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A GENERALIZED ESCAPE SYSTEM SIMULATION COMPUTER PROGRAM: A USER--ETC(U)

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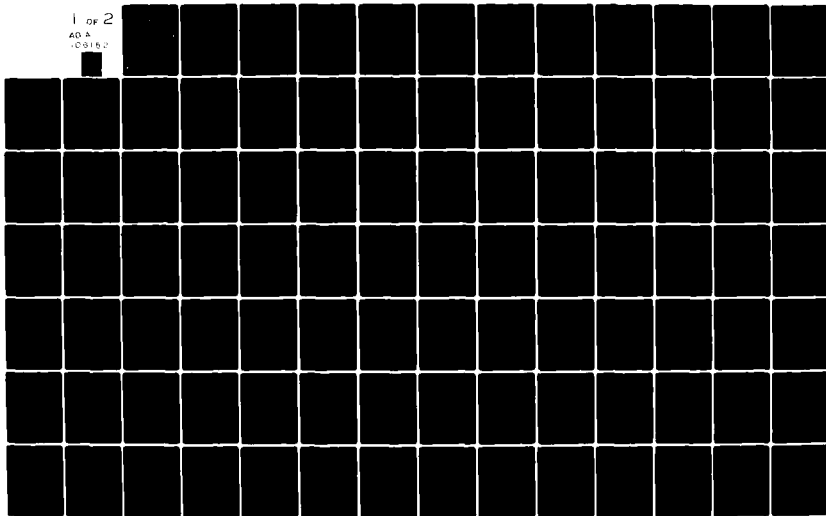
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**A GENERALIZED ESCAPE SYSTEM SIMULATION
COMPUTER PROGRAM:**

A USER'S MANUAL

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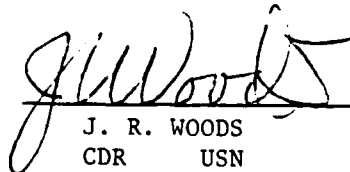
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FOREWORD

This final report presents an outline of the steps required to successfully execute the Generalized Escape System Simulation Computer Program. The program was developed to allow the simulation and analysis of numerous ejection seats under various ejection conditions. A complete listing of the program source code is not included in this report because such a listing would be several hundred pages long. However, a printout and a copy of the program may be obtained by contacting the author at NADC.

A portion of the work contained in this report was performed by Computer Sciences Corporation in accordance with Task Order 46, "Escape System Ejection Seat Simulation and Analysis", issued under contract N62269-78-C-0191.

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I. INTRODUCTION

This manual is a guide to running the Generalized Escape System Simulation (GESS) Program. The following is a list of the segments needed to complete a successful run of this program. These segments must be exercised in the order listed below:

1. Creating the Aerodynamic Coefficient Tables (via the ACT Program).
2. Build a GESS Input File
3. Execute the GESS Program
4. Run Utilities on the Plotting File (Optional)
5. Re-run the GESS Program (Optional)

Each section of this manual describes one of the above segments. Any steps to be performed within each segment must be done in the order in which they are described within the corresponding section.

It will be assumed in this User's Manual that the reader/user is familiar with the NADC Central Computer System and the KRONOS Operating System. If particular questions arise refer to references 1 and 2.

The GESS Program System was written to simulate ejection seat escape systems. The program generates various trajectories of escape system components and personnel by means of mathematical modeling. This program was written in a general sense to simulate a number of ejection seat escape systems. The program is a digital simulation designed to run on a Control Data 6600/Cyber Series Computer. The programming language used was Fortran Extended Version 4. The program requires

an input data file and random files of Aerodynamic Data (see Appendix D). Output reports and plotting files are generated by the GESS Program.

Several naming conventions were used to identify variables and how they were used in the program. Refer to Appendix A for a specific variable description. These naming schedules are listed below:

- SA - Variables with this suffix can relate to "Seat Alone" activities.
- QA - Variables with this suffix can relate to "Occupant Alone" activities.
- SO - Variables with this suffix can relate to "Seat Occupant" activities.
- NPIS - Variables containing this can contain a "Number of Points" for indexing etc.
- RK - Variables with this prefix can relate to "Rocket" values.
- WGHT - Variables containing this can contain a "Weight" value.
- X - Variables with this prefix can relate to the "X" axis.
- Y - Variables with this prefix can relate to the "Y" axis.
- Z - Variables with this prefix can relate to the "Z" axis.
- L - Variables with this suffix can relate to a "Left" side.
- R - Variables with this suffix can relate to a "Right" side.
- VEL - Variables with this can contain a "Velocity" value.
- PORO - Variables with this can contain a "Porosity" value.
- REC - Variables with this prefix can relate to the "Recovery" chute.
- DRO/DR - Variables with either of these prefixes can relate to the "Drogue" chute.
- DRT - Variables with this can relate to "Dart" values.

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POS - Variables with this can relate to "Position" values.
IGN - Variables with this can relate to "Ignition" values.
CAT - Variables with this can relate to "Catapult" values.

II. A. BUILDING THE GESS PROGRAM INPUT FILE

Prior to running the GESS Program, an eighty column card image input file must be created. This file is divided into start/stop cards, a three line header and fourteen data sections (in this order). Appendix A contains an alphabetical list of the variables by sections. This list gives a brief definition of each input variable, its units of measurement, possible legal values and the input format (in order to determine the magnitude of the number). Appendix C is a sample listing of a typical input file.

The program can be run against several sets of data without having to submit the job several times. To accomplish this, a start card is placed at the beginning of every input set (thus separating the sets). A stop card (or a blank card) is placed at the end (last card) of the entire input file. This card terminates the job.

The three line header is used to identify the input file. It is free formatted and any information can be entered. It must be three lines (or records) long. Blank records may be inserted if necessary.

The input variables are divided into fourteen sections. Sections containing small arrays and/or single variables generally contain one, two, or three fields per record (depending on the layout of the section). The control variables (Section 1) and larger tables of data such as "NPTSCT", for example, have up to four fields per record. A field is 20 columns in length and this length is fixed. The first ten

columns describe the value (usually just the variable name). Information in these ten columns can be entered in free format, however, it is usually left justified for easier reading. Imbedded spaces are used when needed to fill up the ten columns. The entire ten columns can be blank filled since the descriptions are optional. This half of the field is used for entering the actual value. Integer numbers and floating point numbers without a decimal point must be right justified (refer to Appendix A for each variable's input format). Floating point numbers containing the decimal point can be entered anywhere within these ten columns but are usually right justified for easier reading. When possible, these entries are edited for legal values. Descriptive error messages are printed when problems occur. The errors are depicted as either fatal or warnings. Warning messages do not abort the run and default values are substituted for the erroneous values. Fatal errors cause program termination. The input file must be edited manually to correct fatal errors before the job can be re-run.

II. B. DESCRIPTION OF THE GESS INPUT SECTIONS

The rules in the previous paragraphs are general and pertain to all of the fourteen input sections. Each input section also has its own unique set of rules that must be strictly adhered to. All values must be present in the file unless otherwise specified in this section. The following chart (Table 1) describes each of the fourteen input sections. (The start/stop and header records were described earlier but it should be noted that variable 'DOWHAT' contains the value for the start/stop record.

The legal values are 'start', 'stop', or a blank card image, and the data must be left justified). The sections must be in the order in which they appear in Table 1. The sections are broken down into records (each line of variable names represents one record). The order of the records and the order of the variables within the record on the chart is the order in which they are read. Remember, each variable is a twenty column field.

Section	Record (or Line of Input)	Remarks
START/STOP	DOMHAT	
HEADER	-	Enter 3 lines (3, 80 char. records) of information.
1	TSTART, TSTOP, ESTOP, IRESTRI IUNITS, IAIRTR, ISEATTR, ICLRNC ISOSEP, IPILOT	
2	IREPTS, IREPTS, IREPTS : IREPTS, IREPTS, IREPTS IPRIFRQ	Thirty (30) word array (IREPTS)
3	DTPHAS1, DTPHAS2, DTPHAS3	
4	TEMP, PRESSUR, VROC XPOS, YPOS, ZPOS YAW, PITCH, ROLL RVEL, QVEL, PVEL WINDX, WINDY, WINDZ VELTOTC, CKPITHIT, DENSITY NPTSAAT AAT, AAT, AAT, AAT, AAT : AAT, AAT, AAT, AAT, AAT	4a. Array AAT (4X50). If NPTSAAT=0, AAT is not input. If NPTSAAT is positive (and non-zero) then NPTSAAT is used for the number of 4 item occurrences.
	NPTSLAT LAT, LAT, LAT, LAT, LAT : LAT, LAT, LAT, LAT, LAT	4b. Array LAT (4X50). If NPTSLAT=0, LAT is not input. If NPTSLAT is positive (and non-zero) then NPTSLAT is used for the number of 4 item occurrences.

TABLE 1 A LAYOUT OF THE GESS INPUT BY SECTION (Page 1 of 5)

Section	Record (or Line of Input)	Remarks
5	XPOSSRP, YPOSSRP, ZPOSSRP XCGSA, YCGSA, ZCGSA IXXSA, IYXSA, IZZSA IYXSA, IYXSA, IZZSA PHISA, PSISA, THISA AREASA, HIGTSA, WIGTSA XPOSBOT, YPOSBOT, ZPOSBOT XPOSSCS, YPOSSCS, ZPOSSCS	
6	XCGSO, YCGSO, ZCGSO IXXSO, IYXSO, IZZSO IYXSO, IYXSO, IZZSO AREASO, WIGTSO IXXOA, IYXOA, IZZOA IYXOA, IYXOA, IZZOA AREAOA, WIGTOAB, WHGTOAA	
7	RAILNTH, RAILANG ISTRIL, NSLBKS KXSB, KYSB, MUSB XPOSRE, YPOSRE, ZPOSRE XPOSRE, YPOSRE, ZPOSRE XPOSSB, YPOSSB, ZPOSSB : : XPOSSB, YPOSSB, ZPOSSB TO BE ADDED	7a. If NSLBKS=0 then not input else NSLBKS=number of records (or 3-item entries)
8		

TABLE 1 A LAYOUT OF THE GESS INPUT BY SECTION (Page 2 of 5)

Section	Record (or Line of Input)	Remarks
9	INCAT CATINT, CATSTK, TCI XPOSAP, YPOSAP, ZPOSAP NPTSCT CATHRST, CATHRST, CATHRST, CATHRST : CATHRST, CATHRST ITUBEND KIUBE, CIUBE, PTUBE MUTUBE, RSTCOEF	9a. If INCAT=0 then remainder of Section 9 is not input 9b. Repeated N times where N=INCAT 9c. If NPTSCT=0 then array CATHRST is not input else NPTSCT = # of 2 item pairs <u>See Note</u> 9d. If ITUBEND > 2 then these records are input
10	INRKT RFLAG, RKNPTS RKIGN, RKGHT, RKBURN XPOSRK, YPOSRK, ZPOSRK RKALPH, RKBETA, RKGAMA RKTHIRST, RKTHIRST, RKTHIRST, RKTHIRST : RKTHIRST, RKTHIRST	10a. If INRKT=0 then remainder of section is not input else this group of records repeated N times where N=INRKT 10b. If RKNPTS=0 then array RKTHIRST is not input else RKNPTS = # of 2 item pairs <u>See Note</u>
11	IDART DRIFCE, DRISTRT, DRISTOP XDRTAP, YDRTAP, ZDRTAP XDRTCP, YDRTCP, ZDRTCP XDRTAP, YDRTAP, ZDRTAP XDRTCP, YDRTCP, ZDRTCP	11a. If IDART = 0 then the remainder of Section 11 is not input

TABLE 1 A LAYOUT OF THE GESS INPUT BY SECTION (Page 3 of 5)

Section	Record (or Line of Input)	Remarks
12	ITVC MPHI, MPSI, MYIE ROLLRL, PITCHRL, SMPLRAT TVCDLAY, RKANG	12a. If ITVC = 0 then the remainder of Section 12 is not input
13	IDYNG CX, XSLACK, SXP SXN, CY, SY CZ, ZSLACK, SZP ZEOT, SZNL, SZN2	13a. If IDYNG = 0 or 1 then the remainder of Section 13 is not input
14	IRECOV TRDPLOY, RECOVLL, RECDRAG RECOVPD, POROSR XRECAP, YRECAP, ZRECAP CHALT1, CHALT2, GLIMIT TDELAY NPTSRLS RECOVLS, RECOVLS, RECOVLS, RECOVLS : : RECOVLS, RECOVLS NPTSRT RECOVFT, RECOVFT, RECOVFT, RECOVFT : : RECOVFT, RECOVFT SEPRCE	14a. If IRECOV=0 then this group of records is not input 14b. If NPTSRLS=0 then array RECOVLS is not input else NPTSRLS = # of 2 item pairs See Note 14a. 14c. If NPTSRT=0 then array RECOVFT is not input else NPTSRT = # of 2 item pairs See Note

TABLE 1 A LAYOUT OF THE GESS INPUT BY SECTION (Page 4 of 5)

Section	Record (or Line of Input)	Remarks
	IDROGUE	
	DRDRAG2, DROGPD2, POROSD2	14d. If IDROGUE=0 then the remainder of Section 14 is not input.
	VELCON	
	IFTDRO2	
	NPTDFT2	
	DROGFT2, DROGFT2, DROGFT2, DROGFT2	14e. If IFTDRO2 = 0 then this group of records is not input.
	⋮	
	DROGFT2, DROGFT2	
	IFTDRO1	
	NPTDFT1	
	DROGFT1, DROGFT1, DROGFT1, DROGFT1	14f. If IFTDRO1=0 then this group of records is not input.
	⋮	
	DROGFT1, DROGFT1	
	IDROGLS	
	NPTSDLS	
	DROGLS, DROGLS, DROGLS, DROGLS	14g. If IDROGLS=0 then this group of records is not input.
	⋮	
	DROGLS, DROGLS	
	TDDPLOY, DISPLAY, DROGLL	
	DRDRAG1, DROGPD1, POROSD1	14h. If NPTSDLS=0 then array DROGFT1 is not input else NPTSDLS = # of 2 item pairs See Note
	DROVELX, DROVELY, DROVELZ	
	XDROGAP, YDROGAP, ZDROGAP	
	AREADC	
	WHTDC, CDDC	
START/STOP	DOWHAT	14i. If NPTSDLS=0 then array DROGLS is not input else NPTSDLS = # of 2 item pairs See Note
		14j. If NPTSDLS=0 then array DROGLS is not input else NPTSDLS = # of 2 item pairs See Note

NOTE: Four (4) data items (or 2, 2 item pairs of data) occur per record in this array. However, in the case of an odd number of 2 item pairs, the last record will contain two (2) data items (or 1, 2 item pair of data).

TABLE 1 A LAYOUT OF THE GESS INPUT BY SECTION (Page 5 of 5)

III. RUNNING THE GESS PROGRAM

The GESS Program can be executed by submitting a previously prepared submit file that contains all of the Job Control Cards (CDC KRONOS Operating System).

NOTE: It is likely that different permanent file names will be used at times (e.g. when different input files or Aerodynamic Coefficient Table Files are used). Make the proper changes before submitting the job. The permanent file name for the input file should be associated with TAPE1. The permanent file name for the Aerodynamic Coefficient Table should be associated with TAPE2.

Refer to Appendix B for a listing of the submit file.

To run the GESS Program from an interactive terminal execute the following:

GET, filename

SUBMIT, filename, EI = Print Site

If any fatal input errors occur then make the corrections and re-submit the job.

Note that a special library, MATLIB4, is used. This library contains special math functions that are needed to run the GESS Program. Be sure that this library is present in the submit file.

IV. THE AERODYNAMIC COEFFICIENT TABLES PROGRAM (ACT)

A preliminary step must be taken before running the GESS Program. Program "ACT" must be executed to create the Aerodynamic Coefficient tables used by GESS. This program (ACT) is only run once. The tables created by the ACT program are saved on a Random Access File and can be used indefinitely. The only reason for re-running "ACT" would be to change the Aerodynamic Coefficients.

Running the ACT Program can be broken down into three parts. First, the input coefficients must be put into card form and stored on a permanent file (associated with Tape 10). Secondly, the ACT Program must be executed. Third, the Aerodynamic Coefficient Tables, created by the ACT program, are saved on a Random Access File which can be used by the GESS Program. Refer to Appendix D for a detailed description of the ACT Program and details on how to run the job. Refer to Appendix E for a Fortran Listing of the ACT Program.

V. PLOTTING FILE

The GESS Program creates a file of plot information (TAPE40). This file is saved as a Permanent Direct Access File called GESSPLT (which is done within the submit file automatically). There are utility programs available for plotting the data on this file. This plotting exercise is optional and is not part of this manual.

VI. RE-RUN OPTION

This enhancement has not been fully implemented. Currently the IRESTR variable in Section 1 input (Program Control Variables) must be set to zero (0) to bypass the creation of the restart file (which is not complete).

When this is fully implemented the user will have the option of creating a restart file (IRESTR = 1) or not (IRESTR = 0). This will allow a user to restart the GESS program at some particular time period or event based on the previous run, thus eliminating the necessity of starting the run from the very beginning of the sequence.

APPENDIX A

GESS INPUT VARIABLES

(DEFINITIONS, UNITS OF MEASUREMENT, LEGAL VALUES, AND INPUT FORMATS)

INPUT DESCRIPTIONS - SECTION 1 - Program Control Variables

VARIABLE NAME	FORMAT	UNITS	DEFINITION	INITIAL VALUES
DOWHAT	8A10		allows multiple runs. Each input set must begin with a start card. Only last input set is terminated with a stop card or a blank card.	START, (STOP, blank card)
ESTOP	I2	N.A.	event at which to stop trajectory 0 stop at time TSTOP 1 catapult ignition - catapult 1 2 catapult ignition - catapult 2 3 catapult separation - catapult 1 4 catapult separation - catapult 2 5 rail separation 6 rocket ignition (rkt 1) 7 rocket ignition (rkt 2) 8 rocket ignition (rkt 3) 9 rocket ignition (rkt 4) 10 rocket ignition (rkt 5) 11 rocket ignition (rkt 6) 12 rocket burnout (rkt 1) 13 rocket burnout (rkt 2) 14 rocket burnout (rkt 3) 15 rocket burnout (rkt 4) 16 rocket burnout (rkt 5) 17 rocket burnout (rkt 6) 18 parachute deployment (chute 1) 19 line stretch (chute 1) 20 full inflation (chute 1) 21 parachute deployment (chute 2) 22 line stretch (chute 2) 23 full inflation (chute 2) 24 parachute deployment (chute 3) 25 line stretch (chute 3) 26 full inflation (chute 3) 27 peak trajectory 28 seat/occupant separation 29 seat/occupant impact 30 occupant impact 31 seat impact 32 aircraft impact 33 dart start line 1 (right) 34 dart start line 2 (left) 35 dart line broken - line 1 (right) 36 dart line broken - line 2 (left)	0 - 36
IAINTR	I1	N.A.	aircraft trajectory control flag 0 => do not generate aircraft trajectory 1 => generate aircraft trajectory	0,1

INPUT DESCRIPTIONS - SECTION 1 - Program Control Variables - Continued

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEGAL VALUE
ICLRNCE	I1	N.A.	clearance computation control flag 0 => do not compute aircraft/seat - occupant clearance 1 => compute aircraft/seat - occupant clearance	0,1
IPL0T	I3	N.A.	plotting file control flag 0 => do not create plotting file 1 => create plotting file	0,1
ISEATR	I1	N.A.	seat alone trajectory control flag 0 => do not generate seat alone trajectory 1 => generate seat alone trajectory	0,1
ISOSEP	I3	N.A.	seat/occupant separation control flag 0 => do not allow seat/occupant separation 1 => allow seat/occupant separation	0,1
IRESTR	I1	N.A.	flag for creation of instantaneous restart file 0 = don't create restart file 1 = create restart file	0,1
IUNITS	I1	N.A.	flag for units to be used 0 = Metric units 1 = English units	0,1
TSTART	F10.4	secs	time to start trajectory simulation (if $\neq$ 0, start from restart file)	≥ 0
TSTOP	F10.4	secs	time to stop trajectory (if = 0, stop at event ESTOP)	≥ 0

INPUT DESCRIPTIONS - SECTION 2 - Report Flags

VARIABLE NAMES	FORMAT	UNITS	DESCRIPTION	LEGAL VALUES
IREPTS1	I1	NA	control flag for input validation 0 => don't print report 1 => print report	0,1
IREPTS2	I1	NA	control flag for seat/occupant linear time history 0 => don't print report 1 => print report	0,1
IREPTS3	I1	NA	control flag for seat/occupant alone linear time history 0 => don't print report 1 => print report	0,1
IREPTS4	I1	NA	control flag for occupant alone linear time history 0 => don't print report 1 => print report	0,1
IREPTS5	I1	NA	control flag for seat alone linear time history 0 => don't print report 1 => print report	0,1
IREPTS6	I1	NA	control flag for seat alone angular time history 0 => don't print report 1 => print report	0,1
IREPTS7	I1	NA	control flag for seat/occupant linear time history wrt aircraft 0 => don't print report 1 => print report	0,1
IREPTS8	I1	NA	control flag for seat/occupant angular time history wrt aircraft 0 => don't print report 1 => print report	0,1
IREPTS9	I1	NA	control flag for occupant alone linear time history wrt aircraft 0 => don't print report 1 => print report	0,1
IREPTS10	I1	NA	control flag for seat alone linear time history wrt aircraft 0 => don't print report 1 => print report	0,1

INPUT DESCRIPTIONS - SECTION 2 - Report Flags Continued

VARIABLE NAME	FORMAT	UNITS	DEFINITION	TOTAL VALUE
IREPTS11	I1	NA	control flag for seat alone angular time history wrt aircraft 0 => don't print report 1 => print report	0,1
IREPTS12	I1	NA	control flag for catapult forces, moments 0 => don't print report 1 => print report	0,1
IREPTS13	I1	NA	control flag for rocket 1 forces, moments 0 => don't print report 1 => print report	0,1
IREPTS14	I1	NA	control flag for rocket 2 forces, moments 0 => don't print report 1 => print report	0,1
IREPTS15	I1	NA	control flag for rocket 3 forces, moments 0 => don't print report 1 => print report	0,1
IREPTS16	I1	NA	control flag for rocket 4 forces, moments 0 => don't print report 1 => print report	0,1
IREPTS17	I1	NA	control flag for rocket 5 forces, moments 0 => don't print report 1 => print report	0,1
IREPTS18	I1	NA	control flag for rocket 6 forces, moments 0 => don't print report 1 => print report	0,1
IREPTS19	I1	NA	control flag for dart forces, moments 0 => don't print report 1 => print report	0,1
IREPTS20	I1	NA	control flag for drogue forces, moments 0 => don't print report 1 => print report	0,1
IREPTS21	I1	NA	control flag for parachute forces, moments 0 => don't print report 1 => print report	0,1
IREPTS22	I1	NA	control flag for TVC microprocessor data 0 => don't print report 1 => print report	0,1

INPUT DESCRIPTIONS - SECTION 2 - Report Flags - Continued

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEVEL VALUES
IREPTS23	I1	NA		0,1
IREPTS24	I1	NA		0,1
IREPTS25	I1	NA		0,1
IREPTS26	I1	NA		0,1
IREPTS27	I1	NA		0,1
IREPTS28	I1	NA		0,1
IREPTS29	I1	NA		0,1
IREPTS30	I1	NA		0,1
PRTRFQ	I3		Controls printing (e.g. if PRTRFQ = 3 and TIMESTEP = .01 the printing occurs every .03 or every 3rd TIMESTEP) if PRTRFQ = 0 then printing occurs every 10 th of a second.	0,1,2,.....

INPUT DESCRIPTIONS - SECTION 3 - Integration Time Steps

VARIABLE NAME	FORMAT	UNITS	DEFINITION	INITIAL VALUES
DTPHAS1	F10.4		Integration time step for PHASE 1 (from initiation to rail clearance)	>0
DTPHAS2	F10.4		Integration time step for PHASE 2 (from rail clearance to seat/occ separation)	>0
DTPHAS3	F10.4		Integration time step for PHASE 3 (from seat/occ separation to completion)	>0 if ISOSE anything i ISOSEP = 0

INPUT DESCRIPTIONS - SECTION 4 Aircraft

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEGAL VALUES
CKPITH	F10.4	ft.met	height of cockpit screen (protected height of seat/occupant)	
DENSITY	F10.4	slugs/ feet ³	Atmospheric Density	
NPTSAAT	I3		number of points in angular acceleration table	0-50
(AAT)	F10.4	time, $\frac{\text{deg}}{\text{sec}^2}$	angular acceleration table (time vs. $\frac{\text{deg}}{\text{sec}^2}$)	
NPTSLAT	I3		number of points in linear acceleration table	0-50
(LAT)	F10.4	time $\frac{\text{ft}_2(\text{met})}{\text{sec}^2}$	linear acceleration table (time vs. ft (or met)/ sec^2)	
PITCH	F10.4	deg	initial pitch (wrt EFCS)	
PRESSUR	F10.4	millibars	pressure	
PVEL	F10.4	deg/sec	initial angular velocity about aircraft x-axis	
QVEL	F10.4	deg/sec	initial angular velocity about aircraft y-axis	
ROLL	F10.4	deg.	initial roll (wrt EFCS)	
RVEL	F10.4	deg/sec	initial angular velocity about aircraft z-axis	
TEMP	F10.4	F/C	temperature	
VELTOTL	F10.4	ft/sec (met/sec)	initial total velocity of aircraft	≥ 0 .
VROC	F10.4	ft/sec (met/sec)	initial vertical rate of climb	
WINDX	F10.4	ft./sec (met/sec)	wind velocity x direction (EFCS)	
WINDY	F10.4	ft/sec (met/sec)	wind velocity y direction (EFCS)	
WINDZ	F10.4	ft/sec (met/sec)	wind velocity z direction (EFCS)	
XPOS	F10.4	ft. (met)	initial x-position (downrange) in EFCS (=rail att.pt.)	

INPUT DESCRIPTIONS - SECTION 4 - Aircraft - Continued

VARIABLE NAME	FORMAT	UNITS	DEFINITION	INITIAL VALUES
XTAIL	F10.4	ft. (met.)	x-position of tail in ACS	
YAW	F10.4	deg	initial yaw (wrt EFCS)	
YPOS	F10.4	ft. (met.)	initial y-position (off range) in EFCS (=rail att. pt.)	
YTAIL	F10.4	ft. (met.)	y-position of tail in ACS	
ZPOS	F10.4	ft. (met.)	initial z-position (altitude) in EFCS (=rail att. pt.)	
ZTAIL	F10.4	ft. (met.)	z-position of tail in ACS	

INPUT DESCRIPTION - SECTION 5 - Seat Alone - Initial Conditions

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEGAL VALUES
AREASA	F10.4	ft ² (met ²)	reference area of seat alone	
HGHTSA	F10.4	ft. (met)	length of seat alone (height)	
DOXSA	F10.4	slug-ft ² kg-met ²	} Moments of inertia of the seat alone	
DOYSA	F10.4	slug-ft ² kg-met ²		
DOZSA	F10.4	slug-ft ² kg-met ²		
IYXSA	F10.4	slug-met ² kg-met ²		
IYZSA	F10.4	slug-met ² kg-met ²		
IZZSA	F10.4	slug-met ² kg-met ²		
PHISA	F10.4	deg	rotation about x - axis of aircraft	
PSISA	F10.4	deg	rotation (neg.) about y - axis of aircraft	
THESA	F10.4	deg	rotation about z - axis of aircraft	
WGHTSA	F10.4	lbs (kg)	weight of seat alone	
XCGSA	F10.4	ft. (met)	X position of CG of seat alone in SCS	
XPOSBOT	F10.4	ft. (met)	X position of seat bottom in RCS	
XPOSSCS	F10.4	ft. (met)	X position of origin of Seat C.S. (lower seat reference point in RCS)	
YCGSA	F10.4	ft. (met)	Y position of CG of seat alone in SCS	
YPOSBOT	F10.4	ft. (met)	Y position of seat bottom in RCS	
YPOSSCS	F10.4	ft. (met)	Y position of origin of Seat C.S. (lower seat reference point in RCS)	
YPOSSRP	F10.4	ft. (met)	Y position of seat aerodynamic reference point in SCS	
ZCGSA	F10.4	ft. (met)	Z position of CG of seat alone in SCS	
ZPOSBOT	F10.4	ft. (met)	Z position of seat bottom in RCS	

INPUT DESCRIPTION - SECTION 5 - Seat Alone - Initial Conditions Cont

VARIABLE NAME	FORMAT	UNITS	DEFINITION	INITIAL VALUES
ZPOSSCS	F10.4	ft. (met)	Z position of origin of Seat C.S. (lower seat reference point in RCS)	
ZPOSSRP	F10.4	ft. (met)	Z position of seat aerodynamic reference point in SCS.	

INPUT DESCRIPTIONS - SECTION 6 - Seat/Occupant, Occupant Alone

VARIABLE NAME	FORMAT	UNITS	DEFINITION	INITIAL VALUES
AREAOA	F10.4	ft ² (met ²)	reference area if occupant alone	
AREASO	F10.4	ft ² (met ²)	reference area of seat/occupant	
DOOA	F10.4	slug-ft ² kg met ²	moment of inertia of occupant alone	
IXXSO	F10.4	slug-ft ² kg met ²	moment of inertia of seat/occupant	
IXYOA	F10.4	slug-ft ² kg met ²	moment of inertia of occupant alone	
IXYSO	F10.4	slug-ft ² kg met ²	moment of inertia of seat/occupant	
IXZOA	F10.4	slug-ft ² kg met ²	moment of inertia of occupant alone	
IXZSO	F10.4	slug-ft ² kg met ²	moment of inertia of seat/occupant	
IYYOA	F10.4	slug-ft ² kg met ²	moment of inertia of occupant alone	
IYYSO	F10.4	slug-ft ² kg met ²	moment of inertia of seat/occupant	
IYZOA	F10.4	slug-ft ² kg met ²	moment of inertia of occupant alone	
IYZSO	F10.4	slug-ft ² kg met ²	moment of inertia of seat/occupant	
IZZOA	F10.4	slug-ft ² kg met ²	moment of inertia of occupant alone	
IZZSO	F10.4	slug-ft ² kg met ²	moment of inertia of seat/occupant	
WGHOAA	F10.4	lbs (kg)	weight of occupant alone after seat/occ separ.	> 0
WGHOAB	F10.4	lbs (kg)	weight of occupant alone before seat/occ separ.	> 0
WGHTSO	F10.4	lbs (kg)	weight of seat/occupant	> 0
XGOOA	F10.4	ft(met)	X-position of occupant alone C.G. (SCS)	
XGOSO	F10.4	ft(met)	X-position of seat/occupant C.G. (SCS)	
YGOOA	F10.4	ft(met)	Y-position of occupant alone C.G. (SCS)	

INPUT DESCRIPTIONS - SECTION 6 - Seat/Occupant, Occupant Alone - Contin

VARIABLE NAME	FORMAT	UNITS	DEFINITION	FIXED VALUES
YCGSO	F10.4	ft (met)	Y-position of seat/occupant C.G. (SCS)	
ZCGOA	F10.4	ft (met)	Z-position of occupant alone C.G. (SCS)	
ZCGSO	F10.4	ft (met)	Z-position of seat/occupant C.G. (SCS)	

INPUT DESCRIPTIONS - SECTION 7 - Rail Data

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEGAL VALUES
ISTR	I3	N.A.	flag to indicate whether slider blocks are on seat or on rails 0 = on seat 1 = on rails	0, 1 F
KXSB	F10.6	lbs/ft (nt/met)	X - direction spring constant	
KYSB	F10.6	lbs/ft (nt/met)	Y - direction spring constant	
MUSB	F10.6	N.A.	coefficient of friction	
NSLEKS	I3	N.A.	number of slider blocks (NOTE: 0 = 'continuous' slider block)	0-6 F
RAILANG	F10.4	deg	orientation of rails wrt ACS	
RAILNTH	F10.4	ft (met)	length of rails	
XKTOR			* To Be Added Later	
XPOSLRE	F10.4	ft (met)	X - position of left rail attachment point in ACS	
XPOSRR	F10.4	ft (met)	X - position of right rail attachment point in ACS	
XPOSSB1	F10.4	ft (met)	X - position of slider block 1 SCS	
XPOSSB2	F10.4	ft (met)	X - position of slider block 2 SCS	
XPOSSB3	F10.4	ft (met)	X - position of slider block 3 SCS	
XPOSSB4	F10.4	ft (met)	X - position of slider block 4 SCS	
XPOSSB5	F10.4	ft (met)	X - position of slider block 5 SCS	
XPOSSB6	F10.4	ft (met)	X - position of slider block 6 SCS	
YPOSLRE	F10.4	ft (met)	Y - position of left rail attachment point in ACS	
YPOSRR	F10.4	ft (met)	Y - position of right rail attachment point in ACS	
YPOSSB1	F10.4	ft (met)	Y - position of slider block 1 SCS	
YPOSSB2	F10.4	ft (met)	Y - position of slider block 2 SCS	
YPOSSB3	F10.4	ft (met)	Y - position of slider block 3 SCS	
YPOSSB4	F10.4	ft (met)	Y - position of slider block 4 SCS	

INPUT DESCRIPTIONS - Section 7 - Rail Data -Continued

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LOCAL VALUES
YPOSSB5	F10.4	ft (met)	Y - position of slider block 5 SCS	
YPOSSB6	F10.4	ft (met)	Y - position of slider block 6 SCS	
ZPOSLRE	F10.4	ft (met)	Z - position of left rail attachment point in ACS	
ZPOSRRRE	F10.4	ft (met)	Z - position of right rail attachment point in ACS	
ZPOSSB1	F10.4	ft (met)	Z - position of slider block 1 SCS	
ZPOSSB2	F10.4	ft (met)	Z - position of slider block 2 SCS	
ZPOSSB3	F10.4	ft (met)	Z - position of slider block 3 SCS	
ZPOSSB4	F10.4	ft (met)	Z - position of slider block 4 SCS	
ZPOSSB5	F10.4	ft (met)	Z - position of slider block 5 SCS	
ZPOSSB6	F10.4	ft (met)	Z - position of slider block 6 SCS	

INPUT DESCRIPTIONS - SECTION: 8 - Canopy Data

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEGAL VALUES
ICANOPY	I3	N.A.	Flag to indicate whether or not to track canopy 0 = do not track canopy 1 = track canopy	0, 1

NOTE: Canopy trajectory simulation will
be implemented at a later date.

INPUT DESCRIPTIONS - SECTION 9 - Catapult Data

VARIABLE NAME	FORMAT	UNITS	DEFINITION	ALLOW. VALUES
CATLNT1	F10.4	ft (met)	length of catapult 1 tube	
CATLNT2	F10.4	ft (met)	length of catapult 2 tube	
CATSTK1	F10.4	ft (met)	length of catapult stroke 1	
CATSTK2	F10.4	ft (met)	length of catapult stroke 2	
CTUBE	F10.4	lb sec/ft nt sec/met	C tube spring damping coeff.	
INCAT	I3	N.A.	number of catapults	0 - 2
ITUBEND	I3	N.A.	flag to indicate whether or not to simulate tube bending 0 = no tube bending 1 = do tube bending using default values 2 = do tube bending using input values	0, 1, 2
KTUBE	F10.4	lbs/ft nts/met	K tube spring stiffness constant	
MUTUBE	F10.4	N.A.	coefficient of friction	
NPTSC11	I3	N.A.	number of points in catapult thrust table (cat. 1)	0 - 25
(thrust table 1)	F10.4	time vs thrust	catapult thrust table - catapult 1	
NPTSC12	I3	N.A.	number of points in catapult thrust table (cat. 2)	0 - 25
(thrust table 2)	F10.4	time vs thrust	catapult thrust table - catapult 2	
PTUBE	F10.4	N.A.	empirical tube bending constant	
RSTCOEF	F10.4	lb/ft nt/met	restoring force stiffness coeff.	
TCI1	F10.4	sec.	catapult ignition time catapult 1	
TCI2	F10.4	sec.	catapult ignition time catapult 2	
XPOSCAP1	F10.4	ft(met)	X - position of catapult 1 attachment point in SCS	
XPOSCAP2	F10.4	ft(met)	X - position of catapult 2 attachment point in SCS	
YPOSCAP1	F10.4	ft(met)	Y - position of catapult 1 attachment point in SCS	

INPUT DESCRIPTIONS - SECTION 9 - Catapult Data Cont

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEGAL VALUE
YPOSCAP2	F10.4	ft (met)	Y - position of catapult 2 attachment point in SCS	
ZPOSCAP1	F10.4	ft (met)	Z - position of catapult 1 attachment point in SCS	
ZPOSCAP2	F10.4	ft (met)	Z - position of catapult 2 attachment point in SCS	

INPUT DESCRIPTIONS - SECTION 10 - Rocket Data

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEGAL VALUES
INRKT	F10.4	N.A.	number of rockets on seat	0 - 6
RKALPH1	F10.4	deg		
RKALPH2	F10.4	deg		
RKALPH3	F10.4	deg		
RKALPH4	F10.4	deg		
RKALPH5	F10.4	deg		
RKALPH6	F10.4	deg		
RKBETA1	F10.4	deg	direction cosine angles for rocket 1 wrt SCS	
RKBETA2	F10.4	deg	direction cosine angles for rocket 2 wrt SCS	
RKBETA3	F10.4	deg	direction cosine angles for rocket 3 wrt SCS	
RKBETA4	F10.4	deg	direction cosine angles for rocket 4 wrt SCS	
RKBETA5	F10.4	deg	direction cosine angles for rocket 5 wrt SCS	
RKBETA6	F10.4	deg	direction cosine angles for rocket 6 wrt SCS	
RKBURN1	F10.4	secs	burn time for rocket 1	
RKBURN2	F10.4	secs	burn time for rocket 2	
RKBURN3	F10.4	secs	burn time for rocket 3	
RKBURN4	F10.4	secs	burn time for rocket 4	
RKBURN5	F10.4	secs	burn time for rocket 5	
RKBURN6	F10.4	secs	burn time for rocket 6	
RKFLAG1	I3	N.A.	rocket 1 ignition flag 0 =>rocket ignition is a time 1 =>rocket ignition is a distance	0, 1
RKFLAG2	I3	N.A.	rocket 2 ignition flag (Ref to RKFLAG1)	0, 1
RKFLAG3	I3	N.A.	rocket 3 ignition flag (Ref to RKFLAG1)	0, 1
RKFLAG4	I3	N.A.	rocket 4 ignition flag (Ref to RKFLAG1)	0, 1
RKFLAG5	I3	N.A.	rocket 5 ignition flag (Ref to RKFLAG1)	0, 1
RKFLAG6	I3	N.A.	rocket 6 ignition flag (Ref to RKFLAG1)	0, 1

INPUT DESCRIPTIONS - SECTION 10 - Rocket Data - Continued

VARIABLE NAME	FORMAT	UNITS	DEFINITION	INITIAL VALUES
RKGAMA1 (RKT 1 thrust table)	F10.4	deg secs vs lbs secs vs nts	thrust table for rocket 1	
RKGAMA2 (RKT 2 thrust table)	F10.4	deg secs vs lbs secs vs nts	thrust table for rocket 2	
RKGAMA3 (RKT 3 thrust table)	F10.4	deg secs vs lbs secs vs nts	thrust table for rocket 3	
RKGAMA4 (RKT 4 thrust table)	F10.4	deg secs vs lbs secs vs nts	thrust table for rocket 4	
RKGAMA5 (RKT 5 thrust table)	F10.4	deg secs vs lbs secs vs nts	thrust table for rocket 5	
RKGAMA6 (RKT 6 thrust table)	F10.4	deg secs vs lbs secs vs nts	thrust table for rocket 6	
RKIGN1	F10.4	sec ft met	rocket 1 ignition time or distance	
RKIGN2	F10.4	sec ft met	rocket 2 ignition time or distance	
RKIGN3	F10.4	sec ft met	rocket 3 ignition time or distance	
RKIGN4	F10.4	sec ft met	rocket 4 ignition time or distance	
RKIGN5	F10.4	sec ft met	rocket 5 ignition time or distance	
RKIGN6	F10.4	sec ft met	rocket 6 ignition time or distance	
RKNPTS1	I3	N.A.	number of points in thrust table for rocket 1	2 - 25
RKNPTS2	I3	N.A.	number of points in thrust table for rocket 2	2 - 25
RKNPTS3	I3	N.A.	number of points in thrust table for rocket 3	2 - 25

INPUT DESCRIPTIONS - SECTION 10 - Rocket Data - Continued

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LITAI. VALUES
RKNPTS4	I3	N.A.	number of points in thrust table for rocket 4	2 - 25
RKNPTS5	I3	N.A.	number of points in thrust table for rocket 5	2 - 25
RKNPTS6	I3	N.A.	number of points in thrust table for rocket 6	2 - 25
RKWGHT1	F10.4	lbs kgs	weight of fuel in rocket 1	
RKWGHT2	F10.4	lbs kgs	weight of fuel in rocket 2	
RKWGHT3	F10.4	lbs kgs	weight of fuel in rocket 3	
RKWGHT4	F10.4	lbs kgs	weight of fuel in rocket 4	
RKWGHT5	F10.4	lbs kgs	weight of fuel in rocket 5	
RKWGHT6	F10.4	lbs kgs	weight of fuel in rocket 6	
XPOSRK1	F10.4	ft met	X - position of rocket 1 in SCS	
XPOSRK2	F10.4	ft met	X - position of rocket 2 in SCS	
XPOSRK3	F10.4	ft met	X - position of rocket 3 in SCS	
XPOSRK4	F10.4	ft met	X - position of rocket 4 in SCS	
XPOSRK5	F10.4	ft met	X - position of rocket 5 in SCS	
XPOSRK6	F10.4	ft met	X - position of rocket 6 in SCS	
YPOSRK1	F10.4	ft met	Y - position of rocket 1 in SCS	
YPOSRK2	F10.4	ft met	Y - position of rocket 2 in SCS	
YPOSRK3	F10.4	ft met	Y - position of rocket 3 in SCS	
YPOSRK4	F10.4	ft met	Y - position of rocket 4 in SCS	
YPOSRK5	F10.4	ft met	Y - position of rocket 5 in SCS	
YPOSRK6	F10.4	ft met	Y - position of rocket 6 in SCS	

INPUT DESCRIPTIONS - SECTION 10 (Cont) Rocket Data

VARIABLE NAME	FORMAT	UNITS	DEFINITION	DEFIN. VALUES
ZPOSRK1	F10.4	ft met	Z - position of rocket 1 in SCS	
ZPOSRK2	F10.4	ft met	Z - position of rocket 2 in SCS	
ZPOSRK3	F10.4	ft met	Z - position of rocket 3 in SCS	
ZPOSRK4	F10.4	ft met	Z - position of rocket 4 in SCS	
ZPOSRK5	F10.4	ft met	Z - position of rocket 5 in SCS	
ZPOSRK6	F10.4	ft met	Z - position of rocket 6 in SCS	

INPUT DESCRIPTIONS - SECTION 11 - Dart

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEGAL VALUES
DRIFRCE	F10.4	lbs nts	DART FORCE	
DRISTRT	F10.4	ft. met	DART START DISTANCE	
DRISTOP	F10.4	ft. met	DART STOP DISTANCE	> DART START
IDART	I3	N.A.	DARTFLAG: 0 = no dart system 1 = DART system	0, 1
XDRTAPL	F10.4	ft. met	X POSITION OF LEFT DART COCKPIT ATTACHMENT POINT IN SCS	
XDRTAPR	F10.4	ft. met	X POSITION OF RIGHT DART COCKPIT ATTACHMENT POINT IN SCS	
XDRTCPL	F10.4	ft. met	X POSITION OF LEFT DART CONFLUENCE POINT IN SCS	
XDRTCPR	F10.4	ft. met	X POSITION OF RIGHT DART CONFLUENCE POINT IN SCS	
YDRTAPL	F10.4	ft. met	Y POSITION OF LEFT DART COCKPIT ATTACHMENT POINT IN SCS	
YDRTAPR	F10.4	ft. met	Y POSITION OF RIGHT DART COCKPIT ATTACHMENT POINT IN SCS	
YDRTCPL	F10.4	ft. met	Y POSITION OF LEFT DART CONFLUENCE POINT IN SCS	
YDRTCPR	F10.4	ft. met	Y POSITION OF RIGHT DART CONFLUENCE POINT IN SCS	
ZDRTAPL	F10.4	ft. met	Z POSITION OF LEFT DART COCKPIT ATTACHMENT POINT IN SCS	
ZDRTAPR	F10.4	ft. met	Z POSITION OF RIGHT DART COCKPIT ATTACHMENT POINT IN SCS	
ZDRTCPL	F10.4	ft. met	Z POSITION OF LEFT DART CONFLUENCE POINT IN SCS	
ZDRTCPR	F10.4	ft. met	Z POSITION OF RIGHT DART CONFLUENCE POINT IN SCS	

INPUT DESCRIPTIONS - SECTION 12 - TVC Data

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEGAL VALUES
ITVC	I3	N.A.	flag to control whether or not thrust vector control is to be simulated 0 = do not simulate TVC 1 = simulate TVC	0, 1
MPHI	F10.4	DEG	rotation about x - axis of SCS to get TVOCS	
MPSI	F10.4	DEG	rotation (neg) about y - axis of SCS to get TVOCS	
MTHE	F10.4	DEG	rotation about z - axis of SCS to get TVOCS	
PITCHRL	F10.4	DEG	rocket movement limit in "PITCH" plane	
RYANG	F10.4			
ROLLRL	F10.4	DEG	rocket movement limit in "ROLL" plane	
SMPLRAC	F10.4	DEG/SEC	maximum sampling rate of gyroscopes	
TVCDELAY	F10.4	SECS	time delay after rocket ignition to start gimballing	

INPUT DESCRIPTIONS - SECTION 13 Dynamic CG Variables

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEGAL VALUES
CX	F10.4	nt/met-sec lb/ft/sec	X DAMPING CONSTANT	
CY	F10.4	nt/met-sec lb/ft/sec	Y DAMPING CONSTANT	
CZ	F10.4	nt/met-sec lb/ft/sec	Z DAMPING CONSTANT	
IDYNOG	I3	N.A.	flag to determine whether or not to simulate dynamic CG movement 0 = do not simulate CG movement 1 = simulate using default data 2 = simulate using input data	0,1,2
SXN	F10.4	nt/ met lb/ft	X SPRING MODULUS CONSTANT	
SXP	F10.4	nt/met lb/ft	X SPRING MODULUS CONSTANT	
SY	F10.4	nt/met lb/ft	Y SPRING MODULUS CONSTANT	
SZN1	F10.4	nt/met lb/ft	Z SPRING MODULUS CONSTANT	
SZN2	F10.4	nt/met lb/ft	Z SPRING MODULUS CONSTANT	
SZP	F10.4	nt/met lb/ft	Z SPRING MODULUS CONSTANT	
XSLACK	F10.4	ft (met)	X DIRECTION DEAD ZONE	
ZBOT	F10.4	ft (met)	Z DIRECTION BOTTOMING DISTANCE	
ZSLACK	F10.4	ft (met)	Z DIRECTION DEAD ZONE	

INPUT DESCRIPTIONS - SECTION 14 - Parachute Variables

VARIABLE NAME	FORMAT	UNITS	DEFINITION	TYPICAL VALUES
AREADC	F10.4	FT ² (MET ²)	REFERENCE AREA OF THE DROGUE CONTAINER/SLUG	≥ 0
CDDC	F10.4	N/A	DROGUE CHUTE CONTAINER/SLUG DRAG COEFFICIENT	≥ 0
CHALT1	F10.4	FT. (MET)	LOWER ALTITUDE PARAMETER USED IN DETERMINING TIME DELAYS FOR CHUTE DEPLOYMENT	≥ 0
CHALT2	F10.4	FT. (MET)	UPPER ALTITUDE PARAMETER USED IN DETERMINING TIME DELAYS FOR CHUTE DEPLOYMENT	≥ 0
DISFLOY	F10.4	FT. (MET)	DISTANCE ALONG THE RAILS THAT THE SEAT/OCCUPANT MUST TRAVEL BEFORE THE DROGUE CHUTE IS DEPLOYED	≥ 0
DRDRAG1	F10.4	N/A	DROGUE CHUTE 1 DRAG COEFFICIENT	≥ 0
DRDRAG2	F10.4	N/A	DROGUE CHUTE 2 DRAG COEFFICIENT	≥ 0
[DROGFT1]	F10.4	FT/SEC (MET/SEC) S E C	TABLE OF TIMES FROM FIRST DROGUE CHUTE LINE STRETCH TO FULL INFLATION (VELOCITY VS. TIME)	
[DROGFT2]	F10.4	FT/SEC (MET/SEC) S E C	TABLE OF TIMES FROM SECOND DROGUE CHUTE LINE STRETCH TO FULL INFLATION (VELOCITY VS. TIME)	
DROGLL	F10.4	FT. (MET)	DROGUE CHUTE LINE LENGTH	> 0
[DROGLS]	F10.4	FT/SEC (MET/SEC) S E C	TABLE OF TIMES FROM SHACKLE RELEASE TO DROGUE CHUTE LINE STRETCH (VELOCITY VS. TIME)	
DROGPD1	F10.4	FT. (MET)	DROGUE CHUTE1 PROJECTED DIAMETER	> 0
DROGPD2	F10.4	FT. (MET)	DROGUE CHUTE2 PROJECTED DIAMETER	> 0
DROVELX	F10.4	FT/SEC (MET/SEC)	X AXIS PROJECTION VELOCITY OF THE DROGUE CONTAINER RELATIVE TO THE SEAT IN THE SCS	ANY VALUE
DROVELY	F10.4	FT/SEC (MET/SEC)	Y AXIS PROJECTION VELOCITY OF THE DROGUE CONTAINER RELATIVE TO THE SEAT IN THE SCS	ANY VALUE
DROVELZ	F10.4	FT/SEC (MET/SEC)	Z AXIS PROJECTION VELOCITY OF THE DROGUE CONTAINER RELATIVE TO THE SEAT IN THE SCS	ANY VALUE
GLIMIT	F10.4	N/A	ACCELERATION ALONG THE SEAT BACK ABOVE WHICH RECOVERY CHUTE DEPLOYMENT IS DELAYED	ANY VALUE

INPUT DESCRIPTIONS - SECTION 14 - Parachute Variables - Continued

VARIABLE NAME	FORMAT	UNITS	DEFINITION	INPUT VALUES
IDROGLS	I3	N/A	DROGUE CHUTE TIME-TO-LINE STRETCH CONTROL FLAG 0 = CALCULATED THEORETICAL 1 = TABLE	0,1
IDROGUE	I3	N/A	FLAG TO INDICATE TYPE OF DROGUE SYSTEM 0 = NO DROGUE 1 = NONE OR 1 DROGUE DEPENDING ON ALTITUDE AND VELOCITY (STENCEL) 2 = DUPLEX DROGUE SYSTEM 3 = VELCON DROGUE SYSTEM	0,1,2,3

INPUT DESCRIPTIONS - SECTION 14 - PARACHUTE VARIABLES - Continues!

VARIABLE NAME	FORMAT	UNITS	DEFINITION	LEGAL VALUE
IFTDRO1	I3	N/A	FILLING TIME CONTROL FLAGS FOR DROGUES 1 AND 2	0,1
IFTDRO2	I3	N/A	= 0 - CALCULATED THEORETICAL = 1 - TABLES	0,1
IFTRECV	I3	N/A	FILLING TIME CONTROL FLAG FOR RECOVERY CHUTE = 0 - CALCULATED THEORETICAL = 1 - TABLE	
IRECOV	I3	N/A	FLAG TO INDICATE WHETHER OR NOT THERE IS A RECOVERY CHUTE 0 = NO RECOVERY CHUTE 1 = STENCEL 2 = GO TYPE AEROCNICAL CANOPY	0,1
NPTDFT1	I3	N/A	NUMBER OF POINTS IN FIRST DROGUE CHUTE FILLING TIME TABLE	2-25
NPTDFT2	I3	N/A	NUMBER OF POINTS IN SECOND DROGUE CHUTE FILLING TIME TABLE	2-25
NPTSOLS	I3	N/A	NUMBER OF POINTS IN DROGUE CHUTE LINE STRETCH TABLE	2-25
NPTSRTT	I3	N/A	NUMBER OF POINTS IN RECOVERY CHUTE FILLING TIME TABLE	2-25
NPTSRLS	I3	N/A	NUMBER OF POINTS IN RECOVERY CHUTE LINE STRETCH TABLE	2-25
POROSD1	F10.4	N/A	EFFECTIVE POROSITY OF DROGUE CHUTE1	≥ 0
POROSD2	F10.4	N/A	EFFECTIVE POROSITY OF DROGUE CHUTE2	≥ 0
POROSR	F10.4	N/A	EFFECTIVE POROSITY OF RECOVERY CHUTE	≥ 0
RECDRAG	F10.4	N/A	RECOVERY CHUTE DRAG COEFFICIENT	≥ 0
RECOVFT	F10.4		TABLE OF TIMES FROM RECOVERY CHUTE LINE STRETCH TO FULL INFLATION (VELOCITY VS. TIME)	
RECOVLL	F10.4	FT (MET)	RECOVERY CHUTE LINE LENGTH	≥ 0
RECOVLS	F10.4	FT/SEC S MET/SEC E C	TABLE OF TIMES FROM SHACKLE RELEASE TO RECOVERY CHUTE LINE STRETCH (VELOCITY VS. TIME)	
RECOVPD	F10.4	FT (MET)	RECOVERY CHUTE PROJECTED DIAMETER	≥ 0
SEPFRC	F10.4	LBS NTS	SEPARATION FORCE SEAT/OCCUPANT	

INPUT DESCRIPTIONS - SECTION 14 Parachute Variables - Continued

VARIABLE NAME	FORMAT	UNITS	DEFINITION	INITIAL VALUES
TDDPLOY	F10.4	SEC.	DROGUE DEPLOYMENT TIME	0
TDELAY	F10.4	SEC.	DELAY TIME OF RECOVERY CHUTE DEPLOYMENT	
TDROGLS			* TO BE ADDED LATER	
TFP1			* TO BE ADDED LATER	
TFP2			* TO BE ADDED LATER	
TFP3			* TO BE ADDED LATER	
TROPLOY	F10.4	SEC.	RECOVERY CHUTE DEPLOYMENT TIME	0
VELCON	F10.4	FT/SEC	RESULTANT VELOCITY AT WHICH LARGE VELCON DROGUE FALLS OFF	0
WGHTDC	F10.4	LBS (KG)	WEIGHT OF THE DROGUE CONTAINER/SLUG	0
XDROGAP	F10.4	FT. (MET)	X - COORDINATE OF THE DROGUE ATTACHMENT POINT (SCS)	ANY VALUE
XRECAP	F10.4		ATTACHMENT POINT OF RECOVERY CHUTE	
YDROGAP	F10.4	FT. (MET)	Y - COORDINATE OF THE DROGUE ATTACHMENT POINT (SCS)	ANY VALUE
YRECAP	F10.4		ATTACHMENT POINT OF RECOVERY CHUTE	
ZDROGAP	F10.4	FT. (MET)	Z - COORDINATE OF THE DROGUE ATTACHMENT POINT (SCS)	ANY VALUE
ZRECAP	F10.4		ATTACHMENT POINT OF RECOVERY CHUTE	

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APPENDIX B

LISTING OF THE GESS SUBMIT FILE

```
/JOB
GESS(CB173000,T30)
ACCOUNT(NUMBER,PASSWORD)
RETURN(TAPE1,TAPE2,TAPE3,TAPE4)
RETURN(TAPE5,TAPE6,TAPE7,TAPE8)
RETURN(TAPE9,TAPE10,TAPE11,TAPE12)
RETURN(TAPE13,TAPE14,TAPE15,TAPE16)
RETURN(TAPE17,TAPE18,TAPE19,TAPE20)
RETURN(TAPE21,TAPE22,TAPE23,TAPE24)
RETURN(TAPE25,TAPE26,TAPE27,TAPE28)
RETURN(TAPE29,TAPE30,TAPE31)
RETURN(TAPE32,TAPE33,TAPE34)
RETURN(TAPE35,TAPE36,TAPE37)
RETURN(TAPE38,TAPE39,TAPE40)
PURGE(GESSPLT)
DEFINE(TAPE40=GESSPLT)
GET(TAPE1=GESSIN)
GET(TAPE2=AERO4)
GET(GESBNRY)
GET(MATLIB4/UN=SYSTEM)
LDSET(LIB=MATLIB4,MAP=BS)
GESBNRY.
1,REWIND(TAPE1,TAPE2,TAPE3,TAPE4)
REWIND(TAPE5,TAPE6,TAPE7,TAPE8)
REWIND(TAPE9,TAPE10,TAPE11,TAPE12)
REWIND(TAPE13,TAPE14,TAPE15,TAPE16)
REWIND(TAPE17,TAPE18,TAPE19,TAPE20)
REWIND(TAPE21,TAPE22,TAPE23,TAPE24)
REWIND(TAPE25,TAPE26,TAPE27,TAPE28)
REWIND(TAPE29,TAPE30,TAPE31)
REWIND(TAPE32,TAPE33,TAPE34)
REWIND(TAPE35,TAPE36,TAPE37)
REWIND(TAPE38,TAPE39,TAPE40)
COPYBF(TAPE5)
COPYBF(TAPE6)
COPYBF(TAPE7)
COPYBF(TAPE8)
COPYBF(TAPE9)
COPYBF(TAPE10)
COPYBF(TAPE11)
COPYBF(TAPE12)
COPYBF(TAPE13)
COPYBF(TAPE14)
COPYBF(TAPE15)
COPYBF(TAPE16)
COPYBF(TAPE17)
COPYBF(TAPE18)
COPYBF(TAPE19)
COPYBF(TAPE20)
```

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COPYBF (TAPE21)
COPYBF (TAPE22)
COPYBF (TAPE23)
COPYBF (TAPE24)
COPYBF (TAPE25)
COPYBF (TAPE26)
COPYBF (TAPE27)
COPYBF (TAPE28)
COPYBF (TAPE29)
COPYBF (TAPE30)
COPYBF (TAPE31)
COPYBF (TAPE32)
COPYBF (TAPE33)
COPYBF (TAPE34)
COPYBF (TAPE35)
COPYBF (TAPE36)
COPYBF (TAPE37)
COPYBF (TAPE38)
COPYBF (TAPE39)
EXIT.
GOTO, 1.
/EOR
/EOI

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APPENDIX C

SAMPLE INPUT FOR THE GESS PROGRAM

START

THIS IS TEST DATA

FOR MPES NON-CATAPULT VERSION, 90 DEG POLL TEST

THIRD LINE

TSTART	0.0	TSTOP	0.00	ESTOP	12	IRESTR	C
IUNITS	1	IAIRTR	0	ISEATTR	0	ICLRNCE	0
ISOSEP	0	IPLOT	1				
IREPTS (1)	1	IREPTS (2)	1	IREPTS (3)	1		
IREPTS (4)	0	IREPTS (5)	1	IREPTS (6)	0		
IREPTS (7)	0	IREPTS (8)	0	IREPTS (9)	0		
IREPTS (10)	0	IREPTS (11)	0	IREPTS (12)	1		
IREPTS (13)	1	IREPTS (14)	0	IREPTS (15)	0		
IREPTS (16)	0	IREPTS (17)	0	IREPTS (18)	0		
IREPTS (19)	0	IREPTS (20)	0	IREPTS (21)	0		
IREPTS (22)	1	IREPTS (23)	1	IREPTS (24)	1		
IREPTS (25)	0	IREPTS (26)	0	IREPTS (27)	0		
IREPTS (28)	0	IREPTS (29)	0	IREPTS (30)	0		
PRTFRQ	10						
DTPHAS1	.00125	DTPHAS2	.00125	DTPHAS3	.01		
TEMP	89.0	PRESSUR	925.900	VROC	0.0		
XPOS	7300.0	YPOS	-9.5	ZPOS	61.0		
YAW	0.0	PITCH	0.0	ROLL	180.0		
RVEL	0.0	QVEL	0.0	PVEL	0.0		
WINDX	0.0	WINDY	0.00	WINDZ	0.0		
VELTOTL	0.00	CKPITHT	4.0	DENSITY	0.0		
NPTSAA	0						
NPTSLAT	0						
XPOSSRP	0.0	YPOSSRP	0.0	ZPOSSRP	0.0		
XCGSA	.4648	YCGSA	0.0	ZCGSA	1.1299		
LXXSA	4.0	LYSA	0.0	IXZSA	0.0		
IYYSA	5.0	IYZSA	0.0	IZZSA	1.0		
PHISA	0.0	PSISA	-13.0	THESA	0.0		
AREASA	6.0	HGHTSA	3.0	WGHTSA	143.0		
XPOSBOT	0.0	YPOSBOT	0.0	ZPOSBOT	0.0		
XPOSSCS	0.0	YPOSSCS	0.0	ZPOSSCS	0.0		
XCGSO	0.8250	YCGSO	0.0	ZCGSO	1.092		
LXXSO	10.75	LYSO	0.0	IXZSO	3.46		
IYYSO	15.19	IYZSO	0.0	IZZSO	-6.82		
AREASO	7.5	WGHTSO	359.0				
LXXQA	0.0	LYQA	0.0	IXZQA	0.0		
IYYQA	0.0	IYZQA	0.0	IZZQA	0.0		
AREAQA	9.6	WGHTQA	216.0	WGHTQA	216.0		
RAILNTH	3.66	RAILANG	-13.0				
ISTR	0	NSLBKS	0				
KXSB	35000.0	KYSB	20000.0	MUSB	0.025		
XKTOR	261.7801						
XPOSRR	0.0	YPOSRR	0.0	ZPOSRR	0.0		
XPOSRL	0.0	YPOSRL	0.0	ZPOSRL	0.0		
INCAT	1						
CATLNT (1)	3.60	CATSTK (1)	3.60	TCI (1)	0.0		
XPOSAP (1)	0.00	YPOSAP (1)	0.00	ZPOSAP (1)	-3.59		

NPTSCT(1)	2			
	0.0	0.0	0.3	0.0
ITUBEND	0			
INRKT	1			
RKFLAG(1)	0	RKNPTS(1)	20	
RKIGN(1)	0.0	RKWGHT(1)	6.0	RKBURN(1) 1.750
XPOSRK(1)	.8553	YPOSRK(1)	0.0	ZPOSRK(1) 0.0
RKALPH(1)	90.000	RKBETA(1)	90.00	RKGAMA(1) 0.000
	0.0		0.0	0.0921
	0.1842		1065.9542	0.2763
	0.3684		1761.9124	0.4605
	0.5526		2693.0230	0.6447
	0.7368		3474.7570	0.8289
	0.9211		3938.1702	1.0132
	1.1053		3495.4746	1.1974
	1.2895		2219.5930	1.3816
	1.4737		573.4004	1.5658
	1.6579		34.0892	1.7500
				787.9528
				1410.8922
				2693.0230
				3133.0848
				3793.9460
				3871.6354
				2955.9940
				1268.8412
				218.1590
				0.0000
IDART	0			
ITVC	1			
MPHI	180.0000	MPSI	13.0	MTHE 0.000
ROLLRL	16.000	PITCHRL	16.00	SMPLRAT 500.00
TVCDLAY	.400	RKANG	0.0	
IDYNCG	0			
IRECOV	0			
IDROGUE	0			
STOP				

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APPENDIX D

DETAILED DESCRIPTION OF THE ACT PROGRAM

ABSTRACT

This appendix describes a Fortran extended program designed to create random files of equally spaced aerodynamic coefficient tables. These tables, which may represent functions of two or three variables, are to be used as input data for a seat ejection program (GESS).

These coefficients are used in the computation of the equations which calculate the aerodynamic forces and moments acting on a body.

This appendix was derived almost entirely from Reference 5. It is included here since it is crucial for the successful execution of the GESS Program.

I. INTRODUCTION

During execution of the GESS seat ejection simulation program, equally spaced aerodynamic coefficients are required to compute the aerodynamic forces acting upon the seat/occupant system. These data have been obtained through wind tunnel experiments using various ejection seats. Using the data that were produced by these tests, the aerodynamic coefficient table (ACT) program creates tables that are a function of the seat orientation and its velocity. See Reference 6 for details on the wind tunnel experiments.

The ACT program provides an efficient method of creating and modifying these aerodynamic coefficient tables. The tables are then stored on a random access file so that they can be easily retrieved by the GESS program during execution of simulation runs.

Because of their similarity, this program was closely modeled after the "RFWTHR" Program (see Reference 3).

II. DESCRIPTION

A. Aerodynamic Coefficient Tables

The ACT program creates Aerodynamic Coefficient Tables that are designed to be functions of either two or three variables. The format in which the ACT tables are created is designed to be similar to the format in which the experimental data are received. A maximum of 500 entries is allowed in a table. For three-way tables, the coefficients are functions of the angle of attack (α), the angle of sideslip (β), and mach number (M). The two-way tables may be functions of β and M , β and α , or α and M .

By specifying the order in which the data must be read into memory, and through the use of variable dimensioned arrays, the user can easily store and reference his tables on random files. As the coefficients are stored in consecutive locations in memory, it is necessary that the data be read in as follows:

For three-way data:

$$C(I,J,K) = F(\text{ALPHA}(I), \text{BETA}(J), \text{MACH}(K)), \quad I = 1,L$$

$$J = 1,M$$

$$K = 1,N$$

For two-way data:

$$C(J,K) = F(\text{BETA}(J), \text{MACH}(K)), \quad J = 1,M$$

$$K = 1,N$$

or

$$C(J,I) = F(\text{BETA}(J), \text{ALPHA}(I)), \quad J = 1,M$$

$$I = 1,L$$

or $C(I,K) = F(\text{ALPHA}(I), \text{MACH}(K)), I = 1,L$
 $K = 1,N$

Where L, M, and N are the number of alpha, beta, and mach coordinates, respectively. Properly dimensioned, the array name at (L,M,N), facilitates printout of the tables.

B. Sequence Numbers

A sequence number is assigned to each table and used to reference the disk address at which the table is stored. During creation runs, the program assigns consecutive numbers to the tables as they are read. It was arbitrarily decided that the three-way tables would be assigned sequence numbers 1 to 20, and two-way tables would be assigned numbers 21 to 50. See reference 5 for further information on random files and sequence numbers.

When the tables are extended, the program searches the appropriate "info" array (see Section II.D.2) to determine the sequence number of the last table on random file. The tables that are added are assigned sequence numbers beginning with the next available sequence number. During this search, a check is made to be sure that the tables will not be extended beyond their limit.

To replace a table, the user must specify on card type 3, the sequence number of the table he wishes replaced.

C. "Info" Array

Associated with each table is an "info" array, containing information about each table. There is a 20 by 13 array, INFO3, associated with the three-way tables, and a 30 by 10 array, INFO2, for the two-way tables. These arrays are updated and written to a random file after creating, extending, or replacing tables. To facilitate referencing, the 20 by 13 "info" array is assigned disk address 51, and the 30 by 10 "info" array is assigned address 52.

During an extension run, the proper "info" array is interrogated to determine the number of tables already on random file. The new tables are assigned the next available sequence number, provided there is room to extend them.

In the replacement mode, the first work in the "info" array for the given sequence number is checked to be sure that a table with that sequence number already exists.

The contents of the "info" array, with J representing the sequence number of the current table being processed, are as shown below.

For two-way tables:

INFO2(J,1) = Table Identifier

INFO2(J,2) = Number of Betas

INFO2(J,3) = Number of Machs

INFO2(J,4) = Delta Beta

INFO2(J,5) = Delta Mach

INFO2(J,6) = Minimum Beta

INFO2(J,7) = Minimum Mach

INFO2(J,8) = Maximum Beta

INFO2(J,9) = Maximum Mach

INFO2(J,10) = Type of Two-way Table

Note: Depending on the type of two-way table being processed, the word "Beta" or "Mach", as used above, may be replaced by "Alpha".

For three-way tables:

INFO3(J,1) = Table Identifier

INFO3(J,2) = Number of Alphas

INFO3(J,3) = Number of Betas

INFO3(J,4) = Number of Machs

INFO3(J,5) = Delta Alpha

INFO3(J,6) = Delta Beta

INFO3(J,7) = Delta Mach

INFO3(J,8) = Minimum Alpha

INFO3(J,9) = Minimum Beta

INFO3(J,10) = Minimum Mach

INFO3(J,11) = Maximum Alpha

INFO3(J,12) = Maximum Beta

INFO3(J,13) = Maximum Mach

D. Common Variables

1. Defined Externally

The following common variables are defined by the user through the input.

ALMAX	BEMIN	DELMAC	ITYPE	MODE	NTYP
ALMIN	DELALP	FMT	MAMAX	NCOEF	
BEMAX	DELBET	IDENT	MAMIN	NOFTAB	

The mnemonic definitions of the above will be found in Section III.C.1.

2. Defined Internally

The following table gives the definitions for the common variables which are initialized by the program.

<u>MNEMONIC</u>	<u>DESCRIPTION</u>
IBINK	Hollerith word for blanking out the table name in the "info" array.
IC	The sequence number of the current table. Used in the ACT and INPUTT routines when referencing the "info" array.
IERTEST	Internal test work, set by the ERMSG subroutine, which will alter the flow of the program to compensate for an input error. = 1 Ignore present case, read next type 1 card. = 2 Read excess tables into a dummy name. = 3 Disregard present table, read next table. = 4 End program after present case.
IJ, IK	In a list of extend run, they return the number of tables that have been written to the "info" array.
INFO2, IF2 INFO3, IF3	Two dimensional array which is equivalenced to the three dimensional array INFO3. The array INFO2 (30,10) contains the "info" array for two-way tables. INFO3 (20,13) contains

the "info" array for the tables of three-way data.

Detailed information concerning the contents of the "info" array may be found in Section II.C.

ISEQNO	The sequence number of the table to be replaced. (See Section III.C.1)
ITABNO	Position of table "ISEQNO" on the info array. = ISEQNO - 20 for two-way tables. = ISEQNO for three-way tables.
I2NO I3NO	The number of two-way and three-way tables, respectively. Used as a counter when printing the file dictionary.
MTEST	A control word used in the PTOUT and WRINFO routines. = 0 Read the "info" array from random file prior to processing the first table on a replace or an extension run. = 1 Do not read the "info" array again. = 9 The PTOUT routine only prints the file dictionary.
NAL NBE NMA	The number of alpha, beta, and mach numbers, respectively, that are contained in the present table. Computed by the program from the given maximum, minimum, and delta values for each variable.

E. System Routines

The following routines, which are called by the ACT program, are available on the CDC system's library:

<u>NAME</u>	<u>DESCRIPTION</u>
OPENMS	Informs the operating system that the mass storage file will be a random access file.

READMS	Transfers data from mass storage to central memory.
SECOND	Gives accumulated central processor time.
WRITMS	Transfers data from central memory to mass storage.

A more complete description of these routines can be found in Reference

4.

III. INPUT GUIDE

A. I/O Requirements

The input/output requirements of this program require that the following buffer areas be reserved.

<u>FILE NAME</u>	<u>DEFAULT</u>	<u>CONTENTS</u>	<u>FORMAT</u>
TAPE10/INPUT	Permanent File/ Card Reader	Card Images	Coded
OUTPUT	Printer	Program Output	Coded
TAPE1	Local	Aerodynamic Tables	Random, Binary

It should be recognized that TAPE1 is a random file, which may be saved as a permanent file according to the procedures explained in Reference 1.

B. Deck Setup

The object code for this program is saved as a permanent file. The program may be referenced under the filename ACTBIN. Loading of the program requires 50K octal locations of core.

1. Job Control for creation run.

The following control cards (starting in column 1) are required to execute ACT and save the tables that are created and stored on the random file.

CASE1. If input data is from cards

JOBNAME,CB50000,T10.

ACCOUNT,NUMBER,PASSWORD.

GET,LGO=ACTBIN.

BINARY OF ACT

LGO.

SAVE,TAPE1=AERO4.

RANDOM FILE W/AERO. COEF.

7/8/9 } MULTI-PUNCH

DATA CARDS

6/7/8/9 } MULTI-PUNCH

CASE2. If input data is from a permanent file.

JOBNAME,CB50000,T10.

ACCOUNT,NUMBER,PASSWORD.

GET,LGO=ACTBIN.

GET,CARDS.

LGO,CARDS.

SAVE,TAPE1=AERO4.

6/7/8/9 } MULTI-PUNCH

2. Job Control for Extend Run.

Using the files created in the creation run, the following control cards are necessary to add or replace tables.

This setup can also be used to provide only a listing of the current tables.

CASE1. If input data is from cards

JOBNAME,CB50000,T10.

ACCOUNT,NUMBER,PASSWORD.

GET,LGO=ACTBIN.

GET,TAPE1=AERO4.

LGO.

REPLACE,TAPE1=AERO4.

7/8/9 } MULTI-PUNCH
DATA CARDS

6/7/8/9 } MULTI-PUNCH

CASE2. If input data is from a permanent file.

JOBNAME,CB50000,T10.

ACCOUNT,NUMBER,PASSWORD.

GET,LGO=ACTBIN.

GET,TAPE1=AERO4.

GET,CARDS.

LGO,CARDS.

REPLACE,TAPE1=AERO4.

6/7/8/9 } MULTI-PUNCH

NOTE:

If the "REPLACE" card is not included in the above example, any new tables written to TAPE1 will be lost when the program ends. The "REPLACE" card will not otherwise affect program execution, and may remain in the deck even if no new tables are created.

C. Card Input

1. Card Types

The following are the five different card types that are recognized by the Act Program. Most runs will only require a subset of these, and, unless specified, they must be in the order shown.

All integer data must be right adjusted in their appropriate columns, while all alphanumeric data must be left adjusted.

CARD TYPE 1

<u>FORMAT</u>	<u>COLUMNS</u>	<u>MNEMONIC</u>	<u>DESCRIPTION</u>
I5	1-5	ITYPE	TYPE OF DATA = 1 TWO-WAY DATA = 2 THREE-WAY DATA
I5	6-10	MODE	TYPE OF RUN = 1 CREATION RUN = 2 EXTENSION RUN = 3 REPLACEMENT RUN = 4 SHORT LISTING = 5 LONG LISTING

<u>FORMAT</u>	<u>COLUMNS</u>	<u>MNEMONIC</u>	<u>DESCRIPTION</u>
I5	11-15	NOFTAB	NUMBER OF TABLES TO BE PROCESSED
I5	16-20	NTYP	TYPE OF TWO-WAY TABLE = 1 BETA VS MACH = 2 BETA VS ALPHA = 3 ALPHA VS MACH (DEFAULT IS NTYP = 1)

NOTE: ON A LIST RUN (MODE = + OR 5), "NOFTAB" AND "NTYP" DO NOT HAVE TO BE DEFINED.

CARD TYPE 2

<u>FORMAT</u>	<u>COLUMNS</u>	<u>MNEMONIC</u>	<u>DESCRIPTION</u>
8A10	1-80	FMT	THE FORMAT UNDER WHICH THE COEFFICIENTS WILL BE READ

NOTE: CARD TYPES 3, 4, AND 5 MUST BE REPEATED, IN SEQUENCE, "NOFTAB" TIMES.

CARD TYPE 3

<u>FORMAT</u>	<u>COLUMNS</u>	<u>MNEMONIC</u>	<u>DESCRIPTION</u>
A10	1-10	IDENT	TABLE NAME
I5	11-15	NCOEF	NUMBER OF COEFFICIENTS
I5	16-20	ISEQNO	SEQUENCE NUMBER OF THE TABLE TO BE REPLACED (WHEN MODE = 3)

CARD TYPE 4

<u>FORMAT</u>	<u>COLUMNS</u>	<u>MNEMONIC</u>	<u>DESCRIPTION</u>
F8.0	1-8	ALMIN	MINIMUM ALPHA
F8.0	9-16	ALMAX	MAXIMUM ALPHA
F8.0	17-24	DELALP	DELTA ALPHA
F8.0	25-32	BEMIN	MINIMUM BETA
F8.0	33-40	BEMAX	MAXIMUM BETA
F8.0	41-48	DELBET	DELTA BETA
F8.0	49-56	MAMIN	MINIMUM MACH
F8.0	57-64	MAMAX	MAXIMUM MACH
F8.0	65-72	DELMAC	DELTA MACH

WHEN ITYPE = 1 :

<u>FORMAT</u>	<u>COLUMNS</u>	<u>MNEMONIC</u>	<u>DESCRIPTION</u>		
			NTYP=1	NTYP=2	NTYP=3
F8.0	25-32	BEMIN	MIN. BETA	MIN. BETA	MIN. ALPHA
F8.0	33-40	BEMAX	MAX. BETA	MAX. BETA	MAX. ALPHA
F8.0	41-48	DELBET	DELTA BETA	DELTA BETA	DELTA ALPHA
F8.0	49-56	MAMIN	MIN. MACH	MIN. ALPHA	MIN. MACH

<u>FORMAT</u>	<u>COLUMNS</u>	<u>MNEMONIC</u>	<u>DESCRIPTION</u>		
F8.0	57-64	MAMAX	MAX. MACH	MAX. ALPHA	MAX. MACH
F8.0	65-72	DELMAC	DELTA MACH	DELTA ALPHA	DELTA MACH

CARD TYPE 5

<u>FORMAT</u>	<u>COLUMNS</u>	<u>DESCRIPTION</u>
		SPECIFIED BY THE USER
		TABLE COEFFICIENTS
		IN CARD TYPE 2.

NOTE: SEE SECTION II.A FOR A FURTHER DESCRIPTION OF HOW THE TABLE COEFFICIENTS MUST BE READ IN.

D. Types of errors that can be found.

- # 1 Number of tables greater than 50.
- # 2 Number of coefficients greater than 500.
- # 3 Invalid use of replace mode.
- # 4 Read excess tables into dummy.
- # 5 Two-way tables fully extended.
- # 6 Attempt to extend two-way tables beyond 30.
- # 7 Three-way tables fully extended.
- # 8 Attempt to extend three-way tables beyond 20.
- # 9 Error in number of coefficients defined.

The Act Program provides a method of continuing execution of the program, despite the discovery of an input error. The user is informed of the error that has been found, which will enable him to correct it in a later

run. In cases where a serious error causes the program to end, the info array for all previously created tables is written to the random file.

Under a "LIST" run (mode = 4 or 5), only card type 1 is recognized. For all other runs, all five card types are required. After each set of input is processed, the next card type 1 is read. The program will terminate upon reading an end of information card.

The program is designed to check for obvious input errors, and make the appropriate adjustments to compensate for them. The subroutine ERMSG handles the printing of the error messages, which indicate the source of the error and the action that will be taken by the program. An attempt is always made to save the "INFO" array before terminating the program due to an input error.

On the following pages is a sample of the inputs needed.

SAMPLE INPUT

*** CATALOG RUN ***

1 1 3 3
(14F5.1)

CXS	95	0.	360.	20.	0.	1.2	.3	
-1.0 -0.8 -0.4 -0.2 0.0	0.2	0.4	0.8	1.0	0.8	0.7	0.6	0.4 0.0
-0.4 -0.6 -0.8 -0.9 -1.0								
-1.0 -0.8 -0.4 -0.2 0.0	0.2	0.4	0.8	1.0	0.8	0.7	0.6	0.4 0.0
-0.4 -0.6 -0.8 -0.9 -1.0								
-1.0 -0.8 -0.4 -0.2 0.0	0.2	0.4	0.8	1.0	0.8	0.7	0.6	0.4 0.0
-0.4 -0.6 -0.8 -0.9 -1.0								
-1.2 -1.0 -0.6 -0.2 0.2	0.3	0.6	0.9	1.0	0.9	0.7	0.6	0.4 0.0
-0.4 -0.8 -1.0 -1.2 -1.2								
-1.3 -1.0 -0.7 -0.2 0.0	0.2	0.5	1.0	1.2	1.0	0.8	0.6	0.4 0.2
-0.4 -0.9 -1.1 -1.2 -1.2								

CZS	95	0.	360.	20.	0.	1.2	.3	
0.3 0.0 -0.4 -0.5 -0.6	-0.7	-0.8	-0.7	-0.4	-0.2	0.0	0.0	0.3 0.4
0.5 0.6 0.5 0.4 0.3								
0.3 0.0 -0.4 -0.5 -0.6	-0.7	-0.8	-0.7	-0.4	-0.2	0.0	0.0	0.3 0.4
0.5 0.6 0.5 0.4 0.3								
0.3 0.0 -0.4 -0.5 -0.6	-0.7	-0.8	-0.7	-0.4	-0.2	0.0	0.0	0.3 0.4
0.5 0.6 0.5 0.4 0.3								
0.4 0.0 -0.4 -0.6 -0.6	-0.8	-0.7	-0.4	0.0	0.1	0.0	0.1	0.2 0.4
0.6 0.5 0.6 0.4 0.2								
0.1 0.0 -0.4 -0.7 -0.8	-0.8	-0.9	-0.8	-0.5	-0.2	0.0	0.2	0.4 0.4
0.6 0.7 0.6 0.5 0.3								

CMS	95	0.	360.	20.	0.	1.2	.3	
-0.10-0.05 0.00 0.10 0.15	0.15	0.15	0.10	0.19-0.08-0.10-0.10-0.10-0.02				
0.0 0.05 0.0 -0.05-0.10								
-0.10-0.05 0.00 0.10 0.15	0.15	0.15	0.10	0.19-0.08-0.10-0.10-0.10-0.02				
0.0 0.05 0.0 -0.05-0.10								
-0.10-0.05 0.00 0.10 0.15	0.15	0.15	0.10	0.19-0.08-0.10-0.10-0.10-0.02				
0.0 0.05 0.0 -0.05-0.10								

-0.15-0.10 0.0 0.10 0.15 0.17 0.13 0.10 0.05 0.50 0.10 0.15 0.10 0.05
 0.0 0.90 0.0 0.90-0.15
 0.15-0.05 0.0 0.13 0.15 0.19 0.18 0.10 0.05-0.05-0.13-0.18-0.10-0.02
 0.0 0.0 0.02-0.10-0.15

*** EXTEND RUN ***

1	2	2	1				
(14F5.1)							
CYS	50			0.	45.	5.	0.
						1.2	.3
				0.0-0.10-0.15-0.30-0.35-0.50-0.60-0.70-0.85-1.00			
				0.0-0.10-0.15-0.30-0.35-0.50-0.60-0.70-0.85-1.00			
				0.0-0.10-0.15-0.30-0.35-0.50-0.60-0.70-0.85-1.00			
				0.0-0.10-0.20-0.40-0.50-0.60-0.80-0.90-1.00-1.20			
				0.0-0.10-0.30-0.50-0.60-0.80-0.90-1.10-1.20-1.40			
CLS	50			0.	45.	5.	0.
						1.2	.3
				0.0 +0.01+0.02+0.04+0.05+0.07+0.09+0.09+0.09+0.08			
				0.0 +0.01+0.02+0.04+0.05+0.07+0.09+0.09+0.09+0.08			
				0.0 +0.01+0.02+0.04+0.05+0.07+0.09+0.09+0.09+0.08			
				0.0 +0.01+0.02+0.04+0.05+0.07+0.09+0.09+0.09+0.08			
				0.0 +0.01+0.02+0.04+0.05+0.07+0.09+0.09+0.09+0.08			
1	3	1	1				
(14F5.1)							
CNS	50	23		0.	45.	5.	0.
						1.2	.3
				0.0-0.01-0.03-0.05-0.07-0.08-0.10-0.12-0.13-0.14			
				0.0-0.01-0.03-0.05-0.07-0.08-0.10-0.12-0.13-0.14			
				0.0-0.01-0.03-0.05-0.07-0.08-0.10-0.12-0.13-0.14			
				0.0-0.01-0.03-0.05-0.06-0.10-0.12-0.13-0.14-0.15			
				0.0-0.02-0.03-0.05-0.08-0.10-0.12-0.13-0.14-0.15			

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5. ACT, A CDC 6700 Computer Program for Generating Random Files of Aerodynamic Coefficient Tables Technical Note TN-K-1/74, Naval Weapons Laboratory, Dahlgren, Virginia, January, 1974.
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NADC-81224-60

APPENDIX E

FORTRAN LISTING OF THE ACT PROGRAM

PAGE

81/03/18, 11.19.26

FTN 4.6428

74/74 OPT=1

PROGRAM ACT

```

1  PROGRAM ACT(INPUT,OUTPUT,TAPF1=51),TAPF1C)
   DIMENSION WORK(170),FUT(10),INDEX(57)
   DIMENSION INFOF(30,10),INFOF3(2,13)
   EQUIVA ENCT (INFOF2(1,1),INFOF3(1,1))
   COMMON/SHARE/IDENT,VAL,INFOF,MA,DELALP,DELNET,OFLMAC,ALHIN,
   & NER,MAHIN,ALHAX,IMAX,MAHAX,NIYP
5  COMMON/SHARE/170,180,190,1TAKNO
10  COMMON/FFINFO/INF02(10,10)
   COMMON/FFCURL/ICGLF,IENTEST,1J,JK
   REAL INF02,INF03
   REAL MAC,MAH,MAHIN,MAHIN,MAHAX,IDENT
   IULK=10000000000
   CALL OPENR(1,(INDEX,57),1)
   TIME=SECOND(ISECS)
15  IENTEST=
   C THE FIRST CARD OF THE DATA DECK IS READ
   READ(1,100) ITYPE,MODE,NOFTAB,NIYP
   C ITYPE = 1 DATA FOR TWO-WAY TABLES
   C = 2 DATA FOR THREE-WAY TABLES
   C MODE = 1 EXTENSION FOR
   C = 2 EXTENSION FOR
   C = 3 REPLACEMENT FOR
   C = 4 SHORT LISTING
   C = 5 LONG LISTING
   C NOFTAB - NUMBER OF TABLES TO BE READ,
   C NOT DEFINED FOR MODES 4 AND 5
   C NIYP-TYPE OF TWO-WAY TABLE
   C = 1 IN TA VS WACH
   C = 2 META VS ALPHA
   C = 3 ALPHA VS BACH
   C = 4 ALPHA VS BACH
   C = 5 ALPHA VS BACH
   C IF NIYP.EQ.0,NIYP=1
   C HTEST IS USED BY THE WINFO AND PTOUT SUBROUTINES
   C HTEST = 0 THE ENTIRE RANDOM FILE CONTAINING THE INFO ARRAY
   C = 1 WILL BE READ WHEN MODE = 2 OR 3
   C = 1 NOT NECESSARY TO READ INFO ARRAY AGAIN
   C = 4 INSUPRES THE PTOUT ROUTINE TO PRINT OUT
   C THE FILE DICTIONARY ONLY
   NTE 1=
   IF(COF(10).NE.0)GO TO 19
   IF(ITYPE.EQ.1)MAC=1
   C YOU INITIALIZE THE INFO APRAY BY SETTING THE IDENT POSITION IN THE
   C INFO ARRAY TO 000000000 FOR LATER TESTING
   DO 13 J=1,10
   INFO2(J,1)=IULK
17  CONTINUE
   C IS THIS JUST A LIST? RUN
   IF(MODE.GE.4)GO TO 94
   C TEST FOR MAX. NUMBER OF TABLES
   IF(MOFTAB.GT.3.AND.ITYPE.EQ.1)CALL ERMSG(1)
   IF(MOFTAB.GT.2.AND.ITYPE.EQ.2)CALL ERMSG(1)
   C THE SECOND CARD OF THE DATA DECK GIVES THE FORMAT THAT
   C THE TABLES ARE TO BE READ UNDER

```

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FTN 4.6+420

74/74 OPT=1

PROGRAM ACT

```

60 C THE CURRENT TABLE NUMBER
   DO 11 I=1,NBTAR
   IF (CODE.EQ.2) IC=ICOUNT
   IF (MODE.EQ.2) AND (TEST.NE.0) IC=IC+1
65 C THE THIRD CARD OF THE DATA DECK DEFINES
   C IDENT - THE TABLE NAME
   C NCOEF - THE TOTAL NUMBER OF COEFFICIENTS
   C ISFUND - THE FOURTH CARD OF THE TABLE TO BE REPLACED WHEN MODE=3
119 READ(12,*) IDENT,NCOEF,1*FUND
120 FOR=1,NCOEF,1*FUND
   IF (MODE.EQ.3) GO TO 14
   IF (MODE.EQ.2) AND (TEST.EQ.0) GO TO 14
   IF (TYPE.EQ.1) INFO2(IC,1)=IDENT
   IF (TYPE.EQ.2) INFO3(IC,1)=IDENT
   IF (NCOEF.GT.700) CALL EMSG(2)
   IF (TEST.EQ.3) GO TO 9
   IF (MODE.EQ.3) GO TO 14
75 C PRIOR TO REPLACING A TABLE, THE RANDOM FILE CONTAINING
   C THE INFO ARRAY MUST BE READ
   CALL WINFO(3)
   IF (TEST.EQ.3) GO TO 9
   IC=1:NAR
   GO TO 15
80 C READ THE INFO ARRAY ON THE FIRST PASS OF AN EXTENSION RUN
14 IF (MODE.EQ.2) AND (TEST.EQ.0) CALL WINFO(2)
   IF (TEST.EQ.1) GO TO 12
85 IF (TYPE.EQ.1) INFO2(IC,1)=IDENT
   IF (TYPE.EQ.2) INFO3(IC,1)=IDENT
   C CALL ROUTINE TO READ THE DATA FOR EACH TABLE
   CALL ROUTEINFO(NCOEF)
   IF (TEST.EQ.4) GO TO 95
   INFO=NAL*0.0
   INFO=INFO*0.0
   INFO=INFO*0.0
90 C THE TABLE THAT WAS CREATED IS NOW PRINTED OUT
   CALL PRINTINFOKA,INHA,INHA
95 IF (TEST.EQ.3) TEST=0
   C THIS PROCESS IS CARRIED OUT UNTIL ALL TABLES, AS SPECIFIED
   C BY NBTAR, HAVE BEEN READ
11 CONTINUE
   IF (TEST.EQ.2) CALL EMSG(4)
100 C AFTER ALL TABLES HAVE BEEN CREATED, THE INFO ARRAY IS
   C WRITTEN TO THE PROPER RANDOM FILE
95 CALL WINFO(1)
   IF (TYPE.EQ.1) INFO=IC
   IF (TYPE.EQ.1) INFO=IC
105 IF (CODE.EQ.3) GO TO 9
   IF (MODE.EQ.3) CALL WINFO(2)
   INFO=0
   C THE PRINT ROUTINE NOW PRINTS OUT THE FILE DICTIONARY
   CALL PRINTINFOKA,1,1,1
110 GO TO 44
   C ON LIST OPTION, DETERMINE THE NUMBER OF TABLES ON FILE

```

THIS PROGRAM IS NOT TO BE USED FOR PRACTICAL

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```

115 IF (TYPE.EQ.2)INT=1300
    NTEST=1
    DO 2 IC=1,100
      C READ THE AFFORDANCE COEFFICIENTS INTO MEMORY
      CALL READR (IC,WORKA)
      INAL=IAL+.50
      INHA=HHA+.50
      INH=HHE+.50
      C PRINT OUT THE TABLE
      CALL PRINT (WORKA,INAL,INHA,INH)
      C 2: 97 NTEST=4
      C PRINT OUT CP TIME U-LO
      C 94 TIME=ELCONID(SECS)-TIME
      INH=SETH/3.00
      INH=ADON(TIME,3600.)/60.
      ISCS=TIME-FLOAT(MINUS*60,INOURS*3600)
      PRINT 97,INOURS,INUS,ISECS
      FORMAT(1H,15X,4)CENTRAL PROCESSOR TIME FOR THIS CASE WAS ,13.
      C 97 98 INHUS,13.5H INUS,13.5H SECS)
      IF (IFRTEST.EQ.4)STOP
      GO TO 12
      STOP
      END
  
```

CARD NO. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

ENTRY POINT	DEF LINE	REFERENCES
7221 ACT	1	

PREVIOUSLY DIMENSIONED ARRAY. FIRST DIMENSIONS WILL BE RETAINED.
 PREVIOUSLY DIMENSIONED ARRAY. FIRST DIMENSIONS WILL BE RETAINED.
 CONTROL VARIABLE IN COMMON OK EQUIVALENCED, OPTIMIZATION MAY BE INHIBITED.

SYMBOLIC REFERENCE N-P (R=1)

VARIABLES	SN	TYPE	RELOCATION
12 ALNAY	REAL		PAUGE
7 ALNTH	REAL		PAUGE
13 HENAY	REAL		PAUGE
1 HENTH	REAL		PAUGE
4 DELALP	REAL		PAUGE
5 DELRET	REAL		PAUGE
6 DELMAC	REAL		PAUGE
74	REAL		SHAGE

5 5 DEFINED 55

PROGRAM ACT				74/74	OPT=1	FTN 4.6428				81/03/18. 11.19.26				PAGE
VARIABLES	SN	TYPE	RELOCATION RANGE											
1	1	INTEGER	REAL											
7654	1	INTEGER	REAL											
2	2	INTEGER	REAL											
765	3	INTEGER	REAL											
7651	4	INTEGER	REAL											
11153	5	INTEGER	REAL											
7652	6	INTEGER	REAL											
7656	7	INTEGER	REAL											
14	8	INTEGER	REAL											
2	9	INTEGER	REAL											
11	10	INTEGER	REAL											
12	11	INTEGER	REAL											
15	12	INTEGER	REAL											
1	13	INTEGER	REAL											
2	14	INTEGER	REAL											
3	15	INTEGER	REAL											
4	16	INTEGER	REAL											
5	17	INTEGER	REAL											
6	18	INTEGER	REAL											
7	19	INTEGER	REAL											
8	20	INTEGER	REAL											
9	21	INTEGER	REAL											
10	22	INTEGER	REAL											
11	23	INTEGER	REAL											
12	24	INTEGER	REAL											
13	25	INTEGER	REAL											
14	26	INTEGER	REAL											
15	27	INTEGER	REAL											
16	28	INTEGER	REAL											
17	29	INTEGER	REAL											
18	30	INTEGER	REAL											
19	31	INTEGER	REAL											
20	32	INTEGER	REAL											
21	33	INTEGER	REAL											
22	34	INTEGER	REAL											
23	35	INTEGER	REAL											
24	36	INTEGER	REAL											
25	37	INTEGER	REAL											
26	38	INTEGER	REAL											
27	39	INTEGER	REAL											
28	40	INTEGER	REAL											
29	41	INTEGER	REAL											
30	42	INTEGER	REAL											
31	43	INTEGER	REAL											
32	44	INTEGER	REAL											
33	45	INTEGER	REAL											
34	46	INTEGER	REAL											
35	47	INTEGER	REAL											
36	48	INTEGER	REAL											
37	49	INTEGER	REAL											
38	50	INTEGER	REAL											
39	51	INTEGER	REAL											
40	52	INTEGER	REAL											
41	53	INTEGER	REAL											
42	54	INTEGER	REAL											
43	55	INTEGER	REAL											
44	56	INTEGER	REAL											
45	57	INTEGER	REAL											
46	58	INTEGER	REAL											
47	59	INTEGER	REAL											
48	60	INTEGER	REAL											
49	61	INTEGER	REAL											
50	62	INTEGER	REAL											
51	63	INTEGER	REAL											
52	64	INTEGER	REAL											
53	65	INTEGER	REAL											
54	66	INTEGER	REAL											
55	67	INTEGER	REAL											
56	68	INTEGER	REAL											
57	69	INTEGER	REAL											
58	70	INTEGER	REAL											
59	71	INTEGER	REAL											
60	72	INTEGER	REAL											
61	73	INTEGER	REAL											
62	74	INTEGER	REAL											
63	75	INTEGER	REAL											
64	76	INTEGER	REAL											
65	77	INTEGER	REAL											
66	78	INTEGER	REAL											
67	79	INTEGER	REAL											
68	80	INTEGER	REAL											
69	81	INTEGER	REAL											
70	82	INTEGER	REAL											
71	83	INTEGER	REAL											
72	84	INTEGER	REAL											
73	85	INTEGER	REAL											
74	86	INTEGER	REAL											
75	87	INTEGER	REAL											
76	88	INTEGER	REAL											
77	89	INTEGER	REAL											
78	90	INTEGER	REAL											
79	91	INTEGER	REAL											
80	92	INTEGER	REAL											
81	93	INTEGER	REAL											
82	94	INTEGER	REAL											
83	95	INTEGER	REAL											
84	96	INTEGER	REAL											
85	97	INTEGER	REAL											
86	98	INTEGER	REAL											
87	99	INTEGER	REAL											
88	100	INTEGER	REAL											
89	101	INTEGER	REAL											
90	102	INTEGER	REAL											
91	103	INTEGER	REAL											
92	104	INTEGER	REAL											
93	105	INTEGER	REAL											
94	106	INTEGER	REAL											
95	107	INTEGER	REAL											
96	108	INTEGER	REAL											
97	109	INTEGER	REAL											
98	110	INTEGER	REAL											
99	111	INTEGER	REAL											
100	112	INTEGER	REAL											
101	113	INTEGER	REAL											
102	114	INTEGER	REAL											
103	115	INTEGER	REAL											
104	116	INTEGER	REAL											
105	117	INTEGER	REAL											
106	118	INTEGER	REAL											
107	119	INTEGER	REAL											
108	120	INTEGER	REAL											
109	121	INTEGER	REAL											
110	122	INTEGER	REAL											
111	123	INTEGER	REAL											
112	124	INTEGER	REAL											
113	125	INTEGER	REAL											
114	126	INTEGER	REAL											
115	127	INTEGER	REAL											
116	128	INTEGER	REAL											
117	129	INTEGER	REAL											
118	130	INTEGER	REAL											
119	131	INTEGER	REAL											
120	132	INTEGER	REAL											
121	133	INTEGER	REAL											
122	134	INTEGER	REAL											
123	135	INTEGER	REAL											
124	136	INTEGER	REAL											
125	137	INTEGER	REAL											
126	138	INTEGER	REAL											
127	139	INTEGER	REAL											
128	140	INTEGER	REAL											
129	141	INTEGER	REAL											
130	142	INTEGER	REAL											
131	143	INTEGER	REAL											
132	144	INTEGER	REAL											
133	145	INTEGER	REAL											
134	146	INTEGER	REAL											
135	147	INTEGER	REAL											
136	148	INTEGER	REAL											
137	149	INTEGER	REAL											
138	150	INTEGER	REAL											
139	151	INTEGER	REAL											
140	152	INTEGER	REAL											
141	153	INTEGER	REAL											
142	154	INTEGER	REAL											
143	155	INTEGER	REAL											
144	156	INTEGER	REAL											
145	157	INTEGER	REAL											

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FTN 4.6428

74/74 OPT=1

SUBROUTINE ENHSG

VARIABLES	SN	TYPE	DECLARATION	REF	DEF	LINE	REFERENCES
2	1J	INTEGER	ERCOM	12	74		
3	1K	INTEGER	ERCOM	12	74		
14	1SERNO	INTEGER	SHARE	13			
473	1TYP	1 TLGR	ARRAY	11	21	26	63
				15			74
11	1TYPE	1-TEGFR	SHARE	13	20		
471	J	1-TEGFR		59			
472	LEFT	1-TEGFR		71	69	71	77
12	MODE	1-TEGFR	SHARE	13			
15	1TFT	1-TEGFR	SHARE	13			
16	1TFT	1-TEGFR	SHARE	13			
17	1TFT	1-TEGFR	SHARE	13			
18	1TFT	1-TEGFR	SHARE	13			
19	1TFT	1-TEGFR	SHARE	13			
20	1TFT	1-TEGFR	SHARE	13			
21	1TFT	1-TEGFR	SHARE	13			
22	1TFT	1-TEGFR	SHARE	13			
23	1TFT	1-TEGFR	SHARE	13			
24	1TFT	1-TEGFR	SHARE	13			
25	1TFT	1-TEGFR	SHARE	13			
26	1TFT	1-TEGFR	SHARE	13			
27	1TFT	1-TEGFR	SHARE	13			
28	1TFT	1-TEGFR	SHARE	13			
29	1TFT	1-TEGFR	SHARE	13			
30	1TFT	1-TEGFR	SHARE	13			
31	1TFT	1-TEGFR	SHARE	13			
32	1TFT	1-TEGFR	SHARE	13			
33	1TFT	1-TEGFR	SHARE	13			
34	1TFT	1-TEGFR	SHARE	13			
35	1TFT	1-TEGFR	SHARE	13			
36	1TFT	1-TEGFR	SHARE	13			
37	1TFT	1-TEGFR	SHARE	13			
38	1TFT	1-TEGFR	SHARE	13			
39	1TFT	1-TEGFR	SHARE	13			
40	1TFT	1-TEGFR	SHARE	13			
41	1TFT	1-TEGFR	SHARE	13			
42	1TFT	1-TEGFR	SHARE	13			
43	1TFT	1-TEGFR	SHARE	13			
44	1TFT	1-TEGFR	SHARE	13			
45	1TFT	1-TEGFR	SHARE	13			
46	1TFT	1-TEGFR	SHARE	13			
47	1TFT	1-TEGFR	SHARE	13			
48	1TFT	1-TEGFR	SHARE	13			
49	1TFT	1-TEGFR	SHARE	13			
50	1TFT	1-TEGFR	SHARE	13			
51	1TFT	1-TEGFR	SHARE	13			
52	1TFT	1-TEGFR	SHARE	13			
53	1TFT	1-TEGFR	SHARE	13			
54	1TFT	1-TEGFR	SHARE	13			
55	1TFT	1-TEGFR	SHARE	13			
56	1TFT	1-TEGFR	SHARE	13			
57	1TFT	1-TEGFR	SHARE	13			
58	1TFT	1-TEGFR	SHARE	13			
59	1TFT	1-TEGFR	SHARE	13			
60	1TFT	1-TEGFR	SHARE	13			
61	1TFT	1-TEGFR	SHARE	13			
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63	1TFT	1-TEGFR	SHARE	13			
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66	1TFT	1-TEGFR	SHARE	13			
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71	1TFT	1-TEGFR	SHARE	13			
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82	1TFT	1-TEGFR	SHARE	13			
83	1TFT	1-TEGFR	SHARE	13			
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86	1TFT	1-TEGFR	SHARE	13			
87	1TFT	1-TEGFR	SHARE	13			
88	1TFT	1-TEGFR	SHARE	13			
89	1TFT	1-TEGFR	SHARE	13			
90	1TFT	1-TEGFR	SHARE	13			
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92	1TFT	1-TEGFR	SHARE	13			
93	1TFT	1-TEGFR	SHARE	13			
94	1TFT	1-TEGFR	SHARE	13			
95	1TFT	1-TEGFR	SHARE	13			
96	1TFT	1-TEGFR	SHARE	13			
97	1TFT	1-TEGFR	SHARE	13			
98	1TFT	1-TEGFR	SHARE	13			
99	1TFT	1-TEGFR	SHARE	13			
100	1TFT	1-TEGFR	SHARE	13			

DEF LINE REFERENCES

WRITEFS 17

READS 36

WRITEFS 49

READS 36

WRITEFS 49

READS 36

WRITEFS 49

READS 36

WRITEFS 49

READS 36

WRITEFS 49

READS 36

WRITEFS 49

READS 36

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READS 36

WRITEFS 49

READS 36

SUBROUTINE EHMSG 74/74 OPT=1 PAGE

COMMON BLOCKS LENGTH 4

EPCCM 15

MEMBERS - RIAS NAME (LENGTH)

0 NCDEF (1)

3 IK (1)

2 FTT (1)

1C MOOL (1)

13 MTCST (1)

1 ERTEST (1)

2 JU (1)

9 ITYPE (1)

12 ISEQNO (1)

14 IRLNK (1)

FTN 4.6.42R

81/03/18. 11.19.26

STATISTICS

PROGRAM LENGTH 475H 317

CM LABELED COMMON LENGTH 23H 19

E-11

PAGE

11/13/18, 11.19.26

FTU 4.6+42R

74/74 OPT=1

SUBROUTINE INPUT

VARIABLES SN TYPE PLOCATION

6 DELMAC PVAL SHARE

276 J I-TEGER SHARE

16 I-TEGER SHARE

13 IC

1 IDENT REAL RANGE

2 IJ INTEGER ERCON

3 IK INTEGER ERCON

4 IINFO REAL ERCON

5 INFO1 REAL PFTINFO

329 IPF I-TEGER SHARE

14 ISECO-I-TEGER SHARE

11 ITYPE I-TEGER SHARE

275 J I-TEGER RANGE

277 K I-TEGER RANGE

14 MAXMAX REAL RANGE

11 MAXMIN REAL RANGE

12 MORE INTEGER SHARE

15 HTEST INTEGER SHARE

271 MYCOLF INTEGER RANGE

1 HAL REAL RANGE

2 MME REAL F.P.

6 HCOEF I-TEGER RANGE

3 HNA REAL RANGE

1 FORT/B INTEGER SHARE

15 H1YP INTEGER SHARE

272 HUNA INTEGER SHARE

273 HUNA INTEGER SHARE

274 HUNA INTEGER SHARE

274 HUNA REAL F.P.

274 HUNA REAL F.P.

274 HUNA REAL F.P.

274 HUNA REAL F.P.

274 HUNA REAL F.P.

274 HUNA REAL F.P.

274 HUNA REAL F.P.

274 HUNA REAL F.P.

REF 8

REF 6

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REF 30

REF 54

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REF 84

REF 85

21 36

7 75

75 75

65 75

26 75

39 75

55 75

66 75

12 75

33 75

5 75

55 75

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36 75

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77 75

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21 36

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REF 71

P

81/03/18. 11.19.26

FTH 4.6.42R

74/74 OPT=1

SUMMARY INPUT

STATEMENT LABELS

DEF LINE	REFERENCES
211 31	52
215 32	33
213 33	89
245 20	16

LOOPS LABEL INDEX FROM-TO LENGTH PROPERTIES

LOOP	INDEX	FROM-TO	LENGTH	PROPERTIES
126 22	* J	64 70	20H	EXT REFS NOT INNER
131	* I	70 70	11H	EXT REFS
147 25	* J	73 76	25H	EXT REFS NOT INNER
15 25	* K	74 76	22H	EXT REFS NOT INNER
153	* I	75 75	13H	EXT REFS

COMMON BLOCKS SHAPT LENGTH MEMBERS - RIAS NAME(LENGTH)

COMMON BLOCK	SHAPT	LENGTH	MEMBERS	RIAS NAME(LENGTH)	9 ITYPE	12 ISECHO
RFINFO	RANGE	300	0 FHT (4)	R NOFTAB (1)	(1)	(1)
		14	10 MODE (1)	11 IC (1)	(1)	(1)
			13 MTLT (1)	14 INLIK (1)	(1)	(1)
			0 INFO2 (300)	1 HAL (1)	(1)	(1)
			0 INLET (1)	4 DELALP (1)	(1)	(1)
			3 NNA (1)	7 ALMIN (1)	(1)	(1)
			6 DLIHAC (1)	10 ALMAX (1)	(1)	(1)
			9 HAHIN (1)	13 NTYP (1)	(1)	(1)
			12 HAHAX (1)	1 TEREST(1)	(1)	(1)
			0 NHAQO (1)			
			3 IK (1)			
ERCON		4				

EQUIV CLASSES LENGTH MEMBERS - RIAS NAME(LENGTH)

EQUIV CLASS	LENGTH	MEMBERS	RIAS NAME(LENGTH)
INFO2 INFO2	300	0 INFO3 (200)	

STATISTICS

PROGRAM LENGTH	CH LABELED COMMON LENGTH
3 4R	194
515H	333

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E-16

CARD NR. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

PREVIOUSLY DIMENSIONED ARRAY. FIRST DIMENSIONS WILL BE RETAINED.
 24 IF TATENTH MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
 25 IF TATENTH MAY BE MORE EFFICIENT THAN A 2 OR 3 BRANCH COMPUTED GO TO STATEMENT.
 26 BEGINNING AT THIS CARD IS ENTERED FROM OUTSIDE ITS RANGE.

SYNTHETIC REFERENCE 11 P (R=7)

ENTRY POINT	SUBROUTINE POINT	74/74	OPT=1	REFERENCES	92	133	152	FTN 4.6+428	81/03/18. 11.19.26	PAGE
3	PTOUT	1		87						
VARIABLES	SN	TYPE	DEF LINE	1						
12 ALMAY	12	REAL								
7 ALMIN	7	REAL								
722 ALPH	722	REAL							35	37
13 BEMAX	13	REAL							DEFINED	
10 BEMIN	10	REAL								
1316 DELTA	1316	REAL							89	DEFINED
4 DELALP	4	REAL							79	
5 DELBET	5	REAL							45	DEFINED
6 DELMAC	6	REAL							37	
2307 DICT1	2307	INTEGER							41	
2311 DICT2	2311	INTEGER							122	DEFINED
711 FMT	711	REAL							124	DEFINED
16 IMLNK	16	INTEGER							17	
13 IC	13	INTEGER							124	DEFINED
10 IDENT	10	REAL							18	
712 IN	712	INTEGER							2045	DEFINED
10 INFO2	10	REAL							73	
10 INFO1	10	REAL							2041	
713 ISAVVA	713	INTEGER							52	
14 ISEONO	14	INTEGER							55	
11 ITYPE	11	INTEGER							120	141
12 I2H	12	INTEGER							51	
13 I3H	13	INTEGER							13	
72 J	72	INTEGER							52	136
721 K	721	INTEGER							15	
714 L	714	INTEGER							127	9*128
715 M	715	INTEGER							50	
176 HACH	176	REAL							48	57
14 HACHV	14	REAL							134	
11 HACHIN	11	REAL							136	117
12 HODE	12	INTEGER							134	
15 HTEST	15	INTEGER							134	
716 H	716	INTEGER							148	135
11 HAL	11	REAL							DEFINED	
1 HALP	1	REAL							59	
1 HPE	1	REAL							70	88
2 HRET	2	REAL							73	DEFINED
717 HCHRY	717	INTEGER							79	89
1 HCH	1	REAL							DEFINED	
									59	1
									88	DEFINED
									71	97
									58	71
									100	100
									16	95
									DEFINED	95

AD-A106 152

COMPUTER SCIENCES CORP HUNTINGDON VALLEY PA

F/G 1/3

A GENERALIZED ESCAPE SYSTEM SIMULATION COMPUTER

PROGRAM: A USER--ETC(U)

AUG 81 L A D'AULERIO, K M BREakey

N62269-78-C-0191

UNCLASSIFIED

NADC-81224-60

NL

2 OF 2

43 4
100 42



END

DATE

FILED

11-81
DTIC

SUMROUTINE PTOUT			74/74	OPT=1	RELOCATION		FTN 4.6.42A		81/13/18, 11.19.26		PA
VARIABLES	SN	TYPE	MODE	FILE NAME'S	OUTPUT	SN	TYPE	MODE	FILE NAME'S	OUTPUT	PA
2300 OPT	1	INTEGER	INTEGR	ARRAY	ARRAY	7	14	48	DEFINED	22	
2305 IAN10	2	INTEGER	INTEGR	ARRAY	ARRAY	7	14	48	DEFINED	119	
705 IANT:Y	3	INTEGER	INTEGR	ARRAY	ARRAY	22	82	91	DEFINED	30	98
706 IANT:Y	4	INTEGER	INTEGR	ARRAY	ARRAY	14	79	89	DEFINED	1	
707 IANT:Y	5	INTEGER	INTEGR	ARRAY	ARRAY	4					
708 IANT:Y	6	INTEGER	INTEGR	ARRAY	ARRAY	53	55	60	DEFINED	69	73
709 IANT:Y	7	INTEGER	INTEGR	ARRAY	ARRAY	105	108	115	DEFINED	120	122
710 IANT:Y	8	INTEGER	INTEGR	ARRAY	ARRAY	145	148				
711 IANT:Y	9	INTEGER	INTEGR	ARRAY	ARRAY						
712 IANT:Y	10	INTEGER	INTEGR	ARRAY	ARRAY						
713 IANT:Y	11	INTEGER	INTEGR	ARRAY	ARRAY						
714 IANT:Y	12	INTEGER	INTEGR	ARRAY	ARRAY						
715 IANT:Y	13	INTEGER	INTEGR	ARRAY	ARRAY						
716 IANT:Y	14	INTEGER	INTEGR	ARRAY	ARRAY						
717 IANT:Y	15	INTEGER	INTEGR	ARRAY	ARRAY						
718 IANT:Y	16	INTEGER	INTEGR	ARRAY	ARRAY						
719 IANT:Y	17	INTEGER	INTEGR	ARRAY	ARRAY						
720 IANT:Y	18	INTEGER	INTEGR	ARRAY	ARRAY						
721 IANT:Y	19	INTEGER	INTEGR	ARRAY	ARRAY						
722 IANT:Y	20	INTEGER	INTEGR	ARRAY	ARRAY						
723 IANT:Y	21	INTEGER	INTEGR	ARRAY	ARRAY						
724 IANT:Y	22	INTEGER	INTEGR	ARRAY	ARRAY						
725 IANT:Y	23	INTEGER	INTEGR	ARRAY	ARRAY						
726 IANT:Y	24	INTEGER	INTEGR	ARRAY	ARRAY						
727 IANT:Y	25	INTEGER	INTEGR	ARRAY	ARRAY						
728 IANT:Y	26	INTEGER	INTEGR	ARRAY	ARRAY						
729 IANT:Y	27	INTEGER	INTEGR	ARRAY	ARRAY						
730 IANT:Y	28	INTEGER	INTEGR	ARRAY	ARRAY						
731 IANT:Y	29	INTEGER	INTEGR	ARRAY	ARRAY						
732 IANT:Y	30	INTEGER	INTEGR	ARRAY	ARRAY						
733 IANT:Y	31	INTEGER	INTEGR	ARRAY	ARRAY						
734 IANT:Y	32	INTEGER	INTEGR	ARRAY	ARRAY						
735 IANT:Y	33	INTEGER	INTEGR	ARRAY	ARRAY						
736 IANT:Y	34	INTEGER	INTEGR	ARRAY	ARRAY						
737 IANT:Y	35	INTEGER	INTEGR	ARRAY	ARRAY						
738 IANT:Y	36	INTEGER	INTEGR	ARRAY	ARRAY						
739 IANT:Y	37	INTEGER	INTEGR	ARRAY	ARRAY						
740 IANT:Y	38	INTEGER	INTEGR	ARRAY	ARRAY						
741 IANT:Y	39	INTEGER	INTEGR	ARRAY	ARRAY						
742 IANT:Y	40	INTEGER	INTEGR	ARRAY	ARRAY						
743 IANT:Y	41	INTEGER	INTEGR	ARRAY	ARRAY						
744 IANT:Y	42	INTEGER	INTEGR	ARRAY	ARRAY						
745 IANT:Y	43	INTEGER	INTEGR	ARRAY	ARRAY						
746 IANT:Y	44	INTEGER	INTEGR	ARRAY	ARRAY						
747 IANT:Y	45	INTEGER	INTEGR	ARRAY	ARRAY						
748 IANT:Y	46	INTEGER	INTEGR	ARRAY	ARRAY						
749 IANT:Y	47	INTEGER	INTEGR	ARRAY	ARRAY						
750 IANT:Y	48	INTEGER	INTEGR	ARRAY	ARRAY						
751 IANT:Y	49	INTEGER	INTEGR	ARRAY	ARRAY						
752 IANT:Y	50	INTEGER	INTEGR	ARRAY	ARRAY						
753 IANT:Y	51	INTEGER	INTEGR	ARRAY	ARRAY						
754 IANT:Y	52	INTEGER	INTEGR	ARRAY	ARRAY						
755 IANT:Y	53	INTEGER	INTEGR	ARRAY	ARRAY						
756 IANT:Y	54	INTEGER	INTEGR	ARRAY	ARRAY						
757 IANT:Y	55	INTEGER	INTEGR	ARRAY	ARRAY						
758 IANT:Y	56	INTEGER	INTEGR	ARRAY	ARRAY						
759 IANT:Y	57	INTEGER	INTEGR	ARRAY	ARRAY						
760 IANT:Y	58	INTEGER	INTEGR	ARRAY	ARRAY						
761 IANT:Y	59	INTEGER	INTEGR	ARRAY	ARRAY						
762 IANT:Y	60	INTEGER	INTEGR	ARRAY	ARRAY						
763 IANT:Y	61	INTEGER	INTEGR	ARRAY	ARRAY						
764 IANT:Y	62	INTEGER	INTEGR	ARRAY	ARRAY						
765 IANT:Y	63	INTEGER	INTEGR	ARRAY	ARRAY						
766 IANT:Y	64	INTEGER	INTEGR	ARRAY	ARRAY						
767 IANT:Y	65	INTEGER	INTEGR	ARRAY	ARRAY						
768 IANT:Y	66	INTEGER	INTEGR	ARRAY	ARRAY						
769 IANT:Y	67	INTEGER	INTEGR	ARRAY	ARRAY						
770 IANT:Y	68	INTEGER	INTEGR	ARRAY	ARRAY						
771 IANT:Y	69	INTEGER	INTEGR	ARRAY	ARRAY						
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773 IANT:Y	71	INTEGER	INTEGR	ARRAY	ARRAY						
774 IANT:Y	72	INTEGER	INTEGR	ARRAY	ARRAY						
775 IANT:Y	73	INTEGER	INTEGR	ARRAY	ARRAY						
776 IANT:Y	74	INTEGER	INTEGR	ARRAY	ARRAY						
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779 IANT:Y	77	INTEGER	INTEGR	ARRAY	ARRAY						
780 IANT:Y	78	INTEGER	INTEGR	ARRAY	ARRAY						
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783 IANT:Y	81	INTEGER	INTEGR	ARRAY	ARRAY						
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803 IANT:Y	101	INTEGER	INTEGR	ARRAY	ARRAY						
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805 IANT:Y	103	INTEGER	INTEGR	ARRAY	ARRAY						
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807 IANT:Y	105	INTEGER	INTEGR	ARRAY	ARRAY						
808 IANT:Y	106	INTEGER	INTEGR	ARRAY	ARRAY						
809 IANT:Y	107	INTEGER	INTEGR	ARRAY	ARRAY						
810 IANT:Y	108	INTEGER	INTEGR	ARRAY	ARRAY						
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812 IANT:Y	110	INTEGER	INTEGR	ARRAY	ARRAY						
813 IANT:Y	111	INTEGER	INTEGR	ARRAY	ARRAY						
814 IANT:Y	112	INTEGER	INTEGR	ARRAY	ARRAY						
815 IANT:Y	113	INTEGER	INTEGR	ARRAY	ARRAY						
816 IANT:Y	114	INTEGER	INTEGR	ARRAY	ARRAY						
817 IANT:Y	115	INTEGER	INTEGR	ARRAY	ARRAY						
818 IANT:Y	116	INTEGER	INTEGR	ARRAY	ARRAY						
819 IANT:Y	117	INTEGER	INTEGR	ARRAY	ARRAY						
820 IANT:Y	118	INTEGER	INTEGR	ARRAY	ARRAY						
821 IANT:Y	119	INTEGER	INTEGR	ARRAY	ARRAY						
822 IANT:Y	120	INTEGER	INTEGR	ARRAY	ARRAY						
823 IANT:Y	121	INTEGER	INTEGR	ARRAY	ARRAY						
824 IANT:Y	122	INTEGER	INTEGR	ARRAY	ARRAY						
825 IANT:Y	123	INTEGER	INTEGR	ARRAY	ARRAY						
826 IANT:Y	124	INTEGER	INTEGR	ARRAY	ARRAY						
827 IANT:Y	125	INTEGER	INTEGR	ARRAY	ARRAY						
828 IANT:Y	126	INTEGER	INTEGR	ARRAY	ARRAY						
829 IANT:Y	127	INTEGER	INTEGR	ARRAY	ARRAY						
830 IANT:Y	128	INTEGER	INTEGR	ARRAY	ARRAY						
831 IANT:Y	129	INTEGER	INTEGR	ARRAY	ARRAY						
832 IANT:Y	130	INTEGER	INTEGR	ARRAY	ARRAY						
833 IANT:Y	131	INTEGER	INTEGR	ARRAY	ARRAY						
834 IANT:Y	132	INTEGER	INTEGR	ARRAY	ARRAY						
835 IANT:Y	133	INTEGER	INTEGR	ARRAY	ARRAY						
836 IANT:Y	134	INTEGER	INTEGR	ARRAY	ARRAY						
837 IANT:Y	135	INTEGER	INTEGR	ARRAY	ARRAY						
838 IANT:Y	136	INTEGER	INTEGR	ARRAY	ARRAY						
839 IANT:Y	137	INTEGER	INTEGR	ARRAY	ARRAY						
840 IANT:Y	138	INTEGER	INTEGR	ARRAY	ARRAY						
841 IANT:Y	139	INTEGER	INTEGR	ARRAY	ARRAY						
842 IANT:Y	140	INTEGER	INTEGR	ARRAY	ARRAY						
843 IANT:Y	141	INTEGER	INTEGR	ARRAY	ARRAY						
844 IANT:Y	142	INTEGER	INTEGR	ARRAY	ARRAY						
845 IANT:Y	143	INTEGER	INTEGR	ARRAY	ARRAY						
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847 IANT:Y	145	INTEGER	INTEGR	ARRAY	ARRAY						
848 IANT:Y	146	INTEGER	INTEGR	ARRAY	ARRAY						
849 IANT:Y	147	INTEGER	INTEGR	ARRAY	ARRAY						
850 IANT:Y	148	INTEGER	INTEGR	ARRAY	ARRAY						
851 IANT:Y	149	INTEGER	INTEGR	ARRAY	ARRAY						
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853 IANT:Y	151	INTEGER	INTEGR	ARRAY	ARRAY						
854 IANT:Y	152	INTEGER	INTEGR	ARRAY	ARRAY						
855 IANT:Y	153	INTEGER	INTEGR	ARRAY	ARRAY						
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857 IANT:Y	155	INTEGER	INTEGR	ARRAY	ARRAY						
858 IANT:Y	156	INTEGER	INTEGR	ARRAY	ARRAY						
859 IANT:Y	157	INTEGER	INTEGR	ARRAY	ARRAY						
860 IANT:Y	158	INTEGER	INTEGR	ARRAY	ARRAY						
861 IANT:Y	159	INTEGER	INTEGR	ARRAY	ARRAY						
862 IANT:Y	160	INTEGER	INTEGR	ARRAY	ARRAY						
863 IANT:Y	161	INTEGER	INTEGR	ARRAY	ARRAY						
864 IANT:Y	162	INTEGER	INTEGR	ARRAY	ARRAY						
865 IANT:Y	163	INTEGER	INTEGR	ARRAY	ARRAY						
866 IANT:Y	164	INTEGER	INTEGR	ARRAY	ARRAY						
867 IANT:Y	165	INTEGER	INTEGR	ARRAY	ARRAY						
868 IANT:Y	166	INTEGER	INTEGR	ARRAY	ARRAY						
869 IANT:Y	167	INTEGER	INTEGR	ARRAY	ARRAY						
870 IANT:Y	16										

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PAG

81/03/18. 11.19.26

FTH 4.6+428

OPT=1

SUBROUTINE PTOUT

LOOPS	LABEL	INDEX	FROM-TO	LENGTH	PROPERTIES
34	23	1	36 38	38	INSTACK
55	21	1	44 42	38	INSTACK
104	25	1	59 86	700	INSTACK
143	22	1	70 81	200	
152	28	1	80 79	130	
202	28	1	80 90	200	
211	121	1	89 89	120	
272	121	1	126 132	200	
32	132	1	134 151	650	

COMMON BLOCKS LENGTH 15

MEMBERS - RIAS NAME(LENGTH)

9	ITYPE	(1)
11	IC	(1)
12	ISEQNO	(1)
14	IPURK	(1)
1	HALP	(1)
4	DELALP	(1)
7	ALHTN	(1)
10	ALMAX	(1)
13	NTYP	(1)
1	ISNO	(1)

MEMBERS - RIAS NAME(LENGTH)

9	ITYPE	(1)
11	IC	(1)
12	ISEQNO	(1)
14	IPURK	(1)
1	HALP	(1)
4	DELALP	(1)
7	ALHTN	(1)
10	ALMAX	(1)
13	NTYP	(1)
1	ISNO	(1)

STATISTICS

PROGRAM LENGTH	CH LABELED COMMON LENGTH
2337H	513H
1247	331

PAGE

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FTD 4.6.428

74/74 OPT=1

SUBROUTINE READP

```

1 SUBROUTINE READP (I, WORKA)
2 THIS ROUTINE READS THE TABLES FROM THE RANDOM FILE TO MEMORY
3 DIMENSION WORKA(170)
4 EQUIVALENCE (IF2(1,1), IF3(1,1))
5 COMMON/SHAP/FMT(1), NOFTAN, ITYPE, MONC, IC, ISEONO, HTEST, TRLMK
6 COMMON/PAN/E/IDELT, HAL, NRE, NNA, DELALP, DELHET, DELMAC, ALHIN,
7 IDPHIN, HAHIN, ALMAX, DELMAX, HAHAX, NIYP
8 COMMON/FF/IF0/IF2(10,10)
9 IF2=IF3
10 MEAL, HAL, NRE, F, HMA, HAHIN, HAHAX, IDENT
11 GO TO (1,2,3), ITYPE
12 IF2=IF2(1,1)
13 NRE=IF2(1,2)
14 NNA=IF2(1,3)
15 DELPET=IF2(1,4)
16 DELMAC=IF2(1,5)
17 NERIN=IF2(1,6)
18 MARIN=IF2(1,7)
19 NNA=IF2(1,8)
20 NNA=IF2(1,9)
21 ITYPE=IF2(1,10)
22 MCF=HMF/HMA
23 MCF=MCF*100
24 IF2=1
25 CALL READP (1, WORKA, MCF, ITP)
26 RETURN
27 IF2=IF3(1,1)
28 NRE=IF3(1,2)
29 NNA=IF3(1,3)
30 NNA=IF3(1,4)
31 DELLP=IF3(1,5)
32 DELPET=IF3(1,6)
33 DELMAC=IF3(1,7)
34 ALMPH=IF3(1,8)
35 NERIN=IF3(1,9)
36 MARIN=IF3(1,10)
37 ALMA=IF3(1,11)
38 BENAX=IF3(1,12)
39 HAHAX=IF3(1,13)
40 MCF=NAL/HPE/HMA
41 MCF=MCF*100
42 CALL READP (1, WORKA, MCF, ITP)
43 RETURN
44 END

```

THIS PAGE IS BEST QUALITY PRACTICABLE
 1. COPY 1.000 TO DDC

CARD NO. SEVERITY DETAILS DIAGNOSIS OF PROBLEM

9 1 IF2 PREVIOUSLY DIMENSIONED ARRAY, FIRST DIMENSIONS WILL BE RETAINED.
 12 1 AN IF STATEMENT MAY BE MORE EFFICIENT THAN A ? OR 3 BRANCH COMPUTED GO TO STATEMENT.

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FTN 4.6.42R

11 BEHAX (1)

10 ALMAX (1)
13 NTYP (1)

74/74 OPT=1

MEMBERS - RIAS NAME (LENGTH)

9 MAIN (1)
12 MAX (1)
0 IF2 (300)

MEMBERS - RIAS NAME (LENGTH)

0 IF3 (260)

SUBROUTINE READUF

COMMON BLOCKS LENGTH

300

LENGTH 300

IF2

STATISTICS

PROGRAM LENGTH

CH LABELED COMMON LENGTH

115H 77
511H 329

E-24

SUBROUTINE WRINFO 74/74 OPT=1 81/03/18. 11.19.26 PAGE

ENTRY POINTS 3 WRINFO	DEF LINE 1	REFERENCES 2A	50	58	64	70	74	85
VARIABLES	SN	TYPE	LOCATION					
12 ALHAY	REAL	PAGE	REF					
7 ALMIM	REAL	PAGE	REF					
13 BENAY	REAL	PAGE	REF					
14 BENIM	REAL	PAGE	REF					
4 DELALP	REAL	PAGE	REF					
5 DELHET	REAL	PAGE	REF					
6 DELHAC	REAL	PAGE	REF					
7 FHT	REAL	PAGE	REF					
16 IMLIK	INTEGER	SHARE	REF	38	54	83	88	
13 IC	INTEGER	SHARE	REF	DEFINED	43	59		
1 IDENT	REAL	SHARE	REF	15				
1 IDENTEST	INTEGER	PAGE	REF	42	58	47	2*67	69
2 IJ	INTEGER	ENCOM	REF	38	43	61	2*71	73
3 IK	INTEGER	ENCOM	REF	67	59	14	24	34
14 INFO2	REAL	REFINFO	REF	54	71	27	52	54
14 INFO1	REAL	REFINFO	REF	7	9			
14 INFO0	INTEGER	SHARE	REF	82	87	DEFINED	82	87
11 ITYPE	INTEGER	SHARE	REF	83	88	79	80	
12 ITYPE	INTEGER	SHARE	REF	22	32			
13 ITYPE	INTEGER	SHARE	REF	DEFINED	69			
14 ITYPE	INTEGER	SHARE	REF	DEFINED	73			
15 ITYPE	INTEGER	SHARE	REF	DEFINED	1			
16 ITYPE	INTEGER	SHARE	REF	DEFINED	47			
17 ITYPE	INTEGER	SHARE	REF	DEFINED	61			
18 ITYPE	INTEGER	SHARE	REF	DEFINED	15			
19 ITYPE	INTEGER	SHARE	REF	DEFINED	15			
20 ITYPE	INTEGER	SHARE	REF	DEFINED	15			
21 ITYPE	INTEGER	SHARE	REF	DEFINED	15			
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94 ITYPE	INTEGER	SHARE	REF	DEFINED	15			
95 ITYPE	INTEGER	SHARE	REF	DEFINED	15			
96 ITYPE	INTEGER	SHARE	REF	DEFINED	15			
97 ITYPE	INTEGER	SHARE	REF	DEFINED	15			
98 ITYPE	INTEGER	SHARE	REF	DEFINED	15			
99 ITYPE	INTEGER	SHARE	REF	DEFINED	15			
100 ITYPE	INTEGER	SHARE	REF	DEFINED	15			

STATEMENT LABELS	DEF LINE	REFERENCES
34 22	32	15
43 23	34	32
72 24	53	32
25 25	34	17
61 26	43	14
27 27	43	14

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STATEMENT LABELS

UCF	LYNE	REFERENCES
15	3	14
24	31	22
3	32	22
135	33	22
154	41	1R
166	42	W
156	43	R
17	44	79
121	5	79
127	51	4
		56

FROM-TO	LENGTH	PROPERTIES
37	39	50
53	55	5H

COMMON BLOCKS

MEMBERS	RIAS NAME (LENGTH)
3	FFPT (4)
10	MODE (1)
13	HYPER (1)
0	INFO2 (100)
0	INDEX (1)
3	RMA (1)
6	DELHAC (1)
9	MAHIN (1)
12	MAHAX (1)
3	1270 (1)
0	RCOLF (1)
3	IK (1)

FROM-TO	LENGTH	PROPERTIES
37	39	50
53	55	5H

STATISTICS

PROGRAM LENGTH	253H	171
CN LABELED COMMON LENGTH	523H	336

9	ITYPE (1)
11	IC (1)
14	IRLHK (1)
1	NAL (1)
4	DELALP (1)
7	ALHIN (1)
10	ALHAX (1)
13	NTYP (1)
1	13PO (1)
1	IERTEST (1)
2	NHE (1)
5	DELHET (1)
8	HEMIN (1)
11	HEHAX (1)
2	ITABNO (1)
2	IJ (1)

DATE
LME