=1,NLINES                                                MODAL    198
                   NGPI=NGP(KL)                                                      MODAL    199
              C                                                                      MODAL    200
200           C     ASSIGN ARGUMENTS AND DEFLECTIONS AT GIVEN POINTS.                MODAL    201
              C                                                                      MODAL    202
                   DO 22 I = 1,NGPI                                                  MODAL    203
                   XAT(I) = YGP(I,KL)                                                MODAL    204
                22 DEFL(I,1) = DEF(I,KL)                                             MODAL    205
205                NGPL = MINO (4,NGPI)                                              MODAL    206
                   NFP = 0                                                           MODAL    207
              C                                                                      MODAL    208
              C     SEARCH PANEL Y'S PICKING OUT THOSE THAT FALL ON A                MODAL    209
              C     PANEL OF THE GIVEN LINE.  THE SELECTED POINTS ARE NUMBERED NFP.  MODAL    210
210           C     ASSUMES PANELS ARE ARRANGED BY CHORD.                            MODAL    211
              C                                                                      MODAL    212
                        R      =   0.0                                               MODAL    213
                   IU = 1                                                            MODAL    214
                   YU(1) = 0.0                                                       MODAL    215
215                DO 876   MM  =  1,NBOXS                                           MODAL    216
                   MBOX    = NTBOX + MM                                              MODAL    217
                   YS      = Y(MBOX)                                                 MODAL    218
                   IF (YS.EQ.R)                          GO TO 876                   MODAL    219
                   DO 300 NU = 1,IU                                                  MODAL    220
220                RU = YU(NU)                                                       MODAL    221
                   IF (YS.EQ.RU) GO TO 876                                           MODAL    222
                300 CONTINUE                                                         MODAL    223
                   IU = IU + 1                                                       MODAL    224
                   YU(IU) = YS                                                       MODAL    225
225                R = YS                                                            MODAL    226
                   IF (R.LT.YTERM1(KL))                  GO TO 876                   MODAL    227
                   IF (R.GT.YTERM2(KL))                  GO TO 876                   MODAL    228
                   IF ( NOT WT(K)                        GO TO 31                    MODAL    229
```

```
                     ZEL(I)  = (XTERM2(I)-XTERM1(I)) / (YTERM2(I)-YTERM1(I))
                     NGPI=NGP(I)
                     DO 10 J=1,NGPI
                     LINE = LINE + 1
                     IF (NMPT.EQ.0) GO TO 18
                     WRITE (ITAPEW,718) J,XGP(J,I),YGP(J,I)
                  18 CONTINUE
                  10 CONTINUE
                   1 CONTINUE
               C
               C     INTERPOLATE TO GET INTERMEDIATE DEFL. ON GIVEN LINES
               C
                     KDEG = NISP
                     REWIND MTAP49
                     DO 150 M=1,NMODES
                     CALL RNRW (-MTAP49,QZ,NC)
                     LINE = 0
                     IF (NMPT.EQ.0) GO TO 862
                     WRITE (ITAPEW,400) NF
                     WRITE (ITAPEW,450) M
                 862 JB = NPOINT
                     IF (NELAXS.NE.0) GO TO 12
               C
               C     PICK OUT DEFLECTIONS AT GIVEN POINTS.
               C
                     DO 15 K = 1,NLINES
                     JB = JB + 1
                     NGPI = NGP(K)
                     IF (K.EQ.1) GO TO 16
                     NGPX = NGP(K-1)
                     IF (XGP(1,K).EQ.XGP(NGPX,K-1).AND.YGP(1,K).EQ.YGP(NGPX,K-1))
                    1  JB = JB - 1
                  16 DEF(1,K) = QZ(JB)
                     DO 15 L = 2,NGPI
                     JB = JB + 1
                     DEF(L,K) = QZ(JB)
                  15 CONTINUE
                     GO TO 24
               C
               C     PICK OUT DEFLECTIONS AT GIVEN POINTS FOR AE CASE.
               C
                  12 NZLIN = NLINES / 2
                     DO 17 K = 1,NZLIN
                     JB = JB + 1
                     NGPI = NGP(K)
                     IF (K.EQ.1) GO TO 19
                     NGPX = NGP(K-1)
                     IF (XGP(1,K).EQ.XGP(NGPX,K-1).AND.YGP(1,K).EQ.YGP(NGPX,K-1))
                    1   JB = JB - 2
                  19 DEF(1,K) = QZ(JB)
                     JB = JB + 1
                     DEF(1,K+NZLIN) = DEF(1,K) + QZ(JB) * DIST
                     DO 17 L = 2,NGPI
                     JB = JB + 1
                     DEF(L,K) = QZ(JB)
                     JB = JB + 1
```

```
      C     READ IN 'LINES' DATA AND DETERMINE X + Y OF GIVEN POINTS: XGP,YGP
      C
   60       B22 = B2*B2
            READ (ITAPER, 83) NLINES, NELAXS, NICH, NISP
            NGPTOT=0
            DO 1082 I=1,NLINES
            READ (ITAPER,62) NGP(I),XTERM1(I),YTERM1(I),XTERM2(I),YTERM2(I)
   65       NGPTOT=NGPTOT + NGP(I)
            NGPI=NGP(I)
            DEL=(XTERM2(I)-XTERM1(I))/(YTERM2(I)-YTERM1(I))
            YTM1 = YTERM1(I)
            XTM1 = XTERM1(I)
   70       READ (ITAPER,63)(YGP(J,I),J=1,NGPI)
            YTM2 = YTERM2(I)
            XTM2 = XTERM2(I)
            DO 1083 JK =1,NGPI
            XGP(JK,I) = (YGP(JK,I) - YTM1)*DEL + XTM1
   75       XGP1 = YGP(JK,I)
            IF (XGP1.EQ.YTM2) XGP(JK,I) = XTM2
         1083 CONTINUE
         1082 CONTINUE
      C
   80 C     FORM CREATES A SECOND SET OF POINTS ON A LINE PARALLEL TO THE AE.
      C
            KEL=0
            IF (NELAXS.EQ.1) CALL FORM (NLINES,KEL,NGPTOT,NGPI,XGP,YGP,NGP)
            NLIN=NLINES-1
   85       NGPO=NGPTOT
      C
      C     COUNT THE INTERSECTION OF TWO GIVEN LINES ONLY ONCE
      C
            DO 77 K=1,NLIN
   90       NGPL=NGP(K)
            IF(XGP(NGPL,K).EQ.XGP(1,K+1).AND.YGP(NGPL,K).EQ.YGP(1,K+1))
           1 NGPO=NGPO-1
           77 CONTINUE
      C
   95       IF (NMPT.EQ.0) GO TO 2
            WRITE (ITAPEW,400) NF
            IF ( WILK )   WRITE (ITAPEW,50)
            LINE  =   9 + NGP(1)
            IF ( WILK )        LINE = LINE + 16
  100       WRITE (ITAPEW,70) NGPTOT,NLINES,NMODES
           2 CONTINUE
      C
      C     CALCULATE SLOPES OF GIVEN LINES 'ZEL' AND PRINTOUT GIVEN POINTS.
      C
  105       DO 1 I=1,NLINES
            IF (NMPT.EQ.0) GO TO 3
            IF ( I .EQ. 1 )    GO TO 13
            LINE  =  LINE + 9 + NGP(I)
            IF ( LINE .LT. 55 )     GO TO 13
  110       LINE = 9 + NGP(I)
            WRITE (ITAPEW,400)  NF
           13 WRITE (ITAPEW,51) I,XTERM1(I),YTERM1(I),XTERM2(I),YTERM2(I)
            WRITE (ITAPEW,52)   NGP(I)
            3 CONTINUE
```

```
      C                                                                 MODAL      2
            SUBROUTINE MODAL (NF,NMODES,ITAPE,WILK,NPOINT,NBOXS,NTBOX)  MODAL      3
      C                                                                 MODAL      4
            INTEGER YES                                                 MODAL      5
      CIBM                                                              MODAL      6
      C     DIMENSION TITLE(18)                                         MODAL      7
      CIBM                                                              MODAL      8
      CCDC                                                              MODAL      9
            DIMENSION TITLE(8)                                          MODAL     10
      CCDC                                                              MODAL     11
            DIMENSION        NGP(20) ,   XTERM1(20) ,   XTERM2(20)      MODAL     12
            DIMENSION     XGP(12,20) ,   YTERM1(20) ,   YTERM2(20)      MODAL     13
            DIMENSION     YGP(12,20) ,       A(400) ,       LL(50)      MODAL     14
            DIMENSION         B(50)  ,     ZEL(20) ,       YY(50)      MODAL     15
            DIMENSION     DEF(12,20) ,     XAT(50) ,   DEFL(50,2)      MODAL     16
            DIMENSION AN(50,2),BQ(400),DH1(400),H(400),XX(400),YU(400),YX(400) MODAL 17
            DIMENSION ITAPES(50)                                        MODAL     18
            DIMENSION QZ(220)                                           MODAL     19
            DIMENSION WW(40,40), OMG(40)                                MODAL     20
      C                                                                 MODAL     21
            LOGICAL WILK                                                MODAL     22
      C                                                                 MODAL     23
            COMPLEX  C(40,40), DETAD(40,40)                             MODAL     24
      C                                                                 MODAL     25
            COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IR,JSPECS,  MODAL     26
           1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,  MODAL 27
           2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),  MODAL 28
           3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),  MODAL     29
           4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),  MODAL   30
           5                 XO(50),YO(50),ZO(50),GGMA(50)             MODAL     31
            COMMON /MODD  / C, DETAD, WW, OMG, NC                       MODAL     32
            COMMON/JUNK/XTERM1,XTERM2,YTERM1,YTERM2,DIST                MODAL     33
            COMMON /KMP/ NMPT , KLNN                                    MODAL     34
            COMMON /CNTRL/ X1(5), X2(5), Y1(5), Y2(5), XC(050), NCF     MODAL     35
            COMMON /CHSP/ KDEG                                          MODAL     36
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                        MODAL     37
            COMMON /COMSTS/ NO     ,YES                                 MODAL     38
            COMMON /CLIST / KOUNT ,KPAGE ,LINES ,LINEST,KLABEL,KTPAGE,NPAGE  MODAL 39
           1               ,KBPAGE,LINESG,KOUNTH,KOUNTI                 MODAL     40
            COMMON /CTABLE/ KTABLE,NPASS ,NROWS ,NCOLS ,NCOLST,KTABLO,NPAGEA  MODAL 41
           1               ,ITAPET                                      MODAL     42
            COMMON / CTAPES / ITAPES                                    MODAL     43
      C                                                                 MODAL     44
      C                                                                 MODAL     45
      C INITIAL CONDITIONS                                              MODAL     46
      C                                                                 MODAL     47
            CALL PROGNA (4H(MOD, 4HAL ))                                MODAL     48
            NSURF  =  NF                                                MODAL     49
            KOUNT  =  LINES                                             MODAL     50
            IF (.NOT. WILK) KSURFT = 1                                  MODAL     51
            IF (      WILK) KSURFT = 2                                  MODAL     52
            ITAP18 =  ITAPES(18)                                        MODAL     53
            MTAP16 =  ITAPES(36)                                        MODAL     54
            REWIND MTAP16                                               MODAL     55
            MTAP49 =  ITAPES(49)                                        MODAL     56
      C                                                                 MODAL     57
      C                                                                 MODAL     58
```

```
VARIABLES      SN  TYPE          RELOCATION
 6526  ZZ2        REAL      ARRAY    VARBLS      REFS      7
13432  ZO         REAL      ARRAY    VARBLS      REFS      7
 2606  Z1         REAL      ARRAY    VARBLS      REFS      7
 5066  Z2         REAL      ARRAY    VARBLS      REFS      7
       VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS          TYPE   ARGS      REFERENCES
       HELP                 7           51        54
       MODAL                7           45        52
       RNRW                 3           69        73

STATEMENT LABELS            DEF LINE   REFERENCES
    0  1                        57         38
    0  2                        74         63
    0  3                        73         64
    0  4                        71         66        70
    0  5                        78         76
  232  700      FMT             84         39

LOOPS  LABEL    INDEX     FROM-TO    LENGTH    PROPERTIES
   26  1        I           38 57       55B             EXT REFS
  104  2        N           63 74       26B             EXT REFS  NOT INNER
  105  3        J           64 73       23B             EXT REFS  NOT INNER
  107  4        I           66 71       13B             EXT REFS
  133  5        I           76 78        7B             EXT REFS

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       VARBLS     6014              0 NCNSM1 (1)          1 NB     (1)          2 NDELT  (1)
                                    3 NDATA  (1)          4 NOPAN  (1)          5 IQ     (1)
                                    6 IR     (1)          7 JSPECS (1)          8 NCARAY (50)
                                   58 NSARAY (50)       108 NBARAY (50)       158 ACAP   (1)
                                  159 B2     (1)        160 FL     (1)        161 PI     (1)
                                  162 KR     (1)        163 KRDBR  (1)        164 GMA    (50)
                                  214 X      (400)      614 Y      (400)      1014 ZZ    (400)
                                 1414 Z1     (400)     1814 P1     (400)      2214 ZZ1   (400)
                                 2614 Z2     (400)     3014 P2     (400)      3414 ZZ2   (400)
                                 3814 EV     (400)     4214 PV     (400)      4614 ZV    (400)
                                 5014 SDELX  (400)     5414 DELY   (400)      5814 XO    (50)
                                 5864 YO     (50)      5914 ZO     (50)      5964 GGMA  (50)
       COMA          41              0 LC     (40)       40 BR     (1)
       KMP            2              0 NMPT   (1)         1 KLNN   (1)
       CTAPES        50              0 ITAPES (50)
       COMRWP         3              0 ITAPER (1)          1 ITAPEW (1)          2 ITAPEP (1)

STATISTICS
  PROGRAM LENGTH                1147B      615
  CM LABELED COMMON LENGTH     13736B     6110
        520000B CM USED
```

VARIABLES	SN	TYPE		RELOCATION								
					67	68	77	DEFINED	38	66	76	
242	IBTAPE	INTEGER			REFS	42	53	67	77	DEFINED	25	
5	IQ	INTEGER		VARBLS	REFS	7						
6	IR	INTEGER		VARBLS	REFS	7						
244	ISTAPE	INTEGER			REFS	73	DEFINED	31	32	I/O REFS	33	79
250	ITAPE	INTEGER			REFS	45	51	54	69	DEFINED	42	43
					53	67	77	I/O REFS	44	56	78	
2	ITAPEP	INTEGER		COMRWP	REFS	16						
0	ITAPER	INTEGER		COMRWP	REFS	16	I/O REFS	39				
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	6	15	23	24	25	31	
1	ITAPEW	INTEGER		COMRWP	REFS	16						
252	J	INTEGER			REFS	70	DEFINED	64				
253	JB	INTEGER			REFS	69	71	72	73	DEFINED	65	71
					72							
7	JSPECS	INTEGER		VARBLS	REFS	7						
1	KLNN	INTEGER		KMP	REFS	14	DEFINED	29				
242	KR	INTEGER		VARBLS	REFS	7						
243	KRDBR	INTEGER		VARBLS	REFS	7						
236	KSURF	LOGICAL			REFS	18	43	44	49	50	51	52
					54	DEFINED	39					
0	LC	INTEGER	ARRAY	COMA	REFS	5	13	28	29	30		
243	LC3	INTEGER			REFS	38	66	76	DEFINED	30		
240	MTAP15	INTEGER			REFS	52	DEFINED	23	I/O REFS	50		
241	MTAP34	INTEGER			REFS	32	43	DEFINED	24			
251	N	* INTEGER			DEFINED	63						
1	NB	INTEGER		VARBLS	REFS	7	32					
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	7						
246	NBOXS	INTEGER			REFS	40	45	51	52	54	55	69
					71	DEFINED	39	68				
254	NBX	INTEGER	ARRAY		REFS	17	68	DEFINED	40			
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	7						
0	NCNSM1	INTEGER		VARBLS	REFS	7						
247	NCS	INTEGER			REFS	51	54	DEFINED	39			
3	NDATA	INTEGER		VARBLS	REFS	7						
2	NDELT	INTEGER		VARBLS	REFS	7						
0	NM	INTEGER		F.P.	REFS	45	51	52	54	63		
					DEFINED	4						
0	NMPT	INTEGER		KMP	REFS	14	DEFINED	28				
4	NOPAN	INTEGER		VARBLS	REFS	7						
0	NPOINT	INTEGER		F.P.	REFS	45	52	DEFINED	4	27		
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	7						
0	NTBOX	INTEGER		F.P.	REFS	45	51	52	54	55		
					DEFINED	4	26	55				
241	PI	REAL		VARBLS	REFS	7						
10166	PV	REAL	ARRAY	VARBLS	REFS	7						
3426	P1	REAL	ARRAY	VARBLS	REFS	7						
5706	P2	REAL	ARRAY	VARBLS	REFS	7						
11626	SDELX	REAL	ARRAY	VARBLS	REFS	7						
237	WILK	LOGICAL			REFS	18	45	52	DEFINED	41	49	
326	X	REAL	ARRAY	VARBLS	REFS	7						
312	XI	REAL	ARRAY		REFS	17	69	73				
13266	XO	REAL	ARRAY	VARBLS	REFS	7						
1146	Y	REAL	ARRAY	VARBLS	REFS	7						
13350	YO	REAL	ARRAY	VARBLS	REFS	7						
11006	ZV	REAL	ARRAY	VARBLS	REFS	7						
1766	ZZ	REAL	ARRAY	VARBLS	REFS	7						

```
                C                                                                  MIDI       59
                C                                                                  MIDI       60
      60        C PRINT MODE SHAPES (DEFLECTIONS AND SLOPES) IN DIGITAL FORMAT.  ONE MIDI       61
                C SURFACE AND ONE MODE PER PAGE.                                   MIDI       62
                C                                                                  MIDI       63
                      DO 2 N = 1,NM                                                MIDI       64
                      DO 3 J = 1,3                                                 MIDI       65
      65              JB = 1                                                       MIDI       66
                      DO 4 I = 1,LC3                                               MIDI       67
                      ITAPE  =  IBTAPE + I                                         MIDI       68
                      NBOXS = NBX(I)                                               MIDI       69
                      CALL RNRW (-ITAPE,XI(JB),NBOXS)                              MIDI       70
      70              IF  (J.EQ.1)  GOTO 4                                         MIDI       71
                    4 JB = JB + NBOXS                                              MIDI       72
                      JB = JB - 1                                                  MIDI       73
                    3 CALL RNRW (ISTAPE,XI,JB)                                     MIDI       74
                    2 CONTINUE                                                     MIDI       75
      75        C                                                                  MIDI       76
                      DO 5 I = 1,LC3                                               MIDI       77
                      ITAPE  =  IBTAPE + I                                         MIDI       78
                    5 REWIND ITAPE                                                 MIDI       79
                      REWIND ISTAPE                                                MIDI       80
      80        C                                                                  MIDI       81
                C                                                                  MIDI       82
                C FORMATS                                                          MIDI       83
                C                                                                  MIDI       84
                  700 FORMAT (L5,2I5)                                              MIDI       85
      85        C                                                                  MIDI       86
                      RETURN                                                       MIDI       87
                      END                                                          MIDI       88
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

70 I 4 THIS IF DEGENERATES INTO A SIMPLE TRANSFER TO THE LABEL INDICATED.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES

3 MIDI 4 86

VARIABLES	SN	TYPE		RELOCATION							
236 ACAP		REAL		VARBLS	REFS	7					
50 BR		REAL		COMA	REFS	13					
237 B2		REAL		VARBLS	REFS	7					
12446 DELY		REAL	ARRAY	VARBLS	REFS	7					
7346 EV		REAL	ARRAY	VARBLS	REFS	7					
240 FL		REAL		VARBLS	REFS	7					
13514 GGMA		REAL	ARRAY	VARBLS	REFS	7					
244 GMA		REAL	ARRAY	VARBLS	REFS	7					
245 I		INTEGER			REFS	40	42	45	51	52	53	54

```
      C                                                                 MIDI        2
      C     NMPT    LIST MODAL INPUT DATA                               MIDI        3
      C     NPOINT  LIST MODAL OUTPUT DATA                              MIDI        4
            SUBROUTINE MIDI (NM,NPOINT,NTBOX)                           MIDI        5
            DIMENSION  LC(40)                                           MIDI        6
            DIMENSION ITAPES(50)                                        MIDI        7
            COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IR,JSPECS,  MIDI        8
           1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,  MIDI  9
           2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),  MIDI  10
           3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),  MIDI  11
           4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),  MIDI  12
           5                 XO(50),YO(50),ZO(50),GGMA(50)             MIDI        13
            COMMON / COMA  / LC, BR                                     MIDI        14
            COMMON /KMP/ NMPT,KLNN                                      MIDI        15
            COMMON / CTAPES /ITAPES                                     MIDI        16
            COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                        MIDI        17
            DIMENSION NBX(30), XI(400)                                  MIDI        18
            LOGICAL KSURF, WILK                                         MIDI        19
      C                                                                 MIDI        20
      C                                                                 MIDI        21
      C INITIAL CONDITIONS                                              MIDI        22
      C                                                                 MIDI        23
            MTAP15 =  ITAPES(35)                                        MIDI        24
            MTAP34 =  ITAPES(34)                                        MIDI        25
            IBTAPE =  ITAPES(40)                                        MIDI        26
            NTBOX  = 0                                                  MIDI        27
            NPOINT = 0                                                  MIDI        28
            NMPT = LC(23)                                               MIDI        29
            KLNN = LC(24)                                               MIDI        30
            LC3 = LC(3)                                                 MIDI        31
            ISTAPE =  ITAPES(27)                                        MIDI        32
            IF (NB .NE. 0) ISTAPE = MTAP34                              MIDI        33
            REWIND ISTAPE                                               MIDI        34
      C                                                                 MIDI        35
      C                                                                 MIDI        36
      C PRIMARY SURFACE LOOP                                            MIDI        37
      C                                                                 MIDI        38
            DO 1 I = 1,LC3                                              MIDI        39
            READ (ITAPER,700) KSURF, NBOXS, NCS                         MIDI        40
            NBX(I) = NBOXS                                              MIDI        41
            WILK = .FALSE.                                              MIDI        42
            ITAPE  =  IBTAPE + I                                        MIDI        43
            IF (KSURF) ITAPE = MTAP34                                   MIDI        44
            IF (KSURF)  REWIND ITAPE                                    MIDI        45
            CALL MODAL (I,NM,ITAPE,WILK,NPOINT,NBOXS,NTBOX)             MIDI        46
      C     **  NPOINT COUNTS THE GIVEN POINTS ON ALL SURF AND CONTROL SURF.  MIDI  47
      C     **  NBOXS IS NUMBER OF BOXES ON ENTIRE SURFACE.             MIDI        48
      C     **  NTBOX COUNTS THE BOXES FOR ALL SURFACES.                MIDI        49
            IF (KSURF) WILK = .TRUE.                                    MIDI        50
            IF (KSURF)  REWIND MTAP15                                   MIDI        51
            IF (KSURF) CALL HELP (I,NM,NCS,NBOXS,NTBOX,ITAPE,1)         MIDI        52
            IF (KSURF) CALL MODAL (I,NM,MTAP15,WILK,NPOINT,NBOXS,NTBOX)  MIDI       53
            ITAPE  =  IBTAPE + I                                        MIDI        54
            IF (KSURF) CALL HELP (I,NM,NCS,NBOXS,NTBOX,ITAPE,2)         MIDI        55
            NTBOX = NTBOX + NBOXS                                       MIDI        56
            REWIND ITAPE                                                MIDI        57
          1 CONTINUE                                                    MIDI        58
```

STATISTICS
PROGRAM LENGTH 66B 54
520008 CM USED

```
      1              SUBROUTINE ATAN3(Y,X,T)                                  ATAN3       2
                     PI = 3.141593                                            ATAN3       3
                     PI2 = PI*2.0                                             ATAN3       4
                     IF(X.EQ.0.) T=PI/2.                                      ATAN3       5
      5              IF(X.EQ.0.) GO TO 2                                      ATAN3       6
                     IF(Y.EQ.0.)T=0.                                          ATAN3       7
                     IF(Y.EQ.0.0) GO TO 2                                     ATAN3       8
                     A = Y/X                                                  ATAN3       9
                     T = ATAN(A)                                              ATAN3      10
     10            2 CONTINUE                                                 ATAN3      11
                     IF((Y.GE.0.).AND.(X.EQ.0.)) GO TO 1                      ATAN3      12
                     IF ((Y.EQ.0.).AND.(X.GT.0.)) T=0.                        ATAN3      13
                     IF ((Y.EQ.0.).AND.(X.GT.0.)) GO TO 1                     ATAN3      14
                     IF((Y.GE.0.).AND.(X.LE.0.))T = PI + T                    ATAN3      15
     15              IF((Y.GE.0.).AND.(X.LE.0.))GO TO 1                       ATAN3      16
                     IF((Y.LE.0.).AND.(X.LE.0.))T = PI + T                    ATAN3      17
                     IF((Y.LE.0.).AND.(X.LE.0.))GO TO 1                       ATAN3      18
                     IF((Y.LE.0.).AND.(X.GE.0.))T = PI2+ T                    ATAN3      19
                     IF((Y.LE.0.).AND.(X.GE.0.))GO TO 1                       ATAN3      20
     20            1 CONTINUE                                                 ATAN3      21
                     RETURN                                                   ATAN3      22
                     END                                                      ATAN3      23
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

19 I 1 THIS IF DEGENERATES INTO A SIMPLE TRANSFER TO THE LABEL INDICATED.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 ATAN3 1 21

VARIABLES	SN	TYPE	RELOCATION									
65 A		REAL		REFS	9	DEFINED	8					
63 PI		REAL		REFS	3	4	14	16	DEFINED	2		
64 PI2		REAL		REFS	18	DEFINED	3					
0 T		REAL	F.P.	REFS	14	16	18	DEFINED	1	4	6	
					9	12	14	16	18			
0 X		REAL	F.P.	REFS	4	5	8	11	12	13	14	
					15	16	17	18	19	DEFINED	1	
0 Y		REAL	F.P.	REFS	6	7	8	11	12	13	14	
					15	16	17	18	19	DEFINED	1	

EXTERNALS	TYPE	ARGS	REFERENCES
ATAN	REAL	1	LIBRARY 9

STATEMENT LABELS	DEF LINE	REFERENCES				
57 1	20	11	13	15	17	19
23 2	10	5	7			

EQUIV CLASSES LENGTH MEMBERS - BIAS NAME(LENGTH)
4800 SDELX (400) 5200 DELY (400)

STATISTICS
PROGRAM LENGTH 7033B 3611
CM LABELED COMMON LENGTH 20741B 8673
520008 CM USED

```
400              62 FORMAT(I5,4E10.2)                                                MODAL   401
                 63 FORMAT(8E10.2)                                                   MODAL   402
                 70 FORMAT (2X, 19HMODAL DATA GIVEN AT,I4,1X,9HPOINTS ON,I3,1X,      MODAL   403
                   1         9HLINES FOR,I3,1X,5HMODES)                            MODAL   404
                 82 FORMAT (15X,I4,10X,I4,10X,E18.7)                                 MODAL   405
405              83 FORMAT(4I5)                                                      MODAL   406
                400 FORMAT(1H1,19X, 15HSURFACE NUMBER ,I3/)                          MODAL   407
                450 FORMAT (15X, 26HINPUT MODAL DATA FOR MODE , I3 //                MODAL   408
                   1         15X,4HLINE,10X,5HPOINT,15X,10HDEFLECTION,//)           MODAL   409
               2000 FORMAT (    ,44HINTERPOLATED MODES, PRIMARY SURFACES, SURF =,1I2 MODAL   410
410               1           , 9H,  MODE =,1I3,12X)                               MODAL   411
               2050 FORMAT (    44HINTERPOLATED MODES, CONTROL SURFACES, SURF =,1I2  MODAL   412
                  1           , 9H,  MODE =,1I3,12X)                               MODAL   413
               2100 FORMAT (10X 44HINTERPOLATED MODES, PRIMARY SURFACES, SURF =,1I2  MODAL   414
                  1           , 9H,  MODE =,1I3,/,10X,58(1H-))                     MODAL   415
415            2150 FORMAT (10X 44HINTERPOLATED MODES, CONTROL SURFACES, SURF =,1I2  MODAL   416
                  1           , 9H,  MODE =,1I3,/,10X,58(1H-))                     MODAL   417
               2300 FORMAT (10X, 5H     ,2X,11H          X,2X,11H          Y        MODAL   418
                  1                     2X,11H          H,2X,11H      ALPHA        MODAL   419
                  2     ,/,10X, 5HPOINT,2X,11H     INCHES,2X,11H     INCHES       MODAL   420
420               3                     2X,11H   NO UNITS,2X,11H     RAD/FT)      MODAL   421
               2500 FORMAT (10X,1I5,1P5E13.4)                                       MODAL   422
              CIBM                                                                  MODAL   423
              C3000 FORMAT (18A4)                                                   MODAL   424
              CIBM                                                                  MODAL   425
425           CCDC                                                                  MODAL   426
               3000 FORMAT (7A10,1A2)                                               MODAL   427
              CCDC                                                                  MODAL   428
               4000 FORMAT (10X,51                                                  MODAL   429
                  1   HINTERPOLATED MODES FOR PRIMARY AND CONTROL SURFACES         MODAL   430
430               2     ,/,10X,51(1H-))                                            MODAL   431
                718 FORMAT (4X,I3,3X,E14.7,3X,E14.7)                                MODAL   432
              C                                                                     MODAL   433
                    RETURN                                                          MODAL   434
                    END                                                             MODAL   435
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	MODAL	2	433

VARIABLES

		SN	TYPE		RELOCATION							
2717	A		REAL	ARRAY		REFS	13	250	254	294	325	
						DEFINED	249	250				
236	ACAP		REAL		VARBLS	REFS	25					
4617	AN		REAL	ARRAY		REFS	16	237	249	349	352	354	355
						358	359	361	362	DEFINED	352	358	359
3621	B		REAL	ARRAY		REFS	14	349	DEFINED	345			
4763	BQ		REAL	ARRAY		REFS	16	384	DEFINED	354			
237	B2		REAL		VARBLS	REFS	25	2*60	362				
1645	B22		REAL			REFS	354	DEFINED	60				
0	C		COMPLEX	ARRAY	MODD	REFS	23	31					
4011	DEF		REAL	ARRAY		REFS	15	166	171	190	204		

VARIABLES	SN	TYPE		RELOCATION
4453	DEFL	REAL	ARRAY	
1655	DEL	REAL		
12446	DFLY	REAL	ARRAY	VARBLS
5200	DETAD	COMPLEX	ARRAY	MODD
5603	DH1	REAL	ARRAY	
120	DIST	REAL		JUNK
7346	EV	REAL	ARRAY	VARBLS
240	FL	REAL		VARBLS
13514	GGMA	REAL	ARRAY	VARBLS
244	GMA	REAL	ARRAY	VARBLS
6423	H	REAL	ARRAY	
1653	I	INTEGER		
1712	II	INTEGER		
5	IQ	INTEGER		VARBLS
6	IR	INTEGER		VARBLS
0	ITAPE	INTEGER		F.P.
2	ITAPEP	INTEGER		COMRWP
0	ITAPER	INTEGER		COMRWP
0	ITAPES	INTEGER	ARRAY	CTAPES
7	ITAPET	INTEGER		CTABLE
1	ITAPEW	INTEGER		COMRWP
1642	ITAP18	INTEGER		
1704	IU	INTEGER		
1660	J	INTEGER		
1674	JB	INTEGER		
1663	JK	INTEGER		
7	JSPECS	INTEGER		VARBLS
1670	K	INTEGER		
7	KBPAGE	INTEGER		CLIST
0	KDEG	INTEGER		CHSP
1665	KEL	INTEGER		
1701	KL	INTEGER		
4	KLABEL	INTEGER		CLIST
1	KLNN	INTEGER		KMP
0	KOUNT	INTEGER		CLIST
11	KOUNTH	INTEGER		CLIST
12	KOUNTI	INTEGER		CLIST
1715	KOUNTS	INTEGER		

DEFINED	147	150	164	166	169	171	
REFS	15	237	349	355	DEFINED	204	325
REFS	74	DEFINED	67				
REFS	25	354					
REFS	23	31					
REFS	16	379	386	DEFINED	362		
REFS	32	166	171				
REFS	25	345					
REFS	25						
REFS	25						
REFS	25						
REFS	16	379	385	DEFINED	361		
REFS	5*64	65	66	4*67	68	69	70
71	72	2*74	75	76	107	108	110
5*112	113	5*115	116	2*120	2*203	2*204	304
DEFINED	63	105	202	303			
REFS	2*230	2*317	335	DEFINED	229	316	334
REFS	25						
REFS	25						
REFS	384	385	386	DEFINED	2		
REFS	36						
REFS	36	I/O REFS	61	64	70		
REFS	17	42	52	53	55		
REFS	40						
REFS	36	264	266	283	286	375	
I/O REFS	96	97	100	111	112	113	120
133	134	188	189	190	265	284	285
374	379						
DEFINED	52	I/O REFS	276	277	278	279	280
REFS	219	223	224	307	311	312	
DEFINED	213	223	301	311			
REFS	70	3*120	182	2*190	322	324	325
336	338	344	345	346	351	2*352	354
357	2*358	2*359	361	362	DEFINED	70	117
181	321	335	350	356			
REFS	141	145	147	149	150	158	162
164	165	166	168	169	170	171	173
174	DEFINED	135	141	145	149	158	162
165	168	170	173				
REFS	2*74	75	76	DEFINED	73		
REFS	25						
REFS	90	4*91	142	143	144	4*145	147
150	159	160	161	4*162	164	2*166	169
2*171	2*190	DEFINED	89	140	157	183	
REFS	38						
REFS	35	DEFINED	127	261			
REFS	83	DEFINED	82				
REFS	198	203	204	226	227	3*248	
DEFINED	197						
REFS	38						
REFS	33	262	275	366			
REFS	38	267	281	287	288	368	369
372	376	378	DEFINED	49	267	281	287
372	376	378					
REFS	38	369					
REFS	38						
REFS	368	DEFINED	288	371			

VARIABLES	SN	TYPE		RELOCATION								
1	KPAGE	INTEGER		CLIST	REFS	38						
242	KR	INTEGER		VARBLS	REFS	25						
243	KRDBR	INTEGER		VARBLS	REFS	25						
1641	KSURFT	INTEGER			REFS	277	278	284	285	DEFINED	50	51
0	KTABLE	INTEGER		CTABLE	REFS	40	DEFINED	270	291			
5	KTABLO	INTEGER		CTABLE	REFS	40						
5	KTPAGE	INTEGER		CLIST	REFS	38						
1676	L	INTEGER			REFS	150	169	2*171	DEFINED	148	167	
1672	LINE	INTEGER			REFS	99	108	109	118	185	186	187
					DEFINED	98	99	108	110	118	131	185
					186							
2	LINES	INTEGER		CLIST	REFS	38	49	2*281	2*372			
10	LINESG	INTEGER		CLIST	REFS	38						
3	LINEST	INTEGER		CLIST	REFS	38						
3537	LL	INTEGER	ARRAY		REFS	13	351	357	DEFINED	346		
1721	LLL	INTEGER			REFS	353	2*354	360	3*379	DEFINED	351	357
1713	LM	INTEGER			REFS	246	249	DEFINED	243			
1714	LPT	INTEGER			REFS	254	294	321	DEFINED	253		
1722	L1L	INTEGER			REFS	354	361	362	2*379	DEFINED	353	360
1673	M	INTEGER			REFS	134	173	189	245	277	278	284
					285	DEFINED	129	274				
1706	MBOX	INTEGER			REFS	217	305	DEFINED	216	304		
1705	MM	INTEGER			REFS	216	DEFINED	215				
1643	MTAP16	INTEGER			REFS	254	294	DEFINED	53	I/O REFS	54	257
					387							
1644	MTAP49	INTEGER			REFS	130	DEFINED	55	I/O REFS	128	256	
1	NB	INTEGER		VARBLS	REFS	25						
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	25						
0	NBOXS	INTEGER		F.P.	REFS	215	303	334	384	385	386	
					DEFINED	2						
17550	NC	INTEGER		MODD	REFS	31	130					
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	25						
106	NCF	INTEGER		CNTRL	REFS	34	229	316				
0	NCNSM1	INTEGER		VARBLS	REFS	25						
3	NCOLS	INTEGER		CTABLE	REFS	40	DEFINED	269	290			
4	NCOLST	INTEGER		CTABLE	REFS	40						
3	NDATA	INTEGER		VARBLS	REFS	25						
2	NDELT	INTEGER		VARBLS	REFS	25						
1647	NELAXS	INTEGER			REFS	83	136	DEFINED	61			
0	NF	INTEGER		F.P.	REFS	48	96	111	133	188		
					DEFINED	2						
1720	NFB	INTEGER			REFS	339	344	345	346	348	349	350
					355	356	DEFINED	333	339			
1702	NFP	INTEGER			REFS	233	234	236	237	243		
					DEFINED	206	233					
1733	NGP	INTEGER	ARRAY		REFS	11	65	66	83	90	98	108
					110	113	116	142	144	159	161	182
					198	DEFINED	64					
1654	NGPI	INTEGER			REFS	70	73	83	117	148	167	183
					202	205	237	DEFINED	66	116	142	159
					182	198	327					
1671	NGPL	INTEGER			REFS	2*91	237	DEFINED	90	205		
1667	NGPO	INTEGER			REFS	91	173	DEFINED	85	91		
1652	NGPTOT	INTEGER			REFS	65	83	85	100	DEFINED	62	65
1675	NGPX	INTEGER			REFS	2*145	2*162	DEFINED	144	161		
1650	NICH	INTEGER			REFS	261	DEFINED	61				

VARIABLES	SN	TYPE		RELOCATION								
1666	NLIN	INTEGER			REFS	89	DEFINED	84				
1646	NLINES	INTEGER			REFS	63	83	84	100	105	140	156
					181	197	DEFINED	61				
0	NMODES	INTEGER		F.P.	REFS	100	129	173	274	DEFINED	2	
0	NMPT	INTEGER		KMP	REFS	33	95	106	119	132	175	
0	NO	INTEGER		COMSTS	REFS	37						
4	NOPAN	INTEGER		VARBLS	REFS	25						
6	NPAGE	INTEGER		CLIST	REFS	38						
6	NPAGEA	INTEGER		CTABLE	REFS	40						
1	NPASS	INTEGER		CTABLE	REFS	40						
1717	NPL	INTEGER			REFS	349	355	DEFINED	328			
0	NPOINT	INTEGER		F.P.	REFS	135	DEFINED	2	174			
1700	NPT	INTEGER			REFS	244	246	247	248	249	2*250	253
					323	324	325	327	328	349	355	
					DEFINED	193	244	320	323			
2	NROWS	INTEGER		CTABLE	REFS	40	DEFINED	268	289			
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	25						
1716	NSB	INTEGER			REFS	313	338	DEFINED	299	313		
1640	NSURF	INTEGER			REFS	277	278	284	285	DEFINED	48	
0	NTBOX	INTEGER		F.P.	REFS	216	304	335	353	360		
					DEFINED	2						
1710	NU	INTEGER			REFS	220	308	DEFINED	219	307		
1677	NZLIN	INTEGER			REFS	157	166	171	DEFINED	156		
17500	OMG	REAL	ARRAY	MODD	REFS	19	31					
241	PI	REAL		VARBLS	REFS	25						
10166	PV	REAL	ARRAY	VARBLS	REFS	25						
3426	P1	REAL	ARRAY	VARBLS	REFS	25						
5706	P2	REAL	ARRAY	VARBLS	REFS	25						
11523	QZ	REAL	ARRAY		REFS	18	130	147	150	164	166	169
					171							
1703	R	REAL			REFS	218	226	227	248	306	2*317	322
					336	DEFINED	212	225	235	247	300	314
1711	RU	REAL			REFS	221	309	DEFINED	220	308		
11626	SDELX	REAL	ARRAY	VARBLS	REFS	25	354					
1723	TITLE	REAL	ARRAY		REFS	9	292	DEFINED	280			
0	WILK	LOGICAL		F.P.	REFS	21	50	51	97	99	228	315
					337	DEFINED	2					
14400	WW	REAL	ARRAY	MODD	REFS	19	31					
326	X	REAL	ARRAY	VARBLS	REFS	25	338	344	379			
4371	XAT	REAL	ARRAY		REFS	15	237	349	355	DEFINED	203	324
24	XC	REAL	ARRAY	CNTRL	REFS	34	338					
1757	XGP	REAL	ARRAY		REFS	12	83	2*91	120	2*145	2*162	
					DEFINED	74	76					
1664	XGP1	REAL			REFS	76	DEFINED	75				
0	XTERM1	REAL	ARRAY	JUNK	REFS	11	32	67	69	112	115	248
					DEFINED	64						
24	XTERM2	REAL	ARRAY	JUNK	REFS	11	32	67	72	112	115	
					DEFINED	64						
1657	XTM1	REAL			REFS	74	DEFINED	69				
1662	XTM2	REAL			REFS	76	DEFINED	72				
7243	XX	REAL	ARRAY		REFS	16	324	DEFINED	248			
13266	XO	REAL	ARRAY	VARBLS	REFS	25						
0	X1	REAL	ARRAY	CNTRL	REFS	34						
5	X2	REAL	ARRAY	CNTRL	REFS	34						
1146	Y	REAL	ARRAY	VARBLS	REFS	25	217	305	336	379		
1	YES	INTEGER		COMSTS	REFS	4	37					
2337	YGP	REAL	ARRAY		REFS	13	74	75	83	2*91	120	2*145

VARIABLES	SN	TYPE		RELOCATION								
					2*162	203	DEFINED	70				
1707	YS	REAL			REFS	218	221	224	225	2*230	234	235
					306	309	312	314	DEFINED	217	305	
50	YTERM1	REAL	ARRAY	JUNK	REFS	12	32	67	68	112	115	226
					248	DEFINED	64					
74	YTERM2	REAL	ARRAY	JUNK	REFS	12	32	67	71	112	115	227
					DEFINED	64						
1656	YTM1	REAL			REFS	74	DEFINED	68				
1661	YTM2	REAL			REFS	76	DEFINED	71				
10000	YU	REAL	ARRAY		REFS	16	220	308	DEFINED	214	224	302
					312							
10703	YX	REAL	ARRAY		REFS	16	247	322	DEFINED	246		
3727	YY	REAL	ARRAY		REFS	14	237	246	355	DEFINED	234	344
13350	YO	REAL	ARRAY	VARBLS	REFS	25						
12	Y1	REAL	ARRAY	CNTRL	REFS	34	230	317				
17	Y2	REAL	ARRAY	CNTRL	REFS	34	230	317				
3703	ZEL	REAL	ARRAY		REFS	14	248	DEFINED	115			
11006	ZV	REAL	ARRAY	VARBLS	REFS	25						
1766	ZZ	REAL	ARRAY	VARBLS	REFS	25						
4246	ZZ1	REAL	ARRAY	VARBLS	REFS	25						
6526	ZZ2	REAL	ARRAY	VARBLS	REFS	25						
13432	ZO	REAL	ARRAY	VARBLS	REFS	25						
2606	Z1	REAL	ARRAY	VARBLS	REFS	25						
5066	Z2	REAL	ARRAY	VARBLS	REFS	25						

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES					
FORM		7	83					
HELGA		11	237	349	355			
PLB		3	264	266	283	286	375	
PROGNA		2	47					
PTABLE		3	271	292				
RNRW		3	130	254	294	384	385	386
TITLES		1	263	282	367	373		

INLINE FUNCTIONS	TYPE	ARGS	DEF LINE	REFERENCES			
ABS	REAL	1	INTRIN	250	352	358	359
MINO	INTEGER	0	INTRIN	205	328		

STATEMENT LABELS		DEF LINE	REFERENCES		
0	1	123	105		
152	2	101	95		
201	3	114	106		
715	5	326	321	322	
0	6	251	243		
527	7	249	245		
744	8	347	334	336	338
0	9	381	356		
0	10	122	117		
0	11	INACTIVE 294			
306	12	156	136		
164	13	112	107	109	
0	15	151	140	148	
265	16	147	143		
0	17	172	157	167	
222	18	121	119		
326	19	164	160		

STATEMENT LABELS			DEF LINE	REFERENCES				
416	20		193	175				
0	22		204	202				
357	24		173	152				
0	30		231	229				
476	31		233	228	230			
0	32		318	316				
740	35		339	337				
703	36		320	315	317			
1426	50	FMT	393	97				
1432	51	FMT	394	112				
1445	52	FMT	397	113				
403	60		190	181	183	187		
1460	62	FMT	400	64				
1463	63	FMT	401	70				
1465	70	FMT	402	100				
0	77		93	89				
1475	82	FMT	404	190				
1501	83	FMT	405	61				
0	99		354	350				
643	100		293	275				
1053	120		382	303	306	309	319	348
573	123		273	262				
0	150		255	129				
1021	200		370	368				
1035	250		377	369				
0	300		222	219				
0	301		310	307				
1050	310		380	366				
1503	400	FMT	406	96	111	133	188	
1507	450	FMT	407	134	189			
0	570		386	274				
1624	718	FMT	431	120				
244	862		135	132				
536	875		252	197	236			
501	876		235	215	218	221	226	227	232
0	1082		78	63				
0	1083		77	73				
1520	2000	FMT	409	277				
1531	2050	FMT	411	278				
1542	2100	FMT	413	284				
1554	2150	FMT	415	285				
1566	2300	FMT	417	374				
1607	2500	FMT	421	379				
1612	3000	FMT	426	280				
1614	4000	FMT	428	265				

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES		
32	1082	I	63 78	56B		EXT REFS	NOT INNER
74	1083	JK	73 77	10B	OPT		
124	77	K	89 93	12B	OPT		
153	1	I	105 123	54B		EXT REFS	NOT INNER
210	10	J	117 122	15B		EXT REFS	
233	150	M	129 255	314B		EXT REFS	NOT INNER
250	15	K	140 151	36B		NOT INNER	
277	15	L	148 151	3B	INSTACK		
311	17	K	157 172	46B		NOT INNER	
346	17	I	167 172	6B	INSTACK		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
367	60	J	181 190	27B	EXT REFS NOT INNER
372	60	K	183 190	22B	EXT REFS
420	875	KL	197 252	121B	EXT REFS NOT INNER
427	22	I	202 204	4B	INSTACK
442	876	MM	215 235	43B	NOT INNER
450	300	NU	219 222	6B	INSTACK EXITS
467	30	II	229 231	7B	INSTACK EXITS
520	6	LM	243 251	14B	OPT
574	570	M	274 386	300B	EXT REFS NOT INNER
652	120	I	303 382	204B	EXT REFS NOT INNER
660	301	NU	307 310	6B	INSTACK EXITS
674	32	II	316 318	7B	INSTACK EXITS
710	5	J	321 326	6B	INSTACK
732	8	II	334 347	13B	OPT
755	99	J	350 354	13B	OPT
774	9	J	356 381	57B	EXT REFS

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
VARBLS	6014	0 NCNSM1 (1)	1 NB (1)	2 NDELT (1)			
		3 NDATA (1)	4 NOPAN (1)	5 IQ (1)			
		6 IR (1)	7 JSPECS (1)	8 NCARAY (50)			
		58 NSARAY (50)	108 NBARAY (50)	158 ACAP (1)			
		159 B2 (1)	160 FL (1)	161 PI (1)			
		162 KR (1)	163 KRDBR (1)	164 GMA (50)			
		214 X (400)	614 Y (400)	1014 ZZ (400)			
		1414 Z1 (400)	1814 P1 (400)	2214 ZZ1 (400)			
		2614 Z2 (400)	3014 P2 (400)	3414 ZZ2 (400)			
		3814 EV (400)	4214 PV (400)	4614 ZV (400)			
		5014 SDELX (400)	5414 DELY (400)	5814 XO (50)			
		5864 YO (50)	5914 ZO (50)	5964 GGMA (50)			
MODD	8041	0 C (3200)	3200 DETAD (3200)	6400 WW (1600)			
		8000 OMG (40)	8040 NC (1)				
JUNK	81	0 XTERM1 (20)	20 XTERM2 (20)	40 YTERM1 (20)			
		60 YTERM2 (20)	80 DIST (1)				
KMP	2	0 NMPT (1)	1 KLNN (1)				
CNTRL	71	0 X1 (5)	5 X2 (5)	10 Y1 (5)			
		15 Y2 (5)	20 XC (50)	70 NCF (1)			
CHSP	1	0 KDEG (1)					
COMRWP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)			
COMSTS	2	0 NO (1)	1 YES (1)				
CLIST	11	0 KOUNT (1)	1 KPAGE (1)	2 LINES (1)			
		3 LINEST (1)	4 KLABEL (1)	5 KTPAGE (1)			
		6 NPAGE (1)	7 KBPAGE (1)	8 LINESG (1)			
		9 KOUNTH (1)	10 KOUNTI (1)				
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)			
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)			
		6 NPAGEA (1)	7 ITAPET (1)				
CTAPES	50	0 ITAPES (50)					

STATISTICS

PROGRAM LENGTH	12121B	5201
CM LABELED COMMON LENGTH	33714B	14284

520000B CM USED

```
      SUBROUTINE HELP (NF,NM,NCS,NBOXS,NTOT,ITAPE,KHELP)                HELP      2
C                                                                       HELP      3
      DIMENSION        XC(050) ,        X1(5) ,        X2(5)           HELP      4
      DIMENSION Y1(5)             ,Y2(5)                               HELP      5
      DIMENSION XA(400), XI(400)                                        HELP      6
      DIMENSION ITAPES(50)                                              HELP      7
C                                                                       HELP      8
      COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IR,JSPECS,        HELP      9
     1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,  HELP     10
     2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),  HELP     11
     3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),       HELP     12
     4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),    HELP     13
     5                 XO(50),YO(50),ZO(50),GGMA(50)                    HELP     14
      COMMON /KMP/ NMPT , KLNN                                          HELP     15
      COMMON /CNTRL/ X1 , X2 , Y1 , Y2 , XC , NCF                       HELP     16
      COMMON / CTAPES / ITAPES                                          HELP     17
C                                                                       HELP     18
C                                                                       HELP     19
      ITAPER = ITAPES(5)                                                HELP     20
      ITAPEW = ITAPES(6)                                                HELP     21
      MTAP14 =  ITAPES(34)                                              HELP     22
      MTAP15 =  ITAPES(35)                                              HELP     23
C                                                                       HELP     24
C                                                                       HELP     25
C                                                                       HELP     26
C                                                                       HELP     27
C                                                                       HELP     28
      GO TO (10, 45) , KHELP                                            HELP     29
   10 NCF  =  NCS                                                       HELP     30
      IF (NMPT.NE.0) WRITE (ITAPEW,1)                                   HELP     31
      DO 20 II=1,NCS                                                    HELP     32
      READ (ITAPER,30) X1(II) , Y1(II) , X2(II) , Y2(II)                HELP     33
      IF (NMPT.EQ.0) GO TO 3                                            HELP     34
      WRITE (ITAPEW,2) II , X1(II) , Y1(II) , X2(II) , Y2(II)           HELP     35
    3 CONTINUE                                                          HELP     36
   20 CONTINUE                                                          HELP     37
      NSB      = 0                                                      HELP     38
      YS       = 0.0                                                    HELP     39
      DO 40 J = 1,NBOXS                                                 HELP     40
      MBOX     = NTOT + J                                               HELP     41
      IF(YS.EQ.Y(MBOX))       GO TO 40                                  HELP     42
      YS       = Y(MBOX)                                                HELP     43
      NSB      = NSB + 1                                                HELP     44
      DO 25 I =1,NCS                                                    HELP     45
      IF (YS.LE.Y1(I))        GO TO 25                                  HELP     46
      IF (YS.GE.Y2(I))        GO TO 25                                  HELP     47
      XC(NSB) = X1(I) + (X2(I) - X1(I))* (YS - Y1(I)) / (Y2(I) - Y1(I)) HELP     48
      GO TO 40                                                          HELP     49
   25 XC(NSB) = 1.0E+06                                                 HELP     50
   40 CONTINUE                                                          HELP     51
      GO TO 100                                                         HELP     52
   45 CONTINUE                                                          HELP     53
C                                                                       HELP     54
      REWIND MTAP14                                                     HELP     55
      REWIND MTAP15                                                     HELP     56
C                                                                       HELP     57
      DO 60 I = 1,NM                                                    HELP     58
```

```
                  IF (KLNN.EQ.0) GO TO 4                                    HELP       59
                  WRITE (ITAPEW,70) NF                                      HELP       60
60                WRITE (ITAPEW,71) I                                       HELP       61
                4 CONTINUE                                                  HELP       62
                  DO 5 J = 1,3                                              HELP       63
                  CALL RNRW (-MTAP15,XA,NBOXS)                              HELP       64
                  CALL RNRW (-MTAP14,XI,NBOXS)                              HELP       65
65                R = 0.0                                                   HELP       66
                  NSB = 0                                                   HELP       67
                  DO 50 JJ = 1,NBOXS                                        HELP       68
                  MBOX = NTOT + JJ                                          HELP       69
                  XW  = X(MBOX)                                             HELP       70
70                YW  = Y(MBOX)                                             HELP       71
                  IF (YW.EQ.R)                        GO TO 28              HELP       72
                  NSB = NSB + 1                                             HELP       73
                  R = YW                                                    HELP       74
                  DO 27 II = 1,NCS                                          HELP       75
75                IF (YW.GE.Y1(II).AND.YW.LE.Y2(II)) GO TO 28               HELP       76
               27 CONTINUE                                                  HELP       77
                  GO TO 50                                                  HELP       78
               28 IF (XW.LT.XC(NSB)      )            GO TO 50              HELP       79
                  XI(JJ) = XA(JJ)                                           HELP       80
80             50 CONTINUE                                                  HELP       81
            C                                                               HELP       82
                  CALL RNRW (ITAPE,XI,NBOXS)                                HELP       83
                  IF (KLNN.EQ.0) GO TO 5                                    HELP       84
                  IF (J .EQ. 1) WRITE (ITAPEW,81)                           HELP       85
85                IF (J .EQ. 2) WRITE (ITAPEW,82)                           HELP       86
                  IF (J .EQ. 3) WRITE (ITAPEW,83)                           HELP       87
                  WRITE (ITAPEW,73) (K,XI(K),K=1,NBOXS)                     HELP       88
                5 CONTINUE                                                  HELP       89
               60 CONTINUE                                                  HELP       90
90                REWIND MTAP14                                             HELP       91
                  REWIND MTAP15                                             HELP       92
              100 CONTINUE                                                  HELP       93
            C                                                               HELP       94
            C                                                               HELP       95
95          C FORMATS                                                       HELP       96
            C                                                               HELP       97
                1 FORMAT (/20X,35HCOORDINATES OF HINGE LINE IN INCHES//13X,  HELP       98
                 1         7HSURFACE,26X,7HINBOARD,27X,8HOUTBOARD, //14X,5HINDEX,  HELP  99
                 2         22X,1HX,14X,1HY,19X,1HX,14X,1HY,//)              HELP      100
100             2 FORMAT ((15X,I3,2(10X,E10.2,5X,E10.2))/)                  HELP      101
               30 FORMAT(4E10.2)                                            HELP      102
               70 FORMAT (1H1, 20X, 15HSURFACE NUMBER ,I3, //3X, 67HINTERPOLATED MOD HELP 103
                 1AL DATA FOR SURFACE AND CONTROL SURFACE COMBINATION,//)   HELP      104
               71 FORMAT (20X, 8HMODE NO , I3//)                            HELP      105
105            73 FORMAT (6(4X,I4,2X,E10.3))                                HELP      106
               81 FORMAT (10X,60HBOX NUMBER FOLLOWED BY H(1/4 CHORD) * ELEMENT AREA  HELP 107
                 1(SQ. FT.))                                                HELP      108
               82 FORMAT (10X,35HBOX NUMBER FOLLOWED BY H(3/4 CHORD))       HELP      109
               83 FORMAT (10X,39HBOX NUMBER FOLLOWED BY ALPHA(3/4 CHORD))   HELP      110
110         C                                                               HELP      111
                  RETURN                                                    HELP      112
                  END                                                       HELP      113
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

28 I AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 HELP 1 111

VARIABLES SN TYPE RELOCATION

236	ACAP	REAL		VARBLS	REFS	8					
237	B2	REAL		VARBLS	REFS	8					
12446	DELY	REAL	ARRAY	VARBLS	REFS	8					
7346	EV	REAL	ARRAY	VARBLS	REFS	8					
240	FL	REAL		VARBLS	REFS	8					
13514	GGMA	REAL	ARRAY	VARBLS	REFS	8					
244	GMA	REAL	ARRAY	VARBLS	REFS	8					
430	I	INTEGER			REFS	45	46	6*47	60	DEFINED	44	57
423	II	INTEGER			REFS	4*32	5*34	2*75	DEFINED	31	74	
5	IQ	INTEGER		VARBLS	REFS	8						
6	IR	INTEGER		VARBLS	REFS	8						
0	ITAPE	INTEGER		F.P.	REFS	82	DEFINED	1				
417	ITAPER	INTEGER			DEFINED	19	I/O REFS	32				
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	6	16	19	20	21	22	
420	ITAPEW	INTEGER			DEFINED	20	I/O REFS	30	34	59	60	84
					85	86	87					
426	J	INTEGER			REFS	40	84	85	86	DEFINED	39	62
432	JJ	INTEGER			REFS	68	2*79	DEFINED	67			
7	JSPECS	INTEGER		VARBLS	REFS	8						
435	K	INTEGER			REFS	2*87	DEFINED	87				
0	KHELP	INTEGER		F.P.	REFS	28	DEFINED	1				
1	KLNN	INTEGER		KMP	REFS	14	58	83				
242	KR	INTEGER		VARBLS	REFS	8						
243	KRDBR	INTEGER		VARBLS	REFS	8						
427	MBOX	INTEGER			REFS	41	42	69	70	DEFINED	40	68
421	MTAP14	INTEGER			REFS	64	DEFINED	21	I/O REFS	54	90	
422	MTAP15	INTEGER			REFS	63	DEFINED	22	I/O REFS	55	91	
1	NB	INTEGER		VARBLS	REFS	8						
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	8						
0	NBOXS	INTEGER		F.P.	REFS	39	63	64	67	82	87	
					DEFINED	1						
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	8						
106	NCF	INTEGER		CNTRL	REFS	15	DEFINED	29				
0	NCNSM1	INTEGER		VARBLS	REFS	8						
0	NCS	INTEGER		F.P.	REFS	29	31	44	74	DEFINED	1	
3	NDATA	INTEGER		VARBLS	REFS	8						
2	NDELT	INTEGER		VARBLS	REFS	8						
0	NF	INTEGER		F.P.	REFS	59	DEFINED	1				
0	NM	INTEGER		F.P.	REFS	57	DEFINED	1				
0	NMPT	INTEGER		KMP	REFS	14	30	33				
4	NOPAN	INTEGER		VARBLS	REFS	8						
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	8						
424	NSB	INTEGER			REFS	43	47	49	72	78		

VARIABLES	SN	TYPE		RELOCATION							
					DEFINED	37	43	66	72		
0	NTOT	INTEGER		F.P.	REFS	40	68	DEFINED	1		
241	PI	REAL		VARBLS	REFS	8					
10166	PV	REAL	ARRAY	VARBLS	REFS	8					
3426	P1	REAL	ARRAY	VARBLS	REFS	8					
5706	P2	REAL	ARRAY	VARBLS	REFS	8					
431	R	REAL			REFS	71	DEFINED	65	73		
11626	SDELX	REAL	ARRAY	VARBLS	REFS	8					
326	X	REAL	ARRAY	VARBLS	REFS	8	69				
436	XA	REAL	ARRAY		REFS	5	63	79			
24	XC	REAL	ARRAY	CNTRL	REFS	3	15	78	DEFINED	47	49
1256	XI	REAL	ARRAY		REFS	5	64	82	87	DEFINED	79
433	XW	REAL			REFS	78	DEFINED	69			
13266	XO	REAL	ARRAY	VARBLS	REFS	8					
0	X1	REAL	ARRAY	CNTRL	REFS	3	15	34	2*47	DEFINED	32
5	X2	REAL	ARRAY	CNTRL	REFS	3	15	34	47	DEFINED	32
1146	Y	REAL	ARRAY	VARBLS	REFS	8	41	42	70		
425	YS	REAL			REFS	41	45	46	47	DEFINED	38	42
434	YW	REAL			REFS	71	73	2*75	DEFINED	70	
13350	YO	REAL	ARRAY	VARBLS	REFS	8					
12	Y1	REAL	ARRAY	CNTRL	REFS	4	15	34	45	2*47	75
					DEFINED	32					
17	Y2	REAL	ARRAY	CNTRL	REFS	4	15	34	46	47	75
					DEFINED	32					
11006	ZV	REAL	ARRAY	VARBLS	REFS	8					
1766	ZZ	REAL	ARRAY	VARBLS	REFS	8					
4246	ZZ1	REAL	ARRAY	VARBLS	REFS	8					
6526	ZZ2	REAL	ARRAY	VARBLS	REFS	8					
13432	ZO	REAL	ARRAY	VARBLS	REFS	8					
2606	Z1	REAL	ARRAY	VARBLS	REFS	8					
5066	Z2	REAL	ARRAY	VARBLS	REFS	8					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES			
RNRW		3	63	64	82	

STATEMENT LABELS			DEF LINE	REFERENCES		
324	1	FMT	97	30		
342	2	FMT	100	34		
50	3		35	33		
117	4		61	58		
216	5		88	62	83	
22	10		29	28		
0	20		36	31		
75	25		49	44	45	46
0	27		76	74		
153	28		78	71	75	
346	30	FMT	101	32		
102	40		50	39	41	48
105	45		52	28		
160	50		80	67	77	78
0	60		89	57		
350	70	FMT	102	59		
364	71	FMT	104	60		
367	73	FMT	105	87		
372	81	FMT	106	84		

```
STATEMENT LABELS                DEF LINE    REFERENCES
  410  83        FMT               109          86
  227  100                            92          51

LOOPS  LABEL     INDEX      FROM-TO     LENGTH     PROPERTIES
   27  20        II           31 36        24B                EXT REFS
   55  40        J            39 50        30B                NOT INNER
   64  25        I            44 49        16B          OPT     EXITS
  112  60        I            57 89       111B                EXT REFS  NOT INNER
  120  5         J            62 88       101B                EXT REFS  NOT INNER
  133  50        JJ           67 80        30B                NOT INNER
  144  27        II           74 76         7B       INSTACK    EXITS
  206            K            87 87         7B                EXT REFS

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       VARBLS      6014                 0 NCNSM1 (1)                 1 NB      (1)                 2 NDELT   (1)
                                        3 NDATA  (1)                 4 NOPAN   (1)                 5 IQ      (1)
                                        6 IR     (1)                 7 JSPECS  (1)                 8 NCARAY  (50)
                                       58 NSARAY (50)              108 NBARAY  (50)              158 ACAP    (1)
                                      159 B2     (1)              160 FL      (1)              161 PI      (1)
                                      162 KR     (1)              163 KRDBR   (1)              164 GMA     (50)
                                      214 X      (400)            614 Y       (400)           1014 ZZ      (400)
                                     1414 Z1     (400)           1814 P1      (400)           2214 ZZ1     (400)
                                     2614 Z2     (400)           3014 P2      (400)           3414 ZZ2     (400)
                                     3814 EV     (400)           4214 PV      (400)           4614 ZV      (400)
                                     5014 SDELX  (400)           5414 DELY    (400)           5814 XO      (50)
                                     5864 YO     (50)            5914 ZO      (50)           5964 GGMA    (50)
       KMP            2                0 NMPT   (1)                 1 KLNN    (1)
       CNTRL         71                0 X1     (5)                 5 X2      (5)                10 Y1      (5)
                                       15 Y2     (5)                20 XC      (50)               70 NCF     (1)
       CTAPES        50                0 ITAPES (50)

STATISTICS
  PROGRAM LENGTH                2114B     1100
  CM LABELED COMMON LENGTH     13771B     6137
          52000B CM USED
```

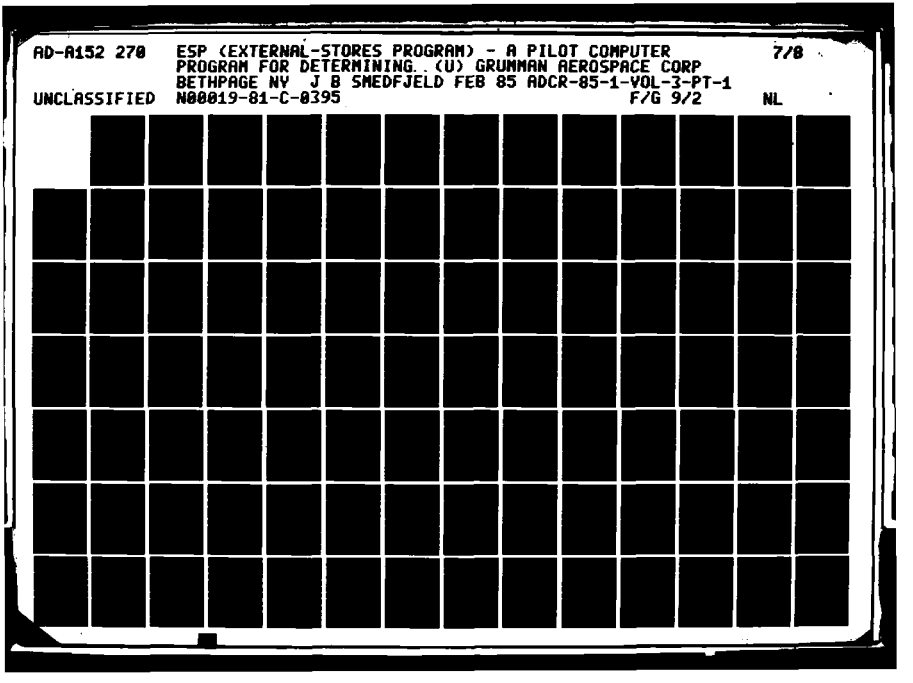
```
      SUBROUTINE BIDI (NM,NPOINT,NTBOX)                                 BIDI        2
      COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IR,JSPECS,        BIDI        3
     1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,  BIDI        4
     2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),  BIDI        5
     3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),       BIDI        6
     4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),    BIDI        7
     5                 XO(50),YO(50),ZO(50),GGMA(50)                    BIDI        8
      COMMON/BODY/ RO(100), ROP(100), NBEA(20), BGMA(20), MRK(20,2),    BIDI        9
     1             XBO(20), YBO(20), ZBO(20)                            BIDI       10
      COMMON / CTAPES / ITAPES                                          BIDI       11
      DIMENSION XI(400)                                                 BIDI       12
      DIMENSION ITAPES(50)                                              BIDI       13
C                                                                       BIDI       14
C                                                                       BIDI       15
C                                                                       BIDI       16
C INITIAL CONDITIONS                                                    BIDI       17
C                                                                       BIDI       18
      MTAP15 =  ITAPES(35)                                              BIDI       19
      IBTAPE =  ITAPES(40)                                              BIDI       20
      NTEL   =  NCNSM1                                                  BIDI       21
      MMRK = MRK(1,1)                                                   BIDI       22
      DO 1 I = 1,NB                                                     BIDI       23
      NEL = NBEA(I)                                                     BIDI       24
      IF (I.GT.1) NEL = NEL - NBEA(I-1)                                 BIDI       25
      NIB = MRK(I,2) - MRK(I,1) + 1                                     BIDI       26
      ITAPE  =  IBTAPE + I                                              BIDI       27
      REWIND ITAPE                                                      BIDI       28
      CALL BEIN (I,NM,ITAPE,NPOINT,NIB,NEL,NTEL)                        BIDI       29
      REWIND ITAPE                                                      BIDI       30
      MK = MRK(I,1)                                                     BIDI       31
      IF (MK.LT.MMRK) MMRK = MK                                         BIDI       32
    1 NTEL = NTEL + NEL                                                 BIDI       33
      DO 2 N = 1,NM                                                     BIDI       34
      DO 3 J = 1,4                                                      BIDI       35
      JB = 1                                                            BIDI       36
      DO 4 I = 1,NB                                                     BIDI       37
      ITAPE  =  IBTAPE + I                                              BIDI       38
      NEL = NBEA(I)                                                     BIDI       39
      IF (I.GT.1) NEL = NEL - NBEA(I-1)                                 BIDI       40
      CALL RNRW (-ITAPE,XI(JB),NEL)                                     BIDI       41
    4 JB = JB + NEL                                                     BIDI       42
      JB = JB - 1                                                       BIDI       43
    3 CALL RNRW (IBTAPE,XI,JB)                                          BIDI       44
      DO 5 J = 1,3                                                      BIDI       45
      DO 7 I = 1,400                                                    BIDI       46
    7 XI(I) = 0.0                                                       BIDI       47
      DO 6 I = 1,NB                                                     BIDI       48
      JP = MRK(I,1)                                                     BIDI       49
      NIB = MRK(I,2) - MRK(I,1) + 1                                     BIDI       50
      ITAPE  =  IBTAPE + I                                              BIDI       51
      CALL RNRW (-ITAPE, XI(JP), NIB)                                   BIDI       52
    6 CONTINUE                                                          BIDI       53
      JP = NCNSM1 - NTBOX                                               BIDI       54
      J1 = MMRK                                                         BIDI       55
    5 CALL RNRW (MTAP15, XI(J1), JP)                                    BIDI       56
      IF (N.NE.NM)  GOTO 2                                              BIDI       57
      DO 8  I=1,NB                                                      BIDI       58
```

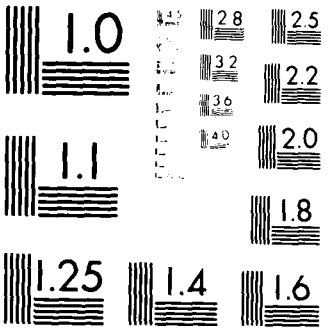
```
                      ITAPE  =  IBTAPE + I                                  BIDI       59
                    8 REWIND ITAPE                                          BIDI       60
     60             2 CONTINUE                                              BIDI       61
                      REWIND MTAP15                                         BIDI       62
                      REWIND IBTAPE                                         BIDI       63
                      RETURN                                                BIDI       64
                      END                                                   BIDI       65
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	BIDI	1	63

VARIABLES	SN	TYPE		RELOCATION								
236	ACAP	REAL		VARBLS	REFS	2						
334	BGMA	REAL	ARRAY	BODY	REFS	8						
237	B2	REAL		VARBLS	REFS	2						
12446	DELY	REAL	ARRAY	VARBLS	REFS	2						
7346	EV	REAL	ARRAY	VARBLS	REFS	2						
240	FL	REAL		VARBLS	REFS	2						
13514	GGMA	REAL	ARRAY	VARBLS	REFS	2						
244	GMA	REAL	ARRAY	VARBLS	REFS	2						
216	I	INTEGER			REFS	23	2*24	2*25	26	28	30	37
					38	2*39	46	48	2*49	50	58	
					DEFINED	22	36	45	47	57		
213	IBTAPE	INTEGER			REFS	26	37	43	50	58		
					DEFINED	19	I/O REFS	62				
5	IO	INTEGER		VARBLS	REFS	2						
6	IR	INTEGER		VARBLS	REFS	2						
221	ITAPE	INTEGER			REFS	28	40	51	DEFINED	26	37	50
					58	I/O REFS	27	29	59			
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	10	12	18	19			
224	J	INTEGER			DEFINED	34	44					
225	JB	INTEGER			REFS	40	41	42	43	DEFINED	35	41
					42							
226	JP	INTEGER			REFS	51	55	DEFINED	48	53		
7	JSPECS	INTEGER		VARBLS	REFS	2						
227	J1	INTEGER			REFS	55	DEFINED	54				
242	KR	INTEGER		VARBLS	REFS	2						
243	KRDBR	INTEGER		VARBLS	REFS	2						
222	MK	INTEGER			REFS	2*31	DEFINED	30				
215	MMRK	INTEGER			REFS	31	54	DEFINED	21	31		
360	MRK	INTEGER	ARRAY	BODY	REFS	8	21	2*25	30	48	2*49	
212	MTAP15	INTEGER			REFS	55	DEFINED	18	I/O REFS	61		
223	N	INTEGER			REFS	56	DEFINED	33				
1	NB	INTEGER		VARBLS	REFS	2	22	36	47	57		
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	2						
310	NBEA	INTEGER	ARRAY	BODY	REFS	8	23	24	38	39		
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	2						
0	NCNSM1	INTEGER		VARBLS	REFS	2	20	53				
3	NDATA	INTEGER		VARBLS	REFS	2						
2	NDELT	INTEGER		VARBLS	REFS	2						
217	NEL	INTEGER			REFS	21	22	32	39	40	41	


AD-A152 270 ESP (EXTERNAL-STORES PROGRAM) - A PILOT COMPUTER 7/8
PROGRAM FOR DETERMINING.. (U) GRUMMAN AEROSPACE CORP
BETHPAGE NY J B SMEDFJELD FEB 85 ADCR-85-1-VOL-3-PT-1
UNCLASSIFIED N00019-81-C-0395 F/G 9/2 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

VARIABLES	SN	TYPE		RELOCATION						
					DEFINED	23	24	38	39	
220	NIB	INTEGER			REFS	28	51	DEFINED	25	49
0	NM	INTEGER		F.P.	REFS	28	33	56	DEFINED	1
4	NOPAN	INTEGER		VARBLS	REFS	2				
0	NPOINT	INTEGER		F.P.	REFS	28	DEFINED	1		
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	2				
0	NTBOX	INTEGER		F.P.	REFS	53	DEFINED	1		
214	NTEL	INTEGER			REFS	28	32	DEFINED	20	32
241	PI	REAL		VARBLS	REFS	2				
10166	PV	REAL	ARRAY	VARBLS	REFS	2				
3426	P1	REAL	ARRAY	VARBLS	REFS	2				
5706	P2	REAL	ARRAY	VARBLS	REFS	2				
0	RO	REAL	ARRAY	BODY	REFS	8				
144	ROP	REAL	ARRAY	BODY	REFS	8				
11626	SDELX	REAL	ARRAY	VARBLS	REFS	2				
326	X	REAL	ARRAY	VARBLS	REFS	2				
430	XBO	REAL	ARRAY	BODY	REFS	8				
230	XI	REAL	ARRAY		REFS	11	40	43	51	55
					DEFINED	46				
13266	XO	REAL	ARRAY	VARBLS	REFS	2				
1146	Y	REAL	ARRAY	VARBLS	REFS	2				
454	YBO	REAL	ARRAY	BODY	REFS	8				
13350	YO	REAL	ARRAY	VARBLS	REFS	2				
500	ZBO	REAL	ARRAY	BODY	REFS	8				
11006	ZV	REAL	ARRAY	VARBLS	REFS	2				
1766	ZZ	REAL	ARRAY	VARBLS	REFS	2				
4246	ZZ1	REAL	ARRAY	VARBLS	REFS	2				
6526	ZZ2	REAL	ARRAY	VARBLS	REFS	2				
13432	ZO	REAL	ARRAY	VARBLS	REFS	2				
2606	Z1	REAL	ARRAY	VARBLS	REFS	2				
5066	Z2	REAL	ARRAY	VARBLS	REFS	2				

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES			
BEIN		7	28			
RNRW		3	40	43	51	55

STATEMENT LABELS		DEF LINE	REFERENCES	
0	1	32	22	
145	2	60	33	56
0	3	43	34	
0	4	41	36	
0	5	55	44	
0	6	52	47	
0	7	46	45	
0	8	59	57	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES		
15	1	I	22 32	31B		EXT REFS	
47	2	N	33 60	101B		EXT REFS	NOT INNER
50	3	J	34 43	27B		EXT REFS	NOT INNER
52	4	I	36 41	17B		EXT REFS	
100	5	J	44 55	33B		EXT REFS	NOT INNER
103	7	I	45 46	2B	INSTACK		
107	6	I	47 52	14B		EXT REFS	
136	8	I	57 59	7B		EXT REFS	

COMMON BLOCKS LENGTH MEMBERS - BIAS NAME(LENGTH)

VARBLS	6014	0	NCNSM1	(1)	1	NB	(1)	2	NDELT	(1)
		3	NDATA	(1)	4	NOPAN	(1)	5	IQ	(1)
		6	IR	(1)	7	JSPECS	(1)	8	NCARAY	(50)
		58	NSARAY	(50)	108	NBARAY	(50)	158	ACAP	(1)
		159	B2	(1)	160	FL	(1)	161	PI	(1)
		162	KR	(1)	163	KRDBR	(1)	164	GMA	(50)
		214	X	(400)	614	Y	(400)	1014	ZZ	(400)
		1414	Z1	(400)	1814	P1	(400)	2214	ZZ1	(400)
		2614	Z2	(400)	3014	P2	(400)	3414	ZZ2	(400)
		3814	EV	(400)	4214	PV	(400)	4614	ZV	(400)
		5014	SDELX	(400)	5414	DELY	(400)	5814	XO	(50)
		5864	YO	(50)	5914	ZO	(50)	5964	GGMA	(50)
BODY	340	0	RO	(100)	100	ROP	(100)	200	NBEA	(20)
		220	BGMA	(20)	240	MRK	(40)	280	XBO	(20)
		300	YBO	(20)	320	ZBO	(20)			
CTAPES	50	0	ITAPES	(50)						

STATISTICS

PROGRAM LENGTH	10568	558
CM LABELED COMMON LENGTH	14404B	6404
52000B CM USED		

```
      SUBROUTINE BEIN (NF,NM,ITAPE,NPOINT,NIB,NEL,NTEL)                 BEIN       2
C                                                                       BEIN       3
      COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IR,JSPECS,        BEIN       4
     1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,  BEIN       5
     2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),  BEIN       6
     3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),       BEIN       7
     4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),    BEIN       8
     5                 XO(50),YO(50),ZO(50),GGMA(50)                    BEIN       9
      COMMON/BODY/ RO(100), ROP(100), NBEA(20), BGMA(20), MRK(20,2),    BEIN      10
     1             XBO(20), YBO(20), ZBO(20)                            BEIN      11
      COMMON /MODD  / BPR, DETAD, WW, OMG, NC                           BEIN      12
      COMMON / COMA  / LC, BR                                           BEIN      13
      COMMON/CHSP/ KDEG                                                 BEIN      14
      COMMON / CTAPES / ITAPES                                          BEIN      15
C                                                                       BEIN      16
      DIMENSION LC(40)                                                  BEIN      17
      DIMENSION QZ(220)                                                 BEIN      18
      DIMENSION WW(40,40), OMG(40)                                      BEIN      19
      DIMENSION XGP(20), DEFL(20), AN(3), D(20,5)                       BEIN      20
      DIMENSION A(50), B(50), C(50)                                     BEIN      21
      DIMENSION BB(50), BQ(400), DH1(400), DH2(50), H(400)              BEIN      22
      DIMENSION ITAPES(50)                                              BEIN      23
C                                                                       BEIN      24
      COMPLEX   BPR(40,40), DETAD(40,40)                                BEIN      25
C                                                                       BEIN      26
      EQUIVALENCE(BB(1), A(1)), (DH2(1),B(1))                           BEIN      27
C                                                                       BEIN      28
C                                                                       BEIN      29
      ITAPER = ITAPES(5)                                                BEIN      30
      ITAPEW = ITAPES(6)                                                BEIN      31
      MTAP49 =  ITAPES(49)                                              BEIN      32
C                                                                       BEIN      33
C                                                                       BEIN      34
C                                                                       BEIN      35
C        LID  LIST MODAL INPUT DATA                                     BEIN      36
C        LOD  LIST MODAL OUTPUT DATA                                    BEIN      37
C                                                                       BEIN      38
      LID = LC(23)                                                      BEIN      39
      LOD = LC(24)                                                      BEIN      40
      KDEG = 2                                                          BEIN      41
      READ (ITAPER,62) NGP,NSTRIP,IPANEL                                BEIN      42
      READ (ITAPER,63)(XGP(I), I = 1,NGP)                               BEIN      43
      NBPS = NIB/NSTRIP                                                 BEIN      44
      WRITE (ITAPEW,400) NF                                             BEIN      45
      B22 = B2*B2                                                       BEIN      46
      REWIND MTAP49                                                     BEIN      47
      DO 150 M = 1,NM                                                   BEIN      48
      CALL RNRW (-MTAP49,QZ,NC)                                         BEIN      49
      IF(LID.EQ.0) GO TO 8                                              BEIN      50
      WRITE (ITAPEW,450)  M                                             BEIN      51
    8 CONTINUE                                                          BEIN      52
      DO 151 N = 1,NGP                                                  BEIN      53
      NN  = NPOINT + N                                                  BEIN      54
      IF(LID.EQ.0) GO TO 151                                            BEIN      55
      WRITE (ITAPEW,451) NN, XGP(N), QZ(NN)                             BEIN      56
  151 DEFL(N)  =  QZ(NN)                                                BEIN      57
      KIND = -1                                                         BEIN      58
```

```
                      ID = 7                                                    BEIN      59
                      EPS = 0.01                                                BEIN      60
   60                 XGP1 = XGP(1)                                             BEIN      61
                      D(1,1) = 0.0                                              BEIN      62
                      D(1,2) = 0.0                                              BEIN      63
                      D(NGP,1) = 0.0                                            BEIN      64
                      D(NGP,2) = 0.0                                            BEIN      65
   65                 F =XGP1                                                   BEIN      66
                      CALL SPLIT3 (XGP,DEFL,NGP,D,KIND,IND,20,F,AN,ID,EPS,1)    BEIN      67
                      DO 160 N = 1,NEL                                          BEIN      68
                      NN  = NTEL + N                                            BEIN      69
                      F = EV(NN)                                                BEIN      70
   70                 LIND = 2                                                  BEIN      71
                      CALL SPLIT3 (XGP,DEFL,NGP,D,LIND,IND,20,F,AN,ID,EPS,2)    BEIN      72
                      BB(N) = DELY(NN) *SDELX(NN) * AN(1) / B22                 BEIN      73
                      IF (ABS(Y(NN)).LT.0.0001) BB(N) = 0.5*BB(N)               BEIN      74
                      F = X(NN)                                                 BEIN      75
   75                 CALL SPLIT3 (XGP,DEFL,NGP,D,LIND,IND,20,F,AN,ID,EPS,2)    BEIN      76
                      H(N) = AN(1)                                              BEIN      77
                      DH1(N) = AN(2) * B2                                       BEIN      78
                  160 DH2(N) = AN(3) * B2                                       BEIN      79
                      CALL RNRW (ITAPE,BB,NEL)                                  BEIN      80
   80                 CALL RNRW (ITAPE,H,NEL)                                   BEIN      81
                      CALL RNRW (ITAPE,DH1,NEL)                                 BEIN      82
                      CALL RNRW (ITAPE,DH2,NEL)                                 BEIN      83
                      IF (LOD.EQ.0) GO TO 10                                    BEIN      84
                      WRITE (ITAPEW,550) M                                      BEIN      85
   85                 DO 11 N = 1,NEL                                           BEIN      86
                      NN = NTEL + N                                             BEIN      87
                   11 WRITE (ITAPEW,551) NN, X(NN), BB(N), H(N), DH1(N), DH2(N) BEIN      88
                   10 CONTINUE                                                  BEIN      89
                      WRITE (ITAPEW,553) IND                                    BEIN      90
   90                 II = MRK(NF,1) - 1                                        BEIN      91
                      DO 12 N = 1,NBPS                                          BEIN      92
                      NN = II + N                                               BEIN      93
                      F = EV(NN)                                                BEIN      94
                      CALL SPLIT3 (XGP,DEFL,NGP,D,LIND,IND,20,F,AN,ID,EPS,2)    BEIN      95
   95                 A(N) = AN(1) / B22                                        BEIN      96
                      F = X(NN)                                                 BEIN      97
                      CALL SPLIT3 (XGP,DEFL,NGP,D,LIND,IND,20,F,AN,ID,EPS,2)    BEIN      98
                      B(N) = AN(1)                                              BEIN      99
                   12 C(N) = AN(2) * B2                                         BEIN     100
  100                 IF (LOD.NE.0) WRITE (ITAPEW,552)                          BEIN     101
                      IS = IPANEL                                               BEIN     102
                      DO 15 J = 1,NSTRIP                                        BEIN     103
                      IF(BGMA(NF).EQ. 0) FAC = COS(GMA(IS))                     BEIN     104
                      IF(BGMA(NF).NE. 0) FAC =-SIN(GMA(IS))                     BEIN     105
  105                 IS = IS + 1                                               BEIN     106
                      JJ = (J-1)* NBPS                                          BEIN     107
                      II = MRK(NF,1) + JJ - 1                                   BEIN     108
                      DO 16 N = 1,NBPS                                          BEIN     109
                      NN = II + N                                               BEIN     110
  110                 MM = JJ + N                                               BEIN     111
                      BQ(MM) = A (N) * FAC * SDELX(NN) * DELY(NN)               BEIN     112
                      H(MM) = B (N) *FAC                                        BEIN     113
                      DH1(MM)= C (N) * FAC                                      BEIN     114
```

```
                  WRITE (ITAPEW,551) NN,EV(NN), X(NN), BQ(MM), H(MM), DH1(MM)
               16 CONTINUE
               15 CONTINUE
                  WRITE (ITAPEW,553) IND
                  CALL RNRW (ITAPE, BQ,NIB)
                  CALL RNRW (ITAPE,  H,NIB)
                  CALL RNRW (ITAPE,DH1,NIB)
            C
              150 CONTINUE
                  REWIND MTAP49
                  REWIND ITAPE
                  NPOINT = NPOINT + NGP
            C
            C
            C FORMATS
            C
               62 FORMAT (10I5)
               63 FORMAT (6E10.3)
              400 FORMAT (1H1,19X, 11HBODY NUMBER,I4, //)
              450 FORMAT (//15X, 25HINPUT MODAL DATA FOR MODE, I4, //
                 1        10X,5HPOINT,15X,1HX,10X,10HDEFLECTION, //)
              451 FORMAT (11X,I4,2(5X,E16.7))
              550 FORMAT (1H1,2X, 32HINTERPOLATED MODAL DATA FOR MODE, I4, //
                 1 1X,7HELEMENT,7X,2HXX,14X,2HBB,15X,1HH,14X,3HDH1,14X,3HDH2,//)
              551 FORMAT (2X,I4,3X,7(E14.7,2X))
              552 FORMAT (//3X,3HBOX,9X,2HEV,15X,1HX,14X,2HBQ,15X,1HH,14X,3HDH1)
              553 FORMAT (//5X,5HIND =,I2)
            C
                  RETURN
                  END
```

BEIN 116
BEIN 117
BEIN 118
BEIN 119
BEIN 120
BEIN 121
BEIN 122
BEIN 123
BEIN 124
BEIN 125
BEIN 126
BEIN 127
BEIN 128
BEIN 129
BEIN 130
BEIN 131
BEIN 132
BEIN 133
BEIN 134
BEIN 135
BEIN 136
BEIN 137
BEIN 138
BEIN 139
BEIN 140
BEIN 141
BEIN 142
BEIN 143
BEIN 144
BEIN 145

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 BEIN 1 143

VARIABLES	SN	TYPE	RELOCATION								
632 A		REAL	ARRAY		REFS	20	26	111	DEFINED	95	
236 ACAP		REAL		VARBLS	REFS	3					
1402 AN		REAL	ARRAY		REFS	19	66	71	72	75	76	77
						78	94	95	97	98	99	
714 B		REAL	ARRAY		REFS	20	26	112	DEFINED	98		
632 BB		REAL	ARRAY		REFS	21	26	73	79	87		
					DEFINED	72	73					
334 BGMA		REAL	ARRAY	BODY	REFS	9	103	104				
0 BPR		COMPLEX	ARRAY	MODD	REFS	11	24					
1633 BQ		REAL	ARRAY		REFS	21	115	119	DEFINED	111		
50 BR		REAL		COMA	REFS	12						
237 B2		REAL		VARBLS	REFS	3	2*45	77	78	99		
611 B22		REAL			REFS	72	95	DEFINED	45			
1551 C		REAL	ARRAY		REFS	20	113	DEFINED	99			
1405 D		REAL	ARRAY		REFS	19	66	71	75	94	97	
					DEFINED	61	62	63	64			

VARIABLES	SN	TYPE	RELOCATION									
1356	DEFL	REAL	ARRAY		REFS	19	66	71	75	94	97	
					DEFINED	56						
12446	DELY	REAL	ARRAY	VARBLS	REFS	3	72	111				
6200	DETAD	COMPLEX	ARRAY	MODD	REFS	11	24					
2453	DH1	REAL	ARRAY		REFS	21	81	87	115	121		
					DEFINED	77	113					
714	DH2	REAL	ARRAY		REFS	21	26	82	87	DEFINED	78	
617	EPS	REAL			REFS	66	71	75	94	97		
					DEFINED	59						
7346	EV	REAL	ARRAY	VARBLS	REFS	3	69	93	115			
621	F	REAL			REFS	66	71	75	94	97		
					DEFINED	65	69	74	93	96		
627	FAC	REAL			REFS	111	112	113	DEFINED	103	104	
240	FL	REAL		VARBLS	REFS	3						
13514	GGMA	REAL	ARRAY	VARBLS	REFS	3						
244	GMA	REAL	ARRAY	VARBLS	REFS	3	103	104				
3273	H	REAL	ARRAY		REFS	21	80	87	115	120		
					DEFINED	76	112					
607	I	INTEGER			REFS	42	DEFINED	42				
616	ID	INTEGER			REFS	66	71	75	94	97		
					DEFINED	58						
624	II	INTEGER			REFS	92	109	DEFINED	90	107		
622	IND	INTEGER			REFS	66	71	75	89	94	97	118
606	IPANEL	INTEGER			REFS	101	DEFINED	41				
5	IQ	INTEGER		VARBLS	REFS	3						
6	IR	INTEGER		VARBLS	REFS	3						
625	IS	INTEGER			REFS	103	104	105	DEFINED	101	105	
0	ITAPE	INTEGER		F.P.	REFS	79	80	81	82	119	120	121
					DEFINED	1	I/O REFS	125				
577	ITAPER	INTEGER			DEFINED	29	I/O REFS	41	42			
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	14	22	29	30	31		
600	ITAPEW	INTEGER			DEFINED	30	I/O REFS	44	50	55	84	87
					89	100	115	118				
626	J	INTEGER			REFS	106	DEFINED	102				
630	JJ	INTEGER			REFS	107	110	DEFINED	106			
7	JSPECS	INTEGER		VARBLS	REFS	3						
0	KDEG	INTEGER		CHSP	REFS	13	DEFINED	40				
615	KIND	INTEGER			REFS	66	DEFINED	57				
242	KR	INTEGER		VARBLS	REFS	3						
243	KRDBR	INTEGER		VARBLS	REFS	3						
0	LC	INTEGER	ARRAY	COMA	REFS	12	16	38	39			
602	LID	INTEGER			REFS	49	54	DEFINED	38			
623	LIND	INTEGER			REFS	71	75	94	97	DEFINED	70	
603	LOD	INTEGER			REFS	83	100	114	DEFINED	39		
612	M	INTEGER			REFS	50	84	DEFINED	47			
631	MM	INTEGER			REFS	111	112	113	3*115	DEFINED	110	
360	MRK	INTEGER	ARRAY	BODY	REFS	9	90	107				
601	MTAP49	INTEGER			REFS	48	DEFINED	31	I/O REFS	46	124	
613	N	INTEGER			REFS	53	55	56	68	72	2*73	76
					77	78	86	4*87	92	95	98	99
					109	110	111	112	113	DEFINED	52	67
					85	91	108					
1	NB	INTEGER		VARBLS	REFS	3						
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	3						
310	NBEA	INTEGER	ARRAY	BODY	REFS	9						
610	NBPS	INTEGER			REFS	91	106	108	DEFINED	43		
17550	NC	INTEGER		MODD	REFS	11	48					

VARIABLES	SN	TYPE		RELOCATION								
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	3						
0	NCNSM1	INTEGER		VARBLS	REFS	3						
3	NDATA	INTEGER		VARBLS	REFS	3						
2	NDELT	INTEGER		VARBLS	REFS	3						
0	NEL	INTEGER		F.P.	REFS	67	79	80	81	82	85	
					DEFINED	1						
0	NF	INTEGER		F.P.	REFS	44	90	103	104	107		
					DEFINED	1						
604	NGP	INTEGER			REFS	42	52	63	64	66	71	75
					94	97	126	DEFINED	41			
0	NIB	INTEGER		F.P.	REFS	43	119	120	121	DEFINED	1	
0	NM	INTEGER		F.P.	REFS	47	DEFINED	1				
614	NN	INTEGER			REFS	2*55	56	69	2*72	73	74	2*87
					93	96	2*111	3*115	DEFINED	53	68	86
					92	109						
4	NOPAN	INTEGER		VARBLS	REFS	3						
0	NPOINT	INTEGER		F.P.	REFS	53	126	DEFINED	1	126		
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	3						
605	NSTRIP	INTEGER			REFS	43	102	DEFINED	41			
0	NTEL	INTEGER		F.P.	REFS	68	86	DEFINED	1			
17500	OMG	REAL	ARRAY	MODD	REFS	11	18					
241	PI	REAL		VARBLS	REFS	3						
10166	PV	REAL	ARRAY	VARBLS	REFS	3						
3426	P1	REAL	ARRAY	VARBLS	REFS	3						
5706	P2	REAL	ARRAY	VARBLS	REFS	3						
776	QZ	REAL	ARRAY		REFS	17	48	55	56			
0	RO	REAL	ARRAY	BODY	REFS	9						
144	ROP	REAL	ARRAY	BODY	REFS	9						
11626	SDELX	REAL	ARRAY	VARBLS	REFS	3	72	111				
14400	WW	REAL	ARRAY	MODD	REFS	11	18					
326	X	REAL	ARRAY	VARBLS	REFS	3	74	87	96	115		
430	XBO	REAL	ARRAY	BODY	REFS	9						
1332	XGP	REAL	ARRAY		REFS	19	55	60	66	71	75	94
					97	DEFINED	42					
620	XGP1	REAL			REFS	65	DEFINED	60				
13266	XO	REAL	ARRAY	VARBLS	REFS	3						
1146	Y	REAL	ARRAY	VARBLS	REFS	3	73					
454	YBO	REAL	ARRAY	BODY	REFS	9						
13350	YO	REAL	ARRAY	VARBLS	REFS	3						
500	ZBO	REAL	ARRAY	BODY	REFS	9						
11006	ZV	REAL	ARRAY	VARBLS	REFS	3						
1766	ZZ	REAL	ARRAY	VARBLS	REFS	3						
4246	ZZ1	REAL	ARRAY	VARBLS	REFS	3						
6526	ZZ2	REAL	ARRAY	VARBLS	REFS	3						
13432	ZO	REAL	ARRAY	VARBLS	REFS	3						
2606	Z1	REAL	ARRAY	VARBLS	REFS	3						
5066	Z2	REAL	ARRAY	VARBLS	REFS	3						

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS		REFERENCES							
COS	REAL	1	LIBRARY	103							
RNRW		3		48	79	80	81	82	119	120	121
SIN	REAL	1	LIBRARY	104							
SPLIT3		12		66	71	75	94	97			

INLINE FUNCTIONS	TYPE	ARGS	DEF LINE	REFERENCES
ABS	REAL	1	INTRIN	73

STATEMENT LABELS			DEF LINE	REFERENCES	
44	8		51	49	
172	10		88	83	
0	11		87	85	
0	12		99	91	
0	15		117	102	
271	16		116	108	114
516	62	FMT	131	41	
520	63	FMT	132	42	
0	150		123	47	
55	151		56	52	54
0	160		78	67	
522	400	FMT	133	44	
526	450	FMT	134	50	
537	451	FMT	136	55	
542	550	FMT	137	84	
555	551	FMT	139	87	115
560	552	FMT	140	100	
566	553	FMT	141	89	118

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
36	150	M	47 123	261B	EXT REFS	NOT INNER
45	151	N	52 56	15B	EXT REFS	
75	160	N	67 78	32B	EXT REFS	
153	11	N	85 87	17B	EXT REFS	
177	12	N	91 99	21B	EXT REFS	
225	15	J	102 117	51B	EXT REFS	NOT INNER
244	16	N	108 116	30B	EXT REFS	

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
VARBLS	6014	0 NCNSMT (1)	1 NB (1)	2 NDELT (1)			
		3 NDATA (1)	4 NOPAN (1)	5 IQ (1)			
		6 IR (1)	7 JSPECS (1)	8 NCARAY (50)			
		58 NSARAY (50)	108 NBARAY (50)	158 ACAP (1)			
		159 B2 (1)	160 FL (1)	161 PI (1)			
		162 KR (1)	163 KRDBR (1)	164 GMA (50)			
		214 X (400)	614 Y (400)	1014 ZZ (400)			
		1414 Z1 (400)	1814 P1 (400)	2214 ZZ1 (400)			
		2614 Z2 (400)	3014 P2 (400)	3414 ZZ2 (400)			
		3814 EV (400)	4214 PV (400)	4614 ZV (400)			
		5014 SDELX (400)	5414 DELY (400)	5814 XO (50)			
		5864 YO (50)	5914 ZO (50)	5964 GGMA (50)			
BODY	340	0 RO (100)	100 ROP (100)	200 NBEA (20)			
		220 BGMA (20)	240 MRK (40)	280 XBO (20)			
		300 YBO (20)	320 ZBO (20)				
MODD	8041	0 BPR (3200)	3200 DETAD (3200)	6400 WW (1600)			
		8000 OMG (40)	8040 NC (1)				
COMA	41	0 LC (40)	40 BR (1)				
CHSP	1	0 KDEG (1)					
CTAPES	50	0 ITAPES (50)					

EQUIV CLASSES	LENGTH	MEMBERS - BIAS NAME(LENGTH)
BB	50	0 A (50)
DH2	50	0 B (50)

STATISTICS

PROGRAM LENGTH	4144B	2148
CM LABELED COMMON LENGTH	34227B	14487

520000B CM USED

```
      SUBROUTINE SPLIT3 (X,F,N,D,KIND,IND,L,ARGT,AN,K,EPS,KSPLIT)
C         X    ARRAY OF INDEPENDENT VARIABLE, DIMENSION N
C         F    ARRAY OF FUNCTIONAL VALUES FOR EACH X, DIMENSION N
C         N    NUMBER OF VALUES IN TABLE
C         D    WORK AREA TO SOLVE FOR SECOND DERIVATIVES WHICH ARE
C              RETURNED IN THE FIRST N LOCATIONS   DIMENSION IN THE
C              CALLING PROGRAM TO AT LEAST 5*N
C         KIND=-1 D(1,1),D(1,2),D(N,1),D(N,2) ARE INITIALIZED TO THE
C                 VALUES Q1,F1,Q2,F2 SUCH THAT D(1)=F1*D2+Q1  AND
C                 D(N)=F2*D(N-1)+Q2
C               =0 D(1,2),D(N,2) ARE INITIALIZED TO PRESCRIBED VALUES
C                  FOR FIRST DERIVATIVES AT X(1) AND X(N)
C               =+1 PERIODIC FUNCTION  F(1)=F(N)    D(1)=D(N)
C                  PERIOD = X(N)-X(1)
C               =+2  EXTRAPOLATION,   QUADRATIC FIT
C               =+3  EXTRAPOLATION,   SAME FIT AS END SEGMENT
C               =+4  NO EXTRAPOLATION
C         ARGT  VALUE AT WHICH INTERPOLATION IS PERFORMED
C         IND  1-MATRIX SINGULAR       0-NON-SINGULAR
C         ANS   ARRAY FOR INTERPOLATED VALUES OF FUNCTION, FIRST
C               AND SECOND DERIVATIVES
C         K     OPTION INDICATOR WHICH VALUES ARE DESIRED
C                 1   FUNCTION
C                 2   FIRST DERIVATIVE
C                 4   SECOND DERIVATIVE
      DIMENSION X(1), F(1), D(L,1)
     *     ,ANS(3)
      DIMENSION AN(1)
      GO TO (100, 111),  KSPLIT
  100 EY  =  2
      NN=N-1
      NNN=NN
      M=1
      DS1=D(1,2)
      DSN=D(N,2)
      IF(KIND) 42,43,44
   42 D(1,4)=1.
      D(1,5)=-DS1
      GO TO 43
   44 S= X(2)-X(1)
      SR=(F(2)-F(1))/S
      GO TO 45
   43 S=X(2)-X(1)
      IF(KIND.EQ.0) D(1,4)=S/3.
   45 SR=(F(2)-F(1))/S
      IF(KIND.EQ.0) D(1,1)=SR-DS1
      IF(KIND.GE.0) D(1,5)=S/6.
      S1= S
      DO 1 I=2,NN
      D(I-1,3)=S/6.
      SR1=SR
      S=X(I+1)-X(I)
      SR=(F(I+1)-F(I))/S
      D(I,4)=(X(I+1)-X(I-1))/3.
      D(I,5)=S/6.
    1 D(I,1)=SR-SR1
      IF(KIND) 52,53,54
```

```
                52 D(NN,3)=-DSN                                                    SPLIT3     59
                   D(N,4)= 1.                                                      SPLIT3     60
60                 GO TO 55                                                        SPLIT3     61
                53 D(NN,3)=D(NN,5)                                                 SPLIT3     62
                   D(N,4)=S/3.                                                     SPLIT3     63
                   D(N,1)=DSN-SR                                                   SPLIT3     64
                55 KEY=1                                                           SPLIT3     65
65                 NN=N                                                            SPLIT3     66
                   GO TO 10                                                        SPLIT3     67
                54 M=2                                                             SPLIT3     68
                   D(2,2)=-D(1,3)                                                  SPLIT3     69
                   NN=NN-1                                                         SPLIT3     70
70                 IF (NN.LT.3) GO TO 152                                          SPLIT3     71
                   DO 6 I=3,NN                                                     SPLIT3     72
                 6 D(I,2)=0.                                                       SPLIT3     73
               152 D(NN+1,2)=-D(NN+1,5)                                            SPLIT3     74
                   GO TO 10                                                        SPLIT3     75
75              10 CALL TRIDI(D(KEY,3),D(KEY,4),D(KEY,5),D(KEY,1),NN,M,L,EPS,IND)  SPLIT3     76
                   IF (IND.NE.0)RETURN                                             SPLIT3     77
                   IF (KIND) 19,98,21                                              SPLIT3     78
                19 I=2                                                             SPLIT3     79
                   II=1                                                            SPLIT3     80
80                 ARG=X(1)                                                        SPLIT3     81
                   KK=2                                                            SPLIT3     82
                   GO TO 2                                                         SPLIT3     83
                56 D(II,2)=ANS(2)                                                  SPLIT3     84
                   IF(II.NE.1) GO TO 97                                            SPLIT3     85
85                 I=N                                                             SPLIT3     86
                   II=N                                                            SPLIT3     87
                   ARG=X(N)                                                        SPLIT3     88
                   GO TO 2                                                         SPLIT3     89
                98 D(1,2)=DS1                                                      SPLIT3     90
90                 D(N,2)=DSN                                                      SPLIT3     91
                97 D(1,3)=D(1,1)/2.                                                SPLIT3     92
                   D(1,4)=D(N,1)/2.                                                SPLIT3     93
                   D(2,3)=D(1,2)-D(1,1)*X(1)                                       SPLIT3     94
                   D(2,4)=D(N,2)-D(N,1)*X(N)                                       SPLIT3     95
95                 D(3,3)=F(1)-X(1)*(D(1,2)-D(1,3)*X(1))                           SPLIT3     96
                   D(3,4)=F(N)-X(N)*(D(N,2)-D(1,4)*X(N))                           SPLIT3     97
                   GO TO 999                                                       SPLIT3     98
                21 SR=SR-(F(2)-F(N))/S1                                            SPLIT3     99
                   SR = D(2,1)*S1/6. + D(N-1,1)*S/6. + SR                          SPLIT3    100
100                SD = D(2,2)*S1/6. + D(N-1,2)*S/6. + (S+S1)/3.                   SPLIT3    101
                   D(1,1) = -SR/SD                                                 SPLIT3    102
                   D(N,1) = D(1,1)                                                 SPLIT3    103
                   DO 22 I=2,NNN                                                   SPLIT3    104
                22 D(I,1)=D(I,1) + D(1,1)*D(I,2)                                   SPLIT3    105
105                GO TO 999                                                       SPLIT3    106
               111 CONTINUE                                                        SPLIT3    107
                   KK=K                                                            SPLIT3    108
                   ARG=ARGT                                                        SPLIT3    109
                   I=1                                                             SPLIT3    110
110                IF(X(1)-ARG) 9,33,30                                            SPLIT3    111
                 9 DO 8 I=2,N                                                      SPLIT3    112
                   IF(X(I)-ARG) 8,33,2                                             SPLIT3    113
                 8 CONTINUE                                                        SPLIT3    114
```

```
                      GO TO 30                                                  SPLIT3    116
                    2 AR=X(I)-ARG                                               SPLIT3    117
                      AG=ARG-X(I-1)                                             SPLIT3    118
                      H=X(I)-X(I-1)                                             SPLIT3    119
                      TT1=AR*D(I-1,1)/H                                         SPLIT3    120
                      TT2=AG*D(I,1)/H                                           SPLIT3    121
                      GO TO (5,4,4,3,3,3,3),KK                                  SPLIT3    122
                    3 ANS(3)=TT1+TT2                                            SPLIT3    123
                      GO TO (5,99,5,90,5,4,4),KK                                SPLIT3    124
                    4 ANS(2)=(TT2*AG-TT1*AR)* 5+(F(I)-F(I-1))/H+H*(D(I-1,1)-D(I,1))/6.  SPLIT3    125
                      GO TO (5,99,5,90,5,90,5),KK                               SPLIT3    126
                    5 TT1=TT1*AR*AR                                             SPLIT3    127
                      TT2=TT2*AG*AG                                             SPLIT3    128
                      ANS(1)=(TT1+TT2)/6.+AG*(F(I)/H-H*D(I,1)/6 )               SPLIT3    129
                     *       +AR*(F(I-1)/H-D(I-1,1)*H/6.)                       SPLIT3    130
                      GO TO 90                                                  SPLIT3    131
                   33 ANS(1)=F(I)                                               SPLIT3    132
                      ANS(3)=D(I,1)                                             SPLIT3    133
                      KK  =  ANDOR(K,2,0)                                       SPLIT3    134
                                                                                SPLIT3    135
                      IF(KK.NE.2) GO TO 99                                      SPLIT3    136
                      IF(I.NE.1.AND.I.NE.N) GO TO 2                             SPLIT3    137
                      ANS(2)=D(I,2)                                             SPLIT3    138
                      GO TO 99                                                  SPLIT3    139
                   30 GO TO (16,27,7,999),KIND                                  SPLIT3    140
                   16 PERIOD =X(N) - X(1)                                       SPLIT3    141
                      AR=AMOD(ARG-X(1),PERIOD)                                  SPLIT3    142
                      IF(AR.LT.0 )AR=PERIOD+AR                                  SPLIT3    143
                      ARG=X(1)+AR                                               SPLIT3    144
                      GO TO 9                                                   SPLIT3    145
                    7 IF(I.EQ.1) I=2                                            SPLIT3    146
                      GO TO 2                                                   SPLIT3    147
                   27 M=3                                                       SPLIT3    148
                      IF(I.EQ.N) M=4                                            SPLIT3    149
                      ANS(1)=D(3,M)+ARG*(D(2,M)+ARG*D(1,M))                     SPLIT3    150
                      ANS(2)=D(I,1)*ARG+D(2,M)                                  SPLIT3    151
                      ANS(3)=D(I,1)                                             SPLIT3    152
                   99 IF (KIND) 56,56,90                                        SPLIT3    153
                   90 AN(1) = ANS(1)                                            SPLIT3    154
                      AN(2)=ANS(2)                                              SPLIT3    155
                      AN(3)=ANS(3)                                              SPLIT3    156
                  999 RETURN                                                    SPLIT3    157
                      END                                                       SPLIT3    158
```

CARD NR	SEVERITY	DETAILS	DIAGNOSIS OF PROBLEM
29	I		AN IF STATEMENT MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
40	I	X	ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
41	I	F	ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
43	I	X	ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
45	I	F	ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
98	I	F	ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
154	I	AN	ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.
155	I	AN	ARRAY REFERENCE OUTSIDE DIMENSION BOUNDS.

COMMON BLOCKS	LENGTH	MEMBERS - BIAS	NAME	(LENGTH)							
		5014	SDELX	(400)	5414	DELY	(400)	5814	XO	(50)	
		5864	YO	(50)	5914	ZO	(50)	5964	GGMA	(50)	
BODY	340	0	RO	(100)	100	ROP	(100)	200	NBEA	(20)	
		220	BGMA	(20)	240	MRK	(40)	280	XBO	(20)	
		300	YBO	(20)	320	ZBO	(20)				
XYZ	350	0	YS	(50)	50	DELYS	(50)	100	ZS	(50)	
		150	DELZS	(50)	200	FGAMMA	(50)	250	CWIG	(50)	
		300	FGGAM	(50)							
XXZ	450	0	XOC	(400)	400	XIJ	(50)				
CTAPES	50	0	ITAPES	(50)							

STATISTICS

PROGRAM LENGTH	5478	359
CM LABELED COMMON LENGTH	160448	7204

520008 CM USED

```
VARIABLES      SN  TYPE          RELOCATION
11006  ZV          REAL          ARRAY    VARBLS      REFS      2      46      60      104    DEFINED     58      104
 1766  ZZ          REAL          ARRAY    VARBLS      REFS      2      43      60      103    DEFINED     55      103
 4246  ZZ1         REAL          ARRAY    VARBLS      REFS      2      44      60    DEFINED       56
 6526  ZZ2         REAL          ARRAY    VARBLS      REFS      2      45      60    DEFINED       57
13432  ZO          REAL          ARRAY    VARBLS      REFS      2      27
  515  ZOO         REAL                                REFS     29      55      56      57       58      79      103
                                                       104     106  DEFINED     27      97
 2606  Z1          REAL          ARRAY    VARBLS      REFS      2      48      60    DEFINED       48
 5066  Z2          REAL          ARRAY    VARBLS      REFS      2      49      60    DEFINED       49
       VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS            TYPE    ARGS        REFERENCES
       COS           REAL      1 LIBRARY      24        71
       SIN           REAL      1 LIBRARY      23        72

INLINE FUNCTIONS     TYPE    ARGS        DEF LINE  REFERENCES
       ABS           REAL      1  INTRIN                80        81

STATEMENT LABELS                 DEF LINE   REFERENCES
    0  1                             87         22
   37  2                             36         33
   42  3                             37         35
  160  4                             63         38        59
  251  5                             86         70        83
    0  6                            107         89
  265  7                             93         90
  270  8                             94         92
    0  9                            105         98
  323  10                           108         88
   33  11                            32         30
  175  12                            69         67
  423  700      FMT                 114         29
  437  701      FMT                 116         21
  441  702      FMT                 117        106
  451  703      FMT                 119         60        84
  454  704      FMT                 120        109
  456  705      FMT                 121         68
  473  706      FMT                 124         31

LOOPS  LABEL    INDEX     FROM-TO    LENGTH    PROPERTIES
   13  1        NP          22 87      243B              EXT REFS  NOT INNER
   45  4        J           38 63      116B              EXT REFS
  177  5        I           70 86       55B              EXT REFS
  260  6        N           89 107      43B              EXT REFS  NOT INNER
  304  9        K           98 105      11B        OPT

COMMON BLOCKS   LENGTH     MEMBERS - BIAS NAME(LENGTH)
       VARBLS     6014                0 NCNSM1 (1)          1 NB      (1)          2 NDELT   (1)
                                      3 NDATA  (1)          4 NOPAN   (1)          5 IQ      (1)
                                      6 IR     (1)          7 JSPECS  (1)          8 NCARAY  (50)
                                     58 NSARAY (50)       108 NBARAY (50)        158 ACAP    (1)
                                    159 B2     (1)        160 FL     (1)        161 PI      (1)
                                    162 KR     (1)        163 KRDBR  (1)        164 GMA     (50)
                                    214 X      (400)      614 Y      (400)     1014 ZZ      (400)
                                   1414 Z1     (400)     1814 P1     (400)     2214 ZZ1     (400)
                                   2614 Z2     (400)     3014 P2     (400)     3414 ZZ2     (400)
                                   3814 ZV     (400)     4214 PV     (400)     4614 ZV      (400)
```

VARIABLES	SN	TYPE		RELOCATION								
7	JSPECS	INTEGER		VARBLS	REFS	2						
517	J1	INTEGER			REFS	38	DEFINED	34	36			
520	J2	INTEGER			REFS	38	91	93	94	DEFINED	37	
541	K	INTEGER			REFS	2*99	2*100	2*101	2*102	2*103	2*104	
					DEFINED	98						
242	KR	INTEGER		VARBLS	REFS	2						
243	KRDBR	INTEGER		VARBLS	REFS	2						
537	K1	INTEGER			REFS	98	DEFINED	91	93			
540	K2	INTEGER			REFS	98	DEFINED	94				
0	LC12	INTEGER		F.P.	REFS	30	59	67	83	DEFINED	1	
360	MRK	INTEGER	ARRAY	BODY	REFS	8						
536	N	INTEGER			REFS	90	93	94	95	96	97	106
					DEFINED	89						
1	NB	INTEGER		VARBLS	REFS	2	88	89				
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	2	36	37				
310	NBEA	INTEGER	ARRAY	BODY	REFS	8	93	94				
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	2						
0	NCNSM1	INTEGER		VARBLS	REFS	2						
3	NDATA	INTEGER		VARBLS	REFS	2						
2	NDELT	INTEGER		VARBLS	REFS	2						
4	NOPAN	INTEGER		VARBLS	REFS	2	22					
510	NP	INTEGER			REFS	23	24	25	26	27	28	29
						33	36	37	65	3*66	2*68	
					DEFINED	22						
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	2	65					
241	PI	REAL		VARBLS	REFS	2						
10166	PV	REAL	ARRAY	VARBLS	REFS	2	42	60	102	DEFINED	54	102
3426	P1	REAL	ARRAY	VARBLS	REFS	2	40	60	DEFINED	52		
5706	P2	REAL	ARRAY	VARBLS	REFS	2	41	60	DEFINED	53		
0	RO	REAL	ARRAY	BODY	REFS	8						
144	ROP	REAL	ARRAY	BODY	REFS	8						
11626	SDELX	REAL	ARRAY	VARBLS	REFS	2						
511	SS	REAL			REFS	51	52	53	54	55	56	57
						58	78	79	80	81	DEFINED	23	72
326	X	REAL	ARRAY	VARBLS	REFS	2	47	60	99	DEFINED	47	99
430	XBO	REAL	ARRAY	BODY	REFS	8	95					
620	XIJ	REAL	ARRAY	XXZ	REFS	12	77	84	DEFINED	77		
0	XOC	REAL	ARRAY	XXZ	REFS	12						
13266	XO	REAL	ARRAY	VARBLS	REFS	2	25					
513	XOO	REAL			REFS	29	47	48	49	50	77	99
						100	106	DEFINED	25	95		
1146	Y	REAL	ARRAY	VARBLS	REFS	2	39	60	101	DEFINED	51	101
454	YBO	REAL	ARRAY	BODY	REFS	8	96					
522	YC	REAL			REFS	51	55	78	79	DEFINED	39	73
525	YCV	REAL			REFS	54	58	DEFINED	42			
523	YC1	REAL			REFS	52	56	DEFINED	40			
524	YC2	REAL			REFS	53	57	DEFINED	41			
0	YS	REAL	ARRAY	XYZ	REFS	10	73	84	DEFINED	78		
13350	YO	REAL	ARRAY	VARBLS	REFS	2	26					
514	YOO	REAL			REFS	29	51	52	53	54	78	101
						102	106	DEFINED	26	96		
500	ZBO	REAL	ARRAY	BODY	REFS	8	97					
526	ZC	REAL			REFS	51	55	78	79	DEFINED	43	74
531	ZCV	REAL			REFS	54	58	DEFINED	46			
527	ZC1	REAL			REFS	52	56	DEFINED	44			
530	ZC2	REAL			REFS	53	57	DEFINED	45			
144	ZS	REAL	ARRAY	XYZ	REFS	10	74	84	DEFINED	79		

```
115               1CHES .  3(2X,F10.2), /30X, 20HDIHEDRAL IN DEGREES . F10.2)          GLOBAL   116
                  701 FORMAT (1H1)                                                     GLOBAL   117
                  702 FORMAT (1HO,10X, 11HBODY NUMBER, I4, 30H.  APEX COORDINATES IN INC GLOBAL 118
                     1HES .  3(2X,F10.2))                                              GLOBAL   119
                  703 FORMAT (2X,I4,12(1X,F9.3))                                       GLOBAL   120
120               704 FORMAT (1H1)                                                     GLOBAL   121
                  705 FORMAT (1HO,2X,5HPANEL,I4, 25HTOTAL DIHEDRAL IN RADIANS, E14.6,// GLOBAL   122
                     1  1X,5HSTRIP,3X,3HXIJ,8X,2HYS,8X,2HZS,5X,5HDELYS,5X,5HDELZS,5X,  GLOBAL   123
                     2  6HFGAMMA,//)                                                  GLOBAL   124
                  706 FORMAT (1HO,3X, 3HBOX, 4X,1HX,9X,2HX1, 8X,2HX2,8X,2HXV,8X,1HY,9X, GLOBAL  125
125                  1        2HY1,8X,2HY2,8X,2HYV,8X,1HZ,8X,2HZ1,8X,2HZ2,8X,2HZV,//)  GLOBAL   126
               C                                                                       GLOBAL   127
                     RETURN                                                           GLOBAL   128
                     END                                                              GLOBAL   129
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	GLOBAL	1	127

VARIABLES

		SN	TYPE		RELOCATION							
236	ACAP		REAL		VARBLS	REFS	2						
334	BGMA		REAL	ARRAY	BODY	REFS	8						
237	B2		REAL		VARBLS	REFS	2						
512	CS		REAL			REFS	51	52	53	54	55	56	57
						58	78	79	80	81	DEFINED	24	71
372	CWIG		REAL	ARRAY	XYZ	REFS	10						
12446	DELY		REAL	ARRAY	VARBLS	REFS	2						
534	DELYC		REAL			REFS	80	81	DEFINED	75			
62	DELYS		REAL	ARRAY	XYZ	REFS	10	75	84	DEFINED	80		
535	DELZC		REAL			REFS	80	81	DEFINED	76			
226	DELZS		REAL	ARRAY	XYZ	REFS	10	76	84	DEFINED	81		
7346	EV		REAL	ARRAY	VARBLS	REFS	2	50	60	100	DEFINED	50	100
310	FGAMMA		REAL	ARRAY	XYZ	REFS	10	82	84	DEFINED	82		
454	FGGAM		REAL	ARRAY	XYZ	REFS	10	71	72	82			
240	FL		REAL		VARBLS	REFS	2						
13514	GGMA		REAL	ARRAY	VARBLS	REFS	2	23	24	28	66		
516	GGMAS		REAL			REFS	29	DEFINED	28				
244	GMA		REAL	ARRAY	VARBLS	REFS	2	66	68	DEFINED	66		
533	I		INTEGER			REFS	71	72	73	74	75	76	2*77
						78	79	80	81	3*82	7*84		
						DEFINED	70						
5	IQ		INTEGER		VARBLS	REFS	2						
6	IR		INTEGER		VARBLS	REFS	2						
0	ITAPES		INTEGER	ARRAY	CTAPES	REFS	13	14	17				
506	ITAPEW		INTEGER			DEFINED	17	I/O REFS	21	29	31	60	68
						84	106	109					
532	I1		INTEGER			REFS	70	DEFINED	64				
507	I2		INTEGER			REFS	64	65	70	DEFINED	20	65	
521	J		INTEGER			REFS	39	40	41	42	43	44	45
						46	2*47	2*48	2*49	2*50	51	52	53
						54	55	56	57	58	13*60		
						DEFINED	38						

```
                  ZV (J) = ZOO + ZCV*CS + YCV*SS                                  GLOBAL     59
                  IF (LC12 EQ.0) GO TO 4                                          GLOBAL     60
   60             WRITE (ITAPEW,703) J,   X(J),  Z1(J),  Z2(J),   EV(J)           GLOBAL     61
                 1                  ,   Y(J),  P1(J),  P2(J),   PV(J)           GLOBAL     62
                 2                  ,  ZZ(J), ZZ1(J), ZZ2(J),   ZV(J)           GLOBAL     63
                4 CONTINUE                                                        GLOBAL     64
                  I1 = I2 + 1                                                     GLOBAL     65
   65             I2 = I2 + NSARAY(NP) - 1                                        GLOBAL     66
                  GMA(NP) = GMA(NP) + GGMA(NP)                                    GLOBAL     67
                  IF (LC12.EQ.0) GO TO 12                                         GLOBAL     68
                  WRITE (ITAPEW,705) NP, GMA(NP)                                  GLOBAL     69
               12 CONTINUE                                                        GLOBAL     70
   70             DO 5 I = I1,I2                                                  GLOBAL     71
                  CS = COS (FGGAM (I))                                            GLOBAL     72
                  SS = SIN (FGGAM (I))                                            GLOBAL     73
                  YC = YS(I)                                                      GLOBAL     74
                  ZC = ZS(I)                                                      GLOBAL     75
   75             DELYC = DELYS(I)                                                GLOBAL     76
                  DELZC = DELZS(I)                                                GLOBAL     77
                  XIJ(I)  = XOO + XIJ(I)                                          GLOBAL     78
                  YS (I) = YOO + YC*CS - ZC*SS                                    GLOBAL     79
                  ZS (I) = ZOO + ZC*CS + YC*SS                                    GLOBAL     80
   80             DELYS(I) = ABS( DELYC*CS - DELZC*SS )                           GLOBAL     81
                  DELZS (I) = ABS( DELYC*SS + DELZC*CS )                          GLOBAL     82
                  FGAMMA(I) = FGAMMA(I) + FGGAM(I)                                GLOBAL     83
                  IF (LC12.EQ.0) GO TO 5                                          GLOBAL     84
                  WRITE (ITAPEW,703) I, XIJ(I), YS(I), ZS(I), DELYS(I), DELZS(I),  GLOBAL     85
   85            1                  FGAMMA(I)                                    GLOBAL     86
                5 CONTINUE                                                        GLOBAL     87
                1 CONTINUE                                                        GLOBAL     88
                  IF (NB.EQ.0) GO TO 10                                           GLOBAL     89
                  DO 6  N = 1,NB                                                  GLOBAL     90
   90             IF (N.GT.1) GO TO 7                                             GLOBAL     91
                  K1 = J2 + 1                                                     GLOBAL     92
                  GO TO 8                                                         GLOBAL     93
                7 K1 = J2 + NBEA(N-1) + 1                                         GLOBAL     94
                8 K2 = J2 + NBEA(N)                                               GLOBAL     95
   95             XOO = XBO(N)                                                    GLOBAL     96
                  YOO = YBO(N)                                                    GLOBAL     97
                  ZOO = ZBO(N)                                                    GLOBAL     98
                  DO 9  K = K1,K2                                                 GLOBAL     99
                  X  (K)  = XOO + X  (K)                                          GLOBAL    100
  100             EV (K)  = XOO + EV (K)                                          GLOBAL    101
                  Y  (K)  = YOO + Y  (K)                                          GLOBAL    102
                  PV (K)  = YOO + PV (K)                                          GLOBAL    103
                  ZZ (K)  = ZOO + ZZ (K)                                          GLOBAL    104
                  ZV (K)  = ZOO + ZV (K)                                          GLOBAL    105
  105             9 CONTINUE                                                      GLOBAL    106
                  WRITE (ITAPEW,702) N, XOO, YOO, ZOO                             GLOBAL    107
                6 CONTINUE                                                        GLOBAL    108
               10 CONTINUE                                                        GLOBAL    109
                  WRITE (ITAPEW,704)                                              GLOBAL    110
  110       C                                                                     GLOBAL    111
            C                                                                     GLOBAL    112
            C FORMATS                                                             GLOBAL    113
            C                                                                     GLOBAL    114
              702 FORMAT (1H0,10X,16HSUBAREA NUMBER ,I4,20H   APEX COORDINATES IN GLOBAL    115
```

```
      SUBROUTINE GLOBAL (LC12)                                          GLOBAL     2
      COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IR,JSPECS,        GLOBAL     3
     1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,  GLOBAL     4
     2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),  GLOBAL     5
     3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),       GLOBAL     6
     4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),    GLOBAL     7
     5                 XO(50),YO(50),ZO(50),GGMA(50)                    GLOBAL     8
      COMMON/BODY/ RO(100), ROP(100), NBEA(20), BGMA(20), MRK(20,2),    GLOBAL     9
     1             XBO(20), YBO(20), ZBO(20)                            GLOBAL    10
      COMMON /XYZ/YS(50),DELYS(50),ZS(50),DELZS(50),FGAMMA(50),         GLOBAL    11
     1           CWIG(50), FGGAM(50)                                    GLOBAL    12
      COMMON  /XXZ/  XOC(400),XIJ(50)                                   GLOBAL    13
      COMMON / CTAPES / ITAPES                                          GLOBAL    14
      DIMENSION ITAPES(50)                                              GLOBAL    15
C                                                                       GLOBAL    16
C                                                                       GLOBAL    17
      ITAPEW = ITAPES(6)                                                GLOBAL    18
C                                                                       GLOBAL    19
C                                                                       GLOBAL    20
      I2 = 0                                                            GLOBAL    21
      WRITE (ITAPEW,701)                                                GLOBAL    22
      DO 1 NP = 1,NOPAN                                                 GLOBAL    23
      SS = SIN(GGMA(NP))                                                GLOBAL    24
      CS  = COS(GGMA(NP))                                               GLOBAL    25
      XOO = XO(NP)                                                      GLOBAL    26
      YOO = YO(NP)                                                      GLOBAL    27
      ZOO = ZO(NP)                                                      GLOBAL    28
      GGMAS = GGMA (NP) * 57.29578                                      GLOBAL    29
      WRITE (ITAPEW,700) NP, XOO, YOO, ZOO, GGMAS                       GLOBAL    30
      IF (LC12.EQ.0) GO TO 11                                           GLOBAL    31
      WRITE (ITAPEW,706)                                                GLOBAL    32
   11 CONTINUE                                                          GLOBAL    33
      IF (NP.GT.1) GO TO 2                                              GLOBAL    34
      J1 = 1                                                            GLOBAL    35
      GO TO 3                                                           GLOBAL    36
    2 J1 = NBARAY(NP-1) + 1                                             GLOBAL    37
    3 J2 = NBARAY(NP)                                                   GLOBAL    38
      DO 4 J = J1,J2                                                    GLOBAL    39
      YC  = Y  (J)                                                      GLOBAL    40
      YC1 = P1 (J)                                                      GLOBAL    41
      YC2 = P2 (J)                                                      GLOBAL    42
      YCV = PV (J)                                                      GLOBAL    43
      ZC  = ZZ  (J)                                                     GLOBAL    44
      ZC1 = ZZ1 (J)                                                     GLOBAL    45
      ZC2 = ZZ2 (J)                                                     GLOBAL    46
      ZCV = ZV  (J)                                                     GLOBAL    47
      X  (J)  = XOO + X  (J)                                            GLOBAL    48
      Z1 (J)  = XOO + Z1 (J)                                            GLOBAL    49
      Z2 (J)  = XOO + Z2 (J)                                            GLOBAL    50
      EV (J)  = XOO + EV (J)                                            GLOBAL    51
      Y  (J) = YOO + YC *CS - ZC *SS                                    GLOBAL    52
      P1 (J) = YOO + YC1*CS - ZC1*SS                                    GLOBAL    53
      P2 (J) = YOO + YC2*CS - ZC2*SS                                    GLOBAL    54
      PV (J) = YOO + YCV*CS - ZCV*SS                                    GLOBAL    55
      ZZ (J) = ZOO + ZC *CS + YC *SS                                    GLOBAL    56
      ZZ1(J) = ZOO + ZC1*CS + YC1*SS                                    GLOBAL    57
      ZZ2(J) = ZOO + ZC2*CS + YC2*SS                                    GLOBAL    58
```

STATISTICS

PROGRAM LENGTH	733B	475
CM LABELED COMMON LENGTH	13660B	6064
52000B CM USED		

VARIABLES	SN	TYPE	RELOCATION								
104	M	* INTEGER			DEFINED	18					
1	NB	INTEGER		VARBLS	REFS	2					
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	2					
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	2					
0	NCNSM1	INTEGER		VARBLS	REFS	2	11	23			
3	NDATA	INTEGER		VARBLS	REFS	2					
2	NDELT	INTEGER		VARBLS	REFS	2					
100	NINP	INTEGER			REFS	22	DEFINED	11			
0	NM	INTEGER		F.P.	REFS	18	DEFINED	1			
4	NOPAN	INTEGER		VARBLS	REFS	2					
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	2					
0	NTBOX	INTEGER		F.P.	REFS	11	20	21	DEFINED	1	
106	NT1	INTEGER			REFS	22	DEFINED	20			
241	PI	REAL		VARBLS	REFS	2					
10166	PV	REAL	ARRAY	VARBLS	REFS	2					
3426	P1	REAL	ARRAY	VARBLS	REFS	2					
5706	P2	REAL	ARRAY	VARBLS	REFS	2					
11626	SDELX	REAL	ARRAY	VARBLS	REFS	2					
326	X	REAL	ARRAY	VARBLS	REFS	2					
107	XI	REAL	ARRAY		REFS	10	21	22	23		
13266	XO	REAL	ARRAY	VARBLS	REFS	2					
1146	Y	REAL	ARRAY	VARBLS	REFS	2					
13350	YO	REAL	ARRAY	VARBLS	REFS	2					
11006	ZV	REAL	ARRAY	VARBLS	REFS	2					
1766	ZZ	REAL	ARRAY	VARBLS	REFS	2					
4246	ZZ1	REAL	ARRAY	VARBLS	REFS	2					
6526	ZZ2	REAL	ARRAY	VARBLS	REFS	2					
13432	ZO	REAL	ARRAY	VARBLS	REFS	2					
2606	Z1	REAL	ARRAY	VARBLS	REFS	2					
5066	Z2	REAL	ARRAY	VARBLS	REFS	2					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES		
RNRW		3	21	22	23

STATEMENT LABELS		DEF LINE	REFERENCES
0	1	24	18
0	2	23	19

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
23	1	M	18 24	238	EXT REFS NOT INNER
24	2	I	19 23	208	EXT REFS

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)								
VARBLS	6014	0	NCNSM1	(1)	1	NB	(1)	2	NDELT	(1)
		3	NDATA	(1)	4	NOPAN	(1)	5	IQ	(1)
		6	IR	(1)	7	JSPECS	(1)	8	NCARAY	(50)
		58	NSARAY	(50)	108	NBARAY	(50)	158	ACAP	(1)
		159	B2	(1)	160	FL	(1)	161	PI	(1)
		162	KR	(1)	163	KRDBR	(1)	164	GMA	(50)
		214	X	(400)	614	Y	(400)	1014	ZZ	(400)
		1414	Z1	(400)	1814	P1	(400)	2214	ZZ1	(400)
		2614	Z2	(400)	3014	P2	(400)	3414	ZZ2	(400)
		3814	EV	(400)	4214	PV	(400)	4614	ZV	(400)
		5014	SDELX	(400)	5414	DELY	(400)	5814	XO	(50)
		5864	YO	(50)	5914	ZO	(50)	5964	GGMA	(50)
CTAPES	50	0	ITAPES	(50)						

```
      SUBROUTINE  MERGE (NM,NTBOX)                                      MERGE       2
      COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IR,JSPECS,        MERGE       3
     1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,  MERGE       4
     2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),  MERGE       5
     3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),       MERGE       6
     4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),    MERGE       7
     5                 XO(50),YO(50),ZO(50),GGMA(50)                    MERGE       8
      COMMON / CTAPES / ITAPES                                          MERGE       9
      DIMENSION ITAPES(50)                                              MERGE      10
      DIMENSION XI(400)                                                 MERGE      11
      NINP = NCNSM1 - NTBOX                                             MERGE      12
      ITAPE  =  ITAPES(27)                                              MERGE      13
      ISTAPE =  ITAPES(34)                                              MERGE      14
      INTAPE =  ITAPES(35)                                              MERGE      15
      REWIND  ITAPE                                                     MERGE      16
      REWIND ISTAPE                                                     MERGE      17
      REWIND INTAPE                                                     MERGE      18
      DO 1 M = 1,NM                                                     MERGE      19
      DO 2 I = 1,3                                                      MERGE      20
      NT1 = NTBOX + 1                                                   MERGE      21
      CALL RNRW (-ISTAPE,XI(1),NTBOX)                                   MERGE      22
      CALL RNRW (-INTAPE,XI(NT1),NINP)                                  MERGE      23
     2 CALL RNRW  (ITAPE,XI(1),NCNSM1)                                  MERGE      24
     1 CONTINUE                                                         MERGE      25
      REWIND  ITAPE                                                     MERGE      26
      REWIND INTAPE                                                     MERGE      27
      REWIND ISTAPE                                                     MERGE      28
      RETURN                                                            MERGE      29
      END                                                               MERGE      30
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	MERGE	1	28

VARIABLES

		SN	TYPE		RELOCATION								
236	ACAP		REAL		VARBLS	REFS	2						
237	B2		REAL		VARBLS	REFS	2						
12446	DELY		REAL	ARRAY	VARBLS	REFS	2						
7346	EV		REAL	ARRAY	VARBLS	REFS	2						
240	FL		REAL		VARBLS	REFS	2						
13514	GGMA		REAL	ARRAY	VARBLS	REFS	2						
244	GMA		REAL	ARRAY	VARBLS	REFS	2						
105	I	*	INTEGER			DEFINED	19						
103	INTAPE		INTEGER			REFS	22	DEFINED	14	I/O REFS	17	26	
5	IQ		INTEGER		VARBLS	REFS	2						
6	IR		INTEGER		VARBLS	REFS	2						
102	ISTAPE		INTEGER			REFS	21	DEFINED	13	I/O REFS	16	27	
101	ITAPE		INTEGER			REFS	23	DEFINED	12	I/O REFS	15	25	
0	ITAPES		INTEGER	ARRAY	CTAPES	REFS	8	9	12	13	14		
7	JSPECS		INTEGER		VARBLS	REFS	2						
242	KR		INTEGER		VARBLS	REFS	2						
243	KRDBR		INTEGER		VARBLS	REFS	2						

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
22	20	J	5 6	3B	INSTACK
27	30	I	7 12	27B	EXITS NOT INNER
47	30	J	11 12	4B	INSTACK
61	40	I	14 17	17B	NOT INNER
71	40	J	16 17	3B	INSTACK

STATISTICS
PROGRAM LENGTH 132B 90
520008 CM USED

```
      1              SUBROUTINE TRIDI (A,B,C,R,N,M,L,EPS,IND)                    TRIDI      2
                     DIMENSION A(1),B(1),C(1),R(L,1)                             TRIDI      3
                     IND=0                                                       TRIDI      4
                     IF( ABS(B(1)).LT.EPS)GO TO 60                               TRIDI      5
      5              DO 20 J=1,M                                                 TRIDI      6
                  20 R(1,J)=R(1,J)/B(1)                                          TRIDI      7
                     DO 30 I=2,N                                                 TRIDI      8
                     C(I-1)=C(I-1)/B(I-1)                                        TRIDI      9
                     B(I)=B(I)-A(I-1)*C(I-1)                                     TRIDI     10
     10              IF( ABS(B(1)).LT.EPS)GO TO 60                               TRIDI     11
                     DO 30 J=1,M                                                 TRIDI     12
                  30 R(I,J)=(R(I,J)-A(I-1)*R(I-1,J))/B(I)                        TRIDI     13
                     II=N                                                        TRIDI     14
                     DO 40 I=2,N                                                 TRIDI     15
     15              II=II-1                                                     TRIDI     16
                     DO 40 J=1,M                                                 TRIDI     17
                  40 R(II,J)=R(II,J)-C(II)*R(II+1,J)                             TRIDI     18
                  50 RETURN                                                      TRIDI     19
                  60 IND=1                                                       TRIDI     20
     20              GO TO 50                                                    TRIDI     21
                     END                                                         TRIDI     22
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	TRIDI	1	18

VARIABLES

		SN	TYPE		RELOCATION							
0	A		REAL	ARRAY	F.P.	REFS	2	9	12	DEFINED	1	
0	B		REAL	ARRAY	F.P.	REFS	2	4	6	8	9	10 12
						DEFINED	1	9				
0	C		REAL	ARRAY	F.P.	REFS	2	8	9	17	DEFINED	1 8
0	EPS		REAL		F.P.	REFS	4	10	DEFINED	1		
107	I		INTEGER			REFS	3*8	4*9	5*12	DEFINED	7	14
110	II		INTEGER			REFS	15	4*17	DEFINED	13	15	
0	IND		INTEGER		F.P.	DEFINED	1	3	19			
106	J		INTEGER			REFS	2*6	3*12	3*17	DEFINED	5	11 16
0	L		INTEGER		F.P.	REFS	2	DEFINED	1			
0	M		INTEGER		F.P.	REFS	5	11	16	DEFINED	1	
0	N		INTEGER		F.P.	REFS	7	13	14	DEFINED	1	
0	R		REAL	ARRAY	F.P.	REFS	2	6	2*12	2*17	DEFINED	1 6
							12	17				

INLINE FUNCTIONS

	TYPE	ARGS		DEF LINE	REFERENCES
ABS	REAL	1	INTRIN		4 10

STATEMENT LABELS

		DEF LINE	REFERENCES	
0	20	6	5	
0	30	12	7	11
0	40	17	14	16
100	50	18	20	
101	60	19	4	10

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
103	1	I	49 56	14B	OPT	
162	6	I	71 72	2B	INSTACK	
317	22	I	103 104	3B	INSTACK	
332	8	I	111 113	6B	INSTACK	EXITS

STATISTICS
PROGRAM LENGTH 646B 422
52000B CM USED

VARIABLES	SN	TYPE	RELOCATION								
				55	62	99	2*100	DEFINED	40	43	52
627	SD	REAL		REFS	101	DEFINED	100				
620	SR	REAL		REFS	46	51	56	63	98	99	101
				DEFINED	41	45	53	98	99		
623	SR1	REAL		REFS	56	DEFINED	51				
621	S1	REAL		REFS	98	99	2*100	DEFINED	48		
633	TT1	REAL		REFS	122	124	126	128	DEFINED	119	126
634	TT2	REAL		REFS	122	124	127	128	DEFINED	120	127
0	X	REAL	ARRAY F.P.	REFS	26	2*40	2*43	2*52	2*54	80	87
				93	94	2*95	2*96	110	112	116	117
				2*118	2*140	141	143	DEFINED	1		

EXTERNALS	TYPE	ARGS	REFERENCES
ANDOR	REAL	3	133
TRIDI		9	75

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
AMOD	REAL	2	INTRIN		141

STATEMENT LABELS			DEF LINE	REFERENCES				
0	1		56	49				
342	2		116	82	88	112	136	146
370	3		122	4*121				
406	4		124	2*121	2*123			
436	5		126	121	3*123	4*125		
0	6		72	71				
530	7		145	139				
0	8		113	111	112			
331	9		111	110	144			
171	10		75	66	74			
513	16		140	139				
0	19	INACTIVE	78	77				
267	21		98	77				
0	22		104	103				
534	27		147	139				
502	30		139	110	115			
457	33		131	110	112			
0	42	INACTIVE	37	36				
44	43		43	36	39			
36	44		40	36				
62	45		47	42				
0	52	INACTIVE	58	57				
131	53		61	57				
147	54		67	57				
144	55		64	60				
217	56		83	2*152				
554	90		153	123	2*125	130	152	
235	97		91	84				
230	98		89	77				
552	99		152	123	125	135	138	
17	100		30	29				
323	111		106	29				
165	152		73	70				
560	999		156	97	105	139		

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 SPLIT3 1 76 156

VARIABLES	SN	TYPE		RELOCATION								
631	AG	REAL			REFS	120	124	2*127	128	DEFINED	117	
0	AN	REAL	ARRAY	F.P.	REFS	28	DEFINED	1	153	154	155	
636	ANS	REAL	ARRAY		REFS	26	83	153	154	155		
					DEFINED	122	124	128	131	132	137	149
					150	151						
630	AR	REAL			REFS	119	124	2*126	128	2*142	143	
					DEFINED	116	141	142				
625	ARG	REAL			REFS	110	112	116	117	141	2*149	150
					DEFINED	80	87	108	143			
0	ARGT	REAL		F.P.	REFS	108	DEFINED	1				
0	D	REAL	ARRAY	F.P.	REFS	26	34	35	61	68	73	4*75
					91	92	2*93	2*94	2*95	2*96	2*99	2*100
					102	3*104	119	120	2*124	2*128	132	137
					3*149	2*150	151	DEFINED	1	37	38	44
					46	47	50	54	55	56	58	59
					61	62	63	68	72	73	83	89
					90	91	92	93	94	95	96	101
					102	104						
616	DSN	REAL			REFS	58	63	90	DEFINED	35		
615	DS1	REAL			REFS	38	46	89	DEFINED	34		
0	EPS	REAL		F.P.	REFS	75	DEFINED	1				
0	F	REAL	ARRAY	F.P.	REFS	26	2*41	2*45	2*53	95	96	2*98
					2*124	2*128	131	DEFINED	1			
632	H	REAL			REFS	119	120	2*124	4*128	DEFINED	118	
622	I	INTEGER			REFS	50	2*52	2*53	3*54	55	56	72
					3*104	112	116	117	2*118	119	120	4*124
					4*128	131	132	2*136	137	145	148	150
					151	DEFINED	49	71	78	85	103	109
					111	114	145					
624	II	INTEGER			REFS	83	84	DEFINED	79	86		
0	IND	INTEGER		F.P.	REFS	75	76	DEFINED	1			
0	K	INTEGER		F.P.	REFS	107	133	DEFINED	1			
611	KEY	INTEGER			REFS	4*75	DEFINED	30	64			
0	KIND	INTEGER		F.P.	REFS	36	44	46	47	57	77	139
					152	DEFINED	1					
626	KK	INTEGER			REFS	121	123	125	135	DEFINED	81	107
					133							
0	KSPLIT	INTEGER		F.P.	REFS	29	DEFINED	1				
0	L	INTEGER		F.P.	REFS	26	75	DEFINED	1			
614	M	INTEGER			REFS	75	3*149	150	DEFINED	33	67	147
					148							
0	N	INTEGER		F.P.	REFS	31	35	59	62	63	65	85
					86	87	90	92	3*94	4*96	98	99
					100	102	111	114	136	140	148	
					DEFINED	1						
612	NN	INTEGER			REFS	32	49	58	2*61	69	70	71
					2*73	75	DEFINED	31	65	69		
613	NNN	INTEGER			REFS	103	DEFINED	32				
635	PERIOD	REAL			REFS	141	142	DEFINED	140			
617	S	REAL			REFS	41	44	45	47	48	50	53

```
      SUBROUTINE GENQ(N4,N5,N6,NRF,JRF,NBE,     NMD,NMTP,NMTB,NCORE,     GENQ      2
     1           KD02,YIN,ZIN,COEFP,COEFB)                               GENQ      3
      COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IR,JSPECS,         GENQ      4
     1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,   GENQ      5
     2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),   GENQ      6
     3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),        GENQ      7
     4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),     GENQ      8
     5                 XO(50),YO(50),ZO(50),GGMA(50)                     GENQ      9
      COMMON /COMA / LC(40), CR                                          GENQ     10
      COMMON/BODY/ RO(100), ROP(100), NBEA(20), BGMA(20), MRK(20,2),     GENQ     11
     1             XBO(20), YBO(20), ZBO(20)                             GENQ     12
      DIMENSION  N8(80),NARQ(80),LARQ(120,2),YIN(50),ZIN(50),COEFP(50),  GENQ     13
     1           COEFB(20),ARQ(120),BQ(400),H(400),DH1(400),DH2(400)     GENQ     14
      COMMON  /MODE/ N8,NARQ,LARQ,ARQ,H,DH1,DH2                          GENQ     15
      COMMON / CTAPES / ITAPES                                           GENQ     16
      DIMENSION ITAPES(50)                                               GENQ     17
      COMPLEX    WQ(400),          ASUM(400),WW(40)                      GENQ     18
      REAL       KR,KRDBR                                                GENQ     19
      COMMON/NTPS/ NTP1,NTP2,NTP3,NTP4,NTP5,NTP6,NTP7,NTP8,NTP9,NTP10    GENQ     20
      ITAPEW = ITAPES(6)                                                 GENQ     21
      MTAP20 =  ITAPES(40)                                               GENQ     22
C                                                                        GENQ     23
C                                                                        GENQ     24
      S    = B2                                                          GENQ     25
      BR = CR * 12.0                                                     GENQ     26
      IROW = 1                                                           GENQ     27
      IF (NB.NE.0.OR.NCORE.GT.KD02.OR.N5.NE.0)  IROW=0                   GENQ     28
      REWIND  NTP2                                                       GENQ     29
      REWIND  NTP3                                                       GENQ     30
      REWIND  NTP4                                                       GENQ     31
      REWIND  NTP8                                                       GENQ     32
      REWIND  NTP10                                                      GENQ     33
      REWIND  NTP7                                                       GENQ     34
      MTAPE  =  ITAPES(27)                                               GENQ     35
      IF (NB .GT. 0) REWIND MTAP20                                       GENQ     36
      REWIND  MTAPE                                                      GENQ     37
      NBOX = NCNSM1                                                      GENQ     38
      NTOT = NBOX+NBE                                                    GENQ     39
      NTPB = NTP10                                                       GENQ     40
      NTPW = NTP4                                                        GENQ     41
      II   = 0                                                           GENQ     42
      IF (NBE.EQ.0)  GO TO 51                                            GENQ     43
      NTPB = NTP2                                                        GENQ     44
      NTPW = NTP3                                                        GENQ     45
      II   = MRK(1,1)                                                    GENQ     46
      DO  53  K=1,NB                                                     GENQ     47
      IF (K.EQ.NB)  GO TO 53                                             GENQ     48
      KP1  = K+1                                                         GENQ     49
      IF (MRK(KP1,1).GE.MRK(K,1))  GO TO 53                              GENQ     50
      II   = MRK(KP1,1)                                                  GENQ     51
   53 CONTINUE                                                           GENQ     52
   51 CONTINUE                                                           GENQ     53
      IF (II.EQ.0)  II=NBOX+1                                            GENQ     54
      IBF  = NBOX+1                                                      GENQ     55
      IBL  = NTOT                                                        GENQ     56
      DO 200  J=1,NMD                                                    GENQ     57
      READ(MTAPE)  (BQ(I), I = 1,NBOX)                                   GENQ     58
```

```
                READ(MTAPE)   (H(I), I = 1,NBOX)                                                    GENQ      59
                READ(MTAPE) (DH1(I), I = 1,NBOX)                                                    GENQ      60
60              WRITE (NTPB)  (BQ(I),  I=1,NBOX)                                                    GENQ      61
                IF (J.EQ.1) WRITE (NTPW) NMD                                                        GENQ      62
                DO 187  IW=1,NBOX                                                                   GENQ      63
                WQ(IW) = (0.0,0.0)                                                                  GENQ      64
                IF (IW.GE.II) GO TO 187                                                             GENQ      65
65              WRE  = DH1(IW)                                                                      GENQ      66
                WIM  = (H(IW)*KR*S)/BR                                                              GENQ      67
                WQ(IW) = CMPLX(WRE,WIM)                                                             GENQ      68
            187 CONTINUE                                                                            GENQ      69
                WRITE (NTPW)  (WQ(I),  I=1,NBOX)                                                    GENQ      70
70          200 CONTINUE                                                                            GENQ      71
                IF (NBE.EQ.0)  GO TO 700                                                            GENQ      72
                REWIND  NTPB                                                                        GENQ      73
                REWIND  NTPW                                                                        GENQ      74
                READ (NTPW) NMD                                                                     GENQ      75
75              DO 600  J=1,NMD                                                                     GENQ      76
                READ  (NTPB)  (BQ(I), I=1,NBOX)                                                     GENQ      77
                READ  (NTPW)  (WQ(I), I=1,NBOX)                                                     GENQ      78
                CALL       AUGW(NMD,NBOX,NBE,NMTB,N4,N6,NRF,JRF,J ,COEFB,ASUM)                      GENQ      79
                DO 525  IX=1,NBOX                                                                   GENQ      80
80              WQ(IX) = WQ(IX) + ASUM(IX)                                                          GENQ      81
            525 CONTINUE                                                                            GENQ      82
                IF (J.EQ.1)  WRITE (NTP4)  NMD                                                      GENQ      83
                BACKSPACE  NTP8                                                                     GENQ      84
                READ  (NTP8)  (BQ(K), K=IBF,IBL)                                                    GENQ      85
85              WRITE (NTP4)  (WQ(I), I=1,NBOX)                                                     GENQ      86
                WRITE (NTP10) (BQ(I), I=1,NTOT)                                                     GENQ      87
            600 CONTINUE                                                                            GENQ      88
                IF (NCORE.GT.KDO2.OR.N5.NE.0)  GO TO 770                                            GENQ      89
                NTPW = NTP4                                                                         GENQ      90
90          700 CONTINUE                                                                            GENQ      91
                REWIND  NTP3                                                                        GENQ      92
                DO 720  I=1,NBOX                                                                    GENQ      93
                REWIND  NTPW                                                                        GENQ      94
                READ (NTPW) NMD                                                                     GENQ      95
95              DO 710  J=1,NMD                                                                     GENQ      96
                READ  (NTPW)  (WQ(K), K=1,NBOX)                                                     GENQ      97
                WW(J)= WQ(I)                                                                        GENQ      98
            710 CONTINUE                                                                            GENQ      99
                WRITE (NTP3)  (WW(L), L=1,NMD)                                                      GENQ     100
100         720 CONTINUE                                                                            GENQ     101
            770 CONTINUE                                                                            GENQ     102
            C                                                                                       GENQ     103
            C                                                                                       GENQ     104
                RETURN                                                                              GENQ     105
105             END                                                                                 GENQ     106
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 GENQ 1 104

VARIABLES	SN	TYPE		RELOCATION								
236	ACAP	REAL		VARBLS	REFS	3						
620	ARQ	REAL	ARRAY	MODE	REFS	12	14					
2760	ASUM	COMPLEX	ARRAY		REFS	17	78	80				
334	BGMA	REAL	ARRAY	BODY	REFS	10						
500	BQ	REAL	ARRAY		REFS	12	60	86	DEFINED	57	76	84
455	BR	REAL			REFS	66	DEFINED	25				
237	B2	REAL		VARBLS	REFS	3	24					
0	COEFB	REAL	ARRAY	F.P.	REFS	12	78	DEFINED	1			
0	COEFP	REAL	ARRAY	F.P.	REFS	12	DEFINED	1				
50	CR	REAL		COMA	REFS	9	25					
12446	DELY	REAL	ARRAY	VARBLS	REFS	3						
1630	DH1	REAL	ARRAY	MODE	REFS	12	14	65	DEFINED	59		
2450	DH2	REAL	ARRAY	MODE	REFS	12	14					
7346	EV	REAL	ARRAY	VARBLS	REFS	3						
240	FL	REAL		VARBLS	REFS	3						
13514	GGMA	REAL	ARRAY	VARBLS	REFS	3						
244	GMA	REAL	ARRAY	VARBLS	REFS	3						
1010	H	REAL	ARRAY	MODE	REFS	12	14	66	DEFINED	58		
472	I	INTEGER			REFS	57	58	59	60	69	76	77
					85	86	97	DEFINED	57	58	59	60
					69	76	77	85	86	92		
467	IBF	INTEGER			REFS	84	DEFINED	54				
470	IBL	INTEGER			REFS	84	DEFINED	55				
464	II	INTEGER			REFS	53	64	DEFINED	41	45	50	53
5	IQ	INTEGER		VARBLS	REFS	3						
6	IR	INTEGER		VARBLS	REFS	3						
456	IROW	INTEGER			DEFINED	26	27					
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	15	16	20	21	34		
452	ITAPEW *	INTEGER			DEFINED	20						
473	IW	INTEGER			REFS	63	64	65	66	67		
					DEFINED	62						
476	IX	INTEGER			REFS	3*80	DEFINED	79				
471	J	INTEGER			REFS	61	78	82	97	DEFINED	56	75
					95							
0	JRF	INTEGER		F.P.	REFS	78	DEFINED	1				
7	JSPECS	INTEGER		VARBLS	REFS	3						
465	K	INTEGER			REFS	47	48	49	84	96		
					DEFINED	46	84	96				
0	KDO2	INTEGER		F.P.	REFS	27	88	DEFINED	1			
466	KP1	INTEGER			REFS	49	50	DEFINED	48			
242	KR	REAL		VARBLS	REFS	3	18	66				
243	KRDBR	REAL		VARBLS	REFS	3	18					
477	L	INTEGER			REFS	99	DEFINED	99				
240	LARQ	INTEGER	ARRAY	MODE	REFS	12	14					
0	LC	INTEGER	ARRAY	COMA	REFS	9						
360	MRK	INTEGER	ARRAY	BODY	REFS	10	45	2*49	50			
457	MTAPE	INTEGER			DEFINED	34	I/O REFS	36	57	58	59	
453	MTAP20	INTEGER			DEFINED	21	I/O REFS	35				
120	NARQ	INTEGER	ARRAY	MODE	REFS	12	14					
1	NB	INTEGER		VARBLS	REFS	3	27	35	46	47		
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	3						
0	NBE	INTEGER		F.P.	REFS	38	42	71	78	DEFINED	1	
310	NBEA	INTEGER	ARRAY	BODY	REFS	10						

VARIABLES	SN	TYPE		RELOCATION							
460	NBOX	INTEGER			REFS	38	53	54	57	58	59	60
						62	69	76	77	78	79	85	92
						96	DEFINED	37					
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	3						
0	NCNSM1	INTEGER		VARBLS	REFS	3	37					
0	NCORE	INTEGER		F.P.	REFS	27	88	DEFINED	1			
3	NDATA	INTEGER		VARBLS	REFS	3						
2	NDELT	INTEGER		VARBLS	REFS	3						
0	NMD	INTEGER		F.P.	REFS	56	61	75	78	82	95	99
					DEFINED	1	74	94				
0	NMTB	INTEGER		F.P.	REFS	78	DEFINED	1				
0	NMTP	INTEGER	*UNUSED	F.P.	DEFINED	1						
4	NOPAN	INTEGER		VARBLS	REFS	3						
0	NRF	INTEGER		F.P.	REFS	78	DEFINED	1				
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	3						
461	NTOT	INTEGER			REFS	55	86	DEFINED	38			
462	NTPB	INTEGER			DEFINED	39	43	I/O REFS	60	72	76	
463	NTPW	INTEGER			DEFINED	40	44	89	I/O REFS	61	69	73
						74	77	93	94	96		
0	NTP1	INTEGER		NTPS	REFS	19						
11	NTP10	INTEGER		NTPS	REFS	19	39	I/O REFS	32	86		
1	NTP2	INTEGER		NTPS	REFS	19	43	I/O REFS	28			
2	NTP3	INTEGER		NTPS	REFS	19	44	I/O REFS	29	91	99	
3	NTP4	INTEGER		NTPS	REFS	19	40	89	I/O REFS	30	82	85
4	NTP5	INTEGER		NTPS	REFS	19						
5	NTP6	INTEGER		NTPS	REFS	19						
6	NTP7	INTEGER		NTPS	REFS	19	I/O REFS	33				
7	NTP8	INTEGER		NTPS	REFS	19	I/O REFS	31	83	84		
10	NTP9	INTEGER		NTPS	REFS	19						
0	N4	INTEGER		F.P.	REFS	78	DEFINED	1				
0	N5	INTEGER		F.P.	REFS	27	88	DEFINED	1			
0	N6	INTEGER		F.P.	REFS	78	DEFINED	1				
0	N8	INTEGER	ARRAY	MODE	REFS	12	14					
241	PI	REAL		VARBLS	REFS	3						
10166	PV	REAL	ARRAY	VARBLS	REFS	3						
3426	P1	REAL	ARRAY	VARBLS	REFS	3						
5706	P2	REAL	ARRAY	VARBLS	REFS	3						
0	RO	REAL	ARRAY	BODY	REFS	10						
144	ROP	REAL	ARRAY	BODY	REFS	10						
454	S	REAL			REFS	66	DEFINED	24				
11626	SDELX	REAL	ARRAY	VARBLS	REFS	3						
475	WIM	REAL			REFS	67	DEFINED	66				
1320	WQ	COMPLEX	ARRAY		REFS	17	69	80	85	97		
					DEFINED	63	67	77	80	96		
474	WRE	REAL			REFS	67	DEFINED	65				
4420	WW	COMPLEX	ARRAY		REFS	17	99	DEFINED	97			
326	X	REAL	ARRAY	VARBLS	REFS	3						
430	XBO	REAL	ARRAY	BODY	REFS	10						
13266	XO	REAL	ARRAY	VARBLS	REFS	3						
1146	Y	REAL	ARRAY	VARBLS	REFS	3						
454	YBO	REAL	ARRAY	BODY	REFS	10						
0	YIN	REAL	ARRAY	F.P.	REFS	12	DEFINED	1				
13350	YO	REAL	ARRAY	VARBLS	REFS	3						
500	ZBO	REAL	ARRAY	BODY	REFS	10						
0	ZIN	REAL	ARRAY	F.P.	REFS	12	DEFINED	1				
11006	ZV	REAL	ARRAY	VARBLS	REFS	3						
1766	ZZ	REAL	ARRAY	VARBLS	REFS	3						

VARIABLES	SN	TYPE	RELOCATION			
4246	ZZ1	REAL	ARRAY	VARBLS	REFS	3
6526	ZZ2	REAL	ARRAY	VARBLS	REFS	3
13432	ZO	REAL	ARRAY	VARBLS	REFS	3
2606	Z1	REAL	ARRAY	VARBLS	REFS	3
5066	Z2	REAL	ARRAY	VARBLS	REFS	3

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES
AUGW		11	78

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
CMPLX	COMPLEX	2	INTRIN		67

STATEMENT LABELS		DEF LINE	REFERENCES		
76	51	52	42		
74	53	51	46	47	49
151	187	68	62	64	
0	200	70	56		
0	525	81	79		
0	600	87	75		
272	700	90	71		
0	710	98	95		
0	720	100	92		
326	770	101	88		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
66	53	K	46 51	7B	INSTACK
105	200	J	56 70	57B	EXT REFS NOT INNER
141	187	IW	62 68	12B	OPT
174	600	J	75 87	70B	EXT REFS NOT INNER
225	525	IX	79 81	4B	INSTACK
275	720	I	92 100	31B	EXT REFS NOT INNER
302	710	J	95 98	14B	EXT REFS

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
VARBLS	6014	0 NCNSM1 (1)	1 NB (1)	2 NDELT (1)			
		3 NDATA (1)	4 NOPAN (1)	5 IQ (1)			
		6 IR (1)	7 JSPECS (1)	8 NCARAY (50)			
		58 NSARAY (50)	108 NBARAY (50)	158 ACAP (1)			
		159 B2 (1)	160 FL (1)	161 PI (1)			
		162 KR (1)	163 KRDBR (1)	164 GMA (50)			
		214 X (400)	614 Y (400)	1014 ZZ (400)			
		1414 Z1 (400)	1814 P1 (400)	2214 ZZ1 (400)			
		2614 Z2 (400)	3014 P2 (400)	3414 ZZ2 (400)			
		3814 EV (400)	4214 PV (400)	4614 ZV (400)			
		5014 SDELX (400)	5414 DELY (400)	5814 XO (50)			
		5864 YO (50)	5914 ZO (50)	5964 GGMA (50)			
COMA	41	0 LC (40)	40 CR (1)				
BODY	340	0 RO (100)	100 ROP (100)	200 NBEA (20)			
		220 BGMA (20)	240 MRK (40)	280 XBO (20)			
		300 YBO (20)	320 ZBO (20)				
MODE	1720	0 N8 (80)	80 NARQ (80)	160 LARQ (240)			
		400 ARQ (120)	520 H (400)	920 DH1 (400)			
		1320 DH2 (400)					
CTAPES	50	0 ITAPES (50)					
NTPS	10	0 NTP1 (1)	1 NTP2 (1)	2 NTP3 (1)			
		3 NTP4 (1)	4 NTP5 (1)	5 NTP6 (1)			

COMMON BLOCKS LENGTH MEMBERS - BIAS NAME(LENGTH)
6 NTP7 (1) 7 NTP8 (1) 8 NTP9 (1)
9 NTP10 (1)

STATISTICS

PROGRAM LENGTH	4555B	2413
CM LABELED COMMON LENGTH	17757B	8175

520000B CM USED

```
      SUBROUTINE AUGW(NMD,NBOX,NBE,NMTB,N4,N6,NRF,JRF,J ,COEFB,ASUM)
C
      COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IR,JSPECS,
     1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,
     2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),
     3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),
     4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),
     5                 XO(50),YO(50),ZO(50),GGMA(50)
      COMMON/NTPS/ NTP1,NTP2,NTP3,NTP4,NTP5,NTP6,NTP7,NTP8,NTP9,NTP10
      COMMON/BODY/ RO(100), ROP(100), NBEA(20), BGMA(20), MRK(20,2),
     1             XBO(20), YBO(20), ZBO(20)
C
      DIMENSION         N8(80) ,     NARQ(80) ,  LARQ(120,2) ,
     1          COEFB(20),ARQ(120),BB(400),H(400),DH1(400),DH2(400)
      DIMENSION VBO(30), RVBO(15)
      DIMENSION ITAPES(50)
C
      COMMON  /MODE/ N8,NARQ,LARQ,ARQ,H,DH1,DH2
      COMMON /FLUTAN/ FMACH ,BETA  ,VBO   ,RVBO  ,NRVBO
      COMMON / CTAPES / ITAPES
      COMMON /COMA/ LC(40), CR
C
      COMPLEX AZY(100), DCP(100), WJ(100), WJP(100), ASUM(400), SUM
      COMPLEX    TRM1, TRM2, TRM3
C
      REAL       KR,KRDBR,KKR,KKI
C
      ITAPEW = ITAPES(6)
C
      BR     =  FL/2.0
      S    = B2
      EPS = 0.001
      REWIND  NTP8
      MTAPE  =  ITAPES(40)
      NBEL = NBEA(NB)
      READ  (MTAPE)  (BB(II),  II=1,NBEL)
      READ  (MTAPE)  (H(II),   II=1,NBEL)
      READ  (MTAPE)  (DH1(II), II=1,NBEL)
      READ  (MTAPE)  (DH2(II), II=1,NBEL)
      WRITE (ITAPEW,37)  NBE,J
      WRITE (ITAPEW,45)  (BB(KX),  KX=1,NBE)
      WRITE (NTP8)  (BB(KX),  KX=1,NBE)
      DO 187  IW=1,NBE
      WRE     = DH1(IW)
      WIM     = (H(IW)*KR*S)/BR
      WJ(IW)  = CMPLX(WRE,WIM)
      WREP    = DH2(IW)
      WIMP    = DH1(IW)*KR/BR
      WJP(IW) = CMPLX(WREP,WIMP)
      TRM1    = 2.0*ROP(IW)*WJ(IW)
      TRM2    = RO(IW)*WJP(IW)
      TRM3I   = KR*RO(IW)/BR
      TRM3 = (CMPLX(0.0,TRM3I))*WJ(IW)
      DCP(IW) = PI*(TRM1+TRM2+TRM3)
  187 CONTINUE
      WRITE (ITAPEW,40)  NBE,J
```

```
                WRITE (ITAPEW,50)  NBE,J                                        AUGW       59
                WRITE (ITAPEW,45)  (WJP(KX), KX=1,NBE)                          AUGW       60
60              WRITE (ITAPEW,64)  J                                            AUGW       61
                WRITE (ITAPEW,45)  (DCP(K), K=1,NBE)                            AUGW       62
                WRITE (NTP7 ) (DCP(K), K=1,NBE)                                 AUGW       63
                NPAN = 1                                                        AUGW       64
                DO 600  I=1,NBOX                                                AUGW       65
65              SUM      = (0.0,0.0)                                            AUGW       66
                ASUM(I) = (0.0,0.0)                                             AUGW       67
                NBODY= 1                                                        AUGW       68
                NFRN = NBEA(NBODY)                                              AUGW       69
                KF   = NBOX                                                     AUGW       70
70              DO 400  K=1,NBE                                                 AUGW       71
                MARK1= MRK(NBODY,1)                                             AUGW       72
                MARK2= MRK(NBODY,2)                                             AUGW       73
                AZY(K) = (0.0,0.0)                                              AUGW       74
                KF = KF + 1                                                     AUGW       75
75              IF (I.GE.MARK1 .AND. I.LE.MARK2) GO TO 375                      AUGW       76
                XO   = X(I) - EV(KF)                                            AUGW       77
                YO   =  Y(I)  - PV(KF)                                          AUGW       78
                ZO   = ZZ(I)  - ZV(KF)                                          AUGW       79
                EE   = RO(K)                                                    AUGW       80
80              E2   = EE*EE                                                    AUGW       81
                GAMS = GMA(NPAN)                                                AUGW       82
                GAMSIG = BGMA(NBODY)                                            AUGW       83
                XKER = SDELX(KF)*RO(K)/(2.0*PI)                                 AUGW       84
                XKR = 0.0                                                       AUGW       85
85              XKI = 0.0                                                       AUGW       86
                IGO = 1                                                         AUGW       87
                FLAGM = 1.0                                                     AUGW       88
            365 CONTINUE                                                        AUGW       89
                CALL       TKER  (XO,YO,ZO,KR,BR,GAMS,GAMSIG,FMACH,E2,KKR,KKI)  AUGW       90
90              XKR = XKR + KKR*FLAGM                                           AUGW       91
                XKI = XKI + KKI*FLAGM                                           AUGW       92
                GO TO (366,367,368,369), IGO                                    AUGW       93
            366 CONTINUE                                                        AUGW       94
                IF (NDELT.EQ.0.OR.(ABS(PV(KF))).LE.EPS) GO TO 367               AUGW       95
95              YO   = Y(I)  + PV(KF)                                           AUGW       96
                GAMSIG = -BGMA(NBODY)                                           AUGW       97
                IGO = 2                                                         AUGW       98
                FLAGM= FLOAT(NDELT)                                             AUGW       99
                GO TO 365                                                       AUGW      100
100         367 CONTINUE                                                        AUGW      101
                IF (JSPECS.EQ.0.OR.(ABS(ZV(KF))).LE.EPS) GO TO 369              AUGW      102
                YO   = Y(I)  - PV(KF)                                           AUGW      103
                ZO   = ZZ(I) + ZV(KF)                                           AUGW      104
                GAMSIG = -BGMA(NBODY)                                           AUGW      105
105             IGO  = 3                                                        AUGW      106
                FLAGM= FLOAT(JSPECS)                                            AUGW      107
                GO TO 365                                                       AUGW      108
            368 CONTINUE                                                        AUGW      109
                IF (NDELT.EQ.0.OR.(ABS(PV(KF))).LE.EPS) GO TO 369               AUGW      110
110             YO   = Y(I)  + PV(KF)                                           AUGW      111
                GAMSIG =  BGMA(NBODY)                                           AUGW      112
                IGO  = 4                                                        AUGW      113
                FLAGM= FLOAT(NDELT)*FLOAT(JSPECS)                               AUGW      114
                GO TO 365                                                       AUGW      115
```

```
                  369 CONTINUE                                                    AUGW      116
                      XKR = XKR *XKER                                             AUGW      117
                      XKI = XKI *XKER                                             AUGW      118
                      AZY(K) = CMPLX(XKR , XKI)                                   AUGW      119
                  375 CONTINUE                                                    AUGW      120
                      SUM  = SUM + AZY(K)*DCP(K)                                  AUGW      121
                      IF (K.NE.NFRN)  GO TO 400                                   AUGW      122
                      NBODY= NBODY+1                                              AUGW      123
                      NFRN = NBEA(NBODY)                                          AUGW      124
                  400 CONTINUE                                                    AUGW      125
                      ASUM(I) = SUM                                               AUGW      126
                      IF (N4.EQ.0)  GO TO 405                                     AUGW      127
                      WRITE (ITAPEW,66)  I,NBE                                    AUGW      128
                      WRITE (ITAPEW,45)  (AZY(K), K=1,NBE)                        AUGW      129
                  405 CONTINUE                                                    AUGW      130
                      IF (I.EQ.NBARAY(NPAN))  NPAN=NPAN+1                         AUGW      131
                  600 CONTINUE                                                    AUGW      132
                      WRITE (ITAPEW,68)  J                                        AUGW      133
                      WRITE (ITAPEW,45)  (ASUM(I),  I=1,NBOX)                     AUGW      134
                C                                                                 AUGW      135
                C                                                                 AUGW      136
                C FORMATS                                                         AUGW      137
                C                                                                 AUGW      138
                   37 FORMAT  (1HO,25X,3HTHE,I4,31H B-MATRIX ELEMENTS FOR MODE NO.,I4)  AUGW  139
                   40 FORMAT  (1HO,25X,3HTHE,I4,32H WJ MATRIX ELEMENTS FOR MODE NO.,I4)  AUGW  140
                   45 FORMAT  (1HO,6E17.8)                                        AUGW      141
                   50 FORMAT  (1HO,25X,3HTHE,I4,31H WJ-PRIME ELEMENTS FOR MODE NO.,I4)  AUGW  142
                   64 FORMAT  (1HO, 8HCOL. NO.,I4,18H  OF DEL-CP MATRIX//)        AUGW      143
                   66 FORMAT  (1HO,10X,7HROW NO.,I4,7H OF THE,I4,17H APZ-APY ELEMENTS')  AUGW  144
                   68 FORMAT  (1HO,10X,10HCOLUMN NO.,I4,19H OF THE AUGW MATRIX//)  AUGW      145
                C                                                                 AUGW      146
                      RETURN                                                      AUGW      147
                      END                                                         AUGW      148
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS

		DEF LINE	REFERENCES
3	AUGW	1	146

VARIABLES

		SN	TYPE		RELOCATION						
236	ACAP		REAL		VARBLS	REFS	3				
620	ARQ		REAL	ARRAY	MODE	REFS	13	18			
0	ASUM		COMPLEX	ARRAY	F.P.	REFS	23	133	DEFINED	1	66	125
1503	AZY		COMPLEX	ARRAY		REFS	23	120	128	DEFINED	73	118
663	BB		REAL	ARRAY		REFS	13	41	42	DEFINED	36	
1	BETA		REAL		FLUTAN	REFS	19					
334	BGMA		REAL	ARRAY	BODY	REFS	10	82	96	104	111	
622	BR		REAL			REFS	45	48	52	89	DEFINED	30
237	B2		REAL		VARBLS	REFS	3	31				
0	COEFB		REAL	ARRAY	F.P.	REFS	13	DEFINED	1			
50	CR		REAL		COMA	REFS	21					
2013	DCP		COMPLEX	ARRAY		REFS	23	61	62	120	DEFINED	54
12446	DELY		REAL	ARRAY	VARBLS	REFS	3					

VARIABLES	SN	TYPE		RELOCATION								
1630	DH1	REAL	ARRAY	MODE	REFS	13	18	44	48	DEFINED	38	
2450	DH2	REAL	ARRAY	MODE	REFS	13	18	47	DEFINED	39		
652	EE	REAL			REFS	2*80	DEFINED	79				
624	EPS	REAL			REFS	94	101	109	DEFINED	32		
7346	EV	REAL	ARRAY	VARBLS	REFS	3	76					
653	E2	REAL			REFS	89	DEFINED	80				
240	FL	REAL		VARBLS	REFS	3	30					
662	FLAGM	REAL			REFS	90	91	DEFINED	87	98	106	113
0	FMACH	REAL		FLUTAN	REFS	19	89					
654	GAMS	REAL			REFS	89	DEFINED	81				
655	GAMSIG	REAL			REFS	89	DEFINED	82	96	104	111	
13514	GGMA	REAL	ARRAY	VARBLS	REFS	3						
244	GMA	REAL	ARRAY	VARBLS	REFS	3	81					
1010	H	REAL	ARRAY	MODE	REFS	13	18	45	DEFINED	37		
641	I	INTEGER			REFS	66	2*75	76	77	78	95	102
						103	110	125	127	130	133	
					DEFINED	64	133					
661	IGO	INTEGER			REFS	92	DEFINED	86	97	105	112	
627	II	INTEGER			REFS	36	37	38	39	DEFINED	36	37
						38	39					
5	IQ	INTEGER		VARBLS	REFS	3						
6	IR	INTEGER		VARBLS	REFS	3						
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	16	20	28	34			
621	ITAPEW	INTEGER			DEFINED	28	I/O REFS	40	41	56	57	58
						59	60	61	127	128	132	133
631	IW	INTEGER			REFS	44	45	46	47	48	49	2*50
						2*51	52	53	54	DEFINED	43	
0	J	INTEGER		F.P.	REFS	40	56	58	60	132		
					DEFINED	1						
0	JRF	INTEGER	*UNUSED	F.P.	DEFINED	1						
7	JSPECS	INTEGER		VARBLS	REFS	3	101	106	113			
637	K	INTEGER			REFS	61	62	73	79	83	118	2*120
						121	128	DEFINED	61	62	70	128
644	KF	INTEGER			REFS	74	76	77	78	83	94	95
						101	102	103	109	110	DEFINED	69	74
620	KKI	REAL			REFS	26	89	91				
617	KKR	REAL			REFS	26	89	90				
242	KR	REAL		VARBLS	REFS	3	26	45	48	52	89	
243	KRDBR	REAL		VARBLS	REFS	3	26					
630	KX	INTEGER			REFS	41	42	57	59	DEFINED	41	42
						57	59					
240	LARQ	INTEGER	ARRAY	MODE	REFS	13	18					
0	LC	INTEGER	ARRAY	COMA	REFS	21						
645	MARK1	INTEGER			REFS	75	DEFINED	71				
646	MARK2	INTEGER			REFS	75	DEFINED	72				
360	MRK	INTEGER	ARRAY	BODY	REFS	10	71	72				
625	MTAPE	INTEGER			DEFINED	34	I/O REFS	36	37	38	39	
120	NARQ	INTEGER	ARRAY	MODE	REFS	13	18					
1	NB	INTEGER		VARBLS	REFS	3	35					
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	3	130					
0	NBE	INTEGER		F.P.	REFS	40	41	42	43	56	57	58
						59	61	62	70	127	128	
					DEFINED	1						
310	NBEA	INTEGER	ARRAY	BODY	REFS	10	35	68	123			
626	NBEL	INTEGER			REFS	36	37	38	39	DEFINED	35	
642	NBODY	INTEGER			REFS	68	71	72	82	96	104	111
						122	123	DEFINED	67	122		

VARIABLES	SN	TYPE		RELOCATION								
0	NBOX	INTEGER		F.P	REFS	64	69	133	DEFINED	1		
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	3						
0	NCNSM1	INTEGER		VARBLS	REFS	3						
3	NDATA	INTEGER		VARBLS	REFS	3						
2	NDELT	INTEGER		VARBLS	REFS	3	94	98	109	113		
643	NFRN	INTEGER			REFS	121	DEFINED	68	123			
0	NMD	INTEGER	*UNUSED	F.P.	DEFINED	1						
0	NMTB	INTEGER	*UNUSED	F.P.	DEFINED	1						
4	NOPAN	INTEGER		VARBLS	REFS	3						
640	NPAN	INTEGER			REFS	81	2*130	DEFINED	63	130		
0	NRF	INTEGER	*UNUSED	F.P.	DEFINED	1						
57	NRVBO	INTEGER		FLUTAN	REFS	19						
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	3						
0	NTP1	INTEGER		NTPS	REFS	9						
11	NTP10	INTEGER		NTPS	REFS	9						
1	NTP2	INTEGER		NTPS	REFS	9						
2	NTP3	INTEGER		NTPS	REFS	9						
3	NTP4	INTEGER		NTPS	REFS	9						
4	NTP5	INTEGER		NTPS	REFS	9						
5	NTP6	INTEGER		NTPS	REFS	9						
6	NTP7	INTEGER		NTPS	REFS	9	I/O REFS	62				
7	NTP8	INTEGER		NTPS	REFS	9	I/O REFS	33	42			
10	NTP9	INTEGER		NTPS	REFS	9						
0	N4	INTEGER		F.P.	REFS	126	DEFINED	1				
0	N6	INTEGER	*UNUSED	F.P.	DEFINED	1						
0	N8	INTEGER	ARRAY	MODE	REFS	13	18					
241	PI	REAL		VARBLS	REFS	3	54	83				
10166	PV	REAL	ARRAY	VARBLS	REFS	3	77	94	95	102	109	110
3426	P1	REAL	ARRAY	VARBLS	REFS	3						
5706	P2	REAL	ARRAY	VARBLS	REFS	3						
40	RVBO	REAL	ARRAY	FLUTAN	REFS	15	19					
0	RO	REAL	ARRAY	BODY	REFS	10	51	52	79	83		
144	ROP	REAL	ARRAY	BODY	REFS	10	50					
623	S	REAL			REFS	45	DEFINED	31				
11626	SDELX	REAL	ARRAY	VARBLS	REFS	3	83					
607	SUM	COMPLEX			REFS	23	120	125	DEFINED	65	120	
611	TRM1	COMPLEX			REFS	24	54	DEFINED	50			
613	TRM2	COMPLEX			REFS	24	54	DEFINED	51			
615	TRM3	COMPLEX			REFS	24	54	DEFINED	53			
636	TRM3I	REAL			REFS	53	DEFINED	52				
2	VBO	REAL	ARRAY	FLUTAN	REFS	15	19					
633	WIM	REAL			REFS	46	DEFINED	45				
635	WIMP	REAL			REFS	49	DEFINED	48				
2323	WJ	COMPLEX	ARRAY		REFS	23	50	53	57	DEFINED	46	
2633	WJP	COMPLEX	ARRAY		REFS	23	51	59	DEFINED	49		
632	WRE	REAL			REFS	46	DEFINED	44				
634	WREP	REAL			REFS	49	DEFINED	47				
326	X	REAL	ARRAY	VARBLS	REFS	3	76					
430	XBO	REAL	ARRAY	BODY	REFS	10						
656	XKER	REAL			REFS	116	117	DEFINED	83			
660	XKI	REAL			REFS	91	117	118	DEFINED	85	91	117
657	XKR	REAL			REFS	90	116	118	DEFINED	84	90	116
13266	XO	REAL	ARRAY	VARBLS	REFS	3						
647	XO	REAL			REFS	89	DEFINED	76				
1146	Y	REAL	ARRAY	VARBLS	REFS	3	77	95	102	110		
454	YBO	REAL	ARRAY	BODY	REFS	10						
13250	YP	REAL	ARRAY	VARBLS	REFS	3						

VARIABLES	SN	TYPE	RELOCATION							
650	YO	REAL			REFS	89	DEFINED	77	95	102	110
500	ZBO	REAL	ARRAY	BODY	REFS	10					
13432	ZO	REAL	ARRAY	VARBLS	REFS	3					
11006	ZV	REAL	ARRAY	VARBLS	REFS	3	78	101	103		
1766	ZZ	REAL	ARRAY	VARBLS	REFS	3	78	103			
4246	ZZ1	REAL	ARRAY	VARBLS	REFS	3					
6526	ZZ2	REAL	ARRAY	VARBLS	REFS	3					
651	ZO	REAL			REFS	89	DEFINED	78	103		
2606	Z1	REAL	ARRAY	VARBLS	REFS	3					
5066	Z2	REAL	ARRAY	VARBLS	REFS	3					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES
TKER		11	89

INLINE FUNCTIONS	TYPE	ARGS	DEF LINE	REFERENCES				
ABS	REAL	1	INTRIN	94	101	109		
CMPLX	COMPLEX	2	INTRIN	46	49	53	118	
FLOAT	REAL	1	INTRIN	98	106	2*113		

STATEMENT LABELS			DEF LINE	REFERENCES					
530	37	FMT	138	40					
537	40	FMT	139	56					
546	45	FMT	140	41	57	59	61	128	133
551	50	FMT	141	58					
560	64	FMT	142	60					
566	66	FMT	143	127					
575	68	FMT	144	132					
0	187		55	43					
231	365		88	99	107	114			
250	366		93	92					
264	367		100	92	94				
302	368		108	92					
320	369		115	92	101	109			
325	375		119	75					
342	400		124	70	121				
360	405		129	126					
0	600		131	64					

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
73	187	IW	43 55	32B	OPT
165	600	I	64 131	202B	EXT REFS NOT INNER
175	400	K	70 124	150B	EXT REFS

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)								
VARBLS	6014	0	NCNSM1	(1)	1	NB	(1)	2	NDELT	(1)
		3	NDATA	(1)	4	NOPAN	(1)	5	IQ	(1)
		6	IR	(1)	7	JSPECS	(1)	8	NCARAY	(50)
		58	NSARAY	(50)	108	NBARAY	(50)	158	ACAP	(1)
		159	B2	(1)	160	FL	(1)	161	PI	(1)
		162	KR	(1)	163	KRDBR	(1)	164	GMA	(50)
		214	X	(400)	614	Y	(400)	1014	ZZ	(400)
		1414	Z1	(400)	1814	P1	(400)	2214	ZZ1	(400)
		2614	Z2	(400)	3014	P2	(400)	3414	ZZ2	(400)
		3814	EV	(400)	4214	PV	(400)	4614	ZV	(400)
		5014	SDELX	(400)	5414	DELY	(400)	5814	XO	(50)
		5864	YO	(50)	5914	ZO	(50)	5964	GGMA	(50)

COMMON BLOCKS	LENGTH	MEMBERS - BIAS	NAME	(LENGTH)						
NTPS	10	0	NTP1	(1)	1	NTP2	(1)	2	NTP3	(1)
		3	NTP4	(1)	4	NTP5	(1)	5	NTP6	(1)
		6	NTP7	(1)	7	NTP8	(1)	8	NTP9	(1)
		9	NTP10	(1)						
BODY	340	0	RO	(100)	100	ROP	(100)	200	NBEA	(20)
		220	BGMA	(20)	240	MRK	(40)	280	XBO	(20)
		300	YBO	(20)	320	ZBO	(20)			
MODE	1720	0	N8	(80)	80	NARQ	(80)	160	LARQ	(240)
		400	ARQ	(120)	520	H	(400)	920	DH1	(400)
		1320	DH2	(400)						
FLUTAN	48	0	FMACH	(1)	1	BETA	(1)	2	VBO	(30)
		32	RVBO	(15)	47	NRVBO	(1)			
CTAPES	50	0	ITAPES	(50)						
COMA	41	0	LC	(40)	40	CR	(1)			

STATISTICS

PROGRAM LENGTH	3153B	1643
CM LABELED COMMON LENGTH	20037B	8223

52000B CM USED

```
      SUBROUTINE TKER  (XO,YO,ZO,KR,BR,GAMS GAMSIG,FMACH,E2,KKR,KKI)      TKER        2
      REAL    M, KR  KKR, KKI, IOOR, IOOI, JOOR, JOOI  I1OR, I1OI, I2OR3, TKER        3
     1        I2OI3, IOUR, IOUI, JOUR, JOUI, I1UR, I1UI, I2UR3, I2UI3,    TKER        4
     2        K1, MU1, MU, K2                                              TKER        5
      REAL    K1O,K2O,K1RT1,K1IT1,K2RT2P,K2IT2P,K1OT1,K2OT2P               TKER        6
      L     = 0                                                            TKER        7
      EPS   = 0.00001                                                      TKER        8
      M     = FMACH                                                        TKER        9
      R1= SQRT (YO*YO+ZO*ZO)                                               TKER       10
      R1S = R1                                                             TKER       11
      RTWO   = R1*R1                                                       TKER       12
      RFOUR  = RTWO*RTWO                                                   TKER       13
      K1O    = 0.0                                                         TKER       14
      K2O    = 0.0                                                         TKER       15
      K1RT1  = 0.0                                                         TKER       16
      K1IT1  = 0.0                                                         TKER       17
      K2RT2P = 0.0                                                         TKER       18
      K2IT2P = 0.0                                                         TKER       19
      K1OT1  = 0.0                                                         TKER       20
      K2OT2P = 0.0                                                         TKER       21
      IF  ( R1 )              200,100,200                                  TKER       22
  100 IF  ( XO )              110,120,120                                  TKER       23
  110 KKR=0.                                                               TKER       24
      KKI=0.                                                               TKER       25
      GO TO  907                                                           TKER       26
  120 C1= KR*XO/BR                                                         TKER       27
      T1= COS(GAMS-GAMSIG)                                                 TKER       28
      K1O    = 2.0                                                         TKER       29
      K1RT1  = 2.0*T1*COS(C1)                                              TKER       30
      K1IT1  =-2.0*T1*SIN(C1)                                              TKER       31
      K1OT1  = 2.0*T1                                                      TKER       32
      GO TO  905                                                           TKER       33
  200 C1=COS(GAMS)                                                         TKER       34
      C2=SIN(GAMS)                                                         TKER       35
      C3=COS(GAMSIG)                                                       TKER       36
      C4=SIN(GAMSIG)                                                       TKER       37
      T2P=(ZO*ZO*C1*C3+YO*YO*C2*C4-ZO*YO*(C2*C3+C1*C4))                    TKER       38
      T2 = T2P/E2                                                          TKER       39
      IF  ( ABS(T2)-EPS )                 210,220,220                      TKER       40
  210 ICHUZ=1                                                              TKER       41
      T1= COS(GAMS-GAMSIG)                                                 TKER       42
      T2=0.                                                                TKER       43
      GO TO 300                                                            TKER       44
  220 T1= COS(GAMS-GAMSIG)                                                 TKER       45
      IF  ( ABS(T1)-EPS )                 230,240,240                      TKER       46
  230 ICHUZ=2                                                              TKER       47
      T1=0.                                                                TKER       48
      GO TO 300                                                            TKER       49
  240 ICHUZ=3                                                              TKER       50
  300 BETA2 = (1.-M*M)                                                     TKER       51
      BIGR = SQRT (XO*XO+BETA2*R1*R1)                                      TKER       52
      K1= KR*R1/BR                                                         TKER       53
      MU1= (M*BIGR-XO)/ (BETA2*R1)                                         TKER       54
      MU=ABS(MU1)                                                          TKER       55
      K2=K1*K1                                                             TKER       56
      IF  ( MU1 )             310,320,330                                  TKER       57
```

VARIABLES	SN	TYPE	RELOCATION								
3426	P1	REAL	ARRAY	VARBLS	REFS	6	62	74	146		
5706	P2	REAL	ARRAY	VARBLS	REFS	6	63	74	145		
40	RVBO	REAL	ARRAY	FLUTAN	REFS	13	17				
627	SAVE1	REAL			REFS	110	134	184	DEFINED	95	110
630	SAVE2	REAL			REFS	165	184	DEFINED	96	134	165
640	SAX2	REAL			REFS	149	DEFINED	147			
624	SDELI	REAL			REFS	104	133	183	DEFINED	92	104
623	SDELR	REAL			REFS	103	132	182	DEFINED	91	103
11626	SDELX	REAL	ARRAY	VARBLS	REFS	6	59	101	156		
557	SGR	REAL			REFS	109	113	164	168	DEFINED	32	192
565	SGS	REAL			REFS	109	113	118	164	168		
					DEFINED	44	118	151	174	191		
617	SL	REAL			REFS	109	113	139	164	168		
					DEFINED	78	86	139				
552	SMALL	REAL			REFS	70	73	100	155	DEFINED	25	
616	SQTL	REAL			REFS	78	79	DEFINED	77	84		
622	SSDELI	REAL			REFS	159	183	DEFINED	90	133	159	
621	SSDELR	REAL			REFS	158	182	DEFINED	89	132	158	
614	TL	REAL			REFS	77	78	109	113	140	164	168
					DEFINED	74	81	83	140			
2	VBO	REAL	ARRAY	FLUTAN	REFS	13	17					
612	WEIRD	REAL			REFS	72	DEFINED	71				
326	X	REAL	ARRAY	VARBLS	REFS	6	64	65	66			
13266	XO	REAL	ARRAY	VARBLS	REFS	6						
637	XPRIME	REAL			DEFINED	112	167					
633	XO	REAL			REFS	105	113	164	168	DEFINED	106	161
1146	Y	REAL	ARRAY	VARBLS	REFS	6	61	62	63	144	145	146
13350	YO	REAL	ARRAY	VARBLS	REFS	6						
634	YO	REAL			REFS	109	113	164	168	DEFINED	107	162
13432	ZO	REAL	ARRAY	VARBLS	REFS	6						
11006	ZV	REAL	ARRAY	VARBLS	REFS	6	67	119	141	175		
1766	ZZ	REAL	ARRAY	VARBLS	REFS	6	67	68	69	119	120	121
					141	142	143	175	176	177		
4246	ZZ1	REAL	ARRAY	VARBLS	REFS	6	68	81	120	143	177	
6526	ZZ2	REAL	ARRAY	VARBLS	REFS	6	69	81	121	142	176	
635	ZO	REAL			REFS	109	113	164	168	DEFINED	108	163
2606	Z1	REAL	ARRAY	VARBLS	REFS	6	65	71	74	81		
5066	Z2	REAL	ARRAY	VARBLS	REFS	6	66	71	74	81		

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES					
COS	REAL	1 LIBRARY	33	45				
INCRO		26	101	156				
SIN	REAL	1 LIBRARY	32	44	151	174	191	192
SNPDF		14	109	113	164	168		
SQRT	REAL	1 LIBRARY	77					

INLINE FUNCTIONS	TYPE	ARGS	DEF LINE	REFERENCES						
ABS	REAL	1 INTRIN		46	72					
FLOAT	REAL	1 INTRIN		103	104	110	114	158	159	165	169

STATEMENT LABELS			DEF LINE	REFERENCES
531	10	FMT	207	199
541	30	FMT	209	200
16	90		30	36
31	100		37	35
21	110		42	57

VARIABLES	SN	TYPE		RELOCATION								
					130	141	142	143	144	145	146	167
					175	176	177	199	DEFINED	28		
6	IR	INTEGER		VARBLS	REFS	6	55	59	61	62	63	64
					65	66	67	68	69	2*71	4*74	76
					4*81	87	101	112	119	120	121	141
					142	143	144	145	146	156	167	175
					176	177	185	186	187	188	193	
					DEFINED	39	188					
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	15	19	22				
550	ITAPEW	INTEGER			DEFINED	22	I/O REFS	199	200			
600	JSPEC	INTEGER			REFS	116	122	171	172	DEFINED	60	123
					138	178						
7	JSPECS	INTEGER		VARBLS	REFS	6	60	124	138	179		
242	KR	REAL		VARBLS	REFS	4	6	101	156			
243	KRDBR	REAL		VARBLS	REFS	4	6	100	155			
3	K1IT1	REAL		DLM	REFS	3	12					
2	K1RT1	REAL		DLM	REFS	3	12					
0	K1O	REAL		DLM	REFS	3	12					
6	K1OT1	REAL		DLM	REFS	3	12					
5	K2IT2P	REAL		DLM	REFS	3	12					
4	K2RT2P	REAL		DLM	REFS	3	12					
1	K2O	REAL		DLM	REFS	3	12					
7	K2OT2P	REAL		DLM	REFS	3	12					
532	LHS	INTEGER			REFS	101	156	DEFINED	99	154		
574	MULT	INTEGER			REFS	103	104	110	114	158	159	165
					169	DEFINED	52	124	152	179		
1	NB	INTEGER		VARBLS	REFS	6	50	DEFINED	40	56		
154	NBARAY	INTEGER	ARRAY	VARBLS	REFS	6	34	49				
0	NBV	INTEGER		F.P.	REFS	101	130	156	DEFINED	1		
561	NBXR	INTEGER			REFS	35	DEFINED	34				
572	NBXS	INTEGER			REFS	55	56	101	156	DEFINED	49	
10	NCARAY	INTEGER	ARRAY	VARBLS	REFS	6	48					
571	NCM1	INTEGER			REFS	50	195	DEFINED	48			
0	NCNSM1	INTEGER		VARBLS	REFS	6	28	193	199	200	201	
573	NCPNB	INTEGER			REFS	101	156	DEFINED	50			
3	NDATA	INTEGER		VARBLS	REFS	6	198					
631	NDBLE	INTEGER			REFS	101	156	DEFINED	97	122	127	172
2	NDELT	INTEGER		VARBLS	REFS	6	24	128	131			
554	NDRAG	INTEGER			REFS	111	166	DEFINED	27			
553	NFF	INTEGER			REFS	101	156	DEFINED	26			
4	NOPAN	INTEGER		VARBLS	REFS	6						
570	NPS	INTEGER			REFS	48	49	DEFINED	47			
57	NRVBO	INTEGER		FLUTAN	REFS	13						
72	NSARAY	INTEGER	ARRAY	VARBLS	REFS	6						
0	NTP1	INTEGER		NTPS	REFS	14	I/O REFS	201				
11	NTP10	INTEGER		NTPS	REFS	14						
1	NTP2	INTEGER		NTPS	REFS	14						
2	NTP3	INTEGER		NTPS	REFS	14						
3	NTP4	INTEGER		NTPS	REFS	14						
4	NTP5	INTEGER		NTPS	REFS	14						
5	NTP6	INTEGER		NTPS	REFS	14						
6	NTP7	INTEGER		NTPS	REFS	14						
7	NTP8	INTEGER		NTPS	REFS	14						
10	NTP9	INTEGER		NTPS	REFS	14						
0	NYAW	INTEGER		F.P.	REFS	129	DEFINED	1				
241	PI	REAL		VARBLS	REFS	6						
10166	PV	REAL	ARRAY	VARBLS	REFS	6	61	144				

ENTRY POINTS DEF LINE REFERENCES
3 PRT2 1 211

VARIABLES SN TYPE RELOCATION

236	ACAP	REAL		VARBLS	REFS	6						
567	ACGS	REAL			REFS	70	DEFINED	46				
613	AWEIRD	REAL			REFS	73	DEFINED	72				
642	AWW	REAL	ARRAY		REFS	18	200	201	DEFINED	185		
1462	AWWI	REAL	ARRAY		REFS	18	200	201	DEFINED	186		
604	AX	REAL			REFS	101	106	156	161	DEFINED	64	
605	AX1	REAL			REFS	101	148	156	DEFINED	65	149	
606	AX2	REAL			REFS	101	147	156	DEFINED	66	148	
601	AY	REAL			REFS	101	107	156	162	DEFINED	61	144
602	AY1	REAL			REFS	101	156	DEFINED	62	145		
603	AY2	REAL			REFS	101	156	DEFINED	63	146		
607	AZ	REAL			REFS	101	108	156	163	DEFINED	67	119
					141	175						
610	AZ1	REAL			REFS	101	156	DEFINED	68	120	142	176
611	AZ2	REAL			REFS	101	156	DEFINED	69	121	143	177
1	BETA	REAL		FLUTAN	REFS	13	74	81	101	109	113	156
					164	168						
237	B2	REAL		VARBLS	REFS	6						
560	CGR	REAL			REFS	109	113	164	168	DEFINED	33	
566	CGS	REAL			REFS	46	74	109	113	164	168	
					DEFINED	45						
620	CL	REAL			REFS	109	113	164	168	DEFINED	79	85
577	CV	REAL			REFS	109	113	164	168	DEFINED	59	
626	DELI	REAL			REFS	101	104	156	159	186		
					DEFINED	94	183					
625	DELR	REAL			REFS	101	103	156	158	185		
					DEFINED	93	182					
12446	DELY	REAL	ARRAY	VARBLS	REFS	6	76	87	101	156		
636	DIV	REAL			REFS	109	110	113	114	164	165	168
					169	185	DEFINED	184				
576	DL	REAL			REFS	169	187	DEFINED	54	135	169	
2302	DPRIME	REAL	ARRAY		REFS	20	DEFINED	187				
575	DR	REAL			REFS	114	135	187	DEFINED	53	114	
615	EE	REAL			REFS	109	113	164	168	DEFINED	76	87
7346	EV	REAL	ARRAY	VARBLS	REFS	6	64	2*112	2*167			
10	E2	REAL		DLM	REFS	12						
551	FDELT	REAL			REFS	182	183	184	187	DEFINED	24	
240	FL	REAL		VARBLS	REFS	6	101	156				
0	FMACH	REAL		FLUTAN	REFS	13						
556	GAMS	REAL			REFS	32	33	101	156	192		
					DEFINED	31	190					
564	GAMSIG	REAL			REFS	44	45	101	117	151	156	174
					191	DEFINED	43	117	150	173	189	
13514	GGMA	REAL	ARRAY	VARBLS	REFS	6						
244	GMA	REAL	ARRAY	VARBLS	REFS	6	31	43	150	173	189	190
641	I	INTEGER			REFS	2*200	2*201	DEFINED	200	201		
562	IG	INTEGER			REFS	42	43	47	150	173	189	
					DEFINED	38	42					
555	IH	INTEGER			REFS	30	31	34	190	DEFINED	29	30
563	IO	INTEGER			REFS	101	156	194	195	DEFINED	41	194
					195							
5	IQ	INTEGER		VARBLS	REFS	6	35	61	62	63	64	65
					66	67	68	69	112	119	120	121

```
                      NDBLE = JSPEC                                          PRT2      173
                      GAMSIG =  GMA(IG)                                      PRT2      174
                      SGS    = SIN(GAMSIG)                                   PRT2      175
  175                 AZ   = ZZ(IQ) + ZV(IR)                                 PRT2      176
                      AZ1  = ZZ(IQ) +ZZ2(IR)                                 PRT2      177
                      AZ2  = ZZ(IQ) +ZZ1(IR)                                 PRT2      178
                      JSPEC = 0                                              PRT2      179
                      MULT = JSPECS                                          PRT2      180
  180                 GO TO 310                                              PRT2      181
                    350 CONTINUE                                             PRT2      182
                      DELR  = SDELR + SSDELR*FDELT                           PRT2      183
                      DELI  = SDELI + SSDELI*FDELT                           PRT2      184
                      DIJ   = SAVE1 + SAVE2 *FDELT                           PRT2      185
  185                 AWW(IR) = DIJ - DELR                                   PRT2      186
                      AWWI(IR)=-DELI                                         PRT2      187
                      DPRIME(IR) = DR + DL*FDELT                             PRT2      188
                      IR = IR + 1                                            PRT2      189
                      GAMSIG = GMA(IG)                                       PRT2      190
  190                 GAMS  = GMA(IH)                                        PRT2      191
                      SGS    = SIN(GAMSIG)                                   PRT2      192
                      SGR    = SIN(GAMS)                                     PRT2      193
                      IF(IR.GT.NCNSM1) GO TO 360                             PRT2      194
                      IO = IO + 1                                            PRT2      195
  195                 IF (IO.GT.NCM1) IO = 1                                 PRT2      196
                      GO TO  120                                             PRT2      197
                    360 CONTINUE                                             PRT2      198
                      IF (NDATA .EQ. 0) GO TO 380                            PRT2      199
                      WRITE (ITAPEW,10) IQ,NCNSM1                            PRT2      200
  200                 WRITE (ITAPEW,30)  (AWW(I),AWWI(I),  I=1,NCNSM1)       PRT2      201
                    380 WRITE (NTP1)  (AWW(I),AWWI(I),  I=1,NCNSM1)          PRT2      202
                    390 CONTINUE                                             PRT2      203
                C                                                            PRT2      204
                C                                                            PRT2      205
  205           C FORMATS                                                    PRT2      206
                C                                                            PRT2      207
                     10 FORMAT (1HO,15HAWW PART OF ROW,I5,2X, 4HWITH,I5,2X,27HELEMENTS IS PRT2      208
                       1NOW PRINTED OUT)                                     PRT2      209
                     30 FORMAT (1HO,6E20.8)                                  PRT2      210
  210           C                                                            PRT2      211
                      RETURN                                                 PRT2      212
                      END                                                    PRT2      213
```

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

28 I CONTROL VARIABLE IN COMMON OR EQUIVALENCED. OPTIMIZATION MAY BE INHIBITED.

SYMBOLIC REFERENCE MAP (R=3)

```
115          250 CONTINUE                                                          PRT2     116
                 IF (JSPEC.EQ.0)  GO TO  270                                       PRT2     117
                 GAMSIG = -GAMSIG                                                  PRT2     118
                 SGS    =-SGS                                                      PRT2     119
                 AZ  = ZZ(IQ) + ZV(IR)                                             PRT2     120
120              AZ1 = ZZ(IQ) +ZZ1(IR)                                             PRT2     121
                 AZ2 = ZZ(IQ) +ZZ2(IR)                                             PRT2     122
                 NDBLE = JSPEC                                                     PRT2     123
                 JSPEC = 0                                                         PRT2     124
                 MULT = JSPECS                                                     PRT2     125
125              GO TO 230                                                         PRT2     126
             270 CONTINUE                                                          PRT2     127
                 NDBLE = 0                                                         PRT2     128
                 IF (NDELT.EQ.0)  GO TO 350                                        PRT2     129
                 IF (NYAW.EQ.0)  GO TO 280                                         PRT2     130
130              IF (IQ.GT.NBV)  GO TO 280                                         PRT2     131
                 IF (NDELT.EQ.1)  GO TO 350                                        PRT2     132
                 SSDELR = -SDELR                                                   PRT2     133
                 SSDELI = -SDELI                                                   PRT2     134
                 SAVE2  = -SAVE1                                                   PRT2     135
135              DL = -DR                                                          PRT2     136
                 GO TO  350                                                        PRT2     137
             280 CONTINUE                                                          PRT2     138
                 JSPEC  = JSPECS                                                   PRT2     139
                 SL   = -SL                                                        PRT2     140
140              TL   = -TL                                                        PRT2     141
                 AZ   = ZZ(IQ) - ZV(IR)                                            PRT2     142
                 AZ1  = ZZ(IQ) -ZZ2(IR)                                            PRT2     143
                 AZ2  = ZZ(IQ) -ZZ1(IR)                                            PRT2     144
                 AY   =  Y(IQ) + PV(IR)                                            PRT2     145
145              AY1  =  Y(IQ) + P2(IR)                                            PRT2     146
                 AY2  =  Y(IQ) + P1(IR)                                            PRT2     147
                 SAX2 = AX2                                                        PRT2     148
                 AX2  = AX1                                                        PRT2     149
                 AX1  =SAX2                                                        PRT2     150
150              GAMSIG = -GMA(IG)                                                 PRT2     151
                 SGS    = SIN(GAMSIG)                                              PRT2     152
                 MULT = 1                                                          PRT2     153
             310 CONTINUE                                                          PRT2     154
                 LHS = 1                                                           PRT2     155
155              IF (KRDBR.LE.SMALL) GO TO 320                                     PRT2     156
                 CALL       INCRO(AX,AY,AZ,AX1,AY1,AZ1,AX2,AY2,AZ2,GAMS,GAMSIG,LHS, PRT2     157
                1IR, NFF ,IO,NBXS,NCPNB,NDBLE,NBV,DELR,DELI,FL,BETA,SDELX,DELY,KR) PRT2     158
                 SSDELR =SSDELR + DELR*(FLOAT(MULT))                               PRT2     159
                 SSDELI =SSDELI + DELI*(FLOAT(MULT))                               PRT2     160
160          320 CONTINUE                                                          PRT2     161
                 XO = AX                                                           PRT2     162
                 YO = AY                                                           PRT2     163
                 ZO = AZ                                                           PRT2     164
                 CALL       SNPDF(SL,CL,TL,SGS,CGS,SGR,CGR,XO,YO,ZO,EE,DIJ,BETA,CV) PRT2     165
165              SAVE2  = SAVE2 + DIJ *(FLOAT(MULT))                               PRT2     166
                 IF (NDRAG.EQ.0)  GO TO  330                                       PRT2     167
                 XPRIME = EV(IQ) - EV(IR)                                          PRT2     168
                 CALL       SNPDF(SL,CL,TL,SGS,CGS,SGR,CGR,XO,YO,ZO,EE,DIJ,BETA,CV) PRT2     169
                 DL     = DL    + DIJ *(FLOAT(MULT))                               PRT2     170
170          330 CONTINUE                                                          PRT2     171
                 IF (JSPEC.EQ.0)  GO TO  350                                       PRT2     172
```

```
      130 CONTINUE                                                          PRT2      59
          CV    = SDELX(IR)                                                 PRT2      60
   60     JSPEC  = JSPECS                                                   PRT2      61
          AY   =  Y(IQ) - PV(IR)                                            PRT2      62
          AY1 =   Y(IQ) - P1(IR)                                            PRT2      63
          AY2 =   Y(IQ) - P2(IR)                                            PRT2      64
          AX   =  X(IQ) - EV(IR)                                            PRT2      65
   65     AX1 =   X(IQ) - Z1(IR)                                            PRT2      66
          AX2 =   X(IQ) - Z2(IR)                                            PRT2      67
          AZ   =  ZZ(IQ) - ZV(IR)                                           PRT2      68
          AZ1 =  ZZ(IQ) -ZZ1(IR)                                            PRT2      69
          AZ2 =  ZZ(IQ) -ZZ2(IR)                                            PRT2      70
   70     IF (ACGS.LE.SMALL) GO TO 190                                      PRT2      71
          WEIRD = Z2(IR) -Z1(IR)                                            PRT2      72
          AWEIRD = ABS(WEIRD)                                               PRT2      73
          IF (AWEIRD.LT.SMALL) GO TO 200                                    PRT2      74
          TL =    (((Z2(IR)-Z1(IR))/(P2(IR)-P1(IR)))*CGS)/BETA              PRT2      75
   75     180 CONTINUE                                                      PRT2      76
          EE =  DELY(IR)/2.                                                 PRT2      77
          SQTL = SQRT(1. + TL**2)                                           PRT2      78
          SL   = TL /SQTL                                                   PRT2      79
          CL   = 1. /SQTL                                                   PRT2      80
   80     GO TO  210                                                        PRT2      81
      190 TL =((Z2(IR) -Z1(IR))/(ZZ2(IR) - ZZ1(IR)))/BETA                  PRT2      82
          GO TO  180                                                        PRT2      83
      200 TL = 0.                                                           PRT2      84
          SQTL = 1.                                                         PRT2      85
   85     CL = 1.                                                           PRT2      86
          SL = 0.                                                           PRT2      87
          EE = (DELY(IR))/2.                                                PRT2      88
      210 CONTINUE                                                          PRT2      89
          SSDELR = 0.                                                       PRT2      90
   90     SSDELI = 0.                                                       PRT2      91
          SDELR = 0.0                                                       PRT2      92
          SDELI = 0.0                                                       PRT2      93
          DELR = 0.0                                                        PRT2      94
          DELI = 0.0                                                        PRT2      95
   95     SAVE1  =  0.                                                      PRT2      96
          SAVE2  =  0.                                                      PRT2      97
          NDBLE = 0                                                         PRT2      98
      230 CONTINUE                                                          PRT2      99
          LHS = 0                                                           PRT2     100
  100     IF (KRDBR.LE.SMALL)  GO TO 240                                    PRT2     101
          CALL        INCRO(AX,AY,AZ,AX1,AY1,AZ1,AX2,AY2,AZ2,GAMS,GAMSIG,LHS, PRT2     102
         1IR, NFF ,IO,NBXS,NCPNB,NDBLE,NBV,DELR,DELI,FL,BETA,SDELX,DELY,KR)  PRT2     103
          SDELR  = SDELR + DELR*(FLOAT(MULT))                               PRT2     104
          SDELI  = SDELI + DELI*(FLOAT(MULT))                               PRT2     105
  105     240 CONTINUE                                                      PRT2     106
          XO = AX                                                           PRT2     107
          YO = AY                                                           PRT2     108
          ZO = AZ                                                           PRT2     109
          CALL        SNPDF(SL,CL,TL,SGS,CGS,SGR,CGR,XO,YO,ZO,EE,DIJ,BETA,CV) PRT2     110
  110     SAVE1  = SAVE1 + DIJ *(FLOAT(MULT))                               PRT2     111
          IF (NDRAG.EQ.0)  GO TO  250                                       PRT2     112
          XPRIME = EV(IQ) - EV(IR)                                          PRT2     113
          CALL        SNPDF(SL,CL,TL,SGS,CGS,SGR,CGR,XO,YO,ZO,EE,DIJ,BETA,CV) PRT2     114
          DR     = DR    + DIJ *(FLOAT(MULT))                               PRT2     115
```

```
      SUBROUTINE PRT2 (NYAW,NBV)                                                PRT2      2
C                                                                               PRT2      3
      REAL    K10,K20,K1RT1,K1IT1,K2RT2P,K2IT2P,K1OT1,K2OT2P                    PRT2      4
      REAL    KR,KRDBR                                                          PRT2      5
C                                                                               PRT2      6
      COMMON /VARBLS / NCNSM1,NB,NDELT,NDATA,NOPAN,IQ,IR,JSPECS,                PRT2      7
     1                 NCARAY(50),NSARAY(50),NBARAY(50),ACAP,B2,FL,PI,         PRT2      8
     2                 KR,KRDBR,GMA(50),X(400),Y(400),ZZ(400),Z1(400),         PRT2      9
     3                 P1(400),ZZ1(400),Z2(400),P2(400),ZZ2(400),              PRT2     10
     4                 EV(400),PV(400),ZV(400),SDELX(400),DELY(400),           PRT2     11
     5                 XO(50),YO(50),ZO(50),GGMA(50)                           PRT2     12
      COMMON  /DLM/  K10,K20,K1RT1,K1IT1,K2RT2P,K2IT2P,K1OT1,K2OT2P,E2          PRT2     13
      COMMON /FLUTAN/ FMACH ,BETA  ,VBO   ,RVBO  ,NRVBO                         PRT2     14
      COMMON  /NTPS/  NTP1,NTP2,NTP3,NTP4,NTP5,NTP6,NTP7,NTP8,NTP9,NTP10        PRT2     15
      COMMON / CTAPES / ITAPES                                                  PRT2     16
C                                                                               PRT2     17
      DIMENSION VBO(30), RVBO(15)                                               PRT2     18
      DIMENSION AWW(400), AWWI(400)                                             PRT2     19
      DIMENSION ITAPES(50)                                                      PRT2     20
      DIMENSION DPRIME(400)                                                     PRT2     21
C                                                                               PRT2     22
      ITAPEW = ITAPES(6)                                                        PRT2     23
C                                                                               PRT2     24
      FDELT = NDELT                                                             PRT2     25
      SMALL = 0.00001                                                           PRT2     26
      NFF = 0                                                                   PRT2     27
      NDRAG= 0                                                                  PRT2     28
      DO 390  IQ = 1,NCNSM1                                                     PRT2     29
      IH = 0                                                                    PRT2     30
   90 IH = IH + 1                                                               PRT2     31
      GAMS  = GMA(IH)                                                           PRT2     32
      SGR   = SIN(GAMS)                                                         PRT2     33
      CGR   = COS(GAMS)                                                         PRT2     34
      NBXR=NBARAY(IH)                                                           PRT2     35
      IF(IQ.LE.NBXR) GO TO 100                                                  PRT2     36
      GO TO 90                                                                  PRT2     37
  100 CONTINUE                                                                  PRT2     38
      IG = 0                                                                    PRT2     39
      IR = 1                                                                    PRT2     40
      NB = 0                                                                    PRT2     41
      IO = 1                                                                    PRT2     42
  110 IG = IG + 1                                                               PRT2     43
      GAMSIG= GMA(IG)                                                           PRT2     44
      SGS   = SIN(GAMSIG)                                                       PRT2     45
      CGS   = COS(GAMSIG)                                                       PRT2     46
      ACGS = ABS(CGS)                                                           PRT2     47
      NPS = IG                                                                  PRT2     48
      NCM1  =  NCARAY(NPS) - 1                                                  PRT2     49
      NBXS = NBARAY(NPS)                                                        PRT2     50
      NCPNB  = NCM1 + NB                                                        PRT2     51
  120 CONTINUE                                                                  PRT2     52
      MULT = 1                                                                  PRT2     53
      DR = 0.                                                                   PRT2     54
      DL = 0.                                                                   PRT2     55
      IF (IR.LE.NBXS) GO TO 130                                                 PRT2     56
      NB = NBXS                                                                 PRT2     57
      GO TO 110                                                                 PRT2     58
```

STATEMENT LABELS			DEF LINE	REFERENCES					
0	100	INACTIVE	22	21					
0	110	INACTIVE	23	22					
27	120		26	2*22					
46	200		33	2*21					
0	210	INACTIVE	40	39					
100	220		44	2*39					
0	230	INACTIVE	46	45					
111	240		49	2*45					
112	300		50	43	48				
0	310	INACTIVE	57	56					
133	320		59	56					
135	330		78	56	58				
264	340		109	104					
302	350		111	6*109					
345	360		125	4*123					
420	370		133	2*131					
451	380		138	109	123	131			
453	390		139	109	123	2*131			
473	410		143	2*123	3*131	4*141			
663	420		162	109	123	131	2*141		
754	430		176	4*175					
1002	440		179	2*175	4*178				
1036	450		184	2*183					
1042	460		186	178	183	185			
1045	500		188	137	3*141	3*175	4*178	6*183	2*185
1111	510		202	2*201					
1116	520		205	201	2*204				
1123	530		208	4*201	204	2*207			
1156	540		214	2*201	207	6*213			
1205	900		221	3*213					
1216	905		228	32					
1235	907		237	25					

STATISTICS

PROGRAM LENGTH 14608 816

52000B CM USED

VARIABLES	SN	TYPE	RELOCATION								
				DEFINED	53						
1434	Q1	REAL		REFS	125	133	143	155	DEFINED	111	
1445	Q10	REAL		REFS	125	133	143	155	DEFINED	120	
1446	Q11	REAL		REFS	125	133	143	155	DEFINED	121	
1435	Q2	REAL		REFS	125	133	143	155	DEFINED	112	
1436	Q3	REAL		REFS	125	133	143	155	DEFINED	113	
1437	Q4	REAL		REFS	125	133	143	155	DEFINED	114	
1440	Q5	REAL		REFS	125	133	143	155	DEFINED	115	
1441	Q6	REAL		REFS	125	133	143	155	DEFINED	116	
1442	Q7	REAL		REFS	125	133	143	155	DEFINED	117	
1443	Q8	REAL		REFS	125	133	143	155	DEFINED	118	
1444	Q9	REAL		REFS	125	133	143	155	DEFINED	119	
1377	RFOUR	REAL		REFS	232	233	234	DEFINED	12		
1376	RTWO	REAL		REFS	2*12	229	230	231	DEFINED	11	
1374	R1	REAL		REFS	10	2*11	21	2*51	52	53	105
					107	111	162	166	196	214	218
				DEFINED	9	92	168	189			
1375	R1S	REAL		REFS	168	189	DEFINED	10			
1432	R10	REAL		REFS	105	107	120	162	166		
				DEFINED	101						
1433	R11	REAL		REFS	105	107	121	162	166		
				DEFINED	102						
1422	R2	REAL		REFS	105	107	112	162	166		
				DEFINED	93						
1423	R3	REAL		REFS	105	107	113	162	166		
				DEFINED	94						
1424	R4	REAL		REFS	105	107	114	162	166		
				DEFINED	95						
1425	R5	REAL		REFS	105	107	115	162	166		
				DEFINED	96						
1426	R6	REAL		REFS	105	107	116	162	166		
				DEFINED	97						
1427	R7	REAL		REFS	105	107	117	162	166		
				DEFINED	98						
1430	R8	REAL		REFS	105	107	118	162	166		
				DEFINED	99						
1431	R9	REAL		REFS	105	107	119	162	166		
				DEFINED	100						
1401	T1	REAL		REFS	29	30	31	45	222	223	226
				DEFINED	27	41	44	47			
1406	T2	REAL		REFS	39	DEFINED	38	42			
1405	T2P	REAL		REFS	38	224	225	227	DEFINED	37	
0	XO	REAL	F.P.	REFS	22	26	2*51	53	198	210	218
				DEFINED	1						
0	YO	REAL	F.P.	REFS	2*9	3*37	DEFINED	1			
0	ZO	REAL	F.P.	REFS	2*9	3*37	DEFINED	1			

EXTERNALS	TYPE	ARGS		REFERENCES							
COS	REAL	1	LIBRARY	27	29	33	35	41	44	171	194	199
EXP	REAL	1	LIBRARY	78							
SIN	REAL	1	LIBRARY	30	34	36	170	195	200		
SQRT	REAL	1	LIBRARY	9	51	172	197				

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES			
ABS	REAL	1	INTRIN		39	45	54	
FLOAT	REAL	1	INTRIN		235			

VARIABLES	SN	TYPE	RELOCATION								
1450	DK1R	REAL		REFS	222	DEFINED	188	211			
1453	DK2I	REAL		REFS	225	DEFINED	192	220			
1452	DK2R	REAL		REFS	224	DEFINED	191	219			
1412	E	REAL		REFS	11*143	11*155	11*162	11*166	DEFINED	78	
1373	EPS	REAL		REFS	39	45	DEFINED	7			
0	E2	REAL	F.P.	REFS	38	DEFINED	1				
0	FMACH	REAL	F.P.	REFS	8	DEFINED	1				
0	GAMS	REAL	F.P.	REFS	27	33	34	41	44		
				DEFINED	1						
0	GAMSIG	REAL	F.P.	REFS	27	35	36	41	44		
				DEFINED	1						
1407	ICHUZ	INTEGER		REFS	57	59	104	109	123	131	137
				141	175	178	183	185	201	204	207
				213	DEFINED	40	46	49	57	59	
1347	IOUI	REAL		REFS	2	176	177	179	181		
				DEFINED	166						
1346	IOUR	REAL		REFS	2	176	177	179	181		
				DEFINED	162						
1337	IOOI	REAL		REFS	2	129	139	DEFINED	107		
1336	IOOR	REAL		REFS	2	135	138	DEFINED	105		
1353	I1UI	REAL		REFS	2	209	DEFINED	177	203		
1352	I1UR	REAL		REFS	2	186	208	DEFINED	176	187	202
1343	I1OI	REAL		REFS	2	203	DEFINED	138			
1342	I1OR	REAL		REFS	2	186	202	DEFINED	139		
1355	I2UI3	REAL		REFS	2	217	DEFINED	181	206		
1354	I2UR3	REAL		REFS	2	184	216	DEFINED	179	184	205
1345	I2OI3	REAL		REFS	2	206	DEFINED	135			
1344	I2OR3	REAL		REFS	2	184	205	DEFINED	129		
1351	JOUI	REAL		REFS	2	179	181	DEFINED	155		
1350	JOUR	REAL		REFS	2	179	181	DEFINED	143		
1341	JOOI	REAL		REFS	2	135	DEFINED	133			
1340	JOOR	REAL		REFS	2	129	DEFINED	125			
0	KKI	REAL	F.P.	REFS	2	DEFINED	1	24	236		
0	KKR	REAL	F.P.	REFS	2	DEFINED	1	23	235		
0	KR	REAL	F.P.	REFS	2	26	52	198	DEFINED	1	
135E	K1	REAL		REFS	2	2*55	107	129	133	135	138
				139	155	166	169	2*176	2*177	2*179	2*181
				193	215	DEFINED	52				
1365	K1IT1	REAL		REFS	5	230	236	DEFINED	16	30	223
				230							
1364	K1RT1	REAL		REFS	5	229	235	DEFINED	15	29	222
				229							
1362	K1O	REAL		REFS	5	226	DEFINED	13	28	210	
1370	K1OT1	REAL		REFS	5	231	235	DEFINED	19	31	226
				231							
1361	K2	REAL		REFS	2	80	81	82	83	84	85
				86	87	88	89	90	11*125	129	135
				11*143	2*179	2*181	DEFINED	55			
1367	K2IT2P	REAL		REFS	5	233	236	DEFINED	18	225	233
1366	K2RT2P	REAL		REFS	5	232	235	DEFINED	17	224	232
1363	K2O	REAL		REFS	5	227	DEFINED	14	218		
1371	K2OT2P	REAL		REFS	5	234	235	DEFINED	20	227	234
1372	L	INTEGER		REFS	235	DEFINED	6				
1335	M	REAL		REFS	2	2*50	53	196	DEFINED	8	
1360	MU	REAL		REFS	2	78	11*143	11*155	169	2*172	173
				2*174	DEFINED	54					
1357	MU1	REAL		REFS	2	54	56	193	2*197	214	

```
                  K1RT1  = K1RT1 /RTWO                                    TKER     230
     230          K1IT1  = K1IT1 /RTWO                                    TKER     231
                  K1OT1  = K1OT1 /RTWO                                    TKER     232
                  K2RT2P = K2RT2P/RFOUR                                   TKER     233
                  K2IT2P = K2IT2P/RFOUR                                   TKER     234
                  K2OT2P = K2OT2P/RFOUR                                   TKER     235
     235          KKR    = K1RT1+K2RT2P - (K1OT1+K2OT2P)*FLOAT(L)         TKER     236
                  KKI    = K1IT1 + K2IT2P                                 TKER     237
                907 CONTINUE                                              TKER     238
                  RETURN                                                  TKER     239
                  END                                                     TKER     240
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	TKER	1	238

VARIABLES	SN	TYPE	RELOCATION								
1410	BETA2	REAL		REFS	51	53	214	218	DEFINED	50	
1411	BIGR	REAL		REFS	53	196	210	214	2*218		
				DEFINED	51						
0	BR	REAL	F.P.	REFS	26	52	198	DEFINED	1		
1447	CAR	REAL		REFS	187	DEFINED	186				
1455	CK1I	REAL		REFS	211	212	DEFINED	209			
1454	CK1R	REAL		REFS	211	212	DEFINED	208			
1457	CK2I	REAL		REFS	219	220	DEFINED	217			
1456	CK2R	REAL		REFS	219	220	DEFINED	216			
1400	C1	REAL		REFS	29	30	2*37	92	111	143	155
				176	177	179	181	208	216	217	
				DEFINED	26	33	80	170	194		
1420	C10	REAL		REFS	101	120	143	155	DEFINED	89	
1421	C11	REAL		REFS	102	121	143	155	DEFINED	90	
1402	C2	REAL		REFS	2*37	93	112	143	155	176	177
				179	181	209	216	217	DEFINED	34	81
				171	195						
1403	C3	REAL		REFS	2*37	94	113	143	155	173	194
				195	208	209	2*214	2*215	DEFINED	35	82
				172	193	196					
1404	C4	REAL		REFS	2*37	95	114	143	155	174	176
				177	2*179	2*181	208	209	3*214	215	
				DEFINED	36	83	173	197			
1413	C5	REAL		REFS	96	115	143	155	179	181	199
				200	DEFINED	84	174	198			
1414	C6	REAL		REFS	97	116	143	155	170	171	179
				181	211	212	219	220	DEFINED	85	169
				199							
1415	C7	REAL		REFS	98	117	143	155	211	212	219
				220	DEFINED	86	200				
1416	C8	REAL		REFS	99	118	143	155	216	217	
				DEFINED	87	214					
1417	C9	REAL		REFS	100	119	143	155	216	217	
				DEFINED	88	215					

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                C3= SQRT(1.+MU*MU)                                                  TKER      173
                C4= MU/C3                                                           TKER      174
                C5= C4/(1.+MU*MU)                                                   TKER      175
175             GO TO  (430,440,430,430,440,430,500,500,500),ICHUZ                  TKER      176
            430 I1UR = C2*(1.-C4+K1*IOUI)-C1*K1*IOUR                                TKER      177
                I1UI =-C2*K1*IOUR-C1*(1.-C4+K1*IOUI)                                TKER      178
                GO TO  (500,440,440,460,440,440,500,500,500),ICHUZ                  TKER      179
            440 I2UR3 = C2*(2.*(1.-C4)-C5+K1*IOUI+K2*JOUR)+C1*(C6*(1.-C4)-K1*IOUR  TKER      180
180            1          +K2*JOUI)                                                TKER      181
                I2UI3 = C2*(C6*(1.-C4)-K1*IOUR+K2*JOUI)-C1*(2.*(1.-C4)-C5+K1*IOUI  TKER      182
               1          +K2*JOUR)                                                TKER      183
                GO TO  (500,500,500,460,450,450,500,500,500),ICHUZ                  TKER      184
            450 I2UR3 = 2.0 * I2OR3 - I2UR3                                         TKER      185
185             IF  ( ICHUZ-6 )                    500,460,500                      TKER      186
            460 CAR = 2.*I1OR-I1UR                                                  TKER      187
                I1UR= CAR                                                           TKER      188
            500 DK1R=0.                                                             TKER      189
                R1 = R1S                                                            TKER      190
190             DK1I=0.                                                             TKER      191
                DK2R=0.                                                             TKER      192
                DK2I=0.                                                             TKER      193
                C3=K1*MU1                                                           TKER      194
                C1=COS(C3)                                                          TKER      195
195             C2=SIN(C3)                                                          TKER      196
                C3= M*R1/BIGR                                                       TKER      197
                C4=SQRT(1.+MU1*MU1)                                                 TKER      198
                C5=KR*XO/BR                                                         TKER      199
                C6=COS(C5)                                                          TKER      200
200             C7=SIN(C5)                                                          TKER      201
                GO TO (530,540,530,530,540,530,510,520,510),ICHUZ                   TKER      202
            510 I1UR=I1OR                                                           TKER      203
                I1UI=I1OI                                                           TKER      204
                IF  ( ICHUZ-7 )                    520,530,520                      TKER      205
205         520 I2UR3= I2OR3                                                        TKER      206
                I2UI3= I2OI3                                                        TKER      207
                IF  ( ICHUZ-8 )                    530,540,530                      TKER      208
            530 CK1R = I1UR + C3*C1/C4                                              TKER      209
                CK1I = I1UI - C3*C2/C4                                              TKER      210
210             K1O  = 1.0 + XO/BIGR                                                TKER      211
                DK1R = CK1R*C6 + CK1I*C7                                            TKER      212
                DK1I = CK1I*C6 - CK1R*C7                                            TKER      213
                GO TO  (900,540,540,900,540,540,900,540,540),ICHUZ                  TKER      214
            540 C8=  (BETA2*(R1/BIGR)**2 + (2.+MU1*C3)/(C4*C4))*(-C3/C4)            TKER      215
215             C9= ( K1*C3)*( C3/C4)                                               TKER      216
                CK2R = -I2UR3 + C8*C1 - C9*C2                                       TKER      217
                CK2I = -I2UI3 - C9*C1 - C8*C2                                       TKER      218
                K2O  = -2.0 -XO*(2.0+BETA2*(R1/BIGR)**2)/BIGR                       TKER      219
                DK2R = CK2R*C6 + CK2I*C7                                            TKER      220
220             DK2I = CK2I*C6 - CK2R*C7                                            TKER      221
            900 CONTINUE                                                            TKER      222
                K1RT1  = T1 * DK1R                                                  TKER      223
                K1IT1  = T1 * DK1I                                                  TKER      224
                K2RT2P = T2P* DK2R                                                  TKER      225
225             K2IT2P = T2P* DK2I                                                  TKER      226
                K1OT1  = K1O* T1                                                    TKER      227
                K2OT2P = K2O* T2P                                                   TKER      228
            905 CONTINUE                                                            TKER      229
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115               Q5  = R5/ C5                                                  TKER      116
                  Q6  = R6/ C6                                                 TKER      117
                  Q7  = R7/ C7                                                 TKER      118
                  Q8  = R8/ C8                                                 TKER      119
                  Q9  = R9/ C9                                                 TKER      120
120               Q10 = R10/C10                                                TKER      121
                  Q11 = R11/C11                                                TKER      122
                                                                               TKER      123
                  GO TO  (420,410,410,390,360,360,380,360,360),ICHUZ           TKER      124
                                                                               TKER      125
125            360 JOOR =  Q1*(.138384-K2)+Q2*(.553536-K2)+Q3*(1.245456-K2)+Q4* TKER      126
                  1        (2.214144-K2)+Q5*(3.4596-K2)+Q6*(4.981824-K2)+Q7*(6.780816 TKER 127
                  2        -K2)+Q8*(8.856576-K2)+Q9*(11.209104-K2)+Q10*(13.8384-K2)+ TKER 128
                  3        Q11*(16.744464-K2)                                  TKER      129
                   I20R3= 2.+K1*I00I+K2*JOOR                                   TKER      130
130                                                                            TKER      131
                  GO TO  (420,410,410,390,410,390,380,370,370),ICHUZ           TKER      132
                                                                               TKER      133
               370 JOOI = -K1*(.744*Q1+1.488*Q2+2.232*Q3+2.976*Q4+3.72*Q5+4.464*Q6+ TKER 134
                  1            5.208*Q7+5.952*Q8+6.696*Q9+7.44*Q10+8.184*Q11)   TKER      135
135                I20I3= -K1*I00R+K2*JOOI                                     TKER      136
                                                                               TKER      137
                  IF  ( ICHUZ .EQ. 8 )              GO TO 500                  TKER      138
               380 I10I = -K1*I00R                                             TKER      139
               390 I10R = 1.+K1*I00I                                           TKER      140
140                                                                            TKER      141
                  GO TO (420,410,410,420,410,410,500,500,500),ICHUZ            TKER      142
                                                                               TKER      143
               410 JOUR = E*(Q1*(.138384-K2+.372*MU*C1)+                       TKER      144
                  1       E*(Q2*(.553536-K2+.744*MU*C2)+                       TKER      145
145               2       E*(Q3*(1.245456-K2+1.116*MU*C3)+                     TKER      146
                  3       E*(Q4*(2.214144-K2+1.488*MU*C4)+                     TKER      147
                  4       E*(Q5*(3.4596-K2+1.86*MU*C5)+                        TKER      148
                  5       E*(Q6*(4.981824-K2+2.232*MU*C6)+                     TKER      149
                  6       E*(Q7*(6.780816-K2+2.604*MU*C7)+                     TKER      150
150               7       E*(Q8*(8.856576-K2+2.976*MU*C8)+                     TKER      151
                  8       E*(Q9*(11.209104-K2+3.348*MU*C9)+                    TKER      152
                  9       E*(Q10*(13.8384-K2+3.72*MU*C10)+                     TKER      153
                  A       E*(Q11*(16.744464-K2+4.092*MU*C11))))))))))))        TKER      154
                                                                               TKER      155
155               JOUI = -K1*(E*(Q1*(.744+MU*C1) + E*(Q2*(1.488+MU*C2) +       TKER      156
                  1            E*(Q3*(2.232+MU*C3)+ E*(Q4*(2.976+MU*C4) +     TKER      157
                  2            E*(Q5*(3.72+MU*C5) + E*(Q6*(4.464+MU*C6) +     TKER      158
                  3            E*(Q7*(5.208+MU*C7) + E*(Q8*(5.952+MU*C8) +    TKER      159
                  4            E*(Q9*(6.696+MU*C9) + E*(Q10*(7.44+MU*C10) +   TKER      160
160               5            E*(Q11*(8.184+MU*C11))))))))))))               TKER      161
                                                                               TKER      162
               420 IOUR = .372*E*(R1+E*(2.*R2+E*(3.*R3+E*(4.*R4+E*(5.*R5+E*(6.*R6+ TKER 163
                  1            E*(7.*R7+E*(8.*R8+E*(9.*R9+E*(10.*R10+E*11.*R11)))))) TKER 164
                  2                 ))))                                       TKER      165
165                                                                            TKER      166
                   IOUI = -K1*(E*(R1+E*(R2+E*(R3+E*(R4+E*(R5+E*(R6+E*(R7+E*(R8+E*(R9 TKER 167
                  1            +E*(R10+E*R11))))))))))                         TKER      168
                   R1  = R1S                                                   TKER      169
                   C6= K1*MU                                                   TKER      170
170                C1= SIN(C6)                                                 TKER      171
                   C2= COS(C6)                                                 TKER      172
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                GO TO 330                                                       TKER       59
              320 ICHUZ=ICHUZ+6                                                 TKER       60
60            C   (N*C)**2  FOR  N=1,11  AND C=.372 =                          TKER       61
              C                                                                 TKER       62
              C     .138384         .553536        1.245456        2.214144     TKER       63
              C    3.4596          4.981824        6.780816        8.856576     TKER       64
              C   11.209104        13.8384         16.744464                    TKER       65
65            C                                                                 TKER       66
              C   (N*C)  FOR  N=1,12  AND  14,16,18,20,22   =                   TKER       67
              C                                                                 TKER       68
              C       .744          1.116           1.488          1.86   2.232 TKER       69
              C      2.604          2.976           3.348          3.72   4.092 TKER       70
70            C      4.464          5.208           5.952          6.696  7.44  TKER       71
              C      8.184                                                      TKER       72
              C                                                                 TKER       73
              C   A(N)  FORN(=1,11  =                                          TKER       74
              C                                                                 TKER       75
75            C     .24186198        -2.7918027        24.991079      -111.59196 TKER       76
              C  271.43549          -305.75288         -41.18363       545.98537 TKER       77
              C -644.78155           328.72755         -64.279511                TKER       78
              330 E= EXP (-.372*MU)                                             TKER       79
                                                                                TKER       80
80                C1 = .138384+K2                                               TKER       81
                  C2 = .553536+K2                                               TKER       82
                  C3 = 1.245456+K2                                              TKER       83
                  C4  = 2.214144 +K2                                            TKER       84
                  C5  = 3.4596   +K2                                            TKER       85
85                C6  = 4.981824 +K2                                            TKER       86
                  C7  = 6.780816 +K2                                            TKER       87
                  C8  = 8.856576 +K2                                            TKER       88
                  C9  = 11.209104+K2                                            TKER       89
                  C10 = 13.8384  +K2                                            TKER       90
90                C11 = 16.744464+K2                                            TKER       91
                                                                                TKER       92
                  R1  = .24186198 / C1                                          TKER       93
                  R2  =-2.7918027 / C2                                          TKER       94
                  R3  = 24.991079 / C3                                          TKER       95
95                R4  =-111.59196 / C4                                          TKER       96
                  R5  = 271.43549 / C5                                          TKER       97
                  R6  =-305.75288 / C6                                          TKER       98
                  R7  =-41.18363  / C7                                          TKER       99
                  R8  = 545.98537 / C8                                          TKER      100
100               R9  =-644.78155 / C9                                          TKER      101
                  R10 = 328.72755 / C10                                         TKER      102
                  R11 =-64.279511 / C11                                         TKER      103
                                                                                TKER      104
                  IF  ( ICHUZ .LT. 4 )                        GO TO 340         TKER      105
105               IOOR = .372*(R1 +2.*R2 + 3.*R3 + 4.*R4 + 5.*R5 + 6.*R6 + 7.*R7 + TKER      106
                 1        8.*R8 + 9.*R9 + 10.*R10 + 11.*R11)                    TKER      107
                  IOOI = -K1*(R1+R2+R3+R4+R5+R6+R7+R8+R9+R10+R11)                TKER      108
                                                                                TKER      109
              340 GO TO  (420,350,350,390,350,350,380,350,350),ICHUZ            TKER      110
110                                                                             TKER      111
              350 Q1  = R1/ C1                                                  TKER      112
                  Q2  = R2/ C2                                                  TKER      113
                  Q3  = R3/ C3                                                  TKER      114
                  Q4  = R4/ C4                                                  TKER      115
```

STATEMENT LABELS		DEF LINE	REFERENCES			
52	120	51	196			
60	130	58	55			
117	180	75	82			
130	190	81	70			
136	200	83	73			
144	210	88	80			
151	230	98	125			
164	240	105	100			
206	250	115	111			
224	270	126	116			
241	280	137	129	130		
270	310	153	180			
303	320	160	155			
325	330	170	166			
344	350	181	128	131	136	171
377	360	197	193			
416	380	201	198			
0	390	202	28			

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
15	390	IQ	28 202	420B	EXT REFS	NOT INNER
405		I	200 200	10B	EXT REFS	
421		I	201 201	10B	EXT REFS	

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
VARBLS	6014	0 NCNSM1 (1)	1 NB (1)	2 NDELT (1)			
		3 NDATA (1)	4 NOPAN (1)	5 IQ (1)			
		6 IR (1)	7 JSPECS (1)	8 NCARAY (50)			
		58 NSARAY (50)	108 NBARAY (50)	158 ACAP (1)			
		159 B2 (1)	160 FL (1)	161 PI (1)			
		162 KR (1)	163 KRDBR (1)	164 GMA (50)			
		214 X (400)	614 Y (400)	1014 ZZ (400)			
		1414 Z1 (400)	1814 P1 (400)	2214 ZZ1 (400)			
		2614 Z2 (400)	3014 P2 (400)	3414 ZZ2 (400)			
		3814 EV (400)	4214 PV (400)	4614 ZV (400)			
		5014 SDELX (400)	5414 DELY (400)	5814 XO (50)			
		5864 YO (50)	5914 ZO (50)	5964 GGMA (50)			
DLM	9	0 K1O (1)	1 K2O (1)	2 K1RT1 (1)			
		3 K1IT1 (1)	4 K2RT2P (1)	5 K2IT2P (1)			
		6 K1OT1 (1)	7 K2OT2P (1)	8 E2 (1)			
FLUTAN	48	0 FMACH (1)	1 BETA (1)	2 VBO (30)			
		32 RVBO (15)	47 NRVBO (1)				
NTPS	10	0 NTP1 (1)	1 NTP2 (1)	2 NTP3 (1)			
		3 NTP4 (1)	4 NTP5 (1)	5 NTP6 (1)			
		6 NTP7 (1)	7 NTP8 (1)	8 NTP9 (1)			
		9 NTP10 (1)					
CTAPES	50	0 ITAPES (50)					

STATISTICS

PROGRAM LENGTH	3127B	1623
CM LABELED COMMON LENGTH	13763B	6131

52000B CM USED

```
      SUBROUTINE INCRO(AX,AY,AZ,AX1,AY1,AZ1,AX2,AY2,AZ2,GAMS,GAMSIG,LHS,  INCRO      2
     1IR, NFF ,IO,NBXS,NCPNB,NDBLE,NBV,DELR,DELI,FL,BETA,SDELX,DELY,KR)  INCRO      3
C     COMBINED  KERNEL-INTEGRATION PROGRAM                                INCRO      4
      REAL   K1O,K2O,K1RT1,K1IT1,K2RT2P,K2IT2P,K1OT1,K2OT2P               INCRO      5
      COMMON  /DLM/  K1O,K2O,K1RT1,K1IT1,K2RT2P,K2IT2P,K1OT1,K2OT2P,E2    INCRO      6
      COMMON /COMA/ LC(40) , CR                                           INCRO      7
      DIMENSION SDELX(400),DELY(400)                                      INCRO      8
      DIMENSION XUSE1(30,2),XUSE2(30,2),XUSE3(30,2),XUSE4(30,2)           INCRO      9
      DIMENSION USE1(30,2), USE2(30,2), USE3(30,2), USE4(30,2)            INCRO     10
      REAL   M, KKR, KKI, KR                                             INCRO     11
      NFF  = 0                                                           INCRO     12
      M = SQRT(1.0 - BETA**2)                                            INCRO     13
      BR  =  12.0 * CR                                                   INCRO     14
      EPS = 0.00001                                                      INCRO     15
      XDELX = SDELX(IR)                                                  INCRO     16
      XDELY =  DELY(IR)                                                  INCRO     17
      SFN = SIN(GAMSIG)                                                  INCRO     18
      CFN = COS(GAMSIG)                                                  INCRO     19
                                                                         INCRO     20
      EE = 0.5*XDELY                                                     INCRO     21
      E2   = EE**2                                                       INCRO     22
      KKR = 0.0                                                          INCRO     23
      KKI = 0.0                                                          INCRO     24
      DELR = 0.0                                                         INCRO     25
      DELI = 0.0                                                         INCRO     26
      AT1S = 0.0                                                         INCRO     27
      AT2S = 0.0                                                         INCRO     28
      T1   = 0.0                                                         INCRO     29
      T2  = 0.0                                                          INCRO     30
      COUNT =0.                                                          INCRO     31
      XO=AX                                                              INCRO     32
      YO=AY                                                              INCRO     33
      ZO=AZ                                                              INCRO     34
      IF (NFF.EQ.0) GO TO 80                                             INCRO     35
      CALL       KERNEL(XO,YO,ZO,KR,BR,GAMS,GAMSIG,M,EPS,T1,T2)          INCRO     36
      DELR = KKR                                                         INCRO     37
      DELI = KKI                                                         INCRO     38
      GO TO 260                                                          INCRO     39
   80 CONTINUE                                                           INCRO     40
      CALL       KERNEL(XO,YO,ZO,KR,BR,GAMS,GAMSIG,M,EPS,T1,T2)          INCRO     41
      AT1  = ABS(T1)                                                     INCRO     42
      AT2  = ABS(T2)                                                     INCRO     43
      IF (AT1.GT.AT1S)  AT1S=AT1                                         INCRO     44
      IF (AT2.GT.AT2S)  AT2S=AT2                                         INCRO     45
      IF (COUNT)130,90,150                                               INCRO     46
   90 DKRC  = K1RT1 - K1OT1                                              INCRO     47
      DKIC  = K1IT1                                                      INCRO     48
      XKRC  = K2RT2P-K2OT2P                                              INCRO     49
      XKIC  = K2IT2P                                                     INCRO     50
      AT2 = ABS(T2)                                                      INCRO     51
      JO = 1                                                             INCRO     52
      IF (NDBLE.NE.0) JO = 2                                             INCRO     53
      IF (IR.LE.NCPNB) GO TO  110                                        INCRO     54
      IF (IR.GT.NBXS) GO TO 110                                          INCRO     55
      IF (LHS.NE.0) GO TO  100                                           INCRO     56
      DKRI = USE1(IO,JO)                                                 INCRO     57
      DKII = USE2(IO,JO)                                                 INCRO     58
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```
                XKRI  = XUSE1(IO,JO)                                              INCRO      59
                XKII  = XUSE2(IO,JO)                                              INCRO      60
 60             XO    = AX2                                                       INCRO      61
                YO    = AY2                                                       INCRO      62
                ZO = AZ2                                                          INCRO      63
                CALL       KERNEL(XO,YO,ZO,KR,BR,GAMS,GAMSIG,M,EPS,T1,T2)         INCRO      64
                AT1  = ABS(T1)                                                    INCRO      65
 65             AT2  = ABS(T2)                                                    INCRO      66
                IF (AT1.GT.AT1S)  AT1S=AT1                                        INCRO      67
                IF (AT2.GT.AT2S)  AT2S=AT2                                        INCRO      68
                DKRO  = K1RT1 - K1OT1                                             INCRO      69
                DKIO  = K1IT1                                                     INCRO      70
 70             XKRO  = K2RT2P-K2OT2P                                             INCRO      71
                XKIO  = K2IT2P                                                    INCRO      72
                GO TO  170                                                        INCRO      73
            100 XO = AX1                                                          INCRO      74
                YO = AY1                                                          INCRO      75
 75             ZO = AZ1                                                          INCRO      76
                CALL       KERNEL(XO,YO,ZO,KR,BR,GAMS,GAMSIG,M,EPS,T1,T2)         INCRO      77
                AT1  = ABS(T1)                                                    INCRO      78
                AT2  = ABS(T2)                                                    INCRO      79
                IF (AT1.GT.AT1S)  AT1S=AT1                                        INCRO      80
 80             IF (AT2.GT.AT2S)  AT2S=AT2                                        INCRO      81
                DKRI  = K1RT1 - K1OT1                                             INCRO      82
                DKII  = K1IT1                                                     INCRO      83
                XKRI  = K2RT2P-K2OT2P                                             INCRO      84
                XKII  = K2IT2P                                                    INCRO      85
 85             DKRO = USE3(IO,JO)                                                INCRO      86
                DKIO = USE4(IO,JO)                                                INCRO      87
                XKRO  = XUSE3(IO,JO)                                              INCRO      88
                XKIO  = XUSE4(IO,JO)                                              INCRO      89
                GO TO  160                                                        INCRO      90
 90         110 CONTINUE                                                         INCRO      91
                COUNT =-1.                                                        INCRO      92
            120 XO = AX1                                                          INCRO      93
                YO = AY1                                                          INCRO      94
                ZO = AZ1                                                          INCRO      95
 95             GO TO 80                                                          INCRO      96
            130 DKRI  = K1RT1 - K1OT1                                             INCRO      97
                DKII  = K1IT1                                                     INCRO      98
                XKRI  = K2RT2P-K2OT2P                                             INCRO      99
                XKII  = K2IT2P                                                    INCRO     100
100         140 COUNT = 1.                                                        INCRO     101
                XO=AX2                                                            INCRO     102
                YO=AY2                                                            INCRO     103
                ZO=AZ2                                                            INCRO     104
                GO TO 80                                                          INCRO     105
105         150 DKRO  = K1RT1 - K1OT1                                             INCRO     106
                DKIO  = K1IT1                                                     INCRO     107
                XKRO  = K2RT2P-K2OT2P                                             INCRO     108
                XKIO  = K2IT2P                                                    INCRO     109
                JO = 1                                                            INCRO     110
110             IF (NDBLE.NE.O) JO = 2                                            INCRO     111
                IF (LHS.EQ.O) GO TO  170                                          INCRO     112
            160 USE3(IO,JO) = DKRI                                                INCRO     113
                USE4(IO,JO) = DKII                                                INCRO     114
                XUSE3(IO,JO)= XKRI                                                INCRO     115
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115                 XUSE4(IO,JO)= XKII                                          INCRO    116
                    GO TO 180                                                   INCRO    117
                170 USE1(IO,JO) = DKRO                                          INCRO    118
                    USE2(IO,JO) = DKIO                                          INCRO    119
                    XUSE1(IO,JO)= XKRO                                          INCRO    120
120                 XUSE2(IO,JO)= XKIO                                          INCRO    121
                180 CONTINUE                                                    INCRO    122
                    XO = AX                                                     INCRO    123
                    YO = AY                                                     INCRO    124
                    ZO = AZ                                                     INCRO    125
125                 ZERO = 0.0                                                  INCRO    126
                    XIIJR= 0.                                                   INCRO    127
                    XIIJI= 0.                                                   INCRO    128
                    DIIJR= 0.0                                                  INCRO    129
                    DIIJI= 0.0                                                  INCRO    130
130                 PI   = 3.1415926                                            INCRO    131
                    XMULT =((XDELX)/(8.0*PI))                                   INCRO    132
                    IF ((YO.EQ.ZERO).AND.(ZO.EQ.ZERO))  GO TO 220               INCRO    133
                    IF   ((ZO.EQ.ZERO).AND.(SFN.EQ.ZERO))  GO TO 230            INCRO    134
                190 ETAO1 = YO*CFN + ZO*SFN                                     INCRO    135
135                 ZETO1 =-YO*SFN + ZO*CFN                                     INCRO    136
                    AZETO = ABS(ZETO1)                                          INCRO    137
                    IF (AZETO.LE.0.0001)  ZETO1 = 0.                            INCRO    138
                200 R1SQX = ETAO1**2 + ZETO1**2                                 INCRO    139
                210 ARE = (DKRI -2.*DKRC + DKRO)/(2.0*E2)                       INCRO    140
140                 AIM = (DKII -2.*DKIC + DKIO)/(2.0*E2)                       INCRO    141
                    BRE = (DKRO - DKRI)/(2.0*EE)                                INCRO    142
                    BIM = (DKIO - DKII)/(2.0*EE)                                INCRO    143
                    CRE =  DKRC                                                 INCRO    144
                    CIM =  DKIC                                                 INCRO    145
145                 GO TO 250                                                   INCRO    146
                220 ETAO1 = 0.0                                                 INCRO    147
                    ZETO1 = 0.0                                                 INCRO    148
                    R1SQX = 0.0                                                 INCRO    149
                    GO TO  210                                                  INCRO    150
150             230 ETAO1  = YO*CFN                                             INCRO    151
                    ZETO1  = 0.                                                 INCRO    152
                240 R1SQX  = ETAO1**2                                           INCRO    153
                    GO TO  210                                                  INCRO    154
                250 CONTINUE                                                    INCRO    155
155                 IF (AT1S.EQ.0.0)  GO TO 255                                 INCRO    156
                    CALL       IDF1 (EE,E2,AT2,ETAO1,ZETO1,ARE,AIM,BRE,BIM,CRE,CIM,  INCRO  157
                   1                  R1SQX,XIIJR,XIIJI)                        INCRO    158
                    DELR =XMULT*XIIJR                                           INCRO    159
                    DELI =XMULT*XIIJI                                           INCRO    160
160             255 CONTINUE                                                    INCRO    161
                    IF (AT2S.EQ.0.0)  GO TO 260                                 INCRO    162
                    A2R  = (XKRI - 2.0*XKRC + XKRO)/(2.0*E2)                    INCRO    163
                    A2I  = (XKII - 2.0*XKIC + XKIO)/(2.0*E2)                    INCRO    164
                    B2R  = (XKRO - XKRI)/(2.0*EE)                               INCRO    165
165                 B2I  = (XKIO - XKII)/(2.0*EE)                               INCRO    166
                    C2R  =  XKRC                                                INCRO    167
                    C2I  =  XKIC                                                INCRO    168
                    CALL       IDF2(EE,E2,AT2,ETAO1,ZETO1,A2R,A2I,B2R,B2I,C2R,C2I,  INCRO  169
                   1                  R1SQX,DIIJR,DIIJI)                        INCRO    170
170                 DELR = DELR + XMULT*DIIJR                                   INCRO    171
                    DELI = DELI + XMULT*DIIJI                                   INCRO    172
```

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                C                                                       INCRO     173
                C                                                       INCRO     174
                C FORMATS                                               INCRO     175
    175         C                                                       INCRO     176
                  10 FORMAT (1HO,6E20.8)                                INCRO     177
                C                                                       INCRO     178
                  260 RETURN                                            INCRO     179
                      END                                               INCRO     180
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	INCRO	1	178

VARIABLES	SN	TYPE	RELOCATION								
575	AIM	REAL		REFS	156	DEFINED	140				
574	ARE	REAL		REFS	156	DEFINED	139				
542	AT1	REAL		REFS	2*43	2*66	2*79	DEFINED	41	64	77
532	AT1S	REAL		REFS	43	66	79	155	DEFINED	26	43
					66	79					
543	AT2	REAL		REFS	2*44	2*67	2*80	156	168		
				DEFINED	42	50	65	78			
533	AT2S	REAL		REFS	44	67	80	161	DEFINED	27	44
					67	80					
0	AX	REAL	F.P.	REFS	31	122	DEFINED	1			
0	AX1	REAL	F.P.	REFS	73	92	DEFINED	1			
0	AX2	REAL	F.P.	REFS	60	101	DEFINED	1			
0	AY	REAL	F.P.	REFS	32	123	DEFINED	1			
0	AY1	REAL	F.P.	REFS	74	93	DEFINED	1			
0	AY2	REAL	F.P.	REFS	61	102	DEFINED	1			
0	AZ	REAL	F.P.	REFS	33	124	DEFINED	1			
572	AZETO	REAL		REFS	137	DEFINED	136				
0	AZ1	REAL	F.P.	REFS	75	94	DEFINED	1			
0	AZ2	REAL	F.P.	REFS	62	103	DEFINED	1			
603	A2I	REAL		REFS	168	DEFINED	163				
602	A2R	REAL		REFS	168	DEFINED	162				
0	BETA	REAL	F.P.	REFS	12	DEFINED	1				
577	BIM	REAL		REFS	156	DEFINED	142				
523	BR	REAL		REFS	35	40	63	76	DEFINED	13	
576	BRE	REAL		REFS	156	DEFINED	141				
605	B2I	REAL		REFS	168	DEFINED	165				
604	B2R	REAL		REFS	168	DEFINED	164				
530	CFN	REAL		REFS	134	135	150	DEFINED	18		
601	CIM	REAL		REFS	156	DEFINED	144				
536	COUNT	REAL		REFS	45	DEFINED	30	91	100		
50	CR	REAL	COMA	REFS	6	13					
600	CRE	REAL		REFS	156	DEFINED	143				
607	C2I	REAL		REFS	168	DEFINED	167				
606	C2R	REAL		REFS	168	DEFINED	166				
0	DELI	REAL	F.P.	REFS	171	DEFINED	1	25	37	159	171
0	DELR	REAL	F.P.	REFS	170	DEFINED	1	24	36	158	170
0	DELY	REAL ARRAY	F.P.	REFS	7	16	DEFINED	1			
565	DIJ.IJ	REAL		REFS	168	171	DEFINED	129			

VARIABLES	SN	TYPE		RELOCATION							
564	DIIJR	REAL			REFS	168	170	DEFINED	128		
545	DKIC	REAL			REFS	140	144	DEFINED	47		
552	DKII	REAL			REFS	113	140	142	DEFINED	57	82	97
556	DKIO	REAL			REFS	118	140	142	DEFINED	69	86	106
544	DKRC	REAL			REFS	139	143	DEFINED	46			
551	DKRI	REAL			REFS	112	139	141	DEFINED	56	81	96
555	DKRO	REAL			REFS	117	139	141	DEFINED	68	85	105
531	EE	REAL			REFS	21	141	142	156	164	165	168
					DEFINED	20						
524	EPS	REAL			REFS	35	40	63	76	DEFINED	14	
570	ETA01	REAL			REFS	138	152	156	168	DEFINED	134	146
					150							
10	E2	REAL		DLM	REFS	5	139	140	156	162	163	168
					DEFINED	21						
0	FL	REAL	*UNUSED	F.P.	DEFINED	1						
0	GAMS	REAL		F.P.	REFS	35	40	63	76	DEFINED	1	
0	GAMSIG	REAL		F.P.	REFS	17	18	35	40	63	76	
					DEFINED	1						
0	IO	INTEGER		F.P.	REFS	56	57	58	59	85	86	87
					88	112	113	114	115	117	118	119
					120	DEFINED	1					
0	IR	INTEGER		F.P.	REFS	15	16	53	54	DEFINED	1	
550	JO	INTEGER			REFS	56	57	58	59	85	86	87
					88	112	113	114	115	117	118	119
					120	DEFINED	51	52	109	110		
522	KKI	REAL			REFS	10	37	DEFINED	23			
521	KKR	REAL			REFS	10	36	DEFINED	22			
0	KR	REAL		F.P.	REFS	10	35	40	63	76		
					DEFINED	1						
3	K1IT1	REAL		DLM	REFS	4	5	47	69	82	97	106
2	K1RT1	REAL		DLM	REFS	4	5	46	68	81	96	105
0	K1O	REAL		DLM	REFS	4	5					
6	K1OT1	REAL		DLM	REFS	4	5	46	68	81	96	105
5	K2IT2P	REAL		DLM	REFS	4	5	49	71	84	99	108
4	K2RT2P	REAL		DLM	REFS	4	5	48	70	83	98	107
1	K2O	REAL		DLM	REFS	4	5					
7	K2OT2P	REAL		DLM	REFS	4	5	48	70	83	98	107
0	LC	INTEGER	ARRAY	COMA	REFS	6						
0	LHS	INTEGER		F.P.	REFS	55	111	DEFINED	1			
520	M	REAL			REFS	10	35	40	63	76		
					DEFINED	12						
0	NBV	INTEGER	*UNUSED	F.P.	DEFINED	1						
0	NBXS	INTEGER		F.P.	REFS	54	DEFINED	1				
0	NCPNB	INTEGER		F.P.	REFS	53	DEFINED	1				
0	NDBLE	INTEGER		F.P.	REFS	52	110	DEFINED	1			
0	NFF	INTEGER		F.P.	REFS	34	DEFINED	1	11			
566	PI	REAL			REFS	131	DEFINED	130				
573	R1SQX	REAL			REFS	156	168	DEFINED	138	148	152	
0	SDELX	REAL	ARRAY	F.P.	REFS	7	15	DEFINED	1			
527	SFN	REAL			REFS	133	134	135	DEFINED	17		
534	T1	REAL			REFS	35	40	41	63	64	76	77
					DEFINED	28						
535	T2	REAL			REFS	35	40	42	50	63	65	76
					78	DEFINED	29					
1170	USE1	REAL	ARRAY		REFS	9	56	DEFINED	117			
1264	USE2	REAL	ARRAY		REFS	9	57	DEFINED	118			
1360	USE3	REAL	ARRAY		REFS	9	85	DEFINED	112			

VARIABLES	SN	TYPE	RELOCATION								
1454	USE4	REAL	ARRAY	REFS	9	86	DEFINED	113			
525	XDELX	REAL		REFS	131	DEFINED	15				
526	XDELY	REAL		REFS	20	DEFINED	16				
563	XIIJI	REAL		REFS	156	159	DEFINED	127			
562	XIIJR	REAL		REFS	156	158	DEFINED	126			
547	XKIC	REAL		REFS	163	167	DEFINED	49			
554	XKII	REAL		REFS	115	163	165	DEFINED	59	84	99
560	XKIO	REAL		REFS	120	163	165	DEFINED	71	88	108
546	XKRC	REAL		REFS	162	166	DEFINED	48			
553	XKRI	REAL		REFS	114	162	164	DEFINED	58	83	98
557	XKRO	REAL		REFS	119	162	164	DEFINED	70	87	107
567	XMULT	REAL		REFS	158	159	170	171	DEFINED	131	
610	XUSE1	REAL	ARRAY	REFS	8	58	DEFINED	119			
704	XUSE2	REAL	ARRAY	REFS	8	59	DEFINED	120			
1000	XUSE3	REAL	ARRAY	REFS	8	87	DEFINED	114			
1074	XUSE4	REAL	ARRAY	REFS	8	88	DEFINED	115			
537	XO	REAL		REFS	35	40	63	76	DEFINED	31	60
				73	92	101	122				
540	YO	REAL		REFS	35	40	63	76	132	134	135
				150	DEFINED	32	61	74	93	102	123
561	ZERO	REAL		REFS	2*132	2*133	DEFINED	125			
571	ZETO1	REAL		REFS	136	138	156	168	DEFINED	135	137
				147	151						
541	ZO	REAL		REFS	35	40	63	76	132	133	134
				135	DEFINED	33	62	75	94	103	124

EXTERNALS	TYPE	ARGS		REFERENCES							
COS	REAL	1	LIBRARY	18							
IDF1		14		156							
IDF2		14		168							
KERNEL		11		35	40	63	76				
SIN	REAL	1	LIBRARY	17							
SQRT	REAL	1	LIBRARY	12							

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES						
ABS	REAL	1	INTRIN		41	42	50	64	65	77	78	136

STATEMENT LABELS			DEF LINE	REFERENCES		
504	10	FMT NO REFS	176			
56	80		39	34	95	104
0	90	INACTIVE	46	45		
167	100		73	55		
233	110		90	53	54	
0	120	INACTIVE	92			
242	130		96	45		
0	140	INACTIVE	100			
261	150		105	45		
276	160		112	89		
307	170		117	72	111	
317	180		121	116		
0	190	INACTIVE	134			
0	200	INACTIVE	138			
350	210		139	149	153	
366	220		146	132		
371	230		150	133		
0	240	INACTIVE	152			
375	250		154	145		

```
STATEMENT LABELS                DEF LINE    REFERENCES
  404  255                        160         155
  431  260                        178          38        161

COMMON BLOCKS    LENGTH      MEMBERS - BIAS NAME(LENGTH)
       DLM            9                 0 K10     (1)          1 K20     (1)          2 K1RT1   (1)
                                        3 K1IT1   (1)          4 K2RT2P  (1)          5 K2IT2P  (1)
                                        6 K1OT1   (1)          7 K2OT2P  (1)          8 E2      (1)
       COMA          41                 0 LC      (40)        40 CR      (1)

STATISTICS
  PROGRAM LENGTH                  1550B      872
  CM LABELED COMMON LENGTH         62B       50
          52000B CM USED
```

```
      SUBROUTINE KERNEL(XO,YO,ZO,KR,BR,GAMS,GAMSIG,M,EPS,T1,T2)          KERNEL     2
      REAL    M, KR, KKR, KKI, I00R, I00I, J00R, J00I, I10R, I10I, I20R3, KERNEL     3
     1        I20I3, I0UR, I0UI, J0UR, J0UI, I1UR, I1UI, I2UR3, I2UI3,   KERNEL     4
     2        K1, MU1, MU, K2                                            KERNEL     5
      REAL    K10,K20,K1RT1,K1IT1,K2RT2P,K2IT2P,K1OT1,K2OT2P              KERNEL     6
      COMMON  /DLM/  K10,K20,K1RT1,K1IT1,K2RT2P,K2IT2P,K1OT1,K2OT2P,E2    KERNEL     7
      PI    = 3 1415926                                                  KERNEL     8
      K10   = 0.0                                                        KERNEL     9
      K20   = 0 0                                                        KERNEL    10
      K1RT1  = 0.0                                                       KERNEL    11
      K1IT1  = 0.0                                                       KERNEL    12
      K2RT2P = 0.0                                                       KERNEL    13
      K2IT2P = 0.0                                                       KERNEL    14
      K1OT1  = 0.0                                                       KERNEL    15
      K2OT2P = 0.0                                                       KERNEL    16
      R1= SQRT (YO*YO+ZO*ZO)                                             KERNEL    17
      R1S = R1                                                           KERNEL    18
      IF  ( R1 )              200,100,200                                KERNEL    19
  100 IF  ( XO )              110,120,120                                KERNEL    20
  110 KKR=0.                                                             KERNEL    21
      KKI=0.                                                             KERNEL    22
      GO TO  905                                                         KERNEL    23
  120 C1= KR*XO/BR                                                       KERNEL    24
      T1= COS(GAMS-GAMSIG)                                               KERNEL    25
      KKR= 2.*(COS(C1)-1.)*T1                                            KERNEL    26
      KKI=-2.*SIN(C1)*T1                                                 KERNEL    27
      K10   = 2.0                                                        KERNEL    28
      K1RT1  = 2.0*T1*COS(C1)                                            KERNEL    29
      K1IT1  =-2.0*T1*SIN(C1)                                            KERNEL    30
      K1OT1  = 2.0*T1                                                    KERNEL    31
      GO TO  905                                                         KERNEL    32
  200 C1=COS(GAMS)                                                       KERNEL    33
      C2=SIN(GAMS)                                                       KERNEL    34
      C3=COS(GAMSIG)                                                     KERNEL    35
      C4=SIN(GAMSIG)                                                     KERNEL    36
      T2P=(ZO*ZO*C1*C3+YO*YO*C2*C4-ZO*YO*(C2*C3+C1*C4))                  KERNEL    37
      T2 = T2P/E2                                                        KERNEL    38
      IF  ( ABS(T2)-EPS )           210,220,220                          KERNEL    39
  210 ICHUZ=1                                                            KERNEL    40
      T1= COS(GAMS-GAMSIG)                                               KERNEL    41
      T2=0.                                                              KERNEL    42
      GO TO 300                                                          KERNEL    43
  220 T1= COS(GAMS-GAMSIG)                                               KERNEL    44
      IF  ( ABS(T1)-EPS )           230,240,240                          KERNEL    45
  230 ICHUZ=2                                                            KERNEL    46
      T1=0.                                                              KERNEL    47
      GO TO 300                                                          KERNEL    48
  240 ICHUZ=3                                                            KERNEL    49
  300 BETA2 = (1.-M*M)                                                   KERNEL    50
      BIGR = SQRT (XO*XO+BETA2*R1*R1)                                    KERNEL    51
      K1= KR*R1/BR                                                       KERNEL    52
      MU1= (M*BIGR-XO)/ (BETA2*R1)                                       KERNEL    53
      MU=ABS(MU1)                                                        KERNEL    54
      K2=K1*K1                                                           KERNEL    55
      IF  ( MU1 )             310,320,330                                KERNEL    56
  310 ICHUZ=ICHUZ+3                                                      KERNEL    57
      GO TO 330                                                          KERNEL    58
```

```
      320 ICHUZ=ICHUZ+6                                                  KERNEL     59
        C   (N*C)**2  FOR  N=1,11  AND C=.372 =                        KERNEL     60
60      C                                                              KERNEL     61
        C      .138384         .553536        1.245456        2.214144 KERNEL     62
        C     3.4596          4.981824        6.780816        8.856576 KERNEL     63
        C    11.209104       13.8384         16.744464                 KERNEL     64
        C                                                              KERNEL     65
65      C   (N*C)  FOR  N=1,12  AND  14,16,18,20,22   =                KERNEL     66
        C                                                              KERNEL     67
        C       .744          1.116           1.488          1.86     2.232  KERNEL 68
        C      2.604          2.976           3.348          3.72     4.092  KERNEL 69
        C      4.464          5.208           5.952          6.696    7.44   KERNEL 70
70      C      8.184                                                   KERNEL     71
        C                                                              KERNEL     72
        C   A(N)  FORN(=1,11  =                                        KERNEL     73
        C                                                              KERNEL     74
        C      .24186198       -2.7918027       24.991079       -111.59196  KERNEL 75
75      C  271.43549          -305.75288       -41.18363        545.98537  KERNEL 76
        C -644.78155           328.72755       -64.279511                  KERNEL 77
      330 E= EXP (-.372*MU)                                            KERNEL     78
                                                                       KERNEL     79
          C1 = .138384+K2                                              KERNEL     80
80        C2 = .553536+K2                                              KERNEL     81
          C3 = 1.245456+K2                                             KERNEL     82
          C4  = 2.214144 +K2                                           KERNEL     83
          C5  = 3.4596   +K2                                           KERNEL     84
          C6  = 4.981824 +K2                                           KERNEL     85
85        C7  = 6.780816 +K2                                           KERNEL     86
          C8  = 8.856576 +K2                                           KERNEL     87
          C9  = 11.209104+K2                                           KERNEL     88
          C10 = 13.8384  +K2                                           KERNEL     89
          C11 = 16.744464+K2                                           KERNEL     90
90                                                                     KERNEL     91
          R1  = .24186198 / C1                                         KERNEL     92
          R2  =-2.7918027 / C2                                         KERNEL     93
          R3  = 24.991079 / C3                                         KERNEL     94
          R4  =-111.59196 / C4                                         KERNEL     95
95        R5  = 271.43549 / C5                                         KERNEL     96
          R6  =-305.75288 / C6                                         KERNEL     97
          R7  =-41.18363  / C7                                         KERNEL     98
          R8  = 545.98537 / C8                                         KERNEL     99
          R9  =-644.78155 / C9                                         KERNEL     100
100       R10 = 328.72755 / C10                                        KERNEL     101
          R11 =-64.279511 / C11                                        KERNEL     102
                                                                       KERNEL     103
          IF  ( ICHUZ .LT. 4 )                        GO TO 340        KERNEL     104
          IOOR = .372*(R1 +2.*R2 + 3.*R3 + 4.*R4 + 5.*R5 + 6.*R6 + 7.*R7 +  KERNEL 105
105      1       8.*R8 + 9.*R9 + 10.*R10 + 11.*R11)                    KERNEL     106
          IOOI = -K1*(R1+R2+R3+R4+R5+R6+R7+R8+R9+R10+R11)               KERNEL     107
                                                                       KERNEL     108
      340 GO TO  (420,350,350,390,350,350,380,350,350),ICHUZ           KERNEL     109
                                                                       KERNEL     110
110   350 Q1  = R1/ C1                                                 KERNEL     111
          Q2  = R2/ C2                                                 KERNEL     112
          Q3  = R3/ C3                                                 KERNEL     113
          Q4  = R4/ C4                                                 KERNEL     114
          Q5  = R5/ C5                                                 KERNEL     115
```

```
115               Q6  = R6/ C6                                                  KERNEL    116
                  Q7  = R7/ C7                                                  KERNEL    117
                  Q8  = R8/ C8                                                  KERNEL    118
                  Q9  = R9/ C9                                                  KERNEL    119
                  Q10 = R10/C10                                                 KERNEL    120
120               Q11 = R11/C11                                                 KERNEL    121
                                                                                KERNEL    122
                  GO TO  (420,410,410,390,360,360,380,360,360),ICHUZ            KERNEL    123
                                                                                KERNEL    124
              360 JOOR =  Q1*(.138384-K2)+Q2*(.553536-K2)+Q3*(1.245456-K2)+Q4*  KERNEL    125
125              1       (2.214144-K2)+Q5*(3.4596-K2)+Q6*(4.981824-K2)+Q7*(6.780816 KERNEL    126
                 2       -K2)+Q8*(8.856576-K2)+Q9*(11.209104-K2)+Q10*(13.8384-K2)+ KERNEL    127
                 3       Q11*(16.744464-K2)                                     KERNEL    128
                  I2OR3= 2.+K1*IOOI+K2*JOOR                                     KERNEL    129
                                                                                KERNEL    130
130               GO TO  (420,410,410,390,410,390,380,370,370),ICHUZ            KERNEL    131
                                                                                KERNEL    132
              370 JOOI = -K1*(.744*Q1+1.488*Q2+2.232*Q3+2.976*Q4+3.72*Q5+4.464*Q6+ KERNEL    133
                 1            5.208*Q7+5.952*Q8+6.696*Q9+7.44*Q10+8.184*Q11)    KERNEL    134
                  I2OI3= -K1*IOOR+K2*JOOI                                       KERNEL    135
135                                                                             KERNEL    136
                  IF  ( ICHUZ .EQ. 8 )              GO TO 500                   KERNEL    137
              380 I10I = -K1*IOOR                                               KERNEL    138
              390 I10R = 1.+K1*IOOI                                             KERNEL    139
                                                                                KERNEL    140
140           400 GO TO (420,410,410,420,410,410,500,500,500),ICHUZ             KERNEL    141
                                                                                KERNEL    142
              410 JOUR = E*(Q1*(.138384-K2+.372*MU*C1)+                         KERNEL    143
                 1       E*(Q2*(.553536-K2+.744*MU*C2)+                         KERNEL    144
                 2       E*(Q3*(1.245456-K2+1.116*MU*C3)+                       KERNEL    145
145              3       E*(Q4*(2.214144-K2+1.488*MU*C4)+                       KERNEL    146
                 4       E*(Q5*(3.4596-K2+1.86*MU*C5)+                          KERNEL    147
                 5       E*(Q6*(4.981824-K2+2.232*MU*C6)+                       KERNEL    148
                 6       E*(Q7*(6.780816-K2+2.604*MU*C7)+                       KERNEL    149
                 7       E*(Q8*(8.856576-K2+2.976*MU*C8)+                       KERNEL    150
150              8       E*(Q9*(11.209104-K2+3.348*MU*C9)+                      KERNEL    151
                 9       E*(Q10*(13.8384-K2+3.72*MU*C10)+                       KERNEL    152
                 A       E*(Q11*(16.744464-K2+4.092*MU*C11))))))))))))         KERNEL    153
                                                                                KERNEL    154
                   JOUI = -K1*(E*(Q1*(.744+MU*C1) + E*(Q2*(1.488+MU*C2) +       KERNEL    155
155              1             E*(Q3*(2.232+MU*C3)+ E*(Q4*(2.976+MU*C4) +       KERNEL    156
                 2             E*(Q5*(3.72+MU*C5) + E*(Q6*(4.464+MU*C6) +       KERNEL    157
                 3             E*(Q7*(5.208+MU*C7) + E*(Q8*(5.952+MU*C8) +      KERNEL    158
                 4             E*(Q9*(6.696+MU*C9) + E*(Q10*(7.44+MU*C10) +     KERNEL    159
                 5             E*(Q11*(8.184+MU*C11))))))))))))))               KERNEL    160
160                                                                             KERNEL    161
              420 IOUR = .372*E*(R1+E*(2.*R2+E*(3.*R3+E*(4.*R4+E*(5.*R5+E*(6.*R6+ KERNEL    162
                 1          E*(7.*R7+E*(8.*R8+E*(9.*R9+E*(10.*R10+E*11.*R11)))))) KERNEL    163
                 2               ))))                                           KERNEL    164
                                                                                KERNEL    165
165               IOUI = -K1*(E*(R1+E*(R2+E*(R3+E*(R4+E*(R5+E*(R6+E*(R7+E*(R8+E*(R9 KERNEL    166
                 1          +E*(R10+E*R11))))))))))                             KERNEL    167
                  R1  = R1S                                                     KERNEL    168
                  C6= K1*MU                                                     KERNEL    169
                  C1= SIN(C6)                                                   KERNEL    170
170               C2= COS(C6)                                                   KERNEL    171
                  C3= SQRT(1.+MU*MU)                                            KERNEL    172
```

```
                C4= MU/C3                                                          KERNEL   173
                C5= C4/(1.+MU*MU)                                                  KERNEL   174
                GO TO  (430,440,430,430,440,430,500,500,500),ICHUZ                 KERNEL   175
175          430 I1UR = C2*(1.-C4+K1*IOUI)-C1*K1*IOUR                              KERNEL   176
                I1UI =-C2*K1*IOUR-C1*(1.-C4+K1*IOUI)                               KERNEL   177
                GO TO  (500,440,440,460,440,440,500,500,500),ICHUZ                 KERNEL   178
             440 I2UR3 = C2*(2.*(1.-C4)-C5+K1*IOUI+K2*JOUR)+C1*(C6*(1.-C4)-K1*IOUR KERNEL   179
               1          +K2*JOUI)                                               KERNEL   180
180             I2UI3 = C2*(C6*(1.-C4)-K1*IOUR+K2*JOUI)-C1*(2.*(1.-C4)-C5+K1*IOUI KERNEL   181
               1          +K2*JOUR)                                               KERNEL   182
                GO TO  (500,500,500,460,450,450,500,500,500),ICHUZ                 KERNEL   183
             450 I2UR3 = 2.0 * I20R3 - I2UR3                                       KERNEL   184
                IF  ( ICHUZ-6 )                    500,460,500                     KERNEL   185
185          460 CAR = 2.*I10R-I1UR                                                KERNEL   186
                I1UR= CAR                                                          KERNEL   187
             500 DK1R=0.                                                           KERNEL   188
                R1 = R1S                                                           KERNEL   189
                DK1I=0.                                                            KERNEL   190
190             DK2R=0.                                                            KERNEL   191
                DK2I=0.                                                            KERNEL   192
                C3=K1*MU1                                                          KERNEL   193
                C1=COS(C3)                                                         KERNEL   194
                C2=SIN(C3)                                                         KERNEL   195
195             C3= M*R1/BIGR                                                      KERNEL   196
                C4=SQRT(1.+MU1*MU1)                                                KERNEL   197
                C5=KR*XO/BR                                                        KERNEL   198
                C6=COS(C5)                                                         KERNEL   199
                C7=SIN(C5)                                                         KERNEL   200
200             GO TO (530,540,530,530,540,530,510,520,510),ICHUZ                  KERNEL   201
             510 I1UR=I10R                                                         KERNEL   202
                I1UI=I10I                                                          KERNEL   203
                IF  ( ICHUZ-7 )                    520,530,520                     KERNEL   204
             520 I2UR3= I20R3                                                      KERNEL   205
205             I2UI3= I20I3                                                       KERNEL   206
                IF  ( ICHUZ-8 )                    530,540,530                     KERNEL   207
             530 CK1R = I1UR + C3*C1/C4                                            KERNEL   208
                CK1I = I1UI - C3*C2/C4                                             KERNEL   209
                K10  = 1.0 + XO/BIGR                                               KERNEL   210
210             DK1R = CK1R*C6 + CK1I*C7                                           KERNEL   211
                DK1I = CK1I*C6 - CK1R*C7                                           KERNEL   212
                GO TO  (900,540,540,900,540,540,900,540,540),ICHUZ                 KERNEL   213
             540 C8=  (BETA2*(R1/BIGR)**2 + (2.+MU1*C3)/(C4*C4))*(-C3/C4)          KERNEL   214
                C9= ( K1*C3)*( C3/C4)                                              KERNEL   215
215             CK2R = -I2UR3 + C8*C1 - C9*C2                                      KERNEL   216
                CK2I = -I2UI3 - C9*C1 - C8*C2                                      KERNEL   217
                K20  = -2.0 -XO*(2.0+BETA2*(R1/BIGR)**2)/BIGR                      KERNEL   218
                DK2R = CK2R*C6 + CK2I*C7                                           KERNEL   219
                DK2I = CK2I*C6 - CK2R*C7                                           KERNEL   220
220          900 KKR = T1*DK1R + T2*DK2R                                           KERNEL   221
                KKI = T1*DK1I + T2*DK2I                                            KERNEL   222
                K1RT1  = T1 * DK1R                                                 KERNEL   223
                K1IT1  = T1 * DK1I                                                 KERNEL   224
                K2RT2P = T2P* DK2R                                                 KERNEL   225
225             K2IT2P = T2P* DK2I                                                 KERNEL   226
                K1OT1  = K1O* T1                                                   KERNEL   227
                K2OT2P = K2O* T2P                                                  KERNEL   228
             905 CONTINUE                                                          KERNEL   229
```

```
                C                                                       KERNEL    230
    230         C                                                       KERNEL    231
                      RETURN                                            KERNEL    232
                      END                                               KERNEL    233
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES
3 KERNEL 1 231

VARIABLES		SN	TYPE	RELOCATION								
1370	BETA2		REAL		REFS	50	52	213	217	DEFINED	49	
1371	BIGR		REAL		REFS	52	195	209	213	2*217		
					DEFINED	50						
0	BR		REAL	F.P.	REFS	23	51	197	DEFINED	1		
1427	CAR		REAL		REFS	186	DEFINED	185				
1435	CK1I		REAL		REFS	210	211	DEFINED	208			
1434	CK1R		REAL		REFS	210	211	DEFINED	207			
1437	CK2I		REAL		REFS	218	219	DEFINED	216			
1436	CK2R		REAL		REFS	218	219	DEFINED	215			
1362	C1		REAL		REFS	25	26	28	29	2*36	91	110
					142	154	175	176	178	180	207	215
					216	DEFINED	23	32	79	169	193	
1400	C10		REAL		REFS	100	119	142	154	DEFINED	88	
1401	C11		REAL		REFS	101	120	142	154	DEFINED	89	
1363	C2		REAL		REFS	2*36	92	111	142	154	175	176
					178	180	208	215	216	DEFINED	33	80
					170	194						
1364	C3		REAL		REFS	2*36	93	112	142	154	172	193
					194	207	208	2*213	2*214	DEFINED	34	81
					171	192	195					
1365	C4		REAL		REFS	2*36	94	113	142	154	173	175
					176	2*178	2*180	207	208	3*213	214	
					DEFINED	35	82	172	196			
1373	C5		REAL		REFS	95	114	142	154	178	180	198
					199	DEFINED	83	173	197			
1374	C6		REAL		REFS	96	115	142	154	169	170	178
					180	210	211	218	219	DEFINED	84	168
					198							
1375	C7		REAL		REFS	97	116	142	154	210	211	218
					219	DEFINED	85	199				
1376	C8		REAL		REFS	98	117	142	154	215	216	
					DEFINED	86	213					
1377	C9		REAL		REFS	99	118	142	154	215	216	
					DEFINED	87	214					
1431	DK1I		REAL		REFS	221	223	DEFINED	189	211		
1430	DK1R		REAL		REFS	220	222	DEFINED	187	210		
1433	DK2I		REAL		REFS	221	225	DEFINED	191	219		
1432	DK2R		REAL		REFS	220	224	DEFINED	190	218		
1372	E		REAL		REFS	11*142	11*154	11*161	11*165	DEFINED	77	
0	EPS		REAL	F.P.	REFS	38	44	DEFINED	1			
10	E2		REAL	DLM	REFS	6	37					
0	GAMS		REAL	F.P.	REFS	24	32	33	40	43		

VARIABLES	SN	TYPE	RELOCATION							
				DEFINED	1						
0	GAMSIG	REAL	F P.	REFS	24	34	35	40	43		
				DEFINED	1						
1367	ICHUZ	INTEGER		REFS	56	58	103	108	122	130	136
					140	174	177	182	184	200	203	206
					212	DEFINED	39	45	48	56	58	
1344	IOUI	REAL		REFS	2	175	176	178	180			
				DEFINED	165							
1343	IOUR	REAL		REFS	2	175	176	178	180			
				DEFINED	161							
1334	IOOI	REAL		REFS	2	128	138	DEFINED	106			
1333	IOOR	REAL		REFS	2	134	137	DEFINED	104			
1350	I1UI	REAL		REFS	2	208	DEFINED	176	202			
1347	I1UR	REAL		REFS	2	185	207	DEFINED	175	186	201	
1340	I1OI	REAL		REFS	2	202	DEFINED	137				
1337	I1OR	REAL		REFS	2	185	201	DEFINED	138			
1352	I2UI3	REAL		REFS	2	216	DEFINED	180	205			
1351	I2UR3	REAL		REFS	2	183	215	DEFINED	178	183	204	
1342	I2OI3	REAL		REFS	2	205	DEFINED	134				
1341	I2OR3	REAL		REFS	2	183	204	DEFINED	128			
1346	JOUI	REAL		REFS	2	178	180	DEFINED	154			
1345	JOUR	REAL		REFS	2	178	180	DEFINED	142			
1336	JOOI	REAL		REFS	2	134	DEFINED	132				
1335	JOOR	REAL		REFS	2	128	DEFINED	124				
1332	KKI	REAL		REFS	2	DEFINED	21	26	221			
1331	KKR	REAL		REFS	2	DEFINED	20	25	220			
0	KR	REAL	F.P.	REFS	2	23	51	197	DEFINED	1		
1353	K1	REAL		REFS	2	2*54	106	128	132	134	137	
					138	154	165	168	2*175	2*176	2*178	2*180
					192	214	DEFINED	51				
3	K1IT1	REAL	DLM	REFS	5	6	DEFINED	11	29	223		
2	K1RT1	REAL	DLM	REFS	5	6	DEFINED	10	28	222		
0	K1O	REAL	DLM	REFS	5	6	226	DEFINED	8	27	209	
6	K1OT1	REAL	DLM	REFS	5	6	DEFINED	14	30	226		
1356	K2	REAL		REFS	2	79	80	81	82	83	84	
					85	86	87	88	89	11*124	128	134
					11*142	2*178	2*180	DEFINED	54			
5	K2IT2P	REAL	DLM	REFS	5	6	DEFINED	13	225			
4	K2RT2P	REAL	DLM	REFS	5	6	DEFINED	12	224			
1	K2O	REAL	DLM	REFS	5	6	227	DEFINED	9	217		
7	K2OT2P	REAL	DLM	REFS	5	6	DEFINED	15	227			
0	M	REAL	F.P.	REFS	2	2*49	52	195	DEFINED	1		
1355	MU	REAL		REFS	2	77	11*142	11*154	168	2*171	172	
					2*173	DEFINED	53					
1354	MU1	REAL		REFS	2	53	55	192	2*196	213		
				DEFINED	52							
1357	PI	* REAL		DEFINED	7							
1414	Q1	REAL		REFS	124	132	142	154	DEFINED	110		
1425	Q10	REAL		REFS	124	132	142	154	DEFINED	119		
1426	Q11	REAL		REFS	124	132	142	154	DEFINED	120		
1415	Q2	REAL		REFS	124	132	142	154	DEFINED	111		
1416	Q3	REAL		REFS	124	132	142	154	DEFINED	112		
1417	Q4	REAL		REFS	124	132	142	154	DEFINED	113		
1420	Q5	REAL		REFS	124	132	142	154	DEFINED	114		
1421	Q6	REAL		REFS	124	132	142	154	DEFINED	115		
1422	Q7	REAL		REFS	124	132	142	154	DEFINED	116		
1423	Q8	REAL		REFS	124	132	142	154	DEFINED	117		

```
                  MT = MM                                                    QUAS       59
                  REWIND MT                                                  QUAS       60
60                NIN = NI                                                   QUAS       61
                  REWIND NIN                                                 QUAS       62
                  NOUT = NO                                                  QUAS       63
                  REWIND NOUT                                                QUAS       64
                  MP1 = M + 1                                                QUAS       65
65                NN = N                                                     QUAS       66
                  NEL = NPM                                                  QUAS       67
            C                                                                QUAS       68
            C STORE AIC'S ON TEMPORARY UNIT                                  QUAS       69
            C                                                                QUAS       70
70                LTAPES = LTAPE                                             QUAS       71
                  LTAPE = IUMEMF                                             QUAS       72
                  CALL PUDLAB (8HQUAS  O1,LTAPE,NAMES,1,IRDU,JCDU)           QUAS       73
            C                                                                QUAS       74
            C - - CALCULATE THE MAXIMUM NO. OF ROWS, 'K'                     QUAS       75
75          C                                                                QUAS       76
               10 K = (KORE - NEL) / NEL                                     QUAS       77
            C                                                                QUAS       78
            C - - TEST TO SEE IF THE REST OF THE MATRIX WILL FIT IN CORE     QUAS       79
            C                                                                QUAS       80
80                LAST = K .GE. NN                                           QUAS       81
                  IF( .NOT. LAST ) GO TO 30                                  QUAS       82
                  K = NN                                                     QUAS       83
                  B = 3 + MMAX*2                                             QUAS       84
                  C = 2 * (1 + MMAX - KORE )                                 QUAS       85
85                KTEMP = ( -B + SQRT(B**2  - 4.0* C )  ) / 2.0              QUAS       86
                  IF(KTEMP .GE. K)GO TO 30                                   QUAS       87
            C                                                                QUAS       88
            C***    *  WE MUST REDUCE THE FINAL K                            QUAS       89
            C                                                                QUAS       90
90                K = KTEMP                                                  QUAS       91
                  LAST = .FALSE.                                             QUAS       92
            C                                                                QUAS       93
            C - - READ 'K' ROWS OF THE AUGMENTED 'A' MATRIX                  QUAS       94
            C                                                                QUAS       95
95             30 NT = 0                                                     QUAS       96
                  DO 40 IB = 1, K                                            QUAS       97
                  NS = NT + 1                                                QUAS       98
                  NT = NT + NEL                                              QUAS       99
                  READ (NIN)  (A(IO), IO=NS,NT)                              QUAS      100
100               40 CONTINUE                                                QUAS      101
                  NELP1 = NEL + 1                                            QUAS      102
            C                                                                QUAS      103
            C - - CHECK TO SEE IF WE WERE UNLUCKY ENOUGH TO END UP WITH ONLY ONE ROW QUAS 104
            C                                                                QUAS      105
105               IF (K .EQ. 1) GO TO 56                                     QUAS      106
            C                                                                QUAS      107
            C - - 'K' IS GREATER THAN '1' SO WE CAN START THE TRIANGULARIZATION QUAS    108
            C                                                                QUAS      109
                  NS = - NEL                                                 QUAS      110
110               NELP2 = NELP1 + 1                                          QUAS      111
            C                                                                QUAS      112
            C - - FORM THE 'TRAPEZOIDAL' ARRAY  (8)                          QUAS      113
            C                                                                QUAS      114
                  DO 50 IB = 2, K                                            QUAS      115
```

```
      SUBROUTINE QUAS(ND,MD,KD,NI,MM,NO,NAT,NW,LTAPE,RHSTAP,NPR1,NFILE)
C     ***   COMPLEX   SOLVIT     QUASI INVERSE
C
C           ****    ***/  *******  *****  *       ***/          *
C           *   *  *  /*     *     *      *      *  /*       ******
C     ****  ****   * / *     *     ***    *      * / *  ****    *  *
C           *      */  *     *     *      *      */  *          ***
C           *      /***      *     *      *****  /***           *  *
C
C             D I R E C T   M A T R I X   S O L U T I O N
C
C*** ***LTAPE IS THE TAPE THE L(I,J) MATRIX WILL BE PUT ON
C*** ***RHSTAP IS THE TAPE THAT THE RIGHT HAND SIDES ARE INPUT ON
      COMPLEX A(2000), SUM
C
      INTEGER RHSTAP
C
      DIMENSION ITAPES(50),IFILES(50)
      DIMENSION DUMMY(4000)
      DIMENSION NAMES(2), NAME(2)
      DIMENSION IOS(98)
C
      COMMON / CTAPES / ITAPES
      COMMON /CFILES/ KFILES,IFILES
      COMMON /PLACES/ IOS
C
      LOGICAL JPASS1
      LOGICAL  LASTRS
      LOGICAL  LAST
C
      DATA NAMES /4HTEMP,4HAICS/
C
      IRDU = 99999
      JCDU = 99999
      IUMEMF = IOS(49)
    1 CONTINUE
      NATAPE = NAT
      REWIND NATAPE
      REWIND NW
C
      ITAPEW = ITAPES(6)
C
C
      N = ND
      KORE = KD
C*** *  RHSTAP = 0 IF THERE ARE NO RHS TO BE PROCESSED THIS RUN
      IF(RHSTAP .NE. 0 )GO TO 5
      MRHS = 0
      GO TO 6
    5 REWIND RHSTAP
      READ(RHSTAP)MRHS
    6 M = KORE / N  -  1
      MMAX = MINO(MRHS,M)
      NPM = N + MMAX
      IF (MAXO(3 * NPM, M * N) .GT. KORE) RETURN
      M = 0
      NPM = N
```

```
VARIABLES      SN  TYPE          RELOCATION
  227  VY         REAL                          REFS      49    DEFINED      47
  230  VZ         REAL                          REFS      49    DEFINED      48
  231  WW         REAL                          REFS      50    DEFINED      49
    0  XO         REAL                F.P.      REFS       8    DEFINED       1
  170  XOB        REAL                          REFS       9         13    DEFINED       8
    0  YO         REAL                F.P.      REFS      10         14    DEFINED       1
    0  ZO         REAL                F.P.      REFS      11         15    DEFINED       1

EXTERNALS          TYPE    ARGS       REFERENCES
       SQRT        REAL       1 LIBRARY      12         16

INLINE FUNCTIONS   TYPE    ARGS        DEF LINE  REFERENCES
       ABS         REAL       1  INTRIN                28         29         37

STATEMENT LABELS                 DEF LINE   REFERENCES
  110  30                           34         30         31
    0  40           INACTIVE        35         34
  114  50                           37        2*34
  121  60                           38         33         36
    0  70           INACTIVE        51

STATISTICS
  PROGRAM LENGTH                    232B      154
          52000B CM USED
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	SNPDF	1	54

VARIABLES	SN	TYPE	RELOCATION								
214	ACAB	REAL		REFS	30	DEFINED	28				
215	ACBB	REAL		REFS	31	DEFINED	29				
0	BETA	REAL	F.P.	REFS	8	DEFINED	1				
201	CAB	REAL		REFS	21	28	32	34	DEFINED	17	
216	CACB	REAL		REFS	39	40	DEFINED	32	35	37	
204	CAO	REAL		REFS	44	DEFINED	20				
224	CAOONE	REAL		REFS	45	46	DEFINED	44			
162	CAVE	REAL		REFS	50	DEFINED	2				
202	CBB	REAL		REFS	29	32	34	DEFINED	18		
203	CBI	REAL		REFS	41	DEFINED	19				
0	CGR	REAL	F.P.	REFS	49	DEFINED	1				
0	CGS	REAL	F.P.	REFS	4	6	DEFINED	1			
0	CL	REAL	F.P.	REFS	3	4	DEFINED	1			
164	CLCGS	REAL		REFS	17	18	23	40	DEFINED	4	
163	CLSGS	REAL		REFS	17	18	24	39	DEFINED	3	
0	CV	REAL	F.P.	REFS	2	DEFINED	1				
206	DBX	REAL		REFS	25	39	40	DEFINED	22		
207	DBY	REAL		REFS	25	40	DEFINED	23			
210	DBZ	REAL		REFS	25	39	DEFINED	24			
211	DB2	REAL		REFS	32	DEFINED	25				
0	DIJ	REAL	F.P.	DEFINED	1	50					
212	DI2	REAL		REFS	41	DEFINED	26				
213	DO2	REAL		REFS	44	DEFINED	27				
0	EE	REAL	F.P.	REFS	5	6	7	DEFINED	1		
165	EX	REAL		REFS	9	13	DEFINED	5			
166	EY	REAL		REFS	10	14	DEFINED	6			
167	EZ	REAL		REFS	11	15	DEFINED	7			
21	ONECBI	REAL		REFS	42	43	DEFINED	41			
205	RICAB	REAL		REFS	22	23	24	DEFINED	21		
174	RIMAG	REAL		REFS	17	19	21	37	DEFINED	12	
171	RIX	REAL		REFS	12	17	19	22	DEFINED	9	
172	RIY	REAL		REFS	12	17	23	26	43		
				DEFINED	10						
173	RIZ	REAL		REFS	12	17	24	26	42		
				DEFINED	11						
200	ROMAG	REAL		REFS	18	20	37	DEFINED	16		
175	ROX	REAL		REFS	16	18	20	DEFINED	13		
176	ROY	REAL		REFS	16	18	27	46	DEFINED	14	
177	ROZ	REAL		REFS	16	18	27	45	DEFINED	15	
0	SGR	REAL	F.P.	REFS	49	DEFINED	1				
0	SGS	REAL	F.P.	REFS	3	7	DEFINED	1			
0	SL	REAL	F.P.	REFS	17	18	22	39	40		
				DEFINED	1						
0	TL	REAL	F.P.	REFS	5	DEFINED	1				
217	VBY	REAL		REFS	47	DEFINED	39				
220	VBZ	REAL		REFS	48	DEFINED	40				
222	VIY	REAL		REFS	47	DEFINED	42				
223	VIZ	REAL		REFS	48	DEFINED	43				
225	VOY	REAL		REFS	47	DEFINED	45				
226	VOZ	REAL		REFS	48	DEFINED	46				

```
      SUBROUTINE SNPDF(SL,CL,TL,SGS,CGS,SGR,CGR,XO,YO,ZO,EE,DIJ,BETA,CV) SNPDF     2
      CAVE = CV                                                          SNPDF     3
      CLSGS = CL*SGS                                                     SNPDF     4
      CLCGS = CL*CGS                                                     SNPDF     5
      EX =EE*TL                                                          SNPDF     6
      EY =EE*CGS                                                         SNPDF     7
      EZ =EE*SGS                                                         SNPDF     8
      XOB =  XO / BETA                                                   SNPDF     9
      RIX = XOB+ EX                                                      SNPDF    10
      RIY = YO + EY                                                      SNPDF    11
      RIZ = ZO + EZ                                                      SNPDF    12
      RIMAG = SQRT(RIX**2 + RIY**2 + RIZ**2)                             SNPDF    13
      ROX = XOB- EX                                                      SNPDF    14
      ROY = YO - EY                                                      SNPDF    15
      ROZ = ZO - EZ                                                      SNPDF    16
      ROMAG = SQRT(ROX**2 + ROY**2 + ROZ**2)                             SNPDF    17
      CAB = (RIX*SL + RIY*CLCGS + RIZ*CLSGS)/RIMAG                       SNPDF    18
      CBB = (ROX*SL + ROY*CLCGS + ROZ*CLSGS)/ROMAG                       SNPDF    19
      CBI = -RIX/RIMAG                                                   SNPDF    20
      CAO =  ROX/ROMAG                                                   SNPDF    21
      RICAB = RIMAG*CAB                                                  SNPDF    22
      DBX = RIX - RICAB*SL                                               SNPDF    23
      DBY = RIY - RICAB*CLCGS                                            SNPDF    24
      DBZ = RIZ - RICAB*CLSGS                                            SNPDF    25
      DB2 = DBX**2 + DBY**2 + DBZ**2                                     SNPDF    26
      DI2 = RIY**2 + RIZ**2                                              SNPDF    27
      DO2 = ROY**2 + ROZ**2                                              SNPDF    28
      ACAB = ABS(CAB)                                                    SNPDF    29
      ACBB = ABS(CBB)                                                    SNPDF    30
      IF (ACAB.GT..999) GO TO 30                                         SNPDF    31
      IF (ACBB.GT..999) GO TO 30                                         SNPDF    32
      CACB =(CAB - CBB)/DB2                                              SNPDF    33
      GO TO  60                                                          SNPDF    34
   30 IF (CAB*CBB)40,50,50                                               SNPDF    35
   40 CACB = 0.                                                          SNPDF    36
      GO TO 60                                                           SNPDF    37
   50 CACB = 0.5*ABS((1./RIMAG**2)-(1./ROMAG**2))                        SNPDF    38
   60 CONTINUE                                                           SNPDF    39
      VBY = CACB * (DBX*CLSGS - DBZ*SL)                                  SNPDF    40
      VBZ = CACB * (DBY*SL - DBX*CLCGS)                                  SNPDF    41
      ONECBI = (1.0 - CBI)/DI2                                           SNPDF    42
      VIY = ONECBI*RIZ                                                   SNPDF    43
      VIZ = -ONECBI*RIY                                                  SNPDF    44
      CAOONE = (1.0 + CAO)/DO2                                           SNPDF    45
      VOY = -CAOONE*ROZ                                                  SNPDF    46
      VOZ = CAOONE*ROY                                                   SNPDF    47
      VY = VBY + VIY + VOY                                               SNPDF    48
      VZ = VBZ + VIZ + VOZ                                               SNPDF    49
      WW= VY*SGR - VZ*CGR                                                SNPDF    50
      DIJ = WW* CAVE / 25.132741                                         SNPDF    51
   70 CONTINUE                                                           SNPDF    52
C                                                                        SNPDF    53
C                                                                        SNPDF    54
      RETURN                                                             SNPDF    55
      END                                                                SNPDF    56
```

STATEMENT LABELS	DEF LINE	REFERENCES
261 140	74	65 71
273 170	79	43

STATISTICS

PROGRAM LENGTH	376B	254

520000B CM USED

VARIABLES	SN	TYPE	RELOCATION								
344	DEN3	REAL		REFS	22	23	DEFINED	15			
0	DIIJI	REAL	F.P.	DEFINED	1	42	78				
0	DIIJR	REAL	F.P.	DEFINED	1	41	77				
0	EE	REAL	F.P.	REFS	11	12	14	15	16	17	18
					19	20	21	22	23	25	48
					49	57	70	77	78	DEFINED	1
0	ETAO1	REAL	F.P.	REFS	5	6	7	8	14	15	16
					17	18	19	20	21	22	23
					48	49	52	53	DEFINED	1	
337	ETAO2	REAL		REFS	16	17	73	DEFINED	8		
0	E2	REAL	F.P.	REFS	4	11	25	31	32	50	51
					52	53	54	55	57	63	64
					70	2*73	75	76	DEFINED	1	
336	FACI	REAL		REFS	40	76	DEFINED	7			
335	FACR	REAL		REFS	39	75	DEFINED	6			
345	FAC2A	REAL		REFS	20	21	DEFINED	16			
347	FAC2B	REAL		REFS	20	21	DEFINED	18			
346	FAC3A	REAL		REFS	22	23	DEFINED	17			
350	FAC3B	REAL		REFS	22	23	DEFINED	19			
363	FUNCT	REAL		REFS	39	40	70	DEFINED	32	37	45
					64	69					
334	PARN	REAL		REFS	6	7	DEFINED	5			
0	R1SQX	REAL	F.P.	REFS	4	11	16	17	18	19	25
					54	55	57	DEFINED	1		
360	S	REAL		REFS	5*30	5*62	DEFINED	29	61		
361	SER	REAL		REFS	31	63	DEFINED	30	62		
342	TEST	REAL		REFS	13	DEFINED	12				
357	TESTT	REAL		REFS	28	60	DEFINED	27	59		
341	TESTO	REAL		REFS	24	DEFINED	11				
367	TRM1I	REAL		REFS	42	78	DEFINED	40	55		
366	TRM1R	REAL		REFS	41	77	DEFINED	39	54		
352	TRM2I	REAL		REFS	42	78	DEFINED	21	76		
351	TRM2R	REAL		REFS	41	77	DEFINED	20	75		
354	TRM3I	REAL		REFS	42	DEFINED	23				
353	TRM3R	REAL		REFS	41	DEFINED	22				
373	UP1I	REAL		REFS	55	DEFINED	51				
372	UP1R	REAL		REFS	54	DEFINED	50				
375	UP2I	REAL		REFS	55	DEFINED	53				
374	UP2R	REAL		REFS	54	DEFINED	52				
0	ZETO1	REAL	F.P.	REFS	3	5	9	12	26	32	48
					49	58	64	DEFINED	1		
340	ZETO2	REAL		REFS	14	15	16	17	41	42	70
				DEFINED	9						

EXTERNALS	TYPE	ARGS		REFERENCES	
ATAN	REAL	1	LIBRARY	36	68

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES				
ABS	REAL	1	INTRIN		3	11	12	27	59

STATEMENT LABELS		DEF LINE	REFERENCES	
137	90	34	28	
144	100	38	33	46
157	110	44	24	
161	120	47	10	13
243	125	66	60	

```
                      ARGA = COEF*ZETO1                                                  IDF2      59
                      TESTT= ABS(ARGA)                                                   IDF2      60
     60               IF (TESTT.GT.0.3)  GO TO 125                                       IDF2      61
                      S    = ARGA**2                                                     IDF2      62
                      SER  = 1./3.+S*(-1./5.+S*(1./7.+S*(-1./9.+S*(1./11.-S/13.))))      IDF2      63
                      ALPHA= E2*(COEF**2)*SER                                            IDF2      64
                      FUNCT= COEF*(1.0-ALPHA*(ZETO1**2)/E2)                              IDF2      65
     65               GO TO 140                                                          IDF2      66
                  125 CONTINUE                                                           IDF2      67
                      ARGT= COEF*AZET                                                    IDF2      68
                      ATANA= ATAN(ARGT)                                                  IDF2      69
                      FUNCT= ATANA/AZET                                                  IDF2      70
     70               ALPHA= (E2/ZETO2)*(1.0-FUNCT*(DENO/(2.0*EE)))                      IDF2      71
                      GO TO 140                                                          IDF2      72
                  130 CONTINUE                                                           IDF2      73
                      ALPHA= ((2.0*E2)/(ETAO2-E2))**2                                    IDF2      74
                  140 CONTINUE                                                           IDF2      75
     75               TRM2R= -ALPHA*FACR/E2                                              IDF2      76
                      TRM2I= -ALPHA*FACI/E2                                              IDF2      77
                      DIIJR= EE*(TRM1R + TRM2R)/DENO                                     IDF2      78
                      DIIJI= EE*(TRM1I + TRM2I)/DENO                                     IDF2      79
                  170 CONTINUE                                                           IDF2      80
     80           C                                                                      IDF2      81
                  C                                                                      IDF2      82
                      RETURN                                                             IDF2      83
                      END                                                                IDF2      84
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	IDF2	1	82

VARIABLES		SN	TYPE	RELOCATION								
362	ALPHA		REAL		REFS	32	64	75	76	DEFINED	31	63
					70	73						
356	ARGA		REAL		REFS	27	29	59	61	DEFINED	26	58
364	ARGT		REAL		REFS	36	68	DEFINED	35	67		
365	ATANA		REAL		REFS	37	69	DEFINED	36	68		
0	AT2		REAL	*UNUSED F.P.	DEFINED	1						
332	AZET		REAL		REFS	10	11	35	37	56	67	69
					DEFINED	3						
0	A2I		REAL	F.P.	REFS	7	21	23	51	DEFINED	1	
0	A2R		REAL	F.P.	REFS	6	20	22	50	DEFINED	1	
0	B2I		REAL	F.P.	REFS	7	21	23	53	DEFINED	1	
0	B2R		REAL	F.P.	REFS	6	20	22	52	DEFINED	1	
355	COEF		REAL		REFS	26	31	32	35	58	63	64
					67	DEFINED	25	57				
0	C2I		REAL	F.P.	REFS	7	21	23	51	DEFINED	1	
0	C2R		REAL	F.P.	REFS	6	20	22	50	DEFINED	1	
370	DENA		REAL		REFS	54	55	DEFINED	48			
371	DENB		REAL		REFS	54	55	DEFINED	49			
333	DENO		REAL		REFS	12	70	77	78	DEFINED	4	
343	DEN2		REAL		REFS	20	21	DEFINED	14			

```
      SUBROUTINE IDF2(EE,E2,AT2,ETAO1,ZETO1,A2R,A2I,B2R,B2I,C2R,C2I,     IDF2      2
     1                R1SQX,DIIJR,DIIJI)                                 IDF2      3
      AZET = ABS(ZETO1)                                                 IDF2      4
      DENO = R1SQX-E2                                                   IDF2      5
      PARN = ETAO1**2 + ZETO1**2                                        IDF2      6
      FACR = PARN*A2R + ETAO1*B2R + C2R                                 IDF2      7
      FACI = PARN*A2I + ETAO1*B2I + C2I                                 IDF2      8
      ETAO2=ETAO1**2                                                    IDF2      9
      ZETO2= ZETO1**2                                                   IDF2     10
      IF (AZET.EQ.0.0)  GO TO 120                                       IDF2     11
      TESTO= ABS ( (R1SQX - E2) / (2.0*EE*AZET) )                       IDF2     12
      TEST = ABS(DENO/(2.0*EE*ZETO1))                                   IDF2     13
      IF (TEST.GT.0.1)  GO TO 120                                       IDF2     14
      DEN2 = (ETAO1+EE)**2+ZETO2                                        IDF2     15
      DEN3 = (ETAO1-EE)**2+ZETO2                                        IDF2     16
      FAC2A= R1SQX*ETAO1+(ETAO2-ZETO2)*EE                               IDF2     17
      FAC3A= R1SQX*ETAO1-(ETAO2-ZETO2)*EE                               IDF2     18
      FAC2B= R1SQX+ETAO1*EE                                             IDF2     19
      FAC3B= R1SQX-ETAO1*EE                                             IDF2     20
      TRM2R= (FAC2A*A2R+FAC2B*B2R+(ETAO1+EE)*C2R)/DEN2                  IDF2     21
      TRM2I= (FAC2A*A2I+FAC2B*B2I+(ETAO1+EE)*C2I)/DEN2                  IDF2     22
      TRM3R=-(FAC3A*A2R+FAC3B*B2R+(ETAO1-EE)*C2R)/DEN3                  IDF2     23
      TRM3I=-(FAC3A*A2I+FAC3B*B2I+(ETAO1-EE)*C2I)/DEN3                  IDF2     24
      IF (TESTO.LE.0.0001)  GO TO 110                                   IDF2     25
      COEF = (2.0*EE)/(R1SQX-E2)                                        IDF2     26
      ARGA = COEF*ZETO1                                                 IDF2     27
      TESTT= ABS(ARGA)                                                  IDF2     28
      IF (TESTT.GT.0.3)  GO TO 90                                       IDF2     29
      S    = ARGA**2                                                    IDF2     30
      SER  = 1./3.+S*(-1./5.+S*(1./7.+S*(-1./9.+S*(1./11.-S/13.))))     IDF2     31
      ALPHA= E2*(COEF**2)*SER                                           IDF2     32
      FUNCT= COEF*(1.0-ALPHA*(ZETO1**2)/E2)                             IDF2     33
      GO TO 100                                                         IDF2     34
   90 CONTINUE                                                          IDF2     35
      ARGT = COEF*AZET                                                  IDF2     36
      ATANA= ATAN(ARGT)                                                 IDF2     37
      FUNCT= ATANA/AZET                                                 IDF2     38
  100 CONTINUE                                                          IDF2     39
      TRM1R= FACR*FUNCT                                                 IDF2     40
      TRM1I= FACI*FUNCT                                                 IDF2     41
      DIIJR= (TRM1R + TRM2R + TRM3R)/(2.0*ZETO2)                        IDF2     42
      DIIJI= (TRM1I + TRM2I + TRM3I)/(2.0*ZETO2)                        IDF2     43
      GO TO 170                                                         IDF2     44
  110 CONTINUE                                                          IDF2     45
      FUNCT= 0.0                                                        IDF2     46
      GO TO 100                                                         IDF2     47
  120 CONTINUE                                                          IDF2     48
      DENA = (ETAO1+EE)**2 + ZETO1**2                                   IDF2     49
      DENB = (ETAO1-EE)**2 + ZETO1**2                                   IDF2     50
      UP1R = 2.0*(E2*A2R + C2R)                                         IDF2     51
      UP1I = 2.0*(E2*A2I + C2I)                                         IDF2     52
      UP2R = 4.0*E2*ETAO1*B2R                                           IDF2     53
      UP2I = 4.0*E2*ETAO1*B2I                                           IDF2     54
      TRM1R= (UP1R *(R1SQX+E2) + UP2R )/(DENA*DENB)                     IDF2     55
      TRM1I= (UP1I *(R1SQX+E2) + UP2I )/(DENA*DENB)                     IDF2     56
      IF (AZET.EQ.0.0)  GO TO 130                                       IDF2     57
      COEF = (2.0*EE)/(R1SQX-E2)                                        IDF2     58
```

STATISTICS
PROGRAM LENGTH 201B 129
52000B CM USED

VARIABLES	SN	TYPE	RELOCATION									
0	AIM	REAL		F.P.	REFS	5	7	14	DEFINED	1		
174	ALPHA	REAL			REFS	38	DEFINED	31	37			
0	ARE	REAL		F.P.	REFS	4	6	13	DEFINED	1		
167	ARGA	REAL			REFS	21	35	DEFINED	20			
171	ARGT	REAL			REFS	24	DEFINED	23				
157	ARG2	REAL			REFS	11	12	DEFINED	10			
172	ATANA	REAL			REFS	25	DEFINED	24				
0	AT2	REAL	*UNUSED	F.P.	DEFINED	1						
164	AZET	REAL			REFS	16	17	23	25	DEFINED	15	
0	BIM	REAL		F.P.	REFS	5	7	DEFINED	1			
0	BRE	REAL		F.P.	REFS	4	6	DEFINED	1			
0	CIM	REAL		F.P.	REFS	5	DEFINED	1				
166	COEF	REAL			REFS	20	23	37	38	DEFINED	19	
0	CRE	REAL		F.P.	REFS	4	DEFINED	1				
156	DOWN	REAL			REFS	10	DEFINED	9				
0	EE	REAL		F.P.	REFS	8	9	13	14	17	19	28
					DEFINED	1						
0	ETAO1	REAL		F.P.	REFS	3	4	5	6	7	8	9
					28	DEFINED	1					
0	E2	REAL		F.P.	REFS	17	19	28	31	37	38	
					DEFINED	1						
152	FACI	REAL			REFS	41	DEFINED	5				
151	FACR	REAL			REFS	40	DEFINED	4				
173	FUNCT	REAL			REFS	40	41	DEFINED	25	28	32	38
150	PARN	REAL			REFS	4	5	DEFINED	3			
154	PARNI	REAL			REFS	12	DEFINED	7				
153	PARNR	REAL			REFS	11	DEFINED	6				
0	R1SQX	REAL		F.P.	REFS	17	19	DEFINED	1			
175	S	REAL			REFS	5*36	DEFINED	35				
176	SER	REAL			REFS	37	DEFINED	36				
170	TEST	REAL			REFS	22	DEFINED	21				
165	TESTO	REAL			REFS	18	DEFINED	17				
200	TRM1I	REAL			REFS	43	DEFINED	41				
177	TRM1R	REAL			REFS	42	DEFINED	40				
161	TRM2I	REAL			REFS	43	DEFINED	12				
160	TRM2R	REAL			REFS	42	DEFINED	11				
163	TRM3I	REAL			REFS	43	DEFINED	14				
162	TRM3R	REAL			REFS	42	DEFINED	13				
155	UP	REAL			REFS	10	DEFINED	8				
0	XIIJI	REAL		F.P.	DEFINED	1	43					
0	XIIJR	REAL		F.P.	DEFINED	1	42					
0	ZETO1	REAL		F.P.	REFS	3	8	9	15	20	31	38
					DEFINED	1						

EXTERNALS	TYPE	ARGS	REFERENCES	
ALOG	REAL	1 LIBRARY	11	12
ATAN	REAL	1 LIBRARY	24	

INLINE FUNCTIONS	TYPE	ARGS	DEF LINE	REFERENCES		
ABS	REAL	1 INTRIN	15	17	21	

STATEMENT LABELS		DEF LINE	REFERENCES		
65	100	27	16		
72	110	30	18		
76	120	34	22		
115	170	39	26	29	33

```
      SUBROUTINE IDF1 (EE,E2,AT2,ETAO1,ZETO1,ARE,AIM,BRE,BIM,CRE,CIM,     IDF1        2
     1                 R1SQX,XIIJR,XIIJI)                                 IDF1        3
      PARN = ETAO1**2 - ZETO1**2                                          IDF1        4
      FACR = PARN*ARE + ETAO1*BRE + CRE                                   IDF1        5
      FACI = PARN*AIM + ETAO1*BIM + CIM                                   IDF1        6
      PARNR= BRE/2.O  + ETAO1*ARE                                         IDF1        7
      PARNI= BIM/2.O  + ETAO1*AIM                                         IDF1        8
      UP   = (ETAO1-EE)**2 + ZETO1**2                                     IDF1        9
      DOWN = (ETAO1+EE)**2 + ZETO1**2                                     IDF1       10
      ARG2 = UP/DOWN                                                      IDF1       11
      TRM2R= PARNR * ALOG(ARG2)                                           IDF1       12
      TRM2I= PARNI * ALOG(ARG2)                                           IDF1       13
      TRM3R= 2.O*EE* ARE                                                  IDF1       14
      TRM3I= 2.O*EE* AIM                                                  IDF1       15
      AZET = ABS(ZETO1)                                                   IDF1       16
      IF (AZET.EQ.O.O)  GO TO 100                                         IDF1       17
      TESTO= ABS((R1SQX-E2)/(2.O*EE*AZET))                                IDF1       18
      IF (TESTO.LE.O.OOO1)  GO TO 110                                     IDF1       19
      COEF = (2.O*EE)/(R1SQX-E2)                                          IDF1       20
      ARGA = COEF*ZETO1                                                   IDF1       21
      TEST = ABS(ARGA)                                                    IDF1       22
      IF (TEST.LE.O.3)  GO TO 120                                         IDF1       23
      ARGT = COEF*AZET                                                    IDF1       24
      ATANA= ATAN(ARGT)                                                   IDF1       25
      FUNCT= ATANA/AZET                                                   IDF1       26
      GO TO 170                                                           IDF1       27
  100 CONTINUE                                                            IDF1       28
      FUNCT= (2.O*EE)/(ETAO1**2-E2)                                       IDF1       29
      GO TO 170                                                           IDF1       30
  110 CONTINUE                                                            IDF1       31
      ALPHA= E2/ZETO1**2                                                  IDF1       32
      FUNCT= O.O                                                          IDF1       33
      GO TO 170                                                           IDF1       34
  120 CONTINUE                                                            IDF1       35
      S    = ARGA**2                                                      IDF1       36
      SER  = 1./3.+S*(-1./5.+S*(1./7.+S*(-1./9.+S*(1./11.-S/13.))))       IDF1       37
      ALPHA= E2*(COEF**2)*SER                                             IDF1       38
      FUNCT= COEF*(1.O-ALPHA*(ZETO1**2)/E2)                               IDF1       39
  170 CONTINUE                                                            IDF1       40
      TRM1R= FACR * FUNCT                                                 IDF1       41
      TRM1I= FACI * FUNCT                                                 IDF1       42
      XIIJR= TRM1R + TRM2R + TRM3R                                        IDF1       43
      XIIJI= TRM1I + TRM2I + TRM3I                                        IDF1       44
C                                                                         IDF1       45
C                                                                         IDF1       46
      RETURN                                                              IDF1       47
      END                                                                 IDF1       48
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS	DEF LINE	REFERENCES
3 IDF1	1	46

STATEMENT LABELS			DEF LINE	REFERENCES					
144	330		77	55	57				
273	340		108	103					
311	350		110	6*108					
354	360		124	4*122					
427	370		132	2*130					
460	380		137	108	122	130			
462	390		138	108	122	2*130			
0	400	INACTIVE	140						
502	410		142	2*122	3*130	4*140			
672	420		161	108	122	130	2*140		
763	430		175	4*174					
1011	440		178	2*174	4*177				
1045	450		183	2*182					
1051	460		185	177	182	184			
1054	500		187	136	3*140	3*174	4*177	6*182	2*184
1120	510		201	2*200					
1125	520		204	200	2*203				
1132	530		207	4*200	203	2*206			
1165	540		213	2*200	206	6*212			
1214	900		220	3*212					
1231	905		228	22	31				

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)		
DLM	9	0 K10 (1)	1 K20 (1)	2 K1RT1 (1)
		3 K1IT1 (1)	4 K2RT2P (1)	5 K2IT2P (1)
		6 K1OT1 (1)	7 K2OT2P (1)	8 E2 (1)

STATISTICS

PROGRAM LENGTH	1440B	800
CM LABELED COMMON LENGTH	11B	9

52000B CM USED

VARIABLES	SN	TYPE	RELOCATION								
1424	Q9	REAL		REFS	124	132	142	154	DEFINED	118	
1360	R1	REAL		REFS	17	18	2*50	51	52	104	106
				110	161	165	195	213	217		
				DEFINED	16	91	167	188			
1361	R1S	REAL		REFS	167	188	DEFINED	17			
1412	R10	REAL		REFS	104	106	119	161	165		
				DEFINED	100						
1413	R11	REAL		REFS	104	106	120	161	165		
				DEFINED	101						
1402	R2	REAL		REFS	104	106	111	161	165		
				DEFINED	92						
1403	R3	REAL		REFS	104	106	112	161	165		
				DEFINED	93						
1404	R4	REAL		REFS	104	106	113	161	165		
				DEFINED	94						
1405	R5	REAL		REFS	104	106	114	161	165		
				DEFINED	95						
1406	R6	REAL		REFS	104	106	115	161	165		
				DEFINED	96						
1407	R7	REAL		REFS	104	106	116	161	165		
				DEFINED	97						
1410	R8	REAL		REFS	104	106	117	161	165		
				DEFINED	98						
1411	R9	REAL		REFS	104	106	118	161	165		
				DEFINED	99						
0	T1	REAL	F.P.	REFS	25	26	28	29	30	44	220
				221	222	223	226	DEFINED	1	24	40
				43	46						
0	T2	REAL	F.P.	REFS	38	220	221	DEFINED	1	37	41
1366	T2P	REAL		REFS	37	224	225	227	DEFINED	36	
0	XO	REAL	F.P.	REFS	19	23	2*50	52	197	209	217
				DEFINED	1						
0	YO	REAL	F.P.	REFS	2*16	3*36	DEFINED	1			
0	ZO	REAL	F.P.	REFS	2*16	3*36	DEFINED	1			

EXTERNALS	TYPE	ARGS	REFERENCES							
COS	REAL	1 LIBRARY	24	25	28	32	34	40	43	170	193
			198								
EXP	REAL	1 LIBRARY	77								
SIN	REAL	1 LIBRARY	26	29	33	35	169	194	199		
SQRT	REAL	1 LIBRARY	16	50	171	196					

INLINE FUNCTIONS	TYPE	ARGS	DEF LINE	REFERENCES		
ABS	REAL	1 INTRIN		38	44	53

STATEMENT LABELS			DEF LINE	REFERENCES	
0	100	INACTIVE	19	18	
0	110	INACTIVE	20	19	
23	120		23	2*19	
52	200		32	2*18	
0	210	INACTIVE	39	38	
105	220		43	2*38	
0	230	INACTIVE	45	44	
116	240		48	2*44	
117	300		49	42	47
0	310	INACTIVE	56	55	

```
                NP = NELP2 - IB                                          QUAS      116
                NS = NS + NELP1                                          QUAS      117
                NT = NS                                                  QUAS      118
                DO 50 IO = IB, K                                         QUAS      119
                NT = NT + NEL                                            QUAS      120
                MN = NT                                                  QUAS      121
                NB = NS                                                  QUAS      122
                A(NT) = A(NT) / A(NS)                                    QUAS      123
                DO 50 NF = 2, NP                                         QUAS      124
                MN = MN + 1                                              QUAS      125
                NB = NB + 1                                              QUAS      126
             50 A(MN) = A(MN) - A(NT) * A(NB)                            QUAS      127
          C*** ***WRITE PART OF THE LMATRIX ON LTAPE   (TRIANGULAR PART)  QUAS      128
                CALL PUTROW (LTAPE,2,K,1)                                QUAS      129
                LBEG =NELP1                                              QUAS      130
                KM1 = K - 1                                              QUAS      131
                DO 55 IB = 1,KM1                                         QUAS      132
                LEND = LBEG + IB- 1                                      QUAS      133
                MAXW = LEND - LBEG + 1                                   QUAS      134
                CALL PUTROW (LTAPE,2,MAXW,1)                             QUAS      135
                MAXH = 2*MAXW                                            QUAS      136
                CALL PUTROW (LTAPE,2,A(LBEG),MAXH)                       QUAS      137
             55 LBEG = LBEG + NN                                         QUAS      138
          C                                                              QUAS      139
          C - - WRITE THE 'TRAPEZOIDAL' MATRIX ON TAPE                   QUAS      140
          C                                                              QUAS      141
             56 NT = 0                                                   QUAS      142
                NP = NEL                                                 QUAS      143
                NS = - NEL                                               QUAS      144
                DO 60 IO = 1, K                                          QUAS      145
                NS = NS + NELP1                                          QUAS      146
                NT = NT + NEL                                            QUAS      147
                WRITE (MT) NP, (A(IB), IB = NS, NT)                      QUAS      148
             60 NP = NP - 1                                              QUAS      149
                IF (LAST) GO TO 90                                       QUAS      150
                NP = NP - M                                              QUAS      151
                NS = KORE - NEL + 1                                      QUAS      152
          C                                                              QUAS      153
          C - - READ ANOTHER ROW                                         QUAS      154
          C                                                              QUAS      155
                DO 80 IO = 1, NP                                         QUAS      156
                READ (NIN) (A(IB), IB = NS, KORE)                        QUAS      157
          C                                                              QUAS      158
          C - - MODIFY THIS ROW BY THE 'TRAPEZOIDAL' ARRAY               QUAS      159
          C                                                              QUAS      160
                NT = 1                                                   QUAS      161
                MN = NS                                                  QUAS      162
                DO 70 IB = 1, K                                          QUAS      163
                NB = NT                                                  QUAS      164
                NF = MN + 1                                              QUAS      165
                A(MN) = A(MN) / A(NT)                                    QUAS      166
                DO 65 NN = NF, KORE                                      QUAS      167
                NB = NB + 1                                              QUAS      168
             65 A(NN) = A(NN) - A(MN) * A(NB)                            QUAS      169
                MN = NF                                                  QUAS      170
             70 NT = NT + NELP1                                          QUAS      171
          C                                                              QUAS      172
```

```
      C - - WRITE THE MODIFIED ROW ON TAPE                                  QUAS      173
      C                                                                     QUAS      174
      C*** ***WRITE REST OF LMATRIX ON LTAPE                                QUAS      175
175         MNM1 = MN - 1                                                   QUAS      176
            MAXW = MNM1 - NS + 1                                            QUAS      177
            CALL PUTROW (LTAPE,2,MAXW,1)                                    QUAS      178
            MAXH = 2*MAXW                                                   QUAS      179
            CALL PUTROW (LTAPE,2,A(NS),MAXH)                                QUAS      180
180         WRITE (NOUT)  (A(NT), NT=MN,KORE)                               QUAS      181
         80 CONTINUE                                                        QUAS      182
            REWIND NOUT                                                     QUAS      183
            REWIND NIN                                                      QUAS      184
      C                                                                     QUAS      185
185   C - - SWITCH THE TAPES                                                QUAS      186
      C                                                                     QUAS      187
            NT = NIN                                                        QUAS      188
            NIN = NOUT                                                      QUAS      189
            NOUT = NT                                                       QUAS      190
190   C                                                                     QUAS      191
      C - - RE-CALCULATE ROW LENGTH AND LOOP BACK                           QUAS      192
      C                                                                     QUAS      193
            NEL = NEL - K                                                   QUAS      194
            NN = NEL - M                                                    QUAS      195
195         GO TO 10                                                        QUAS      196
      C                                                                     QUAS      197
      C - - REWIND ALL TAPES                                                QUAS      198
      C                                                                     QUAS      199
         90 REWIND NIN                                                      QUAS      200
200         REWIND NOUT                                                     QUAS      201
      C                                                                     QUAS      202
        105 N1 = KORE - K * M + 1                                           QUAS      203
            IFILES(LTAPE) = NFILE                                           QUAS      204
            CALL GEDLAB (8HQUAS  01,LTAPE,NAME,1,IRD,JCD)                   QUAS      205
205         REWIND MT                                                       QUAS      206
      C*** ***CALCULATE THE NUMBER OF COLUMNS TO BRING OFF OF THE RHS TAPE  QUAS      207
            MTOTAL = 0                                                      QUAS      208
            M = MMAX                                                        QUAS      209
            IF(M .EQ. 0)GO TO 295                                           QUAS      210
210   C*** ***MTOTALIS THE TOTAL NUMBER OF RHS COLUMNS ALREADY BROUGHT IN   QUAS      211
        109 MTOTAL = MTOTAL + M                                             QUAS      212
            LASTRS = MTOTAL.GE. MRHS                                        QUAS      213
            MTOTAL = MTOTAL - M                                             QUAS      214
            IF (LASTRS)M = MRHS - MTOTAL                                    QUAS      215
215         MTOTAL = MTOTAL + M                                             QUAS      216
      C*** ***BRING IN M COLUMNS OF RHS                                     QUAS      217
            KINIT = KORE - (M*N)                                            QUAS      218
            IINIT = KINIT                                                   QUAS      219
            NBEG = KINIT + 1                                                QUAS      220
220         NEND = KINIT+ N                                                 QUAS      221
            DO 110 J =1,M                                                   QUAS      222
            READ (RHSTAP)( A(I),I=NBEG,NEND)                                QUAS      223
            NBEG = NEND + 1                                                 QUAS      224
        110 NEND = NEND + N                                                 QUAS      225
225   C*** ***BRING IN L(I,J) MATRIX AND APPLY IT TO RHS                    QUAS      226
            NBEG = 1 + KINIT                                                QUAS      227
            NEND = 1 + (M-1) * N + KINIT                                    QUAS      228
```

```
                C*** ***DO TRIANGULAR SECTION OF LMATRIX                                QUAS    230
230                   NLCNT = 0                                                         QUAS    231
                  111 CONTINUE                                                        QUAS    232
                      CALL GETROW (LTAPE,1,K,1)                                       QUAS    233
                      NLCNT = NLCNT + 1                                               QUAS    234
                C*** ***KSUM IS THE TOTAL NUMBER OF L ROWS THAT WILL                  QUAS    235
235             C*** ***BE READ AFTER THIS TRIANGULAR SECTION IS FINISHED              QUAS    236
                      KSUM = KSUM + K                                                 QUAS    237
                      KM1 = K - 1                                                     QUAS    238
                C***   ***NOTE THAT KM1 CAN'T BE 0 SINCE K CAN'T BE 1 AND STILL HAVE SOM QUAS    239
                C***   ***ON THE LTAPE                                                QUAS    240
240                   DO 114  I = 1,KM1                                               QUAS    241
                      NBEG = NBEG + 1                                                 QUAS    242
                      NEND = NEND + 1                                                 QUAS    243
                C*** ***READ 1 ROW OF L(I,J) FROM LTAPE---K-1 TIMES---EACH TIME       QUAS    244
                C*** ***STARTING WITH L(1)                                            QUAS    245
245              1114 CONTINUE                                                        QUAS    246
                      CALL GETROW (LTAPE,1,MAXW,1)                                    QUAS    247
                      MAXH = 2*MAXW                                                   QUAS    248
                      CALL GETROW (LTAPE,1,A,MAXH)                                    QUAS    249
                      JCNT = -1                                                       QUAS    250
250             C*** ***REDUCE THE RHS BY GOING ACROSS A SOLUTION ROW (WHICH          QUAS    251
                C*** ***ARE NOT IN CONSECUTIVE ORDER, BUT A(1), A(N+1), A(2N+1) ETC.) QUAS    252
                      DO 113 NPP = NBEG,NEND,N                                        QUAS    253
                      JCNT = JCNT + 1                                                 QUAS    254
                      SUM = (0.0,0.0)                                                 QUAS    255
255                   NROW = KINIT + ( JCNT * N )                                     QUAS    256
                      DO 112 NN=1,I                                                   QUAS    257
                      NROW = NROW + 1                                                 QUAS    258
                  112 SUM = SUM + ( A(NN)*A(NROW))                                    QUAS    259
                  113 A(NPP) = A(NPP) - SUM                                           QUAS    260
260               114 CONTINUE                                                        QUAS    261
                      IF (KSUM .EQ. N)GO TO 116                                       QUAS    262
                C*** ***KSUM = N IF YOU HAVE READ ENTIRE LMATRIX AND                  QUAS    263
                C*** ***THERE IS NO CONSTANT SECTION LEFT                             QUAS    264
                      NTBEG = NBEG                                                    QUAS    265
265                   NTEND = NEND                                                    QUAS    266
                      KSUMP1 = KSUM + 1                                               QUAS    267
                C*** ***READ REST OF LROWS 1 ROW AT A TIME FOR CONSTANT SECTION       QUAS    268
                      DO 115 I=KSUMP1,N                                               QUAS    269
                      NTBEG = NTBEG + 1                                               QUAS    270
270                   NTEND = NTEND + 1                                               QUAS    271
                 1115 CONTINUE                                                        QUAS    272
                      CALL GETROW (LTAPE,1,MAXW,1)                                    QUAS    273
                      MAXH = 2*MAXW                                                   QUAS    274
                      CALL GETROW (LTAPE,1,A,MAXH)                                    QUAS    275
275                   JCNT = -1                                                       QUAS    276
                C*** ***PARTIALLY  REDUCE A RHS ACROSS A RHS ROW BY APPLYING K NUMBER QUAS    277
                C*** ***OF L(I,J) S                                                   QUAS    278
                      DO 124 NPP = NTBEG,NTEND,N                                      QUAS    279
                      JCNT = JCNT + 1                                                 QUAS    280
280                   SUM = (0.0,0.0)                                                 QUAS    281
                      NROW = KINIT + ( JCNT * N )                                     QUAS    282
                      DO 123 NN = 1,K                                                 QUAS    283
                      NROW = NROW + 1                                                 QUAS    284
                  123 SUM = SUM + ( A(NN) * A(NROW) )                                 QUAS    285
285               124 A(NPP) = A(NPP) - SUM                                           QUAS    286
```

```
  115 CONTINUE                                                          QUAS  287
      NBEG = NBEG + 1                                                   QUAS  288
      NEND = NEND + 1                                                   QUAS  289
C*** ***KINIT IS HOW FAR DOWN A COLUMN OF RHS TO START MULTIPLYING BY    QUAS  290
C*** ***L(I,J) AT EACH PASS THROUGH                                     QUAS  291
      KINIT = KINIT + K                                                 QUAS  292
C*** ***IF KSUMP1 = N THERE ARE NO MORE L(I,J)'S LEFT                   QUAS  293
      IF(KSUMP1 .LT. N)GO TO 111                                        QUAS  294
C*** ***WRITE OUT ALL BUT LAST K ROWS OF RHS IN ROW ORDER ON NATAPE     QUAS  295
  116 B = 4*M + 3                                                       QUAS  296
      C = -2 * KORE                                                     QUAS  297
      K = (   B   +  SQRT( B**2  -4.0*C )  )/2.0                        QUAS  298
      IF(K .GT. ND) K = ND                                              QUAS  299
      KF = K                                                            QUAS  300
      KM1 = K - 1                                                       QUAS  301
      KLEFT = N - KF + IINIT                                            QUAS  302
      INITP1 = IINIT + 1                                                QUAS  303
      NEND = (M-1)*N + IINIT                                            QUAS  304
      DO 117 NPP = INITP1,KLEFT                                         QUAS  305
      NEND = NEND + 1                                                   QUAS  306
  117 WRITE(NATAPE) ( A(J),J=NPP,NEND,N)                                QUAS  307
      REWIND NATAPE                                                     QUAS  308
C*** ***JPASS1 IS TRUE ON 1ST PASS THRU BACK SOLUTION                   QUAS  309
      JPASS1 = .TRUE.                                                   QUAS  310
C                                                                       QUAS  311
C***   ***PUT REMAINING RHS IN CONTIGUOUS LOCATIONS BY COLUMNS          QUAS  312
C***  FROM KORE - (M * KF) + 1  TO  KORE                               QUAS  313
C                                                                       QUAS  314
      NNEW = KORE - KF + 1                                              QUAS  315
      MM1 = M - 1                                                       QUAS  316
C                                                                       QUAS  317
C***   ***IF M = 1, THE ELTS OF THE 1 RHS COLUMN ARE ALREADY IN CONTIGUO QUAS  318
C***   ***LOCATIONS                                                     QUAS  319
C                                                                       QUAS  320
      IF (M.EQ.1)  GO TO 1118                                           QUAS  321
      DO 118 I = 1,MM1                                                  QUAS  322
      NOLD = KORE - (I*N) + 1                                           QUAS  323
      DO 118 J = 1,KF                                                   QUAS  324
      NNEW = NNEW - 1                                                   QUAS  325
      NOLD = NOLD - 1                                                   QUAS  326
      A(NNEW) = A(NOLD)                                                 QUAS  327
  118 CONTINUE                                                          QUAS  328
 1118 CONTINUE                                                          QUAS  329
C                                                                       QUAS  330
C***   ***NOW NNEW = KORE - (M*KF) + 1                                  QUAS  331
C***   ***NOW NOLD = KORE - (M - 1) * N + 1 - KF                        QUAS  332
C   ***   SKIP 1ST PART OF TRAPEZOIDAL MATRIX + READ LAST K ROWS        QUAS  333
C*** ***ATTATCH RHS TO IT SO THAT EVERYTHING IS IN CONSECUTIVE ORDER     QUAS  334
      NREMAN = ND - K                                                   QUAS  335
      IF(NREMAN .EQ. 0)GO TO 126                                        QUAS  336
      DO 122 I = 1,NREMAN                                               QUAS  337
  122 READ(MT) IDUMMY                                                   QUAS  338
  126 NEND = 0                                                          QUAS  339
      KCNT = K                                                          QUAS  340
      NNEW = NNEW - 1                                                   QUAS  341
C***   ***NOTE THAT K = KF WHICH IS ALREADY KNOWN IN CORE               QUAS  342
      DO 121 JCNT = 1,K                                                 QUAS  343
```

```
                NBEG = NEND + 1                                                 QUAS      344
                KCNT = KCNT - 1                                                 QUAS      345
345             NEND = NBEG + KCNT                                              QUAS      346
                READ(MT)IDUMMY,(A(J),J=NBEG,NEND)                               QUAS      347
                NNEW = NNEW + 1                                                 QUAS      348
                KEND = (MM1 * KF) + NNEW                                        QUAS      349
                DO 121 NPP=NNEW,KEND,KF                                         QUAS      350
350             NEND = NEND + 1                                                 QUAS      351
              121 A(NEND) = A(NPP)                                              QUAS      352
                IFILES(LTAPE) = NFILE                                           QUAS      353
                CALL GEDLAB (8HQUAS  02,LTAPE,NAME,1,IRD,JCD)                   QUAS      354
                REWIND MT                                                       QUAS      355
355         C                                                                   QUAS      356
            C - - THERE, NOW WE CAN START THE BACK-SOLUTION                     QUAS      357
            C * * NOTE..THE FIRST AVAILABLE LOCATION FOR THE SOLUTIONS IS A(N1) QUAS      358
            C                                                                   QUAS      359
            C                                                                   QUAS      360
360         C***   ***NL IS THE LAST SUBSCRIPT + 1 OF THE TRAPEZOIDAL A MATRIX THAT QUAS  361
            C***   ***CORE                                                      QUAS      362
            C                                                                   QUAS      363
                NL = NEND + 1                                                   QUAS      364
                NREM = N                                                        QUAS      365
365             NPM = N + M                                                     QUAS      366
                NEL = NPM                                                       QUAS      367
                MP1 = M + 1                                                     QUAS      368
                LAST = K .EQ. N                                                 QUAS      369
                NPASS = 0                                                       QUAS      370
370         C                                                                   QUAS      371
            C - - SOLVE FOR THE ANSWERS CORRESPONDING TO 'K' ROWS               QUAS      372
            C                                                                   QUAS      373
              119 KM1 = K - 1                                                   QUAS      374
                KP1 = K + 1                                                     QUAS      375
375             NS = NL - MP1                                                   QUAS      376
                NPASS = NPASS + 1                                               QUAS      377
                DO 130 MN = 1, M                                                QUAS      378
                NF = NS + MN                                                    QUAS      379
                A(NF) = A(NF) / A(NS)                                           QUAS      380
380             NT = NS                                                         QUAS      381
                IF (KM1 .EQ. 0) GO  TO 130                                      QUAS      382
                DO 125 IB = 1, KM1                                              QUAS      383
                NF = NF - IB - M                                                QUAS      384
                NT = NT - MP1 - IB                                              QUAS      385
385             SUM = (0.0,0.0)                                                 QUAS      386
                NP = NF                                                         QUAS      387
                N2 = MP1 + IB                                                   QUAS      388
                DO 120 IO = 1, IB                                               QUAS      389
                NN = NT + IO                                                    QUAS      390
390             NP = NP + N2 - IO                                               QUAS      391
              120 SUM = SUM + A(NN) * A(NP)                                     QUAS      392
              125 A(NF) = (A(NF) - SUM) / A(NT)                                 QUAS      393
              130 CONTINUE                                                      QUAS      394
            C                                                                   QUAS      395
395         C - - MOVE THE SOLUTIONS TO CONTIGUOUS LOCATIONS STARTING AT A(N1)  QUAS      396
            C                                                                   QUAS      397
                N1 = KORE + 1                                                   QUAS      398
                DO 140 NN = 1, K                                                QUAS      399
                DO 135 MM = 1, M                                                QUAS      400
```

```
400                NL = NL - 1                                                  QUAS    401
                   N1 = N1 - 1                                                  QUAS    402
                 135 A(N1) = A(NL)                                              QUAS    403
                 140 NL = NL - NN                                               QUAS    404
                C                                                               QUAS    405
405             C - - WRITE THE SOLUTIONS ON TAPE                               QUAS    406
                C                                                               QUAS    407
                   WRITE (NIN) K                                                QUAS    408
                   NS = N1 - 1                                                  QUAS    409
                   DO 145 MN = 1, M                                             QUAS    410
410                NT = NS + MN                                                 QUAS    411
                 145 WRITE ( NIN ) (A(IO), IO = NT, KORE, M)                    QUAS    412
                C                                                               QUAS    413
                C - - TEST IF THIS IS THE LAST PASS                             QUAS    414
                C                                                               QUAS    415
415                IF (LAST) GO TO 200                                          QUAS    416
                C                                                               QUAS    417
                C - - WE MUST NOW MODIFY THE TRIANGULAR MATRIX TO REFLECT THE EFFECT OF  QUAS    418
                C     THE SOLUTIONS OBTAINED SO FAR  (EQ 21)                    QUAS    419
                C * * NOTE..LOCATIONS A(1) TO A(N1-1) ARE NOW FREE TO USE       QUAS    420
420             C                                                               QUAS    421
                C - - CALCULATE THE NEXT VALUES OF 'NEL' AND 'NREM'             QUAS    422
                C                                                               QUAS    423
                   NELOLD = NEL                                                 QUAS    424
                   KOLD = K                                                     QUAS    425
425                NEL = NEL - K                                                QUAS    426
                   NREM = NREM - K                                              QUAS    427
                C                                                               QUAS    428
                   NROW = NREM - K + 1                                          QUAS    429
                   IF (K .LT. NREM) GO TO 150                                   QUAS    430
430                LAST = .TRUE.                                                QUAS    431
                   NROW = 1                                                     QUAS    432
                   K = NREM                                                     QUAS    433
                 150 NS = 1                                                     QUAS    434
                   NT = NELOLD + 1                                              QUAS    435
435             C                                                               QUAS    436
                C - - READ IN THE ROWS TO BE MODIFIED                           QUAS    437
                C                                                               QUAS    438
                   DO 190 IB = 1, NREM                                          QUAS    439
                   NT = NT - 1                                                  QUAS    440
440                IF (IB .LE. NROW) GO TO 160                                  QUAS    441
                   NS = NS + NN                                                 QUAS    442
                   NT = NT + NN                                                 QUAS    443
                 160 IF (.NOT. JPASS1)GO TO 161                                 QUAS    444
                   NBEG = NT - M + 1                                            QUAS    445
445             C*** ***READ RHS FROM NATAPE                                    QUAS    446
                   READ (NATAPE) ( A(IO),IO = NBEG,NT)                          QUAS    447
                   NT = NT - M                                                  QUAS    448
                 161 READ(MT)NN,(A(IO),IO=NS,NT)                                QUAS    449
                   IF( .NOT. JPASS1 ) GO TO 163                                 QUAS    450
450                NT = NT + M                                                  QUAS    451
                   NN = NN + M                                                  QUAS    452
                 163 NP = N1 - 1                                                QUAS    453
                   NF = NT - M - KM1                                            QUAS    454
                   NN = NN - KOLD                                               QUAS    455
455                DO 170 MN = 1, M                                             QUAS    456
                   N2 = NF                                                      QUAS    457
```

```
                      NA = NP + MN                                              QUAS      458
                      NB = NA                                                   QUAS      459
                      SUM = (0.0,0.0)                                           QUAS      460
460                   DO 165 IO = 1, KOLD                                       QUAS      461
                      SUM = SUM + A(N2) * A(NA)                                 QUAS      462
                      N2 = N2 + 1                                               QUAS      463
                    165 NA = NA + M                                             QUAS      464
                      N2 = N2 + MN - 1                                          QUAS      465
465                 170 A(N2) = A(N2) - SUM                                     QUAS      466
                    C                                                           QUAS      467
                    C - - WRITE THE MODIFIED ROW ON TAPE OR CONDENSE THE ROW    QUAS      468
                    C                                                           QUAS      469
                      NL = NT - M + 1                                           QUAS      470
470                   IF (IB .GE. NROW) GO TO 175                               QUAS      471
                      NF = NL - KP1                                             QUAS      472
                      WRITE (NOUT) NN, (A(IO), IO = NS, NF), (A(IO), IO = NL, NT) QUAS    473
                      GO TO 190                                                 QUAS      474
                    175 NF = NL - KOLD                                          QUAS      475
475                   DO 180 MN = NL, NT                                        QUAS      476
                      A(NF) = A(MN)                                             QUAS      477
                    180 NF = NF + 1                                             QUAS      478
                    190 CONTINUE                                                QUAS      479
                    C*** ***IF 1ST TIME THRU BACK SOLN,SWITCH TAPES SO THAT MT WHICH HAS THE QUAS 480
480                 C*** ***ORIGINAL TRAPEZOIDAL MATRIX ON IT BECOME NATAPE AND IS NOT TO   QUAS 481
                    C*** ***TAPE PART IN ALTERNATING SHRINKING MATRICES.  NATAPE BECOMES MT QUAS 482
                    C*** ***AND THIS NOW DOES THE ALTERNATING WITH NOUT.        QUAS      483
                      IF( .NOT. JPASS1 ) GO TO 195                              QUAS      484
                      NTEMP = MT                                                QUAS      485
485                   MT = NATAPE                                               QUAS      486
                      NATAPE = NTEMP                                            QUAS      487
                      JPASS1= .FALSE.                                           QUAS      488
                      REWIND NATAPE                                             QUAS      489
                    195 REWIND MT                                               QUAS      490
490                   REWIND NOUT                                               QUAS      491
                    C                                                           QUAS      492
                    C - - SWITCH THE TAPES                                      QUAS      493
                    C                                                           QUAS      494
                      NT = MT                                                   QUAS      495
495                   MT = NOUT                                                 QUAS      496
                      NOUT = NT                                                 QUAS      497
                    C                                                           QUAS      498
                    C - - LOOP BACK THRU THE SOLUTION                           QUAS      499
                    C                                                           QUAS      500
500                   NL = NF                                                   QUAS      501
                      GO TO 119                                                 QUAS      502
                    C                                                           QUAS      503
                    C - - START TO WRAP IT UP                                   QUAS      504
                    C                                                           QUAS      505
505                 200 REWIND NIN                                              QUAS      506
                      N2 = N                                                    QUAS      507
                    C                                                           QUAS      508
                    C * * NOTE.. AT THIS POINT ALL LOCATIONS A(1) THRU A(KORE) ARE FREE QUAS 509
                    C                                                           QUAS      510
510                   DO 220 IB = 1, NPASS                                      QUAS      511
                      READ (NIN) K                                              QUAS      512
                      N1 = N2 - K + 1                                           QUAS      513
                      NS = N1                                                   QUAS      514
```

```
                      NT = N2                                                    QUAS      515
515             C                                                                QUAS      516
                C - - READ IN THE SOLUTIONS                                      QUAS      517
                C                                                                QUAS      518
                      DO 210 IO = 1, M                                           QUAS      519
                      READ (NIN) (A(NN), NN = NS, NT)                            QUAS      520
520                   NT = NT + N                                                QUAS      521
                  210 NS = NS + N                                                QUAS      522
                  220 N2 = N1 - 1                                                QUAS      523
                C                                                                QUAS      524
                C  ---  REWIND ALL INPUT TAPES                                   QUAS      525
525                   REWIND NIN                                                 QUAS      526
                      REWIND MT                                                  QUAS      527
                      REWIND NOUT                                                QUAS      528
                C - - WRITE THE SOLUTIONS ON TAPE                                QUAS      529
                C                                                                QUAS      530
530                   NT = O                                                     QUAS      531
                      DO 230 IO = 1, M                                           QUAS      532
                      NS = NT + 1                                                QUAS      533
                      NT = NT + N                                                QUAS      534
                      IF (NPR1.EQ.O) GO TO 230                                   QUAS      535
535                   WRITE (ITAPEW,3) IO                                        QUAS      536
                      WRITE (ITAPEW,2) (A(NN), NN = NS, NT)                      QUAS      537
                  230 WRITE (NW) (A(NN), NN = NS, NT)                            QUAS      538
                C    ***   IF TAPE WAS NEVER SWITCHED IT WOULD BE FOOLISH TO SWITCH BACK  QUAS  539
                      IF(JPASS1)GO TO 290                                        QUAS      540
540             C                                                                QUAS      541
                C***    ***SWITCH TAPES                                          QUAS      542
                C*** ***BACK SO THAT  MT WILL CONAIN THE TRAPEZOIDAL MATRIX      QUAS      543
                C*** ***NATAPE WILL HAVE NOTHING USEFUL ON IT.                   QUAS      544
                      NTEMP = NATAPE                                             QUAS      545
545                   NATAPE = MT                                                QUAS      546
                      MT = NTEMP                                                 QUAS      547
                      REWIND NATAPE                                              QUAS      548
                  290 IF( .NOT. LASTRS)GO TO 109                                 QUAS      549
                  295 CONTINUE                                                   QUAS      550
550             C                                                                QUAS      551
                C READ THE TEMPORARY UNIT FOR AIC'S, STORE ON THE PERMANENT UNIT,  QUAS     552
                C AND ADD THE ADDITIONAL INFORMATION                             QUAS      553
                C                                                                QUAS      554
                      CALL GEDLAB (8HQUAS  03,LTAPE,NAME,1,IRD,JCD)              QUAS      555
555                   REWIND MT                                                  QUAS      556
                      KRED = O                                                   QUAS      557
                C                                                                QUAS      558
                      DO 450 I=1,NLCNT                                           QUAS      559
                      CALL GETROW (LTAPE,1,KREAD,1)                              QUAS      560
560                   CALL PUTROW (LTAPES,2,KREAD,1)                             QUAS      561
                      KRED = KRED + KREAD                                        QUAS      562
                      KREAD = KREAD + (N-KRED-1)                                 QUAS      563
                      DO 450 LREAD=1,KREAD                                       QUAS      564
                      CALL GETROW (LTAPE,1,MAXW,1)                               QUAS      565
565                   CALL PUTROW (LTAPES,2,MAXW,1)                              QUAS      566
                      MAXH = 2*MAXW                                              QUAS      567
                      CALL GETROW (LTAPE,1,DUMMY,MAXH)                           QUAS      568
                      CALL PUTROW (LTAPES,2,DUMMY,MAXH)                          QUAS      569
                  450 CONTINUE                                                   QUAS      570
570             C                                                                QUAS      571
```

```
                      DO 500 NROW=1,ND                                          QUAS      572
                      READ (MT) ICNT,(A(I),I=1,ICNT)                            QUAS      573
                      MAXW = ICNT                                               QUAS      574
                      CALL PUTROW (LTAPES,2,MAXW,1)                             QUAS      575
575                   MAXH = 2*MAXW                                             QUAS      576
                      CALL PUTROW (LTAPES,2,A,MAXH)                             QUAS      577
                    500 CONTINUE                                                QUAS      578
                      LTAPE = LTAPES                                            QUAS      579
                    C                                                           QUAS      580
580                 C   ***   REWIND ALL FILES EXCEPT THE OUTPUT FILE   NW      QUAS      581
                    C                                                           QUAS      582
                      REWIND NI                                                 QUAS      583
                      REWIND MM                                                 QUAS      584
                      REWIND NO                                                 QUAS      585
585                   REWIND NAT                                                QUAS      586
                      IF( RHSTAP .NE. 0 ) REWIND RHSTAP                         QUAS      587
                      MD = MTOTAL                                               QUAS      588
                   9999 CONTINUE                                                QUAS      589
                    C                                                           QUAS      590
590                 C                                                           QUAS      591
                    C FORMATS                                                   QUAS      592
                    C                                                           QUAS      593
                        2 FORMAT (1HO,6E20.8)                                   QUAS      594
                        3 FORMAT (1HO, 10HCOLUMN NO.,I6,2X,17HOF GAMMAS FOLLOWS,//)  QUAS  595
595                 C                                                           QUAS      596
                      RETURN                                                    QUAS      597
                      END                                                       QUAS      598
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS DEF LINE REFERENCES

3	QUAS	1	55 596

VARIABLES SN TYPE RELOCATION

2216	A	COMPLEX	ARRAY	REFS	14	2*122	3*126	136	147	2*165	3*168	
					179	180	248	2*258	259	274	2*284	285
					306	326	351	2*379	2*391	2*392	402	411
					2*461	465	2*472	476	536	537	576	
				DEFINED	99	122	126	156	165	168	222	
					259	285	326	346	351	379	392	402
					446	448	465	476	519	572		
2122	B	REAL		REFS	2*85	2*297	DEFINED	83	295			
2123	C	REAL		REFS	85	297	DEFINED	84	296			
12056	DUMMY	REAL	ARRAY	REFS	19	567	568					
2156	I	INTEGER		REFS	222	256	322	572	DEFINED	222	240	
					268	321	336	558	572			
2126	IB	INTEGER		REFS	115	118	132	147	156	383	384	
					387	388	440	470	DEFINED	96	114	131
					147	156	162	382	438	510		
2215	ICNT	INTEGER		REFS	572	573	DEFINED	572				
2176	IDUMMY	INTEGER		DEFINED	337	346						
1	IFILES	INTEGER	ARRAY CFILES	REFS	18	24	DEFINED	203	352			

VARIABLES	SN	TYPE		RELOCATION								
2171		INITP1	INTEGER			REFS	304	DEFINED	302			
2130		IO	INTEGER			REFS	99	389	390	411	446	448	2*472
						535	DEFINED	99	118	144	155	388	411
						446	448	460	2*472	518	531		
0		IOS	INTEGER	ARRAY	PLACES	REFS	21	25	35				
2146		IRD	INTEGER			REFS	204	353	554				
2077		IRDU	INTEGER			REFS	72	DEFINED	33				
0		ITAPES	INTEGER	ARRAY	CTAPES	REFS	18	23	41				
2103		ITAPEW	INTEGER			DEFINED	41	I/O REFS	535	536			
2101		IUMEMF	INTEGER			REFS	71	DEFINED	35				
2155		J	INTEGER			REFS	306	346	DEFINED	221	306	323	346
2147		JCD	INTEGER			REFS	204	353	554				
2100		JCDU	INTEGER			REFS	72	DEFINED	34				
2161		JCNT	INTEGER			REFS	253	255	279	281	DEFINED	249	253
						275	279	342					
2074		JPASS1	LOGICAL			REFS	27	443	449	483	539		
						DEFINED	309	487					
2121		K	INTEGER			REFS	80	86	96	105	114	118	128
						130	144	162	193	202	232	236	237
						282	291	298	299	300	334	339	342
						368	373	374	398	407	424	425	426
						428	429	512	DEFINED	76	82	90	297
						298	432	511					
2177		KCNT	INTEGER			REFS	344	345	DEFINED	339	344		
0		KD	INTEGER		F.P.	REFS	45	DEFINED	1				
2200		KEND	INTEGER			REFS	349	DEFINED	348				
2167		KF	INTEGER			REFS	301	314	323	348	349		
						DEFINED	299						
0		KFILES	INTEGER		CFILES	REFS	24						
2151		KINIT	INTEGER			REFS	218	219	220	226	227	255	281
						291	DEFINED	217	291				
2170		KLEFT	INTEGER			REFS	304	DEFINED	301				
2140		KMi	INTEGER			REFS	131	240	381	382	453		
						DEFINED	130	237	300	373			
2207		KOLD	INTEGER			REFS	454	460	474	DEFINED	424		
2105		KORE	INTEGER			REFS	52	55	76	84	151	156	166
						180	202	217	296	314	322	397	411
						DEFINED	45						
2204		KP1	INTEGER			REFS	471	DEFINED	374				
2213		KREAD	INTEGER			REFS	559	560	561	562	563		
						DEFINED	562						
2212		KRED	INTEGER			REFS	561	562	DEFINED	556	561		
2157		KSUM	INTEGER			REFS	236	261	266	DEFINED	228	236	
2166		KSUMP1	INTEGER			REFS	268	293	DEFINED	266			
2124		KTEMP	INTEGER			REFS	86	90	DEFINED	85			
2076		LAST	LOGICAL			REFS	29	81	149	415	DEFINED	80	91
						368	430						
2075		LASTRS	LOGICAL			REFS	28	214	548	DEFINED	212		
2137		LBEG	INTEGER			REFS	132	133	136	137	DEFINED	129	137
2141		LEND	INTEGER			REFS	133	DEFINED	132				
2214	*	LREAD	INTEGER			DEFINED	563						
0		LTAPE	INTEGER		F.P.	REFS	70	72	128	134	136	177	179
						203	204	232	246	248	272	274	352
						353	554	559	564	567	DEFINED	1	71
						578							
2120		LTAPES	INTEGER			REFS	560	565	568	574	576	578	
						DEFINED	70						

VARIABLES	SN	TYPE	RELOCATION							
2107	M	INTEGER		REFS	53	55	64	150	194	202	209
				211	213	215	217	221	227	295	303
				315	320	365	367	377	383	399	409
				411	444	447	450	451	453	455	463
				469	518	531	DEFINED	52	56	208	214
2143	MAXH	INTEGER		REFS	136	179	248	274	567	568	576
				DEFINED	135	178	247	273	566	575	
2142	MAXW	INTEGER		REFS	134	135	177	178	246	247	272
				273	564	565	566	574	575		
				DEFINED	133	176	573				
0	MD	INTEGER	F.P.	DEFINED	1	587					
0	MM	INTEGER	F.P.	REFS	58	DEFINED	1	I/O REFS	583		
2110	MMAX	INTEGER		REFS	54	83	84	208	DEFINED	53	
2173	MM1	INTEGER		REFS	321	348	DEFINED	315			
2134	MN	INTEGER		REFS	124	2*126	164	2*165	168	175	180
				378	410	457	464	476	DEFINED	120	124
				161	169	377	399	409	455	475	
2144	MNM1	INTEGER		REFS	176	DEFINED	175				
2115	MP1	INTEGER		REFS	375	384	387	DEFINED	64	367	
2106	MRHS	INTEGER		REFS	53	212	214	DEFINED	48	51	
2112	MT	INTEGER		REFS	484	494	545	DEFINED	58	485	495
				546	I/O REFS	59	147	205	337	346	354
				448	489	526	555	572			
2150	MTOTAL	INTEGER		REFS	211	212	213	214	215	587	
				DEFINED	207	211	213	215			
2104	N	INTEGER		REFS	52	54	55	57	65	217	220
				224	227	252	255	261	268	278	281
				293	301	303	306	322	364	365	368
				506	520	521	533	562	DEFINED	44	
2210	NA	INTEGER		REFS	458	461	463	DEFINED	457	463	
21720	NAME	INTEGER	ARRAY	REFS	20	204	353	554			
21716	NAMES	INTEGER	ARRAY	REFS	20	72	DEFINED	31			
0	NAT	INTEGER	F.P.	REFS	37	DEFINED	1	I/O REFS	585		
2102	NATAPE	INTEGER		REFS	485	544	DEFINED	37	486	545	
				I/O REFS	38	306	307	446	488	547	
2135	NB	INTEGER		REFS	125	126	167	168	DEFINED	121	125
				163	167	458					
2153	NBEG	INTEGER		REFS	222	241	252	264	287	345	346
				446	DEFINED	219	223	226	241	287	343
				444							
0	ND	INTEGER	F.P.	REFS	44	2*298	334	571	DEFINED	1	
2117	NEL	INTEGER		REFS	2*76	98	101	109	119	142	143
				146	151	193	194	423	425		
				DEFINED	66	193	366	425			
2206	NELOLD	INTEGER		REFS	434	DEFINED	423				
2131	NELP1	INTEGER		REFS	110	116	129	145	170		
				DEFINED	101						
2132	NELP2	INTEGER		REFS	115	DEFINED	110				
2154	NEND	INTEGER		REFS	222	223	224	242	252	265	288
				305	306	343	346	350	351	363	
				DEFINED	220	224	227	242	288	303	305
				338	345	350					
2136	NF	INTEGER		REFS	166	169	2*379	383	386	2*392	456
				472	476	477	500	DEFINED	123	164	378
				383	453	471	474	477			
0	NFILE	INTEGER	F.P.	REFS	203	352	DEFINED	1			
0	NI	INTEGER	F.P.	REFS	60	DEFINED	1	I/O REFS	582		

VARIABLES	SN	TYPE	RELOCATION								
2113	NIN	INTEGER		REFS	187	DEFINED	60	188	I/O REFS	61	99
				156	183	199	407	411	505	511	519
				525							
2201	NL	INTEGER		REFS	375	400	402	403	471	472	474
				475	DEFINED	363	400	403	469	500	
2160	NLCNT	INTEGER		REFS	233	558	DEFINED	230	233		
2116	NN	INTEGER		REFS	80	82	137	2*168	258	284	391
				403	441	442	451	454	472	519	536
				537	DEFINED	65	166	194	256	282	389
				398	448	451	454	519	536	537	
2172	NNEW	INTEGER		REFS	324	326	340	347	348	349	
				DEFINED	314	324	340	347			
0	NO	INTEGER	F.P.	REFS	62	DEFINED	1	I/O REFS	584		
2174	NOLD	INTEGER		REFS	325	326	DEFINED	322	325		
2114	NOUT	INTEGER		REFS	188	495	DEFINED	62	189	496	
				I/O REFS	63	180	182	200	472	490	527
2133	NP	INTEGER		REFS	123	147	148	150	155	390	391
				457	DEFINED	115	142	148	150	386	390
				452							
2203	NPASS	INTEGER		REFS	376	510	DEFINED	369	376		
2111	NPM	INTEGER		REFS	55	66	366	DEFINED	54	57	365
2162	NPP	INTEGER		REFS	2*259	2*285	306	351	DEFINED	252	278
				304	349						
0	NPR1	INTEGER	F.P.	REFS	534	DEFINED	1				
2202	NREM	INTEGER		REFS	426	428	429	432	438		
				DEFINED	364	426					
2175	NREMAN	INTEGER		REFS	335	336	DEFINED	334			
2163	NROW	INTEGER		REFS	257	258	283	284	440	470	
				DEFINED	255	257	281	283	428	431	571
2127	NS	INTEGER		REFS	99	116	117	121	122	145	147
				156	161	176	179	378	379	380	410
				441	448	472	519	521	536	537	
				DEFINED	97	109	116	143	145	151	375
				408	433	441	513	521	532		
2125	NT	INTEGER		REFS	97	98	99	119	120	2*122	126
				146	147	163	165	170	180	189	384
				389	392	411	439	442	444	446	447
				448	450	453	469	472	475	496	519
				520	532	533	536	537	DEFINED	95	98
				117	119	141	146	160	170	180	187
				380	384	410	434	439	442	447	450
				494	514	520	530	533			
2164	NTBEG	INTEGER		REFS	269	278	DEFINED	264	269		
2211	NTEMP	INTEGER		REFS	486	546	DEFINED	484	544		
2165	NTEND	INTEGER		REFS	270	278	DEFINED	265	270		
0	NW	INTEGER	F.P.	DEFINED	1	I/O REFS	39	537			
2145	N1	INTEGER		REFS	401	402	408	452	513	522	
				DEFINED	202	397	401	512			
2205	N2	INTEGER		REFS	390	461	462	464	2*465	512	514
				DEFINED	387	456	462	464	506	522	
0	RHSTAP	INTEGER	F.P.	REFS	16	47	586	DEFINED	1		
				I/O REFS	50	51	222	586			
2072	SUM	COMPLEX		REFS	14	258	259	284	285	391	392
				461	465	DEFINED	254	258	280	284	385
				391	459	461					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES							
GEDLAB		6	204	353	554					
GETROW		4	232	246	248	272	274	559	564	567
PUDLAB		6	72							
PUTROW		4	128	134	136	177	179	560	565	568	574
			576							
SQRT	REAL	1 LIBRARY	85	297						

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
MAXO	INTEGER	0	INTRIN		55
MINO	INTEGER	0	INTRIN		53

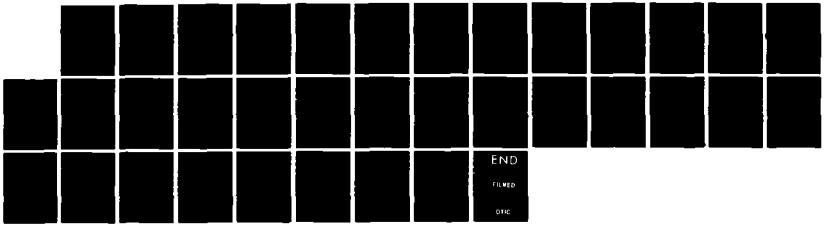
STATEMENT LABELS			DEF LINE	REFERENCES		
0	1	INACTIVE	36			
2054	2	FMT	593	536		
2057	3	FMT	594	535		
25	5		50	47		
31	6		52	49		
71	10		76	195		
115	30		95	81	86	
0	40		100	96		
0	50		126	114	118	123
0	55		137	131		
234	56		141	105		
0	60		148	144		
0	65		168	166		
0	70		170	162		
0	80		181	155		
373	90		199	149		
0	105	INACTIVE	202			
414	109		211	548		
0	110		224	221		
452	111		231	293		
0	112		258	256		
0	113		259	252		
0	114		260	240		
0	115		286	268		
617	116		295	261		
0	117		306	304		
0	118		327	321	323	
1005	119		373	501		
0	120		391	388		
0	121		351	342	349	
0	122		337	336		
0	123		284	282		
0	124		285	278		
0	125		392	382		
725	126		338	335		
1075	130		393	377	381	
0	135		402	399		
0	140		403	398		
0	145		411	409		
1161	150		433	429		
1172	160		443	440		
1205	161		448	443		
1220	163		452	449		
0	165		463	460		

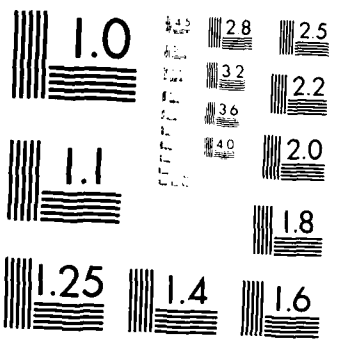
STATEMENT	LABELS		DEF LINE	REFERENCES	
0	170		465	455	
1307	175		474	470	
0	180		477	475	
1323	190		478	438	473
1334	195		489	483	
1345	200		505	415	
0	210		521	518	
0	220		522	510	
1426	230		537	531	534
1445	290		548	539	
1446	295		549	209	
0	450		569	558	563
0	500		577	571	
0	1114	INACTIVE	245		
0	1115	INACTIVE	271		
714	1118		328	320	
0	9999	INACTIVE	588		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
117	40	IB	96 100	14B		EXT REFS
140	50	IB	114 126	46B		NOT INNER
145	50	IO	118 126	36B		NOT INNER
167	50	NF	123 126	11B	OPT	
214	55	IB	131 137	20B		EXT REFS
240	60	IO	144 148	15B		EXT REFS
263	80	IO	155 181	77B		EXT REFS NOT INNER
275	70	IB	162 170	37B		NOT INNER
316	65	NN	166 168	10B	OPT	
430	110	J	221 224	15B		EXT REFS
462	114	I	240 260	50B		EXT REFS NOT INNER
475	113	NPP	252 259	32B		NOT INNER
507	112	NN	256 258	10B	OPT	
540	115	I	268 286	50B		EXT REFS NOT INNER
553	124	NPP	278 285	32B		NOT INNER
565	123	NN	282 284	10B	OPT	
643	117	NPP	304 306	20B		EXT REFS NOT INNER
650		J	306 306	7B		EXT REFS
672	118	I	321 327	22B		NOT INNER
703	118	J	323 327	6B	INSTACK	
720	122	I	336 337	5B		EXT REFS
732	121	JCNT	342 351	33B		EXT REFS NOT INNER
755	121	NPP	349 351	5B	INSTACK	
1013	130	MN	377 393	65B		NOT INNER
1027	125	IB	382 392	46B		NOT INNER
1043	120	IO	388 391	14B	OPT	
1102	140	NN	398 403	20B		NOT INNER
1110	135	MN	399 402	6B	INSTACK	
1127	145	MN	409 411	21B		EXT REFS NOT INNER
1135		IO	411 411	7B		EXT REFS
1164	190	IB	438 478	142B		EXT REFS NOT INNER
1227	170	MN	455 465	40B		NOT INNER
1243	165	IO	460 463	12B	OPT	
1316	180	MN	475 477	4B	INSTACK	
1352	220	IB	510 522	30B		EXT REFS NOT INNER
1361	210	IO	518 521	14B		EXT REFS
1411	230	IO	531 537	27B		EXT REFS
1455	450	I	553 569	31B		EXT REFS NOT INNER

AD-A152 270 ESP (EXTERNAL-STORES PROGRAM) - A PILOT COMPUTER PROGRAM FOR DETERMINING..(U) GRUMMAN AEROSPACE CORP BETHPAGE NY J B SMEDFJELD FEB 85 ADCR-85-1-VOL-3-PT-1 8/8

UNCLASSIFIED N00019-81-C-0395 F/G 9/2 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
1466	450	LREAD	563 569	16B	EXT REFS
1507	500	NROW	571 577	20B	EXT REFS

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)	
CTAPES	50	0 ITAPES (50)	
CFILES	51	0 KFILES (1)	1 IFILES (50)
PLACES	98	0 IOS (98)	

STATISTICS

PROGRAM LENGTH	21750B	9192
CM LABELED COMMON LENGTH	307B	199

520000B CM USED

```
      SUBROUTINE FUTSOL(ND,MD,KD,NI,MM,NO,NAT,NW,LTAPE,LFILE,RHSTAP,     FUTSOL      2
     1NPR1)                                                              FUTSOL      3
C                                                                        FUTSOL      4
C   ***   THIS IS THE COMPLEX VERSION OF FUTSOL                          FUTSOL      5
C                                                                        FUTSOL      6
C                                                                        FUTSOL      7
C                                                                        FUTSOL      8
C          ****    ***/  *******  *****  *       ***/          *        FUTSOL      9
C          *   *  *  /*     *     *      *     *  /*       ******      FUTSOL     10
C     **** ****   * / *     *     ***    *     * / *  ****     *  *     FUTSOL     11
C          *      */  *     *     *      *     */  *             ***     FUTSOL     12
C          *      /***      *     *      *****  /***             *  *    FUTSOL     13
C                                                                        FUTSOL     14
C            D I R E C T   M A T R I X   S O L U T I O N                 FUTSOL     15
C                                                                        FUTSOL     16
C     WRITTEN BY J. L. HESS * PROGRAMMED BY C. D. SCHOOR                 FUTSOL     17
C*** ***LTAPE IS THE TAPE THE L(I,J) MATRIX WILL BE PUT ON               FUTSOL     18
C*** ***RHSTAP IS THE TAPE THAT THE RIGHT HAND SIDES ARE INPUT ON        FUTSOL     19
      INTEGER RHSTAP                                                     FUTSOL     20
C                                                                        FUTSOL     21
      DIMENSION ITAPES(50),IFILES(50)                                    FUTSOL     22
C                                                                        FUTSOL     23
      COMMON / CTAPES / ITAPES                                           FUTSOL     24
      COMMON / CFILES / KFILES, IFILES                                   FUTSOL     25
C                                                                        FUTSOL     26
      DIMENSION NAME(2)                                                  FUTSOL     27
      DIMENSION DUMMY(4000)                                              FUTSOL     28
C                                                                        FUTSOL     29
      COMPLEX A(2000), SUM                                               FUTSOL     30
C                                                                        FUTSOL     31
      LOGICAL JPASS1                                                     FUTSOL     32
      LOGICAL  LASTRS                                                    FUTSOL     33
      LOGICAL  LAST                                                      FUTSOL     34
C                                                                        FUTSOL     35
    1 CONTINUE                                                           FUTSOL     36
      NATAPE = NAT                                                       FUTSOL     37
      REWIND NATAPE                                                      FUTSOL     38
      REWIND NW                                                          FUTSOL     39
C                                                                        FUTSOL     40
C                                                                        FUTSOL     41
      ITAPEW = ITAPES(6)                                                 FUTSOL     42
C                                                                        FUTSOL     43
C                                                                        FUTSOL     44
      N = ND                                                             FUTSOL     45
      KORE = KD                                                          FUTSOL     46
C*** *  RHSTAP = 0 IF THERE ARE NO RHS TO BE PROCESSED THIS RUN          FUTSOL     47
      IF(RHSTAP .NE. 0 )GO TO 5                                          FUTSOL     48
      MRHS = 0                                                           FUTSOL     49
      GO TO 6                                                            FUTSOL     50
    5 REWIND RHSTAP                                                      FUTSOL     51
      READ(RHSTAP)MRHS                                                   FUTSOL     52
    6 M = KORE/N -1                                                      FUTSOL     53
      MMAX = MINO(MRHS,M)                                                FUTSOL     54
      NPM = N + MMAX                                                     FUTSOL     55
      IF (MAXO(3 * NPM, M * N) .GT. KORE) RETURN                         FUTSOL     56
      M = 0                                                              FUTSOL     57
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                      MT = MM                                                  FUTSOL     59
                      REWIND MT                                                FUTSOL     60
60                    NIN = NI                                                 FUTSOL     61
                      REWIND NIN                                               FUTSOL     62
                      NOUT = NO                                                FUTSOL     63
                      REWIND NOUT                                              FUTSOL     64
                      NN = N                                                   FUTSOL     65
65                    NEL = NPM                                                FUTSOL     66
                C                                                              FUTSOL     67
                C - - CALCULATE THE MAXIMUM NO. OF ROWS, 'K'                   FUTSOL     68
                C                                                              FUTSOL     69
                C*** ***CALCULATE THE NUMBER OF COLUMNS TO BRING OFF OF THE RHS TAPE FUTSOL 70
70                    MTOTAL = O                                               FUTSOL     71
                      M = MMAX                                                 FUTSOL     72
                      IF'M .EQ. O)GO TO 295                                    FUTSOL     73
                C*** ***MTOTALIS THE TOTAL NUMBER OF RHS COLUMNS ALREADY BROUGHT IN FUTSOL 74
                  109 MTOTAL = MTOTAL + M                                      FUTSOL     75
75                    LASTRS = MTOTAL.GE. MRHS                                 FUTSOL     76
                      MTOTAL = MTOTAL - M                                      FUTSOL     77
                      IF (LASTRS)M = MRHS - MTOTAL                             FUTSOL     78
                      MP1 = M + 1                                              FUTSOL     79
                      MM1 = M - 1                                              FUTSOL     80
80                    MTOTAL = MTOTAL + M                                      FUTSOL     81
                C*** ***BRING IN M COLUMNS OF RHS                              FUTSOL     82
                      KINIT = KORE - (M*N)                                     FUTSOL     83
                      IINIT = KINIT                                            FUTSOL     84
                      NBEG = KINIT + 1                                         FUTSOL     85
85                    NEND = KINIT+ N                                          FUTSOL     86
                      DO 110 J =1,M                                            FUTSOL     87
                      READ (RHSTAP)( A(I),I=NBEG,NEND)                         FUTSOL     88
                      NBEG = NEND + 1                                          FUTSOL     89
                  110 NEND = NEND + N                                          FUTSOL     90
90              C*** ***BRING IN L(I,J) MATRIX AND APPLY IT TO RHS             FUTSOL     91
                      NBEG = 1 + KINIT                                         FUTSOL     92
                      NEND = 1 + (M-1) * N + KINIT                             FUTSOL     93
                      KSUM = O                                                 FUTSOL     94
                      NLCNT = O                                                FUTSOL     95
95              C*** ***DO TRIANGULAR SECTION OF LMATRIX                       FUTSOL     96
                  111 CONTINUE                                                 FUTSOL     97
                      CALL GETROW (LTAPE,1,K,1)                                FUTSOL     98
                      NLCNT = NLCNT + 1                                        FUTSOL     99
                C*** ***KSUM IS THE TOTAL NUMBER OF L ROWS THAT WILL           FUTSOL    100
100             C*** ***BE READ AFTER THIS TRIANGULAR SECTION IS FINISHED      FUTSOL    101
                      KSUM = KSUM + K                                          FUTSOL    102
                      KM1 = K - 1                                              FUTSOL    103
                C***   ***NOTE THAT KM1 CAN'T BE O SINCE K CAN'T BE 1 AND STILL HAVE SOM FUTSOL 104
                C***   ***ON THE LTAPE                                         FUTSOL    105
105                   DO 114  I = 1,KM1                                        FUTSOL    106
                      NBEG = NBEG + 1                                          FUTSOL    107
                      NEND = NEND + 1                                          FUTSOL    108
                C*** ***READ 1 ROW OF L(I,J) FROM LTAPE---K-1 TIMES---EACH TIME FUTSOL 109
                C*** ***STARTING WITH L(1)                                     FUTSOL    110
110                   CALL GETROW (LTAPE,1,MAXW,1)                             FUTSOL    111
                      MAXH = 2*MAXW                                            FUTSOL    112
                      CALL GETROW (LTAPE,1,A,MAXH)                             FUTSOL    113
                      JCNT = -1                                                FUTSOL    114
                C*** ***REDUCE THE RHS BY GOING ACROSS A SOLUTION ROW (WHICH   FUTSOL    115
```

```
115         C*** ***ARE NOT IN CONSECUTIVE ORDER, BUT A(1), A(N+1), A(2N+1) ETC.)     FUTSOL  116
                  DO 113 NPP = NBEG,NEND,N                                           FUTSOL  117
                  JCNT = JCNT + 1                                                    FUTSOL  118
                  SUM = (0.0,0.0)                                                    FUTSOL  119
                  NROW = KINIT + ( JCNT * N )                                        FUTSOL  120
120               DO 112 NN=1,I                                                      FUTSOL  121
                  NROW = NROW + 1                                                    FUTSOL  122
                112 SUM = SUM + ( A(NN)*A(NROW))                                     FUTSOL  123
                113 A(NPP) = A(NPP) - SUM                                            FUTSOL  124
                114 CONTINUE                                                         FUTSOL  125
125               IF (KSUM .EQ. N)GO TO 116                                          FUTSOL  126
            C*** ***KSUM = N IF YOU HAVE READ ENTIRE LMATRIX AND                     FUTSOL  127
            C*** ***THERE IS NO CONSTANT SECTION LEFT                                FUTSOL  128
                  NTBEG = NBEG                                                       FUTSOL  129
                  NTEND = NEND                                                       FUTSOL  130
130               KSUMP1 = KSUM + 1                                                  FUTSOL  131
            C*** ***READ REST OF LROWS 1 ROW AT A TIME FOR CONSTANT SECTION          FUTSOL  132
                  DO 115 I=KSUMP1,N                                                  FUTSOL  133
                  NTBEG = NTBEG + 1                                                  FUTSOL  134
                  NTEND = NTEND + 1                                                  FUTSOL  135
135               CALL GETROW (LTAPE,1,MAXW,1)                                       FUTSOL  136
                  MAXH = 2*MAXW                                                      FUTSOL  137
                  CALL GETROW (LTAPE,1,A,MAXH)                                       FUTSOL  138
                  JCNT = -1                                                          FUTSOL  139
            C*** ***PARTIALLY  REDUCE A RHS ACROSS A RHS ROW BY APPLYING K NUMBER    FUTSOL  140
140         C*** ***OF L(I,J) S                                                      FUTSOL  141
                  DO 124 NPP = NTBEG,NTEND,N                                         FUTSOL  142
                  JCNT = JCNT + 1                                                    FUTSOL  143
                  SUM = (0.0,0.0)                                                    FUTSOL  144
                  NROW = KINIT + ( JCNT * N )                                        FUTSOL  145
145               DO 123 NN = 1,K                                                    FUTSOL  146
                  NROW = NROW + 1                                                    FUTSOL  147
                123 SUM = SUM + ( A(NN) * A(NROW) )                                  FUTSOL  148
                124 A(NPP) = A(NPP) - SUM                                            FUTSOL  149
                115 CONTINUE                                                         FUTSOL  150
150               NBEG = NBEG + 1                                                    FUTSOL  151
                  NEND = NEND + 1                                                    FUTSOL  152
            C*** ***KINIT IS HOW FAR DOWN A COLUMN OF RHS TO START MULTIPLYING BY    FUTSOL  153
            C*** ***L(I,J) AT EACH PASS THROUGH                                      FUTSOL  154
                  KINIT = KINIT + K                                                  FUTSOL  155
155         C*** ***IF KSUMP1 = N THERE ARE NO MORE L(I,J)'S LEFT                    FUTSOL  156
                  IF(KSUMP1 .LT. N)GO TO 111                                         FUTSOL  157
            C*** ***WRITE OUT ALL BUT LAST K ROWS OF RHS IN ROW ORDER ON NATAPE      FUTSOL  158
                116 B = 4*M + 3                                                      FUTSOL  159
                  C = -2 * KORE                                                      FUTSOL  160
160               K = (  -B  +  SQRT( B**2  -4.0*C )  )/2.0                          FUTSOL  161
                  IF(K .GT. ND) K = ND                                               FUTSOL  162
                  KF = K                                                             FUTSOL  163
                  KM1 = K - 1                                                        FUTSOL  164
                  KLEFT = N - KF + IINIT                                             FUTSOL  165
165               INITP1 = IINIT + 1                                                 FUTSOL  166
                  NEND = (M-1)*N + IINIT                                             FUTSOL  167
                  DO 117 NPP = INITP1,KLEFT                                          FUTSOL  168
                  NEND = NEND + 1                                                    FUTSOL  169
                117 WRITE(NATAPE) ( A(J),J=NPP,NEND,N)                               FUTSOL  170
170               REWIND NATAPE                                                      FUTSOL  171
            C*** ***JPASS1 IS TRUE ON 1ST PASS THRU BACK SOLUTION                    FUTSOL  172
```

```
      JPASS1 = .TRUE.                                                    FUTSOL   173
C                                                                        FUTSOL   174
C***   ***PUT REMAINING RHS IN CONTIGUOUS LOCATIONS BY COLUMNS           FUTSOL   175
C***  FROM KORE - (M * KF) + 1  TO  KORE                                 FUTSOL   176
C                                                                        FUTSOL   177
      NNEW = KORE - KF + 1                                               FUTSOL   178
C                                                                        FUTSOL   179
C***   ***IF M = 1, THE ELTS OF THE 1 RHS COLUMN ARE ALREADY IN CONTIGUO FUTSOL   180
C***   ***LOCATIONS                                                      FUTSOL   181
C                                                                        FUTSOL   182
      IF (M.EQ.1)  GO TO 1118                                            FUTSOL   183
      DO 118 I = 1,MM1                                                   FUTSOL   184
      NOLD = KORE - (I*N) + 1                                            FUTSOL   185
      DO 118 J = 1,KF                                                    FUTSOL   186
      NNEW = NNEW - 1                                                    FUTSOL   187
      NOLD = NOLD - 1                                                    FUTSOL   188
      A(NNEW) = A(NOLD)                                                  FUTSOL   189
  118 CONTINUE                                                           FUTSOL   190
 1118 CONTINUE                                                           FUTSOL   191
C                                                                        FUTSOL   192
C***   ***NOW NNEW = KORE - (M*KF) + 1                                   FUTSOL   193
C***   ***NOW NOLD = KORE - (M - 1) * N + 1 - KF                         FUTSOL   194
C  **   SKIP 1ST PART OF TRAPEZOIDAL MATRIX ON LTAPE                     FUTSOL   195
C  **   READ IN LAST K ROWS OF TRAPEZOIDAL MATRIX AND                    FUTSOL   196
C*** ***ATTATCH RHS TO IT SO THAT EVERYTHING IS IN CONSECUTIVE ORDER     FUTSOL   197
      NREMAN = ND - K                                                    FUTSOL   198
      IF( NREMAN .EQ. 0 )GO TO 126                                       FUTSOL   199
      DO 122 I=1,NREMAN                                                  FUTSOL   200
      CALL GETROW (LTAPE,1,MAXW,1)                                       FUTSOL   201
      MAXH = 2*MAXW                                                      FUTSOL   202
      CALL GETROW (LTAPE,1,DUMMY,MAXH)                                   FUTSOL   203
  122 CONTINUE                                                           FUTSOL   204
  126 NEND = 0                                                           FUTSOL   205
      KCNT = K                                                           FUTSOL   206
      NNEW = NNEW - 1                                                    FUTSOL   207
C***   ***NOTE THAT K = KF WHICH IS ALREADY KNOWN IN CORE                FUTSOL   208
      DO 121 JCNT = 1,K                                                  FUTSOL   209
      NBEG = NEND + 1                                                    FUTSOL   210
      KCNT = KCNT - 1                                                    FUTSOL   211
      NEND = NBEG + KCNT                                                 FUTSOL   212
      CALL GETROW (LTAPE,1,MAXW,1)                                       FUTSOL   213
      MAXH = 2*MAXW                                                      FUTSOL   214
      CALL GETROW (LTAPE,1,A(NBEG),MAXH)                                 FUTSOL   215
      NNEW = NNEW + 1                                                    FUTSOL   216
      KEND = (MM1 * KF) + NNEW                                           FUTSOL   217
      DO 121 NPP=NNEW,KEND,KF                                            FUTSOL   218
      NEND = NEND + 1                                                    FUTSOL   219
  121 A(NEND) = A(NPP)                                                   FUTSOL   220
      IFILES(LTAPE) = LFILE                                              FUTSOL   221
      CALL GEDLAB (8HFUTSOLO1,LTAPE,NAME,LFILE,IRD,JCD)                  FUTSOL   222
C                                                                        FUTSOL   223
C  **  SKIP OVER L MATRIX ON LTAPE TO GET TO TRAPEZOIDAL MATRIX          FUTSOL   224
C                                                                        FUTSOL   225
      KRED = 0                                                           FUTSOL   226
      DO 128 I=1,NLCNT                                                   FUTSOL   227
      CALL GETROW (LTAPE,1,KREAD,1)                                      FUTSOL   228
      KRED = KRED + KREAD                                                FUTSOL   229
```

```
                KREAD = KREAD + ( N - KRED - 1)                                  FUTSOL   230
230             DO 128 LREAD = 1,KREAD                                           FUTSOL   231
                CALL GETROW (LTAPE,1,MAXW,1)                                     FUTSOL   232
                MAXH = 2*MAXW                                                    FUTSOL   233
                CALL GETROW (LTAPE,1,DUMMY,MAXH)                                 FUTSOL   234
              128 CONTINUE                                                       FUTSOL   235
235           C                                                                  FUTSOL   236
              C - - THERE, NOW WE CAN START THE BACK-SOLUTION                     FUTSOL   237
              C * * NOTE..THE FIRST AVAILABLE LOCATION FOR THE SOLUTIONS IS A(N1) FUTSOL   238
              C                                                                  FUTSOL   239
              C                                                                  FUTSOL   240
240           C***   ***NL IS THE LAST SUBSCRIPT + 1 OF THE TRAPEZOIDAL A MATRIX THAT FUTSOL   241
              C***   ***CORE                                                     FUTSOL   242
              C                                                                  FUTSOL   243
                    NL = NEND + 1                                                FUTSOL   244
                    NREM = N                                                     FUTSOL   245
245                 NPM = N + M                                                  FUTSOL   246
                    NEL = NPM                                                    FUTSOL   247
                    MP1 = M + 1                                                  FUTSOL   248
                    LAST = K .EQ. N                                              FUTSOL   249
                    NPASS = 0                                                    FUTSOL   250
250           C                                                                  FUTSOL   251
              C - - SOLVE FOR THE ANSWERS CORRESPONDING TO 'K' ROWS              FUTSOL   252
              C                                                                  FUTSOL   253
              119 KM1 = K - 1                                                    FUTSOL   254
                    KP1 = K + 1                                                  FUTSOL   255
255                 NS = NL - MP1                                                FUTSOL   256
                    NPASS = NPASS + 1                                            FUTSOL   257
                    DO 130 MN = 1, M                                             FUTSOL   258
                    NF = NS + MN                                                 FUTSOL   259
                    A(NF) = A(NF) / A(NS)                                        FUTSOL   260
260                 NT = NS                                                      FUTSOL   261
                    IF (KM1 .EQ. 0) GO  TO 130                                   FUTSOL   262
                    DO 125 IB = 1, KM1                                           FUTSOL   263
                    NF = NF - IB - M                                             FUTSOL   264
                    NT = NT - MP1 - IB                                           FUTSOL   265
265                 SUM = (0.0,0.0)                                              FUTSOL   266
                    NP = NF                                                      FUTSOL   267
                    N2 = MP1 + IB                                                FUTSOL   268
                    DO 120 IO = 1, IB                                            FUTSOL   269
                    NN = NT + IO                                                 FUTSOL   270
270                 NP = NP + N2 - IO                                            FUTSOL   271
              120 SUM = SUM + A(NN) * A(NP)                                      FUTSOL   272
              125 A(NF) = (A(NF) - SUM) / A(NT)                                  FUTSOL   273
              130 CONTINUE                                                       FUTSOL   274
              C                                                                  FUTSOL   275
275           C - - MOVE THE SOLUTIONS TO CONTIGUOUS LOCATIONS STARTING AT A(N1) FUTSOL   276
              C                                                                  FUTSOL   277
                    N1 = KORE + 1                                                FUTSOL   278
                    DO 140 NN = 1, K                                             FUTSOL   279
                    DO 135 MN = 1, M                                             FUTSOL   280
280                 NL = NL - 1                                                  FUTSOL   281
                    N1 = N1 - 1                                                  FUTSOL   282
              135 A(N1) = A(NL)                                                  FUTSOL   283
              140 NL = NL - NN                                                   FUTSOL   284
              C                                                                  FUTSOL   285
```

```
                C                                                                   FUTSOL   287
                      WRITE (NIN) K                                                 FUTSOL   288
                      NS = N1 - 1                                                   FUTSOL   289
                      DO 145 MN = 1, M                                              FUTSOL   290
290                   NT = NS + MN                                                  FUTSOL   291
                  145 WRITE ( NIN ) (A(IO), IO = NT, KORE, M)                       FUTSOL   292
                C                                                                   FUTSOL   293
                C - - TEST IF THIS IS THE LAST PASS                                 FUTSOL   294
                C                                                                   FUTSOL   295
295                   IF (LAST) GO TO 200                                           FUTSOL   296
                C                                                                   FUTSOL   297
                C - - WE MUST NOW MODIFY THE TRIANGULAR MATRIX TO REFLECT THE EFFECT OF FUTSOL 298
                C     THE SOLUTIONS OBTAINED SO FAR  (EQ 21)                        FUTSOL   299
                C * * NOTE..LOCATIONS A(1) TO A(N1-1) ARE NOW FREE TO USE           FUTSOL   300
300             C                                                                   FUTSOL   301
                C - - CALCULATE THE NEXT VALUES OF 'NEL' AND 'NREM'                 FUTSOL   302
                C                                                                   FUTSOL   303
                      NELOLD = NEL                                                  FUTSOL   304
                      KOLD = K                                                      FUTSOL   305
305                   NEL = NEL - K                                                 FUTSOL   306
                      NREM = NREM - K                                               FUTSOL   307
                C                                                                   FUTSOL   308
                      NROW = NREM - K + 1                                           FUTSOL   309
                      IF (K .LT. NREM) GO TO 150                                    FUTSOL   310
310                   LAST = .TRUE.                                                 FUTSOL   311
                      NROW = 1                                                      FUTSOL   312
                      K = NREM                                                      FUTSOL   313
                  150 NS = 1                                                        FUTSOL   314
                      NT = NELOLD + 1                                               FUTSOL   315
315             C                                                                   FUTSOL   316
                C - - READ IN THE ROWS TO BE MODIFIED                               FUTSOL   317
                C                                                                   FUTSOL   318
                      DO 190 IB = 1, NREM                                           FUTSOL   319
                      NT = NT - 1                                                   FUTSOL   320
320                   IF (IB .LE. NROW) GO TO 160                                   FUTSOL   321
                      NS = NS + NN                                                  FUTSOL   322
                      NT = NT + NN                                                  FUTSOL   323
                  160 IF (.NOT. JPASS1)GO TO 161                                    FUTSOL   324
                      NBEG = NT - M + 1                                             FUTSOL   325
325             C*** ***READ RHS FROM NATAPE                                        FUTSOL   326
                      READ (NATAPE) ( A(IO),IO = NBEG,NT)                           FUTSOL   327
                      NT = NT - M                                                   FUTSOL   328
                      CALL GETROW (LTAPE,1,MAXW,1)                                  FUTSOL   329
                      NN = MAXW                                                     FUTSOL   330
330                   MAXH = 2*MAXW                                                 FUTSOL   331
                      CALL GETROW (LTAPE,1,A(NS),MAXH)                              FUTSOL   332
                      NT = NT + M                                                   FUTSOL   333
                      NN = NN + M                                                   FUTSOL   334
                      GO TO 163                                                     FUTSOL   335
335                 161 READ(MT)NN,(A(IO),IO=NS,NT)                                 FUTSOL   336
                  163 NP = N1 - 1                                                   FUTSOL   337
                      NF = NT - M - KM1                                             FUTSOL   338
                      NN = NN - KOLD                                                FUTSOL   339
                      DO 170 MN = 1, M                                              FUTSOL   340
340                   N2 = NF                                                       FUTSOL   341
                      NA = NP + MN                                                  FUTSOL   342
                      NB = NA                                                       FUTSOL   343
```

```
                      SUM = (0.0,0.0)                                          FUTSOL   344
                      DO 165 IO = 1, KOLD                                      FUTSOL   345
345                   SUM = SUM + A(N2) * A(NA)                                FUTSOL   346
                      N2 = N2 + 1                                              FUTSOL   347
                  165 NA = NA + M                                              FUTSOL   348
                      N2 = N2 + MN - 1                                         FUTSOL   349
                  170 A(N2) = A(N2) - SUM                                      FUTSOL   350
350               C                                                            FUTSOL   351
                  C - - WRITE THE MODIFIED ROW ON TAPE OR CONDENSE THE ROW     FUTSOL   352
                  C                                                            FUTSOL   353
                      NL = NT - M + 1                                          FUTSOL   354
                      IF (IB .GE. NROW) GO TO 175                              FUTSOL   355
355                   NF = NL - KP1                                            FUTSOL   356
                      WRITE (NOUT) NN, (A(IO), IO = NS, NF), (A(IO), IO = NL, NT)  FUTSOL   357
                      GO TO 190                                                FUTSOL   358
                  175 NF = NL - KOLD                                           FUTSOL   359
                      DO 180 MN = NL, NT                                       FUTSOL   360
360                   A(NF) = A(MN)                                            FUTSOL   361
                  180 NF = NF + 1                                              FUTSOL   362
                  190 CONTINUE                                                 FUTSOL   363
                      IF( .NOT. JPASS1 ) GO TO 195                             FUTSOL   364
                      JPASS1= .FALSE.                                          FUTSOL   365
365                   REWIND NATAPE                                            FUTSOL   366
                  195 REWIND MT                                                FUTSOL   367
                      REWIND NOUT                                              FUTSOL   368
                  C                                                            FUTSOL   369
                  C - - SWITCH THE TAPES                                       FUTSOL   370
370               C                                                            FUTSOL   371
                      NT = MT                                                  FUTSOL   372
                      MT = NOUT                                                FUTSOL   373
                      NOUT = NT                                                FUTSOL   374
                  C                                                            FUTSOL   375
375               C - - LOOP BACK THRU THE SOLUTION                            FUTSOL   376
                  C                                                            FUTSOL   377
                      NL = NF                                                  FUTSOL   378
                      GO TO 119                                                FUTSOL   379
                  C                                                            FUTSOL   380
380               C - - START TO WRAP IT UP                                    FUTSOL   381
                  C                                                            FUTSOL   382
                  200 REWIND NIN                                               FUTSOL   383
                      N2 = N                                                   FUTSOL   384
                  C                                                            FUTSOL   385
385               C * * NOTE.. AT THIS POINT ALL LOCATIONS A(1) THRU A(KORE) ARE FREE  FUTSOL   386
                  C                                                            FUTSOL   387
                      DO 220 IB = 1, NPASS                                     FUTSOL   388
                      READ (NIN) K                                             FUTSOL   389
                      N1 = N2 - K + 1                                          FUTSOL   390
390                   NS = N1                                                  FUTSOL   391
                      NT = N2                                                  FUTSOL   392
                  C                                                            FUTSOL   393
                  C - - READ IN THE SOLUTIONS                                  FUTSOL   394
                  C                                                            FUTSOL   395
395                   DO 210 IO = 1, M                                         FUTSOL   396
                      READ (NIN) (A(NN), NN = NS, NT)                          FUTSOL   397
                      NT = NT + N                                              FUTSOL   398
                  210 NS = NS + N                                              FUTSOL   399
                  220 N2 = N1 - 1                                              FUTSOL   400
```

```
      C                                                                 FUTSOL   401
      C  ---  REWIND ALL INPUT TAPES                                   FUTSOL   402
            REWIND NIN                                                  FUTSOL   403
            REWIND MT                                                   FUTSOL   404
            REWIND NOUT                                                 FUTSOL   405
      C - - WRITE THE SOLUTIONS ON TAPE                                 FUTSOL   406
      C                                                                 FUTSOL   407
            NT = 0                                                      FUTSOL   408
            DO 230 IO = 1, M                                            FUTSOL   409
            NS = NT + 1                                                 FUTSOL   410
            NT = NT + N                                                 FUTSOL   411
            IF (NPR1.EQ.0) GO TO 230                                    FUTSOL   412
            WRITE (ITAPEW,3) IO                                         FUTSOL   413
            WRITE (ITAPEW,2) (A(NN), NN = NS, NT)                       FUTSOL   414
        230 WRITE (NW) (A(NN), NN = NS, NT)                             FUTSOL   415
      C                                                                 FUTSOL   416
            IF(LASTRS) GO TO 295                                        FUTSOL   417
      C*** ***IF THERE ARE MORE RHS TO BE GOTTEN FROM RHS TAPE, SWITCH TAPES FUTSOL 418
      C*** ***BACK SO THAT  MT WILL CONAIN THE TRAPEZOIDAL MATRIX       FUTSOL   419
      C*** ***NATAPE WILL HAVE NOTHING USEFUL ON IT.                    FUTSOL   420
            NTEMP = NATAPE                                              FUTSOL   421
            NATAPE = MT                                                 FUTSOL   422
            MT = NTEMP                                                  FUTSOL   423
            REWIND NATAPE                                               FUTSOL   424
            IFILES(LTAPE) = LFILE                                       FUTSOL   425
            CALL GEDLAB (8HFUTSOLO2,LTAPE,NAME,LFILE,IRD,JCD)           FUTSOL   426
            GO TO 109                                                   FUTSOL   427
        295 CONTINUE                                                    FUTSOL   428
      C                                                                 FUTSOL   429
      C   ***   REWIND ALL FILES EXCEPT THE OUTPUT FILE   NW            FUTSOL   430
      C                                                                 FUTSOL   431
            REWIND NI                                                   FUTSOL   432
            REWIND MM                                                   FUTSOL   433
            REWIND NO                                                   FUTSOL   434
            REWIND NAT                                                  FUTSOL   435
            REWIND RHSTAP                                               FUTSOL   436
            MD = MTOTAL                                                 FUTSOL   437
       9999 CONTINUE                                                    FUTSOL   438
      C                                                                 FUTSOL   439
      C                                                                 FUTSOL   440
      C FORMATS                                                         FUTSOL   441
      C                                                                 FUTSOL   442
          2 FORMAT (1HO,6E20.8)                                         FUTSOL   443
          3 FORMAT (1HO, 10HCOLUMN NO.,I6,2X,17HOF GAMMAS FOLLOWS,//)   FUTSOL   444
      C                                                                 FUTSOL   445
            RETURN                                                      FUTSOL   446
            END                                                         FUTSOL   447
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS	DEF LINE	REFERENCES
3 FUTSOL	1	55 445

VARIABLES	SN	TYPE	RELOCATION								
11355	A	COMPLEX	ARRAY	REFS	29	112	2*122	123	137	2*147	148
					169	188	214	219	2*259	2*271	2*272	282
					291	331	2*345	349	2*356	360	413	414
				DEFINED	87	123	148	188	219	259	272
					282	326	335	349	360	396		
1452	B	REAL		REFS	2*160	DEFINED	158				
1453	C	REAL		REFS	160	DEFINED	159				
1515	DUMMY	REAL	ARRAY	REFS	27	202	233				
1435	I	INTEGER		REFS	87	120	184	DEFINED	87	105	132
					183	199	226				
1501	IB	INTEGER		REFS	263	264	267	268	320	354	
				DEFINED	262	318	387				
1	IFILES	INTEGER	ARRAY CFILES	REFS	21	24	DEFINED	220	424		
1431	IINIT	INTEGER		REFS	164	165	166	DEFINED	83		
1456	INITP1	INTEGER		REFS	167	DEFINED	165				
1504	IO	INTEGER		REFS	269	270	291	326	335	2*356	412
				DEFINED	268	291	326	335	344	2*356	395
					408						
1464	IRD	INTEGER		REFS	221	425					
0	ITAPES	INTEGER	ARRAY CTAPES	REFS	21	23	41				
1411	ITAPEW	INTEGER		DEFINED	41	I/O REFS	412	413			
1434	J	INTEGER		REFS	169	DEFINED	86	169	185		
1465	JCD	INTEGER		REFS	221	425					
1444	JCNT	INTEGER		REFS	117	119	142	144	DEFINED	113	117
					138	142	208				
1405	JPASS1	LOGICAL		REFS	31	323	363	DEFINED	172	364	
1440	K	INTEGER		REFS	97	101	102	145	154	161	162
					163	197	205	208	248	253	254	278
					287	304	305	306	308	309	389	
				DEFINED	160	161	312	388			
1462	KCNT	INTEGER		REFS	210	211	DEFINED	205	210		
0	KD	INTEGER	F.P.	REFS	45	DEFINED	1				
1463	KEND	INTEGER		REFS	217	DEFINED	216				
1454	KF	INTEGER		REFS	164	177	185	216	217		
				DEFINED	162						
0	KFILES	INTEGER	CFILES	REFS	24						
1430	KINIT	INTEGER		REFS	83	84	85	91	92	119	144
					154	DEFINED	82	154				
1455	KLEFT	INTEGER		REFS	167	DEFINED	164				
1441	KM1	INTEGER		REFS	105	261	262	337	DEFINED	102	163
					253						
1507	KOLD	INTEGER		REFS	338	344	358	DEFINED	304		
1413	KORE	INTEGER		REFS	52	55	82	159	177	184	277
					291	DEFINED	45				
1474	KP1	INTEGER		REFS	355	DEFINED	254				
1467	KREAD	INTEGER		REFS	227	228	229	230	DEFINED	229	
1466	KRED	INTEGER		REFS	228	229	DEFINED	225	228		
1436	KSUM	INTEGER		REFS	101	125	130	DEFINED	93	101	
1451	KSUMP1	INTEGER		REFS	132	156	DEFINED	130			
1407	LAST	LOGICAL		REFS	33	295	DEFINED	248	310		
1406	LASTRS	LOGICAL		REFS	32	77	416	DEFINED	75		
0	LFILE	INTEGER	F.P.	REFS	220	221	424	425	DEFINED	1	
1470	LREAD *	INTEGER		DEFINED	230						
0	LTAPE	INTEGER	F.P.	REFS	97	110	112	135	137	200	202
					212	214	220	221	227	231	233	328
					331	424	425	DEFINED	1		

VARIABLES	SN	TYPE	RELOCATION							
1415	M	INTEGER		REFS	53	55	72	74	76	78	79
					80	82	86	92	158	166	182	245
					247	257	263	279	289	291	324	327
					332	333	337	339	347	353	395	408
				DEFINED	52	56	71	77				
1443	MAXH	INTEGER		REFS	112	137	202	214	233	331		
				DEFINED	111	136	201	213	232	330		
1442	MAXW	INTEGER		REFS	110	111	135	136	200	201	212	
					213	231	232	328	329	330		
0	MD	INTEGER	F.P.	DEFINED	1	436						
0	MM	INTEGER	F.P.	REFS	58	DEFINED	1	I/O REFS	432			
1416	MMAX	INTEGER		REFS	54	71	DEFINED	53				
1427	MM1	INTEGER		REFS	183	216	DEFINED	79				
1476	MN	INTEGER		REFS	258	290	341	348	360			
				DEFINED	257	279	289	339	359			
1426	MP1	INTEGER		REFS	255	264	267	DEFINED	78	247		
1414	MRHS	INTEGER		REFS	53	75	77	DEFINED	48	51		
1420	MT	INTEGER		REFS	371	421	DEFINED	58	372	422		
				I/O REFS	59	335	366	403				
1425	MTOTAL	INTEGER		REFS	74	75	76	77	80	436		
				DEFINED	70	74	76	80				
1412	N	INTEGER		REFS	52	54	55	57	64	82	85	
					89	92	116	119	125	132	141	144
					156	164	166	169	184	229	244	245
					248	383	397	398	410	DEFINED	44	
1510	NA	INTEGER		REFS	342	345	347	DEFINED	341	347		
1513	NAME	INTEGER	ARRAY	REFS	26	221	425					
0	NAT	INTEGER	F.P.	REFS	36	DEFINED	1	I/O REFS	434			
1410	NATAPE	INTEGER		REFS	420	DEFINED	36	421	I/O REFS	37	169	
					170	326	365	423				
1511	NB	* INTEGER		DEFINED	342							
1432	NBEG	INTEGER		REFS	87	106	116	128	150	211	214	
					326	DEFINED	84	88	91	106	150	209
					324							
0	ND	INTEGER	F.P.	REFS	44	2*161	197	DEFINED	1			
1424	NEL	INTEGER		REFS	303	305	DEFINED	65	246	305		
1506	NELOLD	INTEGER		REFS	314	DEFINED	303					
1433	NEND	INTEGER		REFS	87	88	89	107	116	129	151	
					168	169	209	218	219	243		
				DEFINED	85	89	92	107	151	166	168	
					204	211	218					
1477	NF	INTEGER		REFS	2*259	263	266	2*272	340	356	360	
					361	377	DEFINED	258	263	337	355	358
					361							
0	NI	INTEGER	F.P.	REFS	60	DEFINED	1	I/O REFS	431			
1421	NIN	INTEGER		DEFINED	60	I/O REFS	61	287	291	382	388	
					396	402						
1471	NL	INTEGER		REFS	255	280	282	283	355	356	358	
					359	DEFINED	243	280	283	353	377	
1437	NLCNT	INTEGER		REFS	98	226	DEFINED	94	98			
1423	NN	INTEGER		REFS	122	147	271	283	321	322	333	
					338	356	396	413	414	DEFINED	64	120
					145	269	278	329	333	335	338	396
					413	414						
1457	NNEW	INTEGER		REFS	186	188	206	215	216	217		
				DEFINED	177	186	206	215				
0	NO	INTEGER	F.P.	REFS	62	DEFINED	1	I/O REFS	433			

VARIABLES	SN	TYPE	RELOCATION								
1[illegible]	NOLD	INTEGER		REFS	187	188	DEFINED	184	187		
1[illegible]	NOUT	INTEGER		REFS	372	DEFINED	62	373	I/O REFS	63	356
				367	404						
1502	NP	INTEGER		REFS	270	271	341	DEFINED	266	270	336
1473	NPASS	INTEGER		REFS	256	387	DEFINED	249	256		
1417	NPM	INTEGER		REFS	55	65	246	DEFINED	54	57	245
1445	NPP	INTEGER		REFS	2*123	2*148	169	219	DEFINED	116	141
				167	217						
0	NPR1	INTEGER	F.P.	REFS	411	DEFINED	1				
1472	NREM	INTEGER		REFS	306	308	309	312	318		
				DEFINED	244	306					
1461	NREMAN	INTEGER		REFS	198	199	DEFINED	197			
1446	NROW	INTEGER		REFS	121	122	146	147	320	354	
				DEFINED	119	121	144	146	308	311	
1475	NS	INTEGER		REFS	258	259	260	290	321	331	335
				356	396	398	413	414	DEFINED	255	288
				313	321	390	398	409			
1500	NT	INTEGER		REFS	264	269	272	291	319	322	324
				326	327	332	335	337	353	356	359
				373	396	397	409	410	413	414	
				DEFINED	260	264	290	314	319	322	327
				332	371	391	397	407	410		
1447	NTBEG	INTEGER		REFS	133	141	DEFINED	128	133		
1512	NTEMP	INTEGER		REFS	422	DEFINED	420				
1450	NTEND	INTEGER		REFS	134	141	DEFINED	129	134		
0	NW	INTEGER	F.P.	DEFINED	1	I/O REFS	38	414			
1505	N1	INTEGER		REFS	281	282	288	336	390	399	
				DEFINED	277	281	389				
1503	N2	INTEGER		REFS	270	345	346	348	2*349	389	391
				DEFINED	267	340	346	348	383	399	
0	RHSTAP	INTEGER	F.P.	REFS	19	47	DEFINED	1	I/O REFS	50	51
				87	435						
1403	SUM	COMPLEX		REFS	29	122	123	147	148	271	272
				345	349	DEFINED	118	122	143	147	265
				271	343	345					

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS		REFERENCES							
GEDLAB		6		221	425						
GETROW		4		97	110	112	135	137	200	202	212	214
				227	231	233	328	331			
SQRT	REAL	1	LIBRARY	160							

INLINE FUNCTIONS	TYPE	ARGS		DEF LINE	REFERENCES
MAXO	INTEGER	0	INTRIN		55
MINO	INTEGER	0	INTRIN		53

STATEMENT LABELS			DEF LINE	REFERENCES
0	1	INACTIVE	35	
1366	2	FMT	442	413
1371	3	FMT	443	412
22	5		50	47
26	6		52	49
61	109		74	426
0	110		89	86
121	111		96	156
0	112		122	120

```
115         C                                                                   MACH    116
                  IF (KK EQ 1) NPOINT = 0                                       MACH    117
                  CALL MODAZ (KK,NQ,ITAPE,WILK,QZ,NPOINT,ENDX,ES,EL,KEND)       MACH    118
                  CALL TIMEB (23,23HFROM MACH, AFTER MODAZ )                    MACH    119
                  IF(KSURF) WILK=.TRUE.                                         MACH    120
120               IF (KSURF) REWIND MTAP14                                      MACH    121
                  IF (KSURF)  CALL HELZ (KK,NQ,NCS,ES,EL,KEND,1)                MACH    122
                  IF (KSURF)                                                    MACH    123
                 1CALL MODAZ (KK,NQ,MTAP14,WILK,QZ,NPOINT,ENDX,ES,EL,KEND)      MACH    124
                  IF (KSURF) CALL HELZ (KK,NQ,NCS,ES,EL,KEND,2)                 MACH    125
125               CALL DSPMD ( KK , NQ )                                        MACH    126
                  CALL TIMEB (23,23HFROM MACH, AFTER DSPMD )                    MACH    127
                2 NWI (KK)=NWB                                                  MACH    128
              300 NDI(KK)=NDB                                                   MACH    129
               10 XM=0.0                                                        MACH    130
130               YM=0.0                                                        MACH    131
                  DO 15 I=1,NS                                                  MACH    132
                  XM=AMAX1(XM,XI(I))                                            MACH    133
               15 YM=AMAX1(YM,YI(I))                                            MACH    134
               30 NL = XM + 1.0                                                 MACH    135
135               LL=2 *(YM+1.0)                                                MACH    136
                  REWIND  MTAP11                                                MACH    137
            C                                                                   MACH    138
                  NRF = LC(4)                                                   MACH    139
                  IF(LC(1) .EQ  -1) GO TO 42                                    MACH    140
140               IF(LC(1) .EQ. 2  OR  LC(33) .EQ. 1) GO TO 43                  MACH    141
                  IF (LC(13).EQ.1)  NRF = NRVBO                                 MACH    142
                  GO TO 42                                                      MACH    143
               43 NRF = 1                                                       MACH    144
               42 CONTINUE                                                      MACH    145
145               NKF       =  0                                                MACH    146
                  DO 150 IO=1,NRF                                               MACH    147
                  NF = 0                                                        MACH    148
                  REWIND MTAP3                                                  MACH    149
                  DO 149  KK = 1,NS                                             MACH    150
150               NKF       =  NKF + 1                                          MACH    151
                  KDRAW=KPLOT(KK)                                               MACH    152
                  NF=NF+1                                                       MACH    153
                  NWB=NWI(KK)                                                   MACH    154
                  NDB=NDI(KK)                                                   MACH    155
155               READ (MTAP3) NWB,ENDX ,ES,EL,KEND ,NDB                        MACH    156
              888 DO 401 IJ=1,NWB                                               MACH    157
              401 READ(MTAP3) XW(IJ),YW(IJ),AW(IJ),IND(IJ)                      MACH    158
                  IF (NDB.EQ.0) GO TO 420                                       MACH    159
                  DO 402 IJ=1,NDB                                               MACH    160
160           402 READ(MTAP3) XD(IJ),YD(IJ),AD(IJ)                              MACH    161
              420 READ(MTAP3) DUMMY                                             MACH    162
                  IF ( LC(33) .NE. 0 )            VBO = 1.0E+10                 MACH    163
                  IF ( KQINT )              VBO = RVBO(IO)                      MACH    164
                  IF ( .NOT. KQINT )        VBO = VVBO(IO)                      MACH    165
165               ES=ESR(KK)                                                    MACH    166
                  P = 0.0                                                       MACH    167
                  IF ( LC(33) .EQ. 0 .OR. LC(1) .NE. 2 )   P = ES / (VBO*BR)    MACH    168
                  XR=0.0                                                        MACH    169
                  X1=0.0                                                        MACH    170
170               NOB=(NL*(NL-1))/2+LL                                          MACH    171
                  IF (LC(22).EQ.1)  GOTO 36                                     MACH    172
```

```
                  CALL PTABLE (1,47,47                                          MACH      59
                 1   HSUPERSONIC UNSTEADY AERODYNAMICS USING MACH BOX)          MACH      60
60                KTABLE =  2                                                   MACH      61
                  CALL PTABLE (1,20,20                                          MACH      62
                 1   HPROCEDURE (MACH BOX))                                    MACH      63
               C                                                                MACH      64
               C                                                                MACH      65
65                KQRS=LC(6)                                                    MACH      66
                  NOPE = LC(7)                                                  MACH      67
                  AM   =  FMACH                                                 MACH      68
                  KQINT =  FALSE.                                               MACH      69
                  IF (LC(13).NE.0)  KQINT= TRUE.                                MACH      70
70                REWIND MTAP50                                                 MACH      71
                  NS   =   LC(3)                                                MACH      72
                  NQ   =  LC(2)                                                 MACH      73
                  DO 40 I=1,NS                                                  MACH      74
                40 NCSS(I) = 0                                                  MACH      75
75                READ (ITAPER,700) KSURF , NBEL , NPIF , LINC                  MACH      76
                  IF (KSURF) READ (ITAPER,1005)       (NCSS(I),I=1,NS)          MACH      77
                  CALL TIMEB (23,23HFROM MACH, BEGIN        )                   MACH      78
                  REWIND MTAP2                                                  MACH      79
                  READ (ITAPER,1005)       (NSAA(K),K=1,NS)                     MACH      80
80                DO 81 IL = 1,NS                                               MACH      81
                81 KPLOT(IL) = 0                                                MACH      82
                  IF (LC(8).EQ.0) GO TO 83                                      MACH      83
                  READ (ITAPER,1015) (KPLOT(IL),IL=1,NS)                        MACH      84
                83 DO 84 IL = 1,NS                                              MACH      85
85              84 BEX(IL) = 0.0                                                MACH      86
                  IF (.NOT.NBEL) GO TO 67                                       MACH      87
                  READ (ITAPER,59) (BEX(K),K=1,NS)                              MACH      88
                  WRITE (ITAPEW,76)                                             MACH      89
                  DO 77 I = 1,NS                                                MACH      90
90                IF (BEX(I).EQ.0.0) GO TO 77                                   MACH      91
                  WRITE (ITAPEW,78) I , BEX(I)                                  MACH      92
                77 CONTINUE                                                     MACH      93
                67 DO 57 I = 1,NS                                               MACH      94
                  LZ(I) = 1                                                     MACH      95
95                IINC(I) = 10                                                  MACH      96
                  IF (KPLOT(I).EQ.0) GO TO 57                                   MACH      97
                  READ (ITAPER,1015) LZ(I) , IINC(I)                            MACH      98
                57 CONTINUE                                                     MACH      99
               C                                                                MACH     100
100               REWIND MTAP3                                                  MACH     101
                  DO 300 KK=1,NS                                                MACH     102
                  CALL EVOVLE (BETA,ESR,EL,XI,YI,KK,IM,ENDX,KEND,ES)            MACH     103
                  CALL TIMEB (23,23HFROM MACH, AFTER EVOVLE)                    MACH     104
                  CALL  PLAN (KK,AM,XI(KK))                                     MACH     105
105               CALL PUDLAB(8HMACH  01,MTAP9,NAMSRF,KK,IRD,JCD)               MACH     106
                  KSURF = .FALSE.                                               MACH     107
                  WILK=.FALSE.                                                  MACH     108
               C      ----- DOES THIS SURFACE HAVE CONTROL SURFACES ? ----------MACH     109
               C                                                                MACH     110
110               NCS = NCSS(KK)                                                MACH     111
                  IF ( NCS .NE. 0 )       KSURF = .TRUE                         MACH     112
                  ITAPE=MTAP9                                                   MACH     113
                  IF(KSURF) ITAPE=MTAP8                                         MACH     114
                  IF (KSURF) REWIND MTAP8                                       MACH     115
```

```
      SUBROUTINE MACH                                                   MACH      2
C                                                                       MACH      3
      DIMENSION       XW(350) ,      YW(350) ,      XD(250)            MACH      4
      DIMENSION       YD(250) ,      AW(350) ,      AD(250)            MACH      5
      DIMENSION      R1(2000) ,      PP(350) ,      XMAX(5)            MACH      6
      DIMENSION         LS(5) ,        XI(5) ,        YI(5)            MACH      7
      DIMENSION        NWI(5) ,      NDI(5) ,    DWSH(350)            MACH      8
      DIMENSION      Q(40,40) ,    QS(40,40) ,     IND(350)            MACH      9
      DIMENSION       NSAA(5) ,     KPLOT(5) ,      ESR(5)            MACH     10
      DIMENSION       NCSS(5) ,     NCLER(5) ,     NCTER(5)           MACH     11
      DIMENSION   CLEXR(20,5) , CLEYR(20,5) , CTEXR(20,5)             MACH     12
      DIMENSION   CTEYR(20,5)                                         MACH     13
      DIMENSION         LC(40)                                        MACH     14
      DIMENSION    QMWT(40,5) ,       QWT(5)                         MACH     15
      DIMENSION VVBO(30), RVBO(15)                                    MACH     16
      DIMENSION         LZ(5) ,      IINC(5)                          MACH     17
      DIMENSION       NAME(2) ,   NAMSRF(2)                           MACH     18
      DIMENSION DUMMY(50)                                             MACH     19
      DIMENSION TSHF(1)                                               MACH     20
      DIMENSION ITAPES(50)                                            MACH     21
C                                                                       MACH     22
      COMPLEX      Q , QS , R1 , PP , DWSH                            MACH     23
C                                                                       MACH     24
      COMMON /FLUTQ / QMWT, QWT                                       MACH     25
      COMMON /COMA  / LC, BR                                          MACH     26
      COMMON /FLUTAN/ FMACH ,BETA  ,VVBO  ,RVBO  ,NRVBO               MACH     27
      COMMON/CORPSE/R1                                                MACH     28
      COMMON/TOMB/XW,YW,NDB,LS,XMAX,NWB,AD,XD,YD,IND,AW               MACH     29
      COMMON/IDIOT/CLEXR,CLEYR,CTEXR,CTEYR,NCLER,NCTER,NS             MACH     30
      COMMON /BOXS/ BEL , BSR                                         MACH     31
      COMMON /BXLL / BEX(5)                                           MACH     32
      COMMON /KIMA  / LZ, IINC                                        MACH     33
      COMMON / CTAPES / ITAPES                                        MACH     34
      COMMON /COMRWP/ ITAPER,ITAPEW,ITAPEP                            MACH     35
      COMMON /CTSHF / LTSHF ,TSHF                                     MACH     36
      COMMON /CTABLE/ KTABLE,NPASS ,NROWS, NCOLS , NCOLST,KTABLO,NPAGEA MACH     37
     1               ,ITAPET                                          MACH     38
C                                                                       MACH     39
      LOGICAL  KSURF, WILK, KQINT, NBEL, NPTF, LINC                   MACH     40
C                                                                       MACH     41
      DATA NAMSRF /4HSURF,4HACE /                                     MACH     42
C                                                                       MACH     43
      IRD=99999                                                       MACH     44
      JCD=99999                                                       MACH     45
C                                                                       MACH     46
      MTAP2  =  ITAPES(22)                                            MACH     47
      MTAP3  =  ITAPES(23)                                            MACH     48
      MTAP8  =  ITAPES(28)                                            MACH     49
      MTAP9  =  ITAPES(29)                                            MACH     50
      MTAP10 = ITAPES(30)                                             MACH     51
      MTAP11 =  ITAPES(31)                                            MACH     52
      MTAP12 =  ITAPES(32)                                            MACH     53
      MTAP14 =  ITAPES(34)                                            MACH     54
      MTAP50 =  ITAPES(50)                                            MACH     55
      NROWS  =  1                                                     MACH     56
      NCOLS  =  3                                                     MACH     57
      KTABLE =  2                                                     MACH     58
```

COMMON BLOCKS LENGTH MEMBERS - BIAS NAME(LENGTH)

		9	NTP10	(1)							
COMA	41	0	LC	(40)	40	BR	(1)				
CTAPES	50	0	ITAPES	(50)							
XYZ	350	0	YS	(50)	50	DELYS	(50)	100	ZS	(50)	
		150	DELZS	(50)	200	FGAMMA	(50)	250	CWIG	(50)	
		300	DUMMY	(50)							

STATISTICS

PROGRAM LENGTH	14103B	6211
CM LABELED COMMON LENGTH	1427B	791

520008 CM USED

STATEMENT LABELS				DEF LINE	REFERENCES	
1020	10	FMT		209	164	
1034	12	FMT		211	177	
1050	20	FMT		213	171	184
1055	30	FMT		214	188	
1070	32	FMT		216	104	
1101	34	FMT	NO REFS	219		
1114	36	FMT	NO REFS	221		
1120	40	FMT		222	108	
0	50			46	43	
0	60			54	51	
0	70			64	62	
0	80			65	58	
130	90			66	57	
154	100			76	74	
1124	111	FMT		223	32	
0	150			92	88	
0	200			102	77	
0	235			109	105	
335	236			110	103	
0	238			137	132	
0	240			151	122	
507	245			152	116	
0	250			172	165	
601	251			173	163	
0	260			185	178	
631	265			186	174	176
634	266			189	187	
0	272			198	194	197
0	275			200	191	
0	300			201	67	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
12	2	I	29 31	14B	NOT INNER
20	2	J	30 31	2B	INSTACK
43	1	I	38 41	5B	INSTACK
57	50	I	43 46	3B	INSTACK
77	60	L	51 54	3B	INSTACK
107	80	L	58 65	21B	NOT INNER
122	70	I	62 64	3B	INSTACK
131	300	J	67 201	543B	EXT REFS NOT INNER
155	200	K	77 102	132B	EXT REFS NOT INNER
210	150	I	88 92	15B	OPT
312	235	I	105 109	23B	EXT REFS
352	240	LB	122 151	135B	NOT INNER
405	238	I	132 137	16B	OPT
544	250	K	165 172	35B	EXT REFS
610	260	L	178 185	21B	EXT REFS
637	275	JG	191 200	32B	EXT REFS NOT INNER
653	272	IX	194 198	6B	INSTACK

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
BODY	340	0 RO	(100)	100 ROP	(100)	200 NBEA	(20)
		220 BGMA	(20)	240 MRK	(40)	280 XBO	(20)
		300 YBO	(20)	320 ZBO	(20)		
NTPS	10	0 NTP1	(1)	1 NTP2	(1)	2 NTP3	(1)
		3 NTP4	(1)	4 NTP5	(1)	5 NTP6	(1)
		6 NTP7	(1)	7 NTP8	(1)	8 NTP9	(1)

VARIABLES	SN	TYPE	RELOCATION									
2	NTP3	INTEGER	NTPS	REFS	6	I/O REFS	33	73				
3	NTP4	INTEGER	NTPS	REFS	6							
4	NTP5	INTEGER	NTPS	REFS	6							
5	NTP6	INTEGER	NTPS	REFS	6							
6	NTP7	INTEGER	NTPS	REFS	6	I/O REFS	34	75				
7	NTP8	INTEGER	NTPS	REFS	6							
10	NTP9	INTEGER	NTPS	REFS	6							
1211	NWP	* INTEGER		DEFINED	42							
12064	P	COMPLEX	ARRAY	REFS	18	89	106	107	135	136	195	
				DEFINED	73	75						
1174	PRES	COMPLEX		REFS	21	108	DEFINED	106	107			
1152	PRT1	COMPLEX		REFS	19	90	91	DEFINED	89			
1154	PRT2	COMPLEX		REFS	19	94	95	143	144			
				DEFINED	93	142						
1156	PRT3	COMPLEX		REFS	19	98	99	147	148			
				DEFINED	96	145						
1160	PRT4	COMPLEX		REFS	19	98	99	147	148			
				DEFINED	97	146						
0	RO	REAL	ARRAY BODY	REFS	4	134						
144	ROP	REAL	ARRAY BODY	REFS	4							
0	SDELX	REAL	ARRAY F.P.	REFS	10	61	63	89	134			
				DEFINED	1							
1227	SGAM	REAL		REFS	85	DEFINED	83					
1224	SIGN1	REAL		REFS	94	98	100	DEFINED	80	84		
1225	SIGN2	REAL		REFS	95	99	100	DEFINED	81	85		
0	X	REAL	ARRAY F.P.	REFS	11	61	136	DEFINED	1			
1212	XA	REAL		REFS	48	158	159	DEFINED	47			
1213	XB	REAL		REFS	160	DEFINED	48					
2154	XBLE	REAL	ARRAY	REFS	12	136	146	DEFINED	52	61		
430	XBO	REAL	ARRAY BODY	REFS	4							
1214	XC	REAL		REFS	161	162	DEFINED	49				
0	XIJ	REAL	ARRAY F.P.	REFS	10	91	97	DEFINED	1			
1240	XMULT	REAL		REFS	143	144	147	148	DEFINED	130	131	
0	XOC	REAL	ARRAY F.P.	REFS	11	108	DEFINED	1				
0	Y	REAL	ARRAY F.P.	REFS	11	108	128	181	DEFINED	1		
1246	YBOS	REAL		REFS	184	DEFINED	183					
454	YBO	REAL	ARRAY BODY	REFS	4							
1252	YOS	REAL	ARRAY	REFS	10	171	DEFINED	166				
0	YS	REAL	ARRAY XYZ	REFS	23	100	166	171				
1236	YSB	REAL		REFS	131	149	183	184	DEFINED	128	181	
500	ZBO	REAL	ARRAY BODY	REFS	4							
144	ZS	REAL	ARRAY XYZ	REFS	23	100	171					
1237	ZSB	REAL		REFS	149	184	DEFINED	129	182			
0	ZZ	REAL	ARRAY F.P.	REFS	11	108	129	182	DEFINED	1		

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES
COS	REAL	1 LIBRARY	82
SIN	REAL	1 LIBRARY	83

INLINE FUNCTIONS	TYPE	ARGS	DEF LINE	REFERENCES	
ABS	REAL	1 INTRIN		131	
FLOAT	REAL	1 INTRIN		47	49

STATEMENT LABELS	DEF LINE	REFERENCES
0 1	41	38
0 2	31	29 30

VARIABLES	SN	TYPE		RELOCATION								
10424	GF	COMPLEX	ARRAY		REFS	17	196	DEFINED	195			
1136	GFT	COMPLEX			REFS	17	196	199	DEFINED	193	196	
1204	I	INTEGER			REFS	31	39	44	45	63	73	2*89
					91	106	2*107	5*108	134	135	2*136	
					DEFINED	29	38	43	62	73	88	105
					132							
1250	IB	INTEGER			REFS	192	DEFINED	192				
1217	IBX1	INTEGER			REFS	56	60	117	127	DEFINED	55	
1245	IL	INTEGER			REFS	181	182	DEFINED	180			
1222	IP	INTEGER			REFS	75	DEFINED	75				
1215	IP1	INTEGER			REFS	75	DEFINED	50				
0	ITAPES	INTEGER	ARRAY	CTAPES	REFS	8	14	26	36			
1202	ITAPEW	INTEGER			DEFINED	26	I/O REFS	32	104	108	164	171
					177	184	188					
1251	IX	INTEGER			REFS	3*195	196	DEFINED	194			
1221	I1	INTEGER			REFS	2*61	62	88	128	129	132	
					DEFINED	59	86	126				
1220	I2	INTEGER			REFS	59	62	88	126	132		
					DEFINED	56	60	87	117	127		
1205	J	INTEGER			REFS	31	104	164	177	199		
					DEFINED	30	67					
1247	JG	INTEGER			REFS	199	DEFINED	191				
1223	K	INTEGER			REFS	78	79	82	83	86	87	3*90
					4*91	2*93	94	95	2*96	3*97	98	99
					4*100	2*101	2*166	167	168	169	170	4*171
					DEFINED	77	165					
1234	KB	INTEGER			REFS	133	134	DEFINED	121	133		
1244	KL	INTEGER			REFS	179	180	184	DEFINED	175	179	
1216	L	INTEGER			REFS	52	53	60	61	2*63	2*184	
					DEFINED	51	58	178				
1235	LB	INTEGER			REFS	123	124	2*135	2*136	142	145	146
					150	DEFINED	122					
0	LC	INTEGER	ARRAY	COMA	REFS	7	13	103	163	176	187	
0	LIM	INTEGER	ARRAY	F.P.	REFS	10	86	87	DEFINED	1		
1233	LL	INTEGER			REFS	125	127	134	2*136	138	139	2*141
					142	145	2*146	150	DEFINED	120	125	
1231	L1	INTEGER			REFS	122	178	DEFINED	118			
1232	L2	INTEGER			REFS	122	178	DEFINED	119			
1203	MID	INTEGER			REFS	29	30	DEFINED	28			
1210	MK	INTEGER			REFS	2*40	DEFINED	39				
1207	MMRK	INTEGER			REFS	40	42	DEFINED	37	40		
360	MRK	INTEGER	ARRAY	BODY	REFS	4	37	39				
1206	MTAP	INTEGER			DEFINED	36	I/O REFS	202	203	204		
0	NB	INTEGER		F.P.	REFS	38	57	58	116	119	174	197
					DEFINED	1						
310	NBEA	INTEGER	ARRAY	BODY	REFS	4	60	127	180			
0	NBOX	INTEGER		F.P.	REFS	50	55	73	74	105	180	
					DEFINED	1						
0	NBV	INTEGER		F.P.	REFS	2*107	DEFINED	1				
0	NDELT	INTEGER		F.P.	REFS	47	49	DEFINED	1			
0	NMD	INTEGER		F.P.	REFS	67	191	DEFINED	1			
0	NSTRIP	INTEGER		F.P.	REFS	77	118	119	165	DEFINED	1	
0	NSV	INTEGER		F.P.	REFS	2*169	2*170	DEFINED	1			
0	NTOT	INTEGER		F.P.	REFS	74	75	192	194	DEFINED	1	
0	NTP1	INTEGER		NTPS	REFS	6						
11	NTP10	INTEGER		NTPS	REFS	6	I/O REFS	35	190	192		

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

197 I 272 THIS IF DEGENERATES INTO A SIMPLE TRANSFER TO THE LABEL INDICATED.

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
3	GENF	1	225

VARIABLES	SN	TYPE		RELOCATION								
0	ACAP	REAL		F.P.	REFS	47	49	DEFINED	1			
1334	BF	REAL	ARRAY		REFS	11	195	DEFINED	192			
334	BGMA	REAL	ARRAY	BODY	REFS	4	139	141				
50	BR	REAL		COMA	REFS	7						
0	B2	REAL		F.P.	REFS	49	166	183	DEFINED	1		
2200	CBODY	REAL	ARRAY		REFS	12	63	134	136	138	141	142
						145	146	150	DEFINED	53	63	
1241	CFAC	REAL			REFS	135	136	DEFINED	134			
1226	CGAM	REAL			REFS	84	DEFINED	82				
1150	CLI	COMPLEX			REFS	19	101	157	162	188		
					DEFINED	72	101	157	162			
1172	CLIB	COMPLEX			REFS	20	150	157	DEFINED	115	150	
13524	CLJ	COMPLEX	ARRAY		REFS	18	90	93	97	101	135	142
						146	150	167	184	DEFINED	44	78	90
						123	135					
1176	CLJXK	COMPLEX			REFS	21	169	171	DEFINED	167	169	
1144	CM	COMPLEX			REFS	19	98	155	160	188		
					DEFINED	70	98	155	160			
1166	CMB	COMPLEX			REFS	20	147	155	DEFINED	113	147	
13670	CMJ	COMPLEX	ARRAY		REFS	18	91	96	136	145	168	184
					DEFINED	45	79	91	124	136		
1200	CMJXK	COMPLEX			REFS	21	170	171	DEFINED	168	170	
1146	CN	COMPLEX			REFS	19	99	156	161	188		
					DEFINED	71	99	156	161			
1170	CNB	COMPLEX			REFS	20	148	156	DEFINED	114	148	
372	CWIG	REAL	ARRAY	XYZ	REFS	23	90	91	93	96	97	101
1142	CY	COMPLEX			REFS	19	95	154	159	188		
					DEFINED	69	95	154	159			
1164	CYB	COMPLEX			REFS	20	144	154	DEFINED	112	144	
1140	CZ	COMPLEX			REFS	19	94	153	158	188		
					DEFINED	68	94	153	158			
1162	CZB	COMPLEX			REFS	20	143	153	DEFINED	111	143	
62	DELYS	REAL	ARRAY	XYZ	REFS	23	94	98	100			
226	DELZS	REAL	ARRAY	XYZ	REFS	23	95	99	100			
454	DUMMY	REAL	ARRAY	XYZ	REFS	23						
1242	DYB	REAL			REFS	143	147	149	DEFINED	138	139	
1243	DZB	REAL			REFS	144	148	149	DEFINED	140	141	
0	EV	REAL	ARRAY	F.P.	REFS	10	91	108	DEFINED	1		
1230	FACT	REAL			REFS	101	150	DEFINED	100	149		
310	FGAMMA	REAL	ARRAY	XYZ	REFS	23	82	83				
0	FL	REAL		F.P.	REFS	48	DEFINED	1				
0	FREQ	REAL		F.P.	REFS	32	DEFINED	1				
2224	GENFM	COMPLEX	ARRAY		REFS	16	203	DEFINED	31	199		

```
                250 CONTINUE                                                    GENF      173
                251 CONTINUE                                                    GENF      174
                    IF (NB.EQ.0)  GO TO  265                                    GENF      175
175                 KL    = 0                                                   GENF      176
                    IF (LC(8)  EQ. 0)  GOTO 265                                 GENF      177
                    WRITE (ITAPEW,12) J                                         GENF      178
                    DO 260  L=L1,L2                                             GENF      179
                    KL    = KL+1                                                GENF      180
180                 IL    = NBOX + NBEA(KL)                                     GENF      181
                    YSB   = Y(IL)                                               GENF      182
                    ZSB   =ZZ(IL)                                               GENF      183
                    YBOS = YSB/B2                                               GENF      184
                    WRITE (ITAPEW,20)  KL,YSB,ZSB,YBOS,CLJ(L),CMJ(L)            GENF      185
185             260 CONTINUE                                                    GENF      186
                265 CONTINUE                                                    GENF      187
                    IF (LC(8) .EQ  0)  GOTO 266                                 GENF      188
                    WRITE (ITAPEW,30) CZ, CY, CM, CN, CLI                       GENF      189
                266 CONTINUE                                                    GENF      190
190                 REWIND  NTP10                                               GENF      191
                    DO 275  JG=1,NMD                                            GENF      192
                    READ  (NTP10)  (BF(IB),  IB=1,NTOT)                         GENF      193
                    GFT  =(0.0,0.0)                                             GENF      194
                    DO 272  IX=1,NTOT                                           GENF      195
195                 GF(IX)=      P(IX)*BF(IX)                                   GENF      196
                    GFT   = GFT + GF(IX)                                        GENF      197
                    IF (NB .EQ  0) GO TO 272                                    GENF      198
                272 CONTINUE                                                    GENF      199
                    GENFM(J,JG)=GFT                                             GENF      200
200             275 CONTINUE                                                    GENF      201
                300 CONTINUE                                                    GENF      202
                    REWIND MTAP                                                 GENF      203
                    WRITE  (MTAP) GENFM                                         GENF      204
                    REWIND MTAP                                                 GENF      205
205             C                                                               GENF      206
                C                                                               GENF      207
                C FORMATS                                                       GENF      208
                C                                                               GENF      209
                  10 FORMAT  (1H1,40X, 7HMODE NO,I4//10X, 9HSTRIP NO.,5X,1HY,12X,1HZ,   GENF      210
210               112X, 3HYOS,10X,16HLIFT COEFFICIENT,18X,18HMOMENT COEFFICIENT/)       GENF      211
                  12 FORMAT  (1HO,40X, 7HMODE NO,I4//10X, 9HBODY  NO.,5X,1HY,12X,1HZ,   GENF      212
                  112X, 3HYOS,10X,16HLIFT COEFFICIENT,18X,18HMOMENT COEFFICIENT/)       GENF      213
                  20 FORMAT  (1HO,13X,I4, 3F12.4, 2F16.6,5X, 2F16.6)                    GENF      214
                  30 FORMAT  (1HO,3X//15X, 4HCZ =,2F16.6,10X,4HCY =,2F16.6/15X, 4HCM =, GENF      215
215               1        2F16.6,10X,4HCN =,2F16.6/15X,10HCL(ROLL) =,2F16.6/)          GENF      216
                  32 FORMAT (1H1,40X, 7HMODE NO,  I4//                                  GENF      217
                  1          5X, 9HBOX NO.  ,3X, 3HXOC,5X,2H X,7X,2HY ,7X,2HZ ,15X,    GENF      218
                  2 9HPRESSURES//)                                                      GENF      219
                  34 FORMAT  (1HO,3X//15X,13HPRESSURE MODE,5X,15HDEFLECTION MODE,10X,   GENF      220
220               1 45HGENERALIZED FORCES PER UNIT DYNAMIC PRESSURE ,/)                 GENF      221
                  36 FORMAT  (1HO,20X,I4,16X,I4,5X,2E18.8)                              GENF      222
                  40 FORMAT (1HO, 5X,I3,F10.5,3F11.5,2E18.8)                            GENF      223
                 111 FORMAT (1HO,5X,19HREDUCED FREQUENCY =,E10.3 )                      GENF      224
                C                                                               GENF      225
225                 RETURN                                                      GENF      226
                    END                                                         GENF      227
```

```
115               CLIB = (0.0,0.0)                                                  GENF      116
                  IF (NB.EQ.0)  GO TO  245                                          GENF      117
                  I2    = IBX1                                                      GENF      118
                  L1    = NSTRIP+1                                                  GENF      119
                  L2    = NSTRIP+NB                                                 GENF      120
120               LL    = 0                                                         GENF      121
                  KB    = 0                                                         GENF      122
                  DO 240  LB=L1,L2                                                  GENF      123
                  CLJ(LB) = (0.0,0.0)                                               GENF      124
                  CMJ(LB) = (0.0,0.0)                                               GENF      125
125               LL    = LL+1                                                      GENF      126
                  I1    = I2+1                                                      GENF      127
                  I2    = IBX1+NBEA(LL)                                             GENF      128
                  YSB   = Y(I1)                                                     GENF      129
                  ZSB   =ZZ(I1)                                                     GENF      130
130               XMULT= 1.0                                                        GENF      131
                  IF (ABS(YSB).LE.0.0001)  XMULT=0.5                                GENF      132
                  DO 238  I=I1,I2                                                   GENF      133
                  KB    = KB+1                                                      GENF      134
                  CFAC = 2.0*RO(KB)*SDELX(I) /(CBODY(LL)**2)                        GENF      135
135               CLJ(LB) = CLJ(LB)+P(I)*CFAC                                       GENF      136
                  CMJ(LB) = CMJ(LB)-P(I)*CFAC*(X(I)-XBLE(LL))/CBODY(LL)             GENF      137
              238 CONTINUE                                                          GENF      138
                  DYB   = CBODY(LL)                                                 GENF      139
                  IF (BGMA(LL).LT.0.0)  DYB=0.0                                     GENF      140
140               DZB   = 0.0                                                       GENF      141
                  IF (BGMA(LL).LT.0.0)  DZB=CBODY(LL)                               GENF      142
                  PRT2 = CLJ(LB)*CBODY(LL)                                          GENF      143
                  CZB   = CZB + PRT2*DYB*XMULT                                      GENF      144
                  CYB   = CYB + PRT2*DZB*XMULT                                      GENF      145
145               PRT3 =-CMJ(LB)*CBODY(LL)**2                                       GENF      146
                  PRT4 = CLJ(LB)*CBODY(LL)*XBLE(LL)                                 GENF      147
                  CMB   = CMB + (PRT3+PRT4)*DYB*XMULT                               GENF      148
                  CNB   = CNB + (PRT3+PRT4)*DZB*XMULT                               GENF      149
                  FACT = YSB*DYB + ZSB*DZB                                          GENF      150
150               CLIB = CLIB + CLJ(LB)*CBODY(LL)*FACT                              GENF      151
              240 CONTINUE                                                          GENF      152
              245 CONTINUE                                                          GENF      153
                  CZ    = CZ + CZB                                                  GENF      154
                  CY    = CY + CYB                                                  GENF      155
155               CM    = CM + CMB                                                  GENF      156
                  CN    = CN + CNB                                                  GENF      157
                  CLI   = CLI+ CLIB                                                 GENF      158
                  CZ    = XA*CZ                                                     GENF      159
                  CY    =-XA*CY                                                     GENF      160
160               CM    = XB*CM                                                     GENF      161
                  CN    = XC*CN                                                     GENF      162
                  CLI   =-XC*CLI                                                    GENF      163
                  IF (LC(8).EQ.0)  GOTO 251                                         GENF      164
                  WRITE (ITAPEW,10)  J                                              GENF      165
165               DO 250 K=1,NSTRIP                                                 GENF      166
                  YOS(K) = YS(K)/B2                                                 GENF      167
                  CLJXK= CLJ(K)                                                     GENF      168
                  CMJXK= CMJ(K)                                                     GENF      169
                  IF (NSV.NE.0.AND.K.LE.NSV)  CLJXK=2.0*CLJXK                       GENF      170
170               IF (NSV.NE.0.AND.K.LE.NSV)  CMJXK=2.0*CMJXK                       GENF      171
```

```
                DO  80  L=1,NB                                                  GENF       59
                I1    = I2+1                                                    GENF       60
60              I2    = IBX1+NBEA(L)                                            GENF       61
                XBLE(L)  = X(I1)-SDELX(I1)/2.0                                  GENF       62
                DO  70  I=I1,I2                                                 GENF       63
                CBODY(L) = CBODY(L)+SDELX(I)                                    GENF       64
             70 CONTINUE                                                        GENF       65
65           80 CONTINUE                                                        GENF       66
             90 CONTINUE                                                        GENF       67
                DO 300 J=1,NMD                                                  GENF       68
                CZ    = (0.0,0.0)                                               GENF       69
                CY    = (0.0,0.0)                                               GENF       70
70              CM    = (0.0,0.0)                                               GENF       71
                CN    = (0.0,0.0)                                               GENF       72
                CLI   = (0.0,0.0)                                               GENF       73
                READ  (NTP3)   (P(I),  I = 1, NBOX)                             GENF       74
                IF (NBOX.EQ.NTOT)  GO TO 100                                    GENF       75
75              READ  (NTP7 )  (P(IP), IP=IP1,NTOT)                             GENF       76
            100 CONTINUE                                                        GENF       77
                DO 200 K=1,NSTRIP                                               GENF       78
                CLJ(K) = (0.0,0.0)                                              GENF       79
                CMJ(K) = (0.0,0.0)                                              GENF       80
80              SIGN1= 1.0                                                      GENF       81
                SIGN2= 1.0                                                      GENF       82
                CGAM = COS(FGAMMA(K))                                           GENF       83
                SGAM = SIN(FGAMMA(K))                                           GENF       84
                IF (CGAM.LT.0.0)  SIGN1=-1.0                                    GENF       85
85              IF (SGAM.LT.0.0)  SIGN2=-1.0                                    GENF       86
                I1    = LIM(K,1)                                                GENF       87
                I2    = LIM(K,2)                                                GENF       88
                DO 150 I=I1,I2                                                  GENF       89
                PRT1 = P(I)*SDELX(I)                                            GENF       90
90              CLJ(K) = CLJ(K) + PRT1/CWIG(K)                                  GENF       91
                CMJ(K) = CMJ(K) - PRT1*(EV(I)-XIJ(K))/(CWIG(K)**2)              GENF       92
            150 CONTINUE                                                        GENF       93
                PRT2 = CLJ(K)*CWIG(K)                                           GENF       94
                CZ    = CZ + PRT2*DELYS(K)*SIGN1                                GENF       95
95              CY    = CY + PRT2*DELZS(K)*SIGN2                                GENF       96
                PRT3 =-CMJ(K)*(CWIG(K)**2)                                      GENF       97
                PRT4 = CLJ(K)* CWIG(K)*XIJ(K)                                   GENF       98
                CM    = CM + (PRT3+PRT4)*DELYS(K)*SIGN1                         GENF       99
                CN    = CN + (PRT3+PRT4)*DELZS(K)*SIGN2                         GENF      100
100             FACT = YS(K)*DELYS(K)*SIGN1 + ZS(K)*DELZS(K)*SIGN2              GENF      101
                CLI   = CLI+ CLJ(K)*CWIG(K)*FACT                                GENF      102
            200 CONTINUE                                                        GENF      103
                IF (LC(7) .EQ. 0) GO TO 236                                     GENF      104
                WRITE (ITAPEW,32)  J                                            GENF      105
105             DO 235  I=1,NBOX                                                GENF      106
                PRES = P(I)                                                     GENF      107
                IF (NBV.NE.0.AND.I.LE.NBV)  PRES=2.0*P(I)                       GENF      108
                WRITE (ITAPEW,40) I,XOC(I),EV(I),Y(I),ZZ(I), PRES               GENF      109
            235 CONTINUE                                                        GENF      110
110         236 CONTINUE                                                        GENF      111
                CZB   = (0.0,0.0)                                               GENF      112
                CYB   = (0.0,0.0)                                               GENF      113
                CMB   = (0.0,0.0)                                               GENF      114
                CNB   = (0.0,0.0)                                               GENF      115
```

```
      SUBROUTINE GENF(NDELT,NB,NSTRIP,NBOX,NTOT,NBV,NSV,NMD,LIM,ACAP,FL,  GENF      2
     1           B2,EV,Y,ZZ,SDELX,XIJ,XOC,X,FREQ)                         GENF      3
C                                                                         GENF      4
      COMMON/BODY/ RO(100), ROP(100), NBEA(20), BGMA(20), MRK(20,2),      GENF      5
     1             XBO(20), YBO(20), ZBO(20)                            GENF      6
      COMMON  /NTPS/  NTP1,NTP2,NTP3,NTP4,NTP5,NTP6,NTP7,NTP8,NTP9,NTP10 GENF      7
      COMMON/COMA  / LC,BR                                              GENF      8
      COMMON / CTAPES / ITAPES                                          GENF      9
C                                                                         GENF     10
      DIMENSION  LIM(50,3), XIJ(50),YOS(50),EV(400),SDELX(400)          GENF     11
      DIMENSION   BF(400) ,  Y(400) , ZZ(400) , XOC(400) , X(400)       GENF     12
      DIMENSION  XBLE(20), CBODY(20)                                    GENF     13
      DIMENSION LC(40)                                                  GENF     14
      DIMENSION ITAPES(50)                                              GENF     15
C                                                                         GENF     16
      COMPLEX   GENFM(40,40)                                            GENF     17
      COMPLEX   GF(400), GFT                                            GENF     18
      COMPLEX  P(400), CLJ(50), CMJ(50)                                 GENF     19
      COMPLEX  CZ,CY,CM,CN,CLI,PRT1,PRT2,PRT3,PRT4                      GENF     20
      COMPLEX    CZB,CYB,CMB,CNB,CLIB                                   GENF     21
      COMPLEX    PRES,CLJXK,CMJXK                                       GENF     22
C                                                                         GENF     23
      COMMON /XYZ/YS(50),DELYS(50),ZS(50),DELZS(50),FGAMMA(50),CWIG(50)  GENF     24
     1           ,DUMMY(50)                                             GENF     25
C                                                                         GENF     26
      ITAPEW  = ITAPES(6)                                               GENF     27
C                                                                         GENF     28
      MID = 40                                                          GENF     29
      DO 2 I=1,MID                                                      GENF     30
      DO 2 J=1,MID                                                      GENF     31
    2 GENFM(I,J)  = 0.                                                  GENF     32
      WRITE (ITAPEW,111) FREQ                                           GENF     33
      REWIND  NTP3                                                      GENF     34
      REWIND  NTP7                                                      GENF     35
      REWIND  NTP10                                                     GENF     36
      MTAP   =  ITAPES(36)                                              GENF     37
      MMRK = MRK(1,1)                                                   GENF     38
      DO 1 I = 1,NB                                                     GENF     39
      MK = MRK(I,1)                                                     GENF     40
      IF (MK.LT.MMRK) MMRK = MK                                         GENF     41
    1 CONTINUE                                                          GENF     42
      NWP = MMRK - 1                                                    GENF     43
      DO 50  I=1,50                                                     GENF     44
      CLJ(I) = (0.0,0.0)                                                GENF     45
      CMJ(I) = (0.0,0.0)                                                GENF     46
   50 CONTINUE                                                          GENF     47
      XA    = FLOAT(1+NDELT) /(2.0*ACAP)                                GENF     48
      XB    = -XA/FL                                                    GENF     49
      XC    = -FLOAT(1-NDELT)/(2.0*ACAP*B2)                             GENF     50
      IP1   = NBOX+1                                                    GENF     51
      DO  60  L=1,20                                                    GENF     52
      XBLE(L) = 0.0                                                     GENF     53
      CBODY(L)= 0.0                                                     GENF     54
   60 CONTINUE                                                          GENF     55
      IBX1 = NBOX                                                       GENF     56
      I2   = IBX1                                                       GENF     57
      IF (NB.EQ.0) GO TO 90                                             GENF     58
```

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
605	140	NN	278 283	208	NOT INNER
613	135	MN	279 282	6B	INSTACK
632	145	MN	289 291	21B	EXT REFS NOT INNER
640		IO	291 291	7B	EXT REFS
667	190	IB	318 362	152B	EXT REFS NOT INNER
742	170	MN	339 349	40B	NOT INNER
756	165	IO	344 347	12B	OPT
1031	180	MN	359 361	4B	INSTACK
1062	220	IB	387 399	30B	EXT REFS NOT INNER
1071	210	IO	395 398	14B	EXT REFS
1121	230	IO	408 414	27B	EXT REFS

COMMON BLOCKS	LENGTH	MEMBERS - BIAS NAME(LENGTH)	
CTAPES	50	0 ITAPES (50)	
CFILES	51	0 KFILES (1)	1 IFILES (50)

STATISTICS

PROGRAM LENGTH	21240B	8864
CM LABELED COMMON LENGTH	145B	101

520000B CM USED

STATEMENT LABELS			DEF LINE	REFERENCES	
0	113		123	116	
0	114		124	105	
0	115		149	132	
266	116		158	125	
0	117		169	167	
0	118		189	183	185
510	119		253	378	
0	120		271	268	
0	121		219	208	217
0	122		203	199	
0	123		147	145	
0	124		148	141	
0	125		272	262	
401	126		204	198	
0	128		234	226	230
600	130		273	257	261
0	135		282	279	
0	140		283	278	
0	145		291	289	
664	150		313	309	
675	160		323	320	
724	161		335	323	
733	163		336	334	
0	165		347	344	
0	170		349	339	
1022	175		358	354	
0	180		361	359	
1036	190		362	318	357
1044	195		366	363	
1055	200		382	295	
0	210		398	395	
0	220		399	387	
1136	230		414	408	411
1164	295		427	72	416
363	1118		190	182	
0	9999	INACTIVE	437		

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES	
77	110	J	86 89	15B		EXT REFS
131	114	I	105 124	50B		EXT REFS NOT INNER
144	113	NPP	116 123	32B		NOT INNER
156	112	NN	120 122	10B	OPT	
207	115	I	132 149	50B		EXT REFS NOT INNER
222	124	NPP	141 148	32B		NOT INNER
234	123	NN	145 147	10B	OPT	
312	117	NPP	167 169	20B		EXT REFS NOT INNER
317		J	169 169	7B		EXT REFS
341	118	I	183 189	22B		NOT INNER
352	118	J	185 189	6B	INSTACK	
367	122	I	199 203	12B		EXT REFS
406	121	JCNT	208 219	36B		EXT REFS NOT INNER
434	121	NPP	217 219	5B	INSTACK	
454	128	I	226 234	23B		EXT REFS NOT INNER
463	128	LREAD	230 234	12B		EXT REFS
516	130	MN	257 273	65B		NOT INNER
532	125	IB	262 272	46B		NOT INNER

```
                      DO 32 I=1,NOB                                          MACH     173
                   32 R1(I)=CMPLX(XR,X1)                                     MACH     174
                      CALL COFFIN (NL,P,AM,LL,EL,KK, VBO     ,NPIF)          MACH     175
175                   CALL TIMEB (23,23HFROM MACH, AFTER COFFIN)              MACH     176
                   36 CALL GEDLAB(8HMACH  O1,MTAP9,NAME,NF,IRDU,JCDU)        MACH     177
                      OSAAA = NSAA(KK)                                       MACH     178
                      REWIND MTAP12                                          MACH     179
                      IF (LC(22).NE.-1)  GOTO 14                             MACH     180
180                   CALL RIP ( NQ,OSAAA,P,ES,LC(35) )                      MACH     181
                      CALL TIMEB (23,23HFROM MACH, AFTER RIP    )            MACH     182
                          GO TO 60                                           MACH     183
                   14 CALL TRIP ( OSAAA,NQ,LINC,LC(22),NKF,P,ES,VBO,LC(35) ) MACH     184
                      REWIND MTAP14                                          MACH     185
185             C     CALL TIME (0,0,ZRIP,4)                                 MACH     186
                   60 IF ( LC(35) .NE. 0 .AND. NDB .NE  0 .AND. LC(22) .NE  1 ) MACH     187
                     1         CALL DSPDDW ( KK, NQ , VBO , LC(33) )         MACH     188
                      IF (NOPE.EQ.0) GO TO 99                                MACH     189
                      REWIND MTAP12                                          MACH     190
190                   DO 45 I = 1,NQ                                         MACH     191
                      WRITE (ITAPEW,900)  VBO                                MACH     192
                      LINE = 8                                               MACH     193
                      WRITE (ITAPEW,960) I                                   MACH     194
                      CALL CNRW (-MTAP12,PP,NWB)                             MACH     195
195                   DO 45 J = 1,NWB                                        MACH     196
                      LINE = LINE + 1                                        MACH     197
                      IF (LINE.LT.45) GO TO 79                               MACH     198
                      LINE = 10                                              MACH     199
                      WRITE (ITAPEW,900)  VBO                                MACH     200
200                   WRITE (ITAPEW,960) I                                   MACH     201
                   79 XWIN = (XW(J) + 0.5) * ES * 12.0                       MACH     202
                      YWIN = (YW(J) + 0.5) * ES * 12.0 / BETA                MACH     203
                      WRITE (ITAPEW,2002) J , PP(J) , XWIN , YWIN            MACH     204
                   45 CONTINUE                                               MACH     205
205                99 CONTINUE                                               MACH     206
                      DO 80 K = 1,NQ                                         MACH     207
                      DO 80 KJ = 1,NQ                                        MACH     208
                      IF (KK.EQ.1) Q(K,KJ) = 0.0                             MACH     209
                   80 QS(K,KJ) = 0.0                                         MACH     210
210             C                                                            MACH     211
                      CALL GEDLAB(8HMACH  O2,MTAP9,NAME,NF,IRDU,JCDU)        MACH     212
                      DO 100 K = 1,NQ                                        MACH     213
                      MAX=2*NWB                                              MACH     214
                      CALL GETROW(MTAP9,1,DWSH,MAX)                          MACH     215
215                   ZQ1 = QMWT(K,KK)                                       MACH     216
                      REWIND MTAP12                                          MACH     217
                      DO 110 K1 = 1,NQ                                       MACH     218
                      CALL CNRW (-MTAP12,PP,NWB)                             MACH     219
                      ZQ2 = QMWT(K1,KK)                                      MACH     220
220                   IF ( LC(33) .NE. 0 )     FACTOR = 1.0 / (BR*BR)        MACH     221
                      IF ( LC(33) .EQ. 0 )     FACTOR = VBO * VBO            MACH     222
                      DO 120 KJ = 1,NWB                                      MACH     223
                      H    =  REAL (DWSH(KJ))                                MACH     224
                  120 QS(K,K1) = QS(K,K1) + AW(KJ)*PP(KJ)*H*ES*ES*EL*0.5*BR*BR MACH     225
225                  1*FACTOR*ZQ1*ZQ2*QWT(KK)                                MACH     226
                  110 Q(K,K1) = Q(K,K1) + QS(K,K1)                           MACH     227
                  100 CONTINUE                                               MACH     228
                      IF (KK.NE.NS) GO TO 5000                               MACH     229
```

```
                DO 111 K=1,NQ                                                    MACH      230
230           111 WRITE(MTAP50)  (Q(K,K1),K1=1,NQ)                               MACH      231
             5000 CONTINUE                                                       MACH      232
                IF ( KQRS .EQ. 0 )      GO TO 51                                 MACH      233
                LINE = 8                                                         MACH      234
                KONS = NQ/3 + NQ - 3*(NQ/3) + 1                                  MACH      235
235             WRITE (ITAPEW,2015) AM ,  VBO     , KK                           MACH      236
                DO 88 K2=1,NQ                                                    MACH      237
                LINE = LINE + KONS                                               MACH      238
                IF (LINE.LE.62) GO TO 88                                         MACH      239
                LINE = 8 + KONS                                                  MACH      240
240             WRITE (ITAPEW,2015) AM ,  VBO     , KK                           MACH      241
             88 WRITE (ITAPEW,710) (QS(K2,K3),K3=1,NQ)                           MACH      242
                IF(NS.EQ.1) GO TO 51                                             MACH      243
                IF(KK.NE.NS) GO TO 51                                            MACH      244
                WRITE(ITAPEW,130) AM,VBO                                         MACH      245
245             DO 225 I2=1,NQ                                                   MACH      246
            225 WRITE(ITAPEW,710) (Q(I2,J1),J1=1,NQ)                             MACH      247
             51 CONTINUE                                                         MACH      248
                REWIND MTAP12                                                    MACH      249
                IF(KDRAW) 450,450,350                                            MACH      250
250          350 CALL IMAGE (NQ,KK,ES,EL,VBO,AM)                                 MACH      251
                CALL TIMEB (23,23HFROM MACH, AFTER IMAGE )                       MACH      252
            450 CONTINUE                                                         MACH      253
            149 CONTINUE                                                         MACH      254
            150 CONTINUE                                                         MACH      255
255             IF (.NOT.KQINT) GO TO 19                                         MACH      256
                CALL QINTP (MTAP50,NQ,LC(4),RVBO,NRVBO,AM,VVBO)                  MACH      257
             19 CONTINUE                                                         MACH      258
           C                                                                     MACH      259
           C                                                                     MACH      260
260        C FORMATS                                                             MACH      261
           C                                                                     MACH      262
             59 FORMAT  (6E10.3)                                                 MACH      263
             76 FORMAT (1H1,/15X36HBOX ELIMINATION IN FORWARD DIAPHRAGM, //      MACH      264
               1        12X7HSURFACE,5X27HINCHES FWD. OF LEADING EDGE,//)        MACH      265
265          78 FORMAT ((12X,I3,15X,E12.4)/)                                     MACH      266
            130 FORMAT(1H1,5X44H SUM OF GENERALIZED AIRFORCES FOR MACH NO = ,    MACH      267
              1F10.3,/5X5HVBO= ,E10.3,/15X7HBY ROWS,10X11H(REAL,IMAG), /)        MACH      268
            700 FORMAT (14L5)                                                    MACH      269
            710 FORMAT(/( T3,1PE10.3,T15,1PE10.3, T1,2H (,T13,2H, , T25,2H) ,    MACH      270
270            1         T29,1PE10.3,T41,1PE10.3,T27,2H (,T39,2H, , T51,2H) ,   MACH      271
               2         T55,1PE10.3,T67,1PE10.3,T53,2H (,T65,2H, , T77,2H) ))  MACH      272
            900 FORMAT (1H1,/15X28HPLANFORM PRESSURES AT VBO = , F7.3 //         MACH      273
               1        8X4HMODE,15X8HPRESSURE, /15X3HBOX,3X                    MACH      274
               2        21H( REAL  , IMAGINARY ),7X 6HX(IN.),7X6HY(IN.),//)     MACH      275
275         960 FORMAT (9X,I3)                                                   MACH      276
           1005 FORMAT (10I5)                                                    MACH      277
           1015 FORMAT(5I5)                                                      MACH      278
           2002 FORMAT (14X,I4,2X,E10.3,2X,E10.3,5X,E10.3,3X,E10.3)              MACH      279
           2015 FORMAT (1H1,5X37HGENERALIZED AIR FORCES FOR MACH NO = ,F10.3/5X   MACH      280
               1        6HVBO = ,E12.4/5X14HSURFACE NO. = ,I3,/15X7HBY ROWS,10X  MACH      281
280            2        16H(REAL,IMAGINARY),//)                                 MACH      282
                RETURN                                                           MACH      283
                END                                                              MACH      284
```

SYMBOLIC REFERENCE MAP (R=3)

ENTRY POINTS		DEF LINE	REFERENCES
1	MACH	1	282

VARIABLES		SN	TYPE		RELOCATION							
1310	AD		REAL	ARRAY	TOMB	REFS	4	28	DEFINED	160		
1630	AM		REAL			REFS	104	174	235	240	244	250	256
						DEFINED	67						
3424	AW		REAL	ARRAY	TOMB	REFS	4	28	224	DEFINED	157		
0	BEL		REAL		BOXS	REFS	30						
1	BETA		REAL		FLUTAN	REFS	26	102	202				
0	BEX		REAL	ARRAY	BXLL	REFS	31	90	91	DEFINED	85	87	
50	BR		REAL		COMA	REFS	25	167	2*220	2*224			
1	BSR		REAL		BOXS	REFS	30						
0	CLEXR		REAL	ARRAY	IDIOT	REFS	11	29					
144	CLEYR		REAL	ARRAY	IDIOT	REFS	11	29					
310	CTEXR		REAL	ARRAY	IDIOT	REFS	11	29					
454	CTEYR		REAL	ARRAY	IDIOT	REFS	12	29					
21156	DUMMY		REAL	ARRAY		REFS	18	DEFINED	161				
3232	DWSH		COMPLEX	ARRAY		REFS	7	22	214	223			
1637	EL		REAL			REFS	102	117	121	122	124	174	224
						250	DEFINED	155					
1641	ENDX		REAL			REFS	102	117	122	DEFINED	155		
1643	ES		REAL			REFS	102	117	121	122	124	167	180
						183	201	202	2*224	250	DEFINED	155	165
21140	ESR		REAL	ARRAY		REFS	9	102	165				
1703	FACTOR		REAL			REFS	224	DEFINED	220	221			
0	FMACH		REAL		FLUTAN	REFS	26	67					
1704	H		REAL			REFS	224	DEFINED	223				
1632	I		INTEGER			REFS	74	76	90	2*91	94	95	96
						2*97	132	133	173	193	200		
						DEFINED	73	76	89	93	131	172	190
5	IINC		INTEGER	ARRAY	KIMA	REFS	16	32	DEFINED	95	97		
1661	IJ		INTEGER			REFS	4*157	3*160	DEFINED	156	159		
1635	IL		INTEGER			REFS	81	83	85	DEFINED	80	83	84
1640	IM	*	INTEGER			REFS	102						
2666	IND		INTEGER	ARRAY	TOMB	REFS	8	28	DEFINED	157			
1656	IO		INTEGER			REFS	163	164	DEFINED	146			
1613	IRD		INTEGER			REFS	105	DEFINED	43				
1667	IRDU		INTEGER			REFS	176	211					
1645	ITAPE		INTEGER			REFS	117	DEFINED	112	113			
2	ITAPEP		INTEGER		COMRWP	REFS	34						
0	ITAPER		INTEGER		COMRWP	REFS	34	I/O REFS	75	76	79	83	87
						97							
0	ITAPES		INTEGER	ARRAY	CTAPES	REFS	20	33	46	47	48	49	50
						51	52	53	54				
7	ITAPET		INTEGER		CTABLE	REFS	36						
1	ITAPEW		INTEGER		COMRWP	REFS	34	I/O REFS	88	91	191	193	199
						200	203	235	240	241	244	246	
1710	I2		INTEGER			REFS	246	DEFINED	245				
1673	J		INTEGER			REFS	201	202	2*203	DEFINED	195		
1614	JCD		INTEGER			REFS	105	DEFINED	44				
1670	JCDU		INTEGER			REFS	176	211					
1711	J1		INTEGER			REFS	246	DEFINED	246				
1634	K		INTEGER			REFS	79	87	208	209	215	2*224	3*226

VARIABLES	SN	TYPE		RELOCATION								
					230	DEFINED	79	87	206	212	229	
1660	KDRAW	INTEGER			REFS	249	DEFINED	151				
1642	KEND	INTEGER			REFS	102	117	121	122	124		
					DEFINED	155						
1676	KJ	INTEGER			REFS	208	209	223	2*224	DEFINED	207	222
1636	KK	INTEGER			REFS	102	2*104	105	110	116	117	121
					122	124	125	127	128	151	153	154
					165	174	177	186	208	215	219	224
					228	235	240	243	250	DEFINED	101	149
1705	KONS	INTEGER			REFS	237	239	DEFINED	234			
21133	KPLOT	INTEGER	ARRAY		REFS	9	96	151	DEFINED	81	83	
1607	KQINT	LOGICAL			REFS	39	163	164	255	DEFINED	68	69
1626	KQRS	INTEGER			REFS	232	DEFINED	65				
1605	KSURF	LOGICAL			REFS	39	76	113	114	119	120	121
					122	124	DEFINED	75	106	111		
0	KTABLE	INTEGER		CTABLE	REFS	36	DEFINED	57	60			
5	KTABLO	INTEGER		CTABLE	REFS	36						
1701	K1	INTEGER			REFS	219	2*224	3*226	230	DEFINED	217	230
1706	K2	INTEGER			REFS	241	DEFINED	236				
1707	K3	INTEGER			REFS	241	DEFINED	241				
0	LC	INTEGER	ARRAY	COMA	REFS	13	25	65	66	69	71	72
					82	138	139	2*140	141	162	2*167	171
					179	180	2*183	3*186	220	221	256	
1612	LINC	LOGICAL			REFS	39	183	DEFINED	75			
1672	LINE	INTEGER			REFS	196	197	237	238	DEFINED	192	196
					198	233	237	239				
1653	LL	INTEGER			REFS	170	174	DEFINED	135			
1275	LS	INTEGER	ARRAY	TOMB	REFS	6	28					
0	LTSHF	INTEGER		CTSHF	REFS	35						
0	LZ	INTEGER	ARRAY	KIMA	REFS	16	32	DEFINED	94	97		
1677	MAX	INTEGER			REFS	214	DEFINED	213				
1621	MTAP10	* INTEGER			DEFINED	50						
1622	MTAP11	INTEGER			DEFINED	51	I/O REFS	136				
1623	MTAP12	INTEGER			REFS	194	218	DEFINED	52	I/O REFS	178	189
					216	248						
1624	MTAP14	INTEGER			REFS	122	DEFINED	53	I/O REFS	120	184	
1615	MTAP2	INTEGER			DEFINED	46	I/O REFS	78				
1616	MTAP3	INTEGER			DEFINED	47	I/O REFS	100	148	155	157	160
					161							
1625	MTAP50	INTEGER			REFS	256	DEFINED	54	I/O REFS	70	230	
1617	MTAP8	INTEGER			REFS	113	DEFINED	48	I/O REFS	114		
1620	MTAP9	INTEGER			REFS	105	112	176	211	214		
					DEFINED	49						
21152	NAME	INTEGER	ARRAY		REFS	17	176	211				
21154	NAMSRF	INTEGER	ARRAY		REFS	17	105	DEFINED	41			
1610	NBEL	LOGICAL			REFS	39	86	DEFINED	75			
620	NCLER	INTEGER	ARRAY	IDIOT	REFS	10	29					
3	NCOLS	INTEGER		CTABLE	REFS	36	DEFINED	56				
4	NCOLST	INTEGER		CTABLE	REFS	36						
1644	NCS	INTEGER			REFS	111	121	124	DEFINED	110		
21145	NCSS	INTEGER	ARRAY		REFS	10	110	DEFINED	74	76		
625	NCTER	INTEGER	ARRAY	IDIOT	REFS	10	29					
1274	NDB	INTEGER		TOMB	REFS	28	128	158	159	186		
					DEFINED	154	155					
3225	NDI	INTEGER	ARRAY		REFS	7	154	DEFINED	128			
1657	NF	INTEGER			REFS	152	176	211	DEFINED	147	152	
1655	NKF	INTEGER			REFS	150	183	DEFINED	145	150		

VARIABLES	SN	TYPE	RELOCATION								
1652	NL	INTEGER		REFS	2*170	174	DEFINED	134			
1666	NOB	INTEGER		REFS	172	DEFINED	170				
1627	NOPE	INTEGER		REFS	188	DEFINED	66				
6	NPAGEA	INTEGER	CTABLE	REFS	36						
1	NPASS	INTEGER	CTABLE	REFS	36						
1633	NPIF	INTEGER		REFS	174	DEFINED	75				
1646	NPOINT	INTEGER		REFS	117	122	DEFINED	116			
1611	NPTF	* LOGICAL	*UNDEF	REFS	39						
1631	NQ	INTEGER		REFS	117	121	122	124	125	180	183
				186	190	206	207	212	217	229	230
				3*234	236	241	245	246	250	256	
				DEFINED	72						
1654	NRF	INTEGER		REFS	146	DEFINED	138	141	143		
2	NROWS	INTEGER	CTABLE	REFS	36	DEFINED	55				
57	NRVBO	INTEGER	FLUTAN	REFS	26	141	256				
632	NS	INTEGER	IDIOT	REFS	29	73	76	79	80	83	84
				87	89	93	101	131	149	228	242
				243	DEFINED	71					
21126	NSAA	INTEGER	ARRAY	REFS	9	177	DEFINED	79			
1307	NWB	INTEGER	TOMB	REFS	28	127	156	194	195	213	218
				222	DEFINED	153	155				
3220	NWI	INTEGER	ARRAY	REFS	7	153	DEFINED	127			
1671	OSAAA	REAL		REFS	180	183	DEFINED	177			
1663	P	REAL		REFS	174	180	183	DEFINED	166	167	
1712	PP	COMPLEX	ARRAY	REFS	5	22	194	203	218	224	
4526	Q	COMPLEX	ARRAY	REFS	8	22	226	230	246		
				DEFINED	208	226					
0	QMWT	REAL	ARRAY FLUTQ	REFS	14	24	215	219			
12726	QS	COMPLEX	ARRAY	REFS	8	22	224	226	241		
				DEFINED	209	224					
310	QWT	REAL	ARRAY FLUTQ	REFS	14	24	224				
1647	QZ	REAL		REFS	117	122					
40	RVBO	REAL	ARRAY FLUTAN	REFS	15	26	163	256			
0	R1	COMPLEX	ARRAY CORPSE	REFS	5	22	27	DEFINED	173		
1	TSHF	REAL	ARRAY CTSHF	REFS	19	35					
1662	VBO	REAL		REFS	167	174	183	186	191	199	2*221
				235	240	244	250	DEFINED	162	163	164
2	VVBO	REAL	ARRAY FLUTAN	REFS	15	26	164	256			
1606	WILK	LOGICAL		REFS	39	117	122	DEFINED	107	119	
1702	XD	REAL	ARRAY TOMB	REFS	3	28	DEFINED	160			
3206	XI	REAL	ARRAY	REFS	6	102	104	132			
1650	XM	REAL		REFS	132	134	DEFINED	129	132		
1302	XMAX	REAL	ARRAY TOMB	REFS	5	28					
1664	XR	REAL		REFS	173	DEFINED	168				
0	XW	REAL	ARRAY TOMB	REFS	3	28	201	DEFINED	157		
1674	XWIN	REAL		REFS	203	DEFINED	201				
1665	X1	REAL		REFS	173	DEFINED	169				
2274	YD	REAL	ARRAY TOMB	REFS	4	28	DEFINED	160			
3213	YI	REAL	ARRAY	REFS	6	102	133				
1651	YM	REAL		REFS	133	135	DEFINED	130	133		
536	YW	REAL	ARRAY TOMB	REFS	3	28	202	DEFINED	157		
1675	YWIN	REAL		REFS	203	DEFINED	202				
1700	ZQ1	REAL		REFS	224	DEFINED	215				
1702	ZQ2	REAL		REFS	224	DEFINED	219				

VARIABLES USED AS FILE NAMES, SEE ABOVE

EXTERNALS	TYPE	ARGS	REFERENCES					
CNRW		3	194	218				
COFFIN		8	174					
DSPDOW		4	186					
DSPMD		2	125					
EVOVLE		10	102					
GEDLAB		6	176	211				
GETROW		4	214					
HELZ		7	121	124				
IMAGE		6	250					
MODAZ		10	117	122				
PLAN		3	104					
PTABLE		3	58	61				
PUDLAB		6	105					
QINTP		7	256					
RIP		5	180					
TIMEB		2	77	103	118	126	175	181	251
TRIP		9	183					

INLINE FUNCTIONS	TYPE	ARGS	DEF LINE	REFERENCES	
AMAX1	REAL	0	INTRIN	132	133
CMPLX	COMPLEX	2	INTRIN	173	
REAL	REAL	1	INTRIN	223	

STATEMENT LABELS			DEF LINE	REFERENCES		
0	2	INACTIVE	127			
0	10	INACTIVE	129			
432	14		183	179		
0	15		133	131		
766	19		257	255		
0	30	INACTIVE	134			
0	32		173	172		
416	36		176	171		
0	40		74	73		
300	42		144	139	142	
277	43		143	140		
0	45		204	190	195	
747	51		247	232	242	243
151	57		98	93	96	
1446	59	FMT	262	87		
436	60		186	182		
137	67		93	86		
1450	76	FMT	263	88		
134	77		92	89	90	
1463	78	FMT	265	91		
472	79		201	197		
0	80		209	206	207	
0	81		81	80		
110	83		84	82		
0	84		85	84		
701	88		241	236	238	
512	99		205	188		
0	100		227	212		
0	110		226	217		
0	111		230	229		
0	120		224	222		
1466	130	FMT	266	244		

STATEMENT LABELS			DEF LINE	REFERENCES	
0	149		253	149	
0	150		254	146	
0	225		246	245	
0	300		128	101	
0	350	INACTIVE	250	249	
0	401		157	156	
0	402		160	159	
350	420		161	158	
756	450		252	2*249	
1502	700	FMT	268	75	
1504	710	FMT	269	241	246
0	888	INACTIVE	156		
1524	900	FMT	272	191	199
1542	960	FMT	275	193	200
1544	1005	FMT	276	76	79
1546	1015	FMT	277	83	97
1550	2002	FMT	278	203	
1555	2015	FMT	279	235	240
661	5000		231	228	

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES		
50	40	I	73 74	2B	INSTACK		
77	81	IL	80 81	2B	INSTACK		
113	84	IL	84 85	2B	INSTACK		
127	77	I	89 92	10B	EXT REFS		
140	57	I	93 98	14B	EXT REFS		
156	300	KK	101 128	63B	EXT REFS		
246	15	I	131 133	6B	INSTACK		
302	150	IO	146 254	461B	EXT REFS	NOT INNER	
306	149	KK	149 253	453B	EXT REFS	NOT INNER	
320	401	IJ	156 157	14B	EXT REFS		
336	402	IJ	159 160	12B	EXT REFS		
406	32	I	172 173	4B	INSTACK		
451	45	I	190 204	41B	EXT REFS	NOT INNER	
462	45	J	195 204	26B	EXT REFS		
513	80	K	206 209	21B	NOT INNER		
524	80	KJ	207 209	4B	INSTACK		
536	100	K	212 227	100B	EXT REFS	NOT INNER	
550	110	K1	217 226	64B	EXT REFS	NOT INNER	
606	120	KJ	222 224	14B	OPT		
641	111	K	229 230	20B	EXT REFS	NOT INNER	
644		K1	230 230	11B	EXT REFS		
673	88	K2	236 241	26B	EXT REFS	NOT INNER	
704		K3	241 241	11B	EXT REFS		
727	225	I2	245 246	20B	EXT REFS	NOT INNER	
732		J1	246 246	11B	EXT REFS		

COMMON BLOCKS	LENGTH	MEMBERS - BIAS	NAME	(LENGTH)							
FLUTQ	205	0	QMWT	(200)	200	QWT	(5)				
COMA	41	0	LC	(40)	40	BR	(1)				
FLUTAN	48	0	FMACH	(1)	1	BETA	(1)	2	VVBO	(30)	
		32	RVBO	(15)	47	NRVBO	(1)				
CORPSE	4000	0	R1	(4000)							
TOMB	2162	0	XW	(350)	350	YW	(350)	700	NDB	(1)	
		701	LS	(5)	706	XMAX	(5)	711	NWB	(1)	
		712	AD	(250)	962	XD	(250)	1212	YD	(250)	
		1462	IND	(350)	1812	AW	(350)				

COMMON BLOCKS

	LENGTH	MEMBERS - BIAS NAME(LENGTH)					
IDIOT	411	0 CLEXR (100)	100 CLEYR (100)	200 CTEXR (100)			
		300 CTEYR (100)	400 NCLER (5)	405 NCTER (5)			
		410 NS (1)					
BOXS	2	0 BEL (1)	1 BSR (1)				
BXLL	5	0 BEX (5)					
KIMA	10	0 LZ (5)	5 IINC (5)				
CTAPES	50	0 ITAPES (50)					
COMRwP	3	0 ITAPER (1)	1 ITAPEW (1)	2 ITAPEP (1)			
CTSHF	2	0 LTSHF (1)	1 TSHF (1)				
CTABLE	8	0 KTABLE (1)	1 NPASS (1)	2 NROWS (1)			
		3 NCOLS (1)	4 NCOLST (1)	5 KTABLO (1)			
		6 NPAGEA (1)	7 ITAPET (1)				

STATISTICS

PROGRAM LENGTH	21313B	8907
CM LABELED COMMON LENGTH	15443B	6947

520000B CM USED

END

FILMED

5-85

DTIC