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CONVERSION OF COMPUTER SOFTWARE FOR THE GIMBALLED ELECTROSTATIC--ETC(U)
FEB 77 W MIKULSKI, W E SHEPHARD

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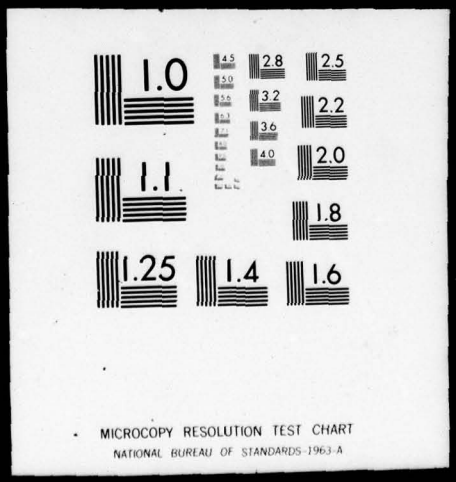

AFAL-TR-77-8
Volume II

CONVERSION OF COMPUTER SOFTWARE FOR THE GIMBALLED ELECTROSTATIC GYRO NAVIGATION SYSTEM

Volume II
SKC-2000 COMPUTER LISTING

REFERENCE SYSTEMS BRANCH
RECONNAISSANCE AND WEAPON DELIVERY DIVISION

FEBRUARY 1977

TECHNICAL REPORT AFAL-TR-77-8, Volume II
FINAL REPORT FOR PERIOD MAY 1973 - DECEMBER 1975

AIR FORCE AVIONICS LABORATORY
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William Mikulski

WILLIAM MIKULSKI
Project Engineer

William E. Shephard

WILLIAM E. SHEPHARD
Project Engineer

FOR THE COMMANDER

Charles L. Hudson

CHARLES L. HUDSON, Colonel, USAF
Chief
Reconnaissance and Weapon Delivery Division

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The Gimballed Electrostatic Gyro Navigation System (GEANS) conversion effort consisted of the conversion of an assembly language program for the Honeywell HDC-601 computer to another assembly language program for the Singer/Kearfott SKC-2000 computer. The HDC-601 and SKC-2000 were run in real time simultaneously. The SKC-2000 real time executive automatically synchronized with the HDC-601 so both programs ran in parallel, using the same input data from the Inertial Measurement Unit (IUM). Alignment and Navigation output of

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20. ABSTRACT (Cont'd)

both programs could then be compared and the SKC-2000 output verified. The conversion was completed successfully, the HDC-601 and SKC-2000 outputs agreeing to about 0.015 nautical miles per hour.

```
VERSION K20A0503      DECK NAME=*NAV   *                                                              PAGE   1

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                 SOURCE
                                  $FAP NAV
              1 05100  20736 -2   BUFORG    SETX    5100        DATA BUFFER ORIGON
                                  *
                                  *    THIS SETS UP A BUFFER AREA AROUND INTERRUPT TRAP AND RETURN AREA
                                  *    7FA0 TO 7FFE
                                  *
              2                0            USE     0
              3                0            ORG     32672
              4 07FA0  32672   0            BSS     96
                                  *
                                  *    GEANS WORLD COMMON VARIABLES DATA AREA
                                  *
              5                4  WLDCOM    COMMON  4
                                  *
              6 00000      0   4  SRT1      BSS     4           GYRO ROTOR 1 SPEED ACCUMULATION
              7 00004      4   4  SRT2      BSS     4           GYRO ROTOR 2 SPEED ACCUMULATION
              8 00008      8   4  RATM      BSS     4           NEGATIVE R.A.T. PULSE ACCUMULATION
              9 0000C     12   4  RATP      BSS     4           POSITIVE R.A.T. PULSE ACCUMULATION
             10 00010     16   4  ROT1      BSS     2           GYRO 1 ROTOR SPEED ( REV/SECOND )
             11 00012     18   4  ROT2      BSS     2           GYRO 2 ROTOR SPEED ( REV/SECOND )
             12 00014     20   4  DVXG      BSS     4           ACCUMULATED DELT VX
             13 00018     24   4  DVYG      BSS     4           ACCUMULATED DELT VY
             14 0001C     28   4  DVZG      BSS     4           ACCUMULATED DELT VZ
             15 00020     32   4  DPVV      BSS     4           DOPPLER VERTICAL VELOCITY ACCUMULATION
             16 00024     36   4  DPDV      BSS     4           DOPPLER DRIFT    VELOCITY ACCUMULATION
             17 00028     40   4  DPHV      BSS     4           DOPPLER HEADING  VELOCITY ACCUMULATION
             18 0002C     44   4  GMT       BSS     4           GREENWICH MEAN TIME
             19 00030     48   4  BTE1      BSS     2           BITE ACTUAL STATE MASK WORD 1
             20 00032     50   4  BTE3      BSS     2           BITE ACTUAL STATE MASK WORD 3
             21 00034     52   4  R1CT      BSS     2           COUNTER FOR ROTOR 1 SPEED FAULT
             22 00036     54   4  R2CT      BSS     2           COUNTER FOR ROTOR 2 SPEED FAULT
             23 00038     56   4  CIPM      BSS     2           INPUT POWER MONITOR COUNTER
             24 0003A     58   4  RAT       BSS     2           REDUNDANT AXIS TORQUING (PULSES)
             25 0003C     60   4  RATL      BSS     2           COUNTER FOR RAT
             26 0003E     62   4  DVX       BSS     4           INPUT DELTA VX
             27 00042     66   4  DVY       BSS     4           INPUT DELTA VY
             28 00046     70   4  DVZ       BSS     4           INPUT DELTA VZ
             29 0004A     74   4  CYLE      BSS     2           OUT-OF-TIME FLAG
             30 0004C     76   4  VRTV      BSS     2           DOPPLER VERTICAL VELOCITY
             31 0004E     78   4  DRFV      BSS     2           DOPPLER DRIFT    VELOCITY
             32 00050     80   4  HDGV      BSS     2           DOPPLER HEADING  VELOCITY
             33 00052     82   4  CTR1      BSS     2           PHASE TIMER
             34 00054     84   4  CTR2      BSS     2           INTERNAL SEQUENCING COUNTER
             35 00056     86   4  CTR3      BSS     2           INTERNAL SEQUENCING COUNTER
             36 00058     88   4  TIME      BSS     4           TIME FROM SYSTEM TURN ON (SECONDS)
             37 0005C     92   4  T0        BSS     4           TIME AT ENTRY TO NAV
             38 00060     96   4  ITER      BSS     2           ITERATION COUNTER
             39 00062     98   4  PHAS      BSS     2           AUTOMATIC SEQUENCING PHASE
             40 00064    100   4  NAVF      BSS     2           IN-NAVIGATION MODE FLAG (2/3 - MAN/AUTO)
             41 00066    102   4  DATA      BSS     2           SYSTEM DATA SWITCH (0-7)
             42 00068    104   4  PUSH      BSS     2           PUSHBUTTON SWITCH (0-31)
             43 0006A    106   4  TEST      BSS     2           PRESS TO TEST SWITCH (0/-1)
             44 0006C    108   4  MODE      BSS     2           SYSTEM MODE SWITCH
             45 0006E    110   4  LITE      BSS     2           CDU LIGHTS (SOFTWARE)
             46 00070    112   4  TMPR      BSS     2           TEMP STORAGE LOCATION
```

```
VERSION K20A0503      DECK NAME=*NAV   *                                                              PAGE   2

DIAGNOSTICS LINE ADRES OADRES LC  PROGRAM                                       SOURCE
                                   *
                                   *    SODL DATA AREA
                                   *
         47 00072    114  4        04F       BSS    2          01    FRAME MARKER
         48 00074    116  4        040       BSS    2          02    MSH OF GMT
         49 00076    118  4        041       BSS    2          03    LSH OF GMT
         50 00078    120  4        042       BSS    2          04    MSH OF LATITUDE
         51 0007A    122  4        043       BSS    2          05    LSH OF LATITUDE
         52 0007C    124  4        044       BSS    2          06    MSH OF LONGITUDE
         53 0007E    126  4        045       BSS    2          07    LSH OF LONGITUDE
         54 00080    128  4        047       BSS    2          08    MSH OF VERTICAL VELOCITY
         55 00082    130  4        048       BSS    2          09    LSH OF VERTICAL VELOCITY
         56 00084    132  4        049       BSS    2          10    MSH OF EAST VELOCITY
         57 00086    134  4        04A       BSS    2          11    LSH OF EAST VELOCITY
         58 00088    136  4        04B       BSS    2          12    MSH OF NORTH VELOCITY
         59 0008A    138  4        04C       BSS    2          13    LSH OF NORTH VELOCITY
         60 0008C    140  4        046       BSS    2          14    I.N.S. ALTITUDE
         61 0008E    142  4        06C       BSS    2          15    AHRS HEADING
         62 00090    144  4        06D       BSS    2          16    AHRS PITCH
         63 00092    146  4        06E       BSS    2          17    AHRS ROLL
         64 00094    148  4        018       BSS    2          18    RESET,IMU,DPU,EAU,CDU,DCU,BATT BITE BITS
         65 00096    150  4        030       BSS    2          19    3RD,4TH,5TH,6TH, RIGHT NUMERIC
         66 00098    152  4        031       BSS    2          20    4 DISCRETES; R.ALPHA; 1ST,2ND R. NUMERIC
         67 0009A    154  4        032       BSS    2          21    2ND,3RD,4TH,5TH LEFT NUMERIC
         68 0009C    156  4        033       BSS    2          22    1ST,2ND WAYPOINT; L. ALPHA; 1ST L.NUMERIC
         69 0009E    158  4        034       BSS    2          23    1ST,2ND FROM< 1ST,2ND TO
         70 000A0    160  4        035       BSS    2          24    CDU/ACDU DISPLAY LIGHTS
         71 000A2    162  4        023       BSS    2          25    HEADING
         72 000A4    164  4        021       BSS    2          26    PITCH
         73 000A6    166  4        022       BSS    2          27    ROLL
         74 000A8    168  4        024       BSS    2          28    STEERING SIGNAL
         75 000AA    170  4                  BSS    2          29    BLANK
         76 000AC    172  4        014       BSS    2          30    SEQ CNT,G1,2 RED,G1,2 TERM SHUTDOWN BITS
         77 000AE    174  4        072       BSS    2          31    TORQUE FOR GIMBALS 1 AND 2
         78 000B0    176  4        071       BSS    2          32    TORQUE FOR GIMBALS 3 AND 4
         79 000B2    178  4        04D       BSS    2          33    ROTOR 1,2, ROTOR SPEED
         80 000B4    180  4        04E       BSS    2          34    RAT AND VERTICAL VELOCITY
         81 000B6    182  4        050       BSS    2          35    -,+ DELTA VX
         82 000B8    184  4        051       BSS    2          36    -,+ DELTA VY
         83 000BA    186  4        052       BSS    2          37    -,+ DELTA VZ
         84 000BC    188  4        053       BSS    2          38    GIMBAL 1 RESOLVER
         85 000BE    190  4        054       BSS    2          39    GIMBAL 2 RESOLVER
         86 000C0    192  4        055       BSS    2          40    GIMBAL 3 RESOLVER
         87 000C2    194  4        056       BSS    2          41    GIMBAL 4 RESOLVER
         88 000C4    196  4        058       BSS    2          42    DATA,MODE,TST AND PUSHBUTTON SWITCHES
         89 000C6    198  4        05D       BSS    2          43    BITE BITS
         90 000C8    200  4        05E       BSS    2          44    BITE BITS
         91 000CA    202  4        025       BSS    2          45    BAROMETRIC ALTITUDE AND BITE BITS
         92 000CC    204  4        060       BSS    2          46    DRIFT AND HEADING VELOCITY
         93 000CE    206  4                  BSS    2          47    SPARE
         94 000D0    208  4                  BSS    2          48    SPARE
         95 000D2    210  4        05A       BSS    2          49    DELTA LATITUDE (FIX)
         96 000D4    212  4        062       BSS    2          50    DELTA LONGITUDE (FIX)
         97 000D6    214  4        057       BSS    2          51    VERTICAL DIFFERENCE VELOCITY
         98 000D8    216  4        058       BSS    2          52    CROSS TRACK DIFFERENCE VELOCITY
```

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VERSION K20A0503      DECK NAME=*NAV    *
                                                                    SOURCE
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM
             99 000DA   218  4        059      BSS    2      53   ALONG TRACK DIFFERENCE VELOCITY
            100 000DC   220  4        063      BSS    2      54   A11 ALIGNMENT MATRIX
            101 000DE   222  4        064      BSS    2      55   A21 ALIGNMENT MATRIX
            102 000E0   224  4        065      BSS    2      56   A31 ALIGNMENT MATRIX
            103 000E2   226  4        066      BSS    2      57   A12 ALIGNMENT MATRIX
            104 000E4   228  4        067      BSS    2      58   A22 ALIGNMENT MATRIX
            105 000E6   230  4        068      BSS    2      59   A32 ALIGNMENT MATRIX
            106 000E8   232  4        069      BSS    2      60   A13 ALIGNMENT MATRIX
            107 000EA   234  4        06A      BSS    2      61   A23 ALIGNMENT MATRIX
            108 000EC   236  4        06B      BSS    2      62   A33 ALIGNMENT MATRIX
            109 000EE   238  4                 BSS    2      63   SPARE
            110 000F0   240  4                 BSS    2      64   SPARE
            111 000F2   242  4        AJ       BSS    36          ALIGNMENT MATRIX
                                      *
            112                  5    NIACOM   COMMON 5           NAV.INIT.AND ALIGN COMMON DATA
                                      *
                                      *   DELTA V'S IN I.J.K SPACE IN M/SEC/CC
                                      *
            113 00000     0  5        DVXI     BSS    4
            114 00004     4  5        DVYJ     BSS    4
            115 00008     8  5        DVZK     BSS    4
            116 0000C    12  5        A        BSS    36          TEMP 3X3 MATRIX A
            117 0000C    12  5        DCAR     EQU    A
            118 00030    48  5        FLGN     BSS    2           SAVE AJ(I.J) FLAG
            119 00032    50  5        SAVT     BSS    4           TIME OF LAST AJ ROTATION
            120 00036    54  5        ASCH     BSS    2           ALIGNMENT SCHEDULER
            121 00036    54  5        NSCH     EQU    ASCH        NAVIGATION SCHEDULER
            122 00038    56  5        CD04D    BSS    12          CD0(I)*DELT   I=4,6
                                      *
            123                  6    NICOM    COMMON 6           NAV AND INIT COMMON DATA
                                      *
            124 00000     0  6        RAD      BSS    4           RADIUS IN METERS
            125 00004     4  6        RXYZ     BSS    4           SQRT(X**2+Y**2+Z**2)
            126 00008     8  6        LAT      BSS    4           EARTH RELATIVE LATITUDE
            127 0000C    12  6        LONG     BSS    4           EARTH RELATIVE LONGITUDE
            128 00010    16  6        DCON     BSS    2           CLOCK CYCLE COUNTER
            129 00012    18  6        CHAJ     BSS    2
                                      *
                                      *   VELOCITY IN INERTIAL SPACE IN M/SEC
                                      *
            130 00014    20  6        VX       BSS    4
            131 00018    24  6        VY       BSS    4
            132 0001C    28  6        VZ       BSS    4
            133 00020    32  6        LONB     BSS    4           LONGITUDE DISPLAY BIAS
            134 00024    36  6        LATB     BSS    4           LATITUDE DISPLAY BIAS
            135 00028    40  6        LGO      BSS    4           LONGITUDE AT ENTRY TO NAV
            136 0002C    44  6        S2GC     BSS    4           (SIN(GEOCENTRIC LATITUDE))**2
            137 00030    48  6        C2GC     BSS    4           (COS(GEOCENTRIC LATITUDE))**2
            138 00034    52  6        SGCL     BSS    4           SIN(GEOCENTRIC LATITUDE)
            139 00038    56  6        CGCL     BSS    4           COS(GEOCENTRIC LATITUDE)
            140 0003C    60  6        AB       BSS    36          (SCALE FACTOR)*(ALPHA-BETA) MATRIX AB
            141 00060    96  6        GM       BSS    36
            142 00084   132  6        VI       BSS    36          POSITION UPDATE MATRIX
            143 000A8   168  6        TEN      BSS    12
            144 000B4   180  6        TEMO     BSS    4
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VERSION K20A0503     DECK NAME=*NAV   *                                                              PAGE   4
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                               SOURCE
            145 000B8    184  6        TEM1      BSS     4
            146 000BC    188  6        TEM2      BSS     4
                                       *  POSITION IN INERTIAL SPACE, METERS
                                       *
            147 000C0    192  6        X         BSS     4
            148 000C4    196  6        Y         BSS     4
            149 000C8    200  6        Z         BSS     4
                                       *
                                       *   SUMMATION OF DELTA V'S IN I,J,K SPACE IN M/SEC/CC
                                       *
            150 000CC    204  6        SDVI      BSS     4
            151 000D0    208  6        SDVJ      BSS     4
            152 000D4    212  6        SDVK      BSS     4
            153 000D8    216  6        TLPO      BSS     4            TIME OF LAST PRINTOUT
                                       *
                                       *
            154                   7    MATCUM    COMMON 7             MATRIX,VECTOR,AND MISCELLANEOUS DATA
                                       *
            155 00000      0  7        SWT       BSS     4            SIN(OMEGA T)
            156 00004      4  7        CWT       BSS     4            COS(OMEGA T)
            157 00008      8  7        SGDL      BSS     4            SIN(GEODETIC LATITUDE)
            158 0000C     12  7        CGDL      BSS     4            COS(GEODETIC LATITUDE)
            159 00010     16  7        ALT       BSS     4            ALTITUDE
                                       *
                                       *    GIMBAL RESOLVER POSITION (BIAS EXCLUDED)
                                       *
            160 00014     20  7        RES1      BSS     4
            161 00018     24  7        RES2      BSS     4
            162 0001C     28  7        RES3      BSS     4
            163 00020     32  7        RES4      BSS     4
            164 00024     36  7        SRA       BSS     8            SUM OF 1-(G KNOWN)/(G ACCELERATION)
            165 0002C     44  7        NMO       BSS     2
                                       *
                                       *    COSINES OF CORRECTED GIMBAL ANGLES
                                       *
            166 0002E     46  7        C1        BSS     4
            167 00032     50  7        C2        BSS     4
            168 00036     54  7        C3        BSS     4
            169 0003A     58  7        C4        BSS     4
                                       *
                                       *    SINES OF CORRECTED GIMBAL ANGLES
                                       *
            170 0003E     62  7        S1        BSS     4
            171 00042     66  7        S2        BSS     4
            172 00046     70  7        S3        BSS     4
            173 0004A     74  7        S4        BSS     4
                                       *
            174 0004E     78  7        KSN1      BSS     2            GAIN COLUMN INDEX
            175 00050     80  7        KSN2      BSS     2            GAIN COLUMN INDEX
            176 00052     82  7        KSN3      BSS     2            GAIN COLUMN INDEX
            177 00054     84  7        D1        BSS     36           TEMP 3X3 MATRIX
            178 00078    120  7        DG        BSS     36           TOTAL GIMBAL AND THEN TSP2
                                       *
                                       *    STATE MATRIX ( STORED ROW MAJOR ORDER )
                                       *****       E11 = PSI = HEADING
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
                                  *****     E12 = THETA = PITCH
                                  *****     E13 = PHI = ROLL
                                  *
                                  *
          179 0009C    156  7     E1        BSS    12
          180 000A8    168  7     E2        BSS    12
          181 000B4    180  7     E3        BSS    12
          182 000C0    192  7     DC        BSS    36          VEHICLE TO CASE TRANSFORMATION MATRIX
          183 000E4    228  7     D         BSS    36          TEMP 3X3 MATRIX
          184 00108    264  7     SA        BSS    36          SAVE AJ MATRIX
          185 0012C    300  7     TM        BSS    36          TEMP 3X3 MATRIX
          186 00150    336  7     TM1       BSS    36          TEMP 3X3 MATRIX
          187 00174    372  7     VECT      BSS    34          TABLE OF SUBROUTINE CALLS
          188 00150    336  7     AP        EQU    TM1         TEMP 3X1 VECTOR
          189 0015C    348  7     AT        EQU    TM1+12      TEMP 3X1 VECTOR
          190 000E4    228  7     J3X3      EQU    D
          191 00150    336  7     K3X3      EQU    TM1
          192 00054     84  7     L3X3      EQU    D1
          193 00024     36  7     LCA1      EQU    SRA         LAST GIMBAL 1 COMMAND
          194 00028     40  7     LCA4      EQU    SRA+4       LAST GIMBAL 4 COMMAND
          195 00008      8  7     SL        EQU    SGDL        SIN(LAT) GEODETIC
          196 0000C     12  7     CL        EQU    CGDL        COS(LAT) GEODETIC
                                  *
                                  *
                                  *     GEANS WORLD COMMON CONSTANTS DATA AREA
                                  *
          197                   9 CONCOM    COMMON 9
                                  *
          198 00000      0  9 FFFFFFC0 N64       DEC    -64
          199 00002      2  9 FFFFFFF8 NOCT      DEC    -8
          200 00004      4  9 FFFFFFFC NFOUR     DEC    -4
          201 00006      6  9 FFFFFFFE NTWO      DEC    -2
          202 00008      8  9 FFFFFFFF NONE      DEC    -1
          203 0000A     10  9 00000001 ONE       DEC    1
          204 0000C     12  9 00000002 TWO       DEC    2
          205 0000E     14  9 00000003 THREE     DEC    3
          206 00010     16  9 00000004 FOUR      DEC    4
          207 00012     18  9 00000006 SIX       DEC    6
          208 00014     20  9 00000007 SEVEN     DEC    7
          209 00016     22  9 00000008 EIGHT     DEC    8
          210 00018     24  9 00000009 NINE      DEC    9
          211 0001A     26  9 0000000A TEN       DEC    10
          212 0001C     28  9 00000000 ZERO      DEC    0
          213 0001E     30  9 40C00000 FONE      DEC    1.0
          214 0001C     28  9          DFONE     EQU    ZERO
          215 0001C     28  9          DTOC      EQU    ZERO        DELTA TIME FOR DC = 1.0 SECOND
          216 00020     32  9 00000000 ONHLF     DEC64  0.5
                                   40400000
          217 00024     36  9 D21C399D OMGA      DEC64  7.292115HE-5  EARTH ROTATION RATE  RAD/SEC
                                   39CC769F
          218 00028     40  9 58E200CB OMEG      DEC64  2.32115255E-5  EARTH RATE   PI RAD/SEC
                                   38E158B2F
          219 0002C     44  9 EEDC506C KGDL      DEC64  1.00673966    GEODETIC LATITUDE CONSTANT
                                   40C0AE6C
          220 00030     48  9 00000000 DELT      DEC64  0.125         DELTA TIME = 1/8 SECOND
                                   3FC00000
          221 00034     52  9 00000000 D1032     DEC64  0.03125       DOUBLE PRECISION 1/32
```

```
                     3E400000
222 00038     56   9 00000000 D3032    DEC64  .09375          =3/32
                     3EE00000
                              *
                              *    CALIBRATION DATA.    CD01-CD64
                              *
223 0003C     60   9 41585226 CD01     DEC64  .011952910      X ACCEL SCALE FACTOR  M/SEC/PULSE
                     3D61E311
224 00040     64   9 E1585226 CD02     DEC64  .011952910      Y ACCEL SCALE FACTOR  M/SEC/PULSE
                     3D61E811
225 00044     68   9 E1585226 CD03     DEC64  .011952910      Z ACCEL SCALE FACTOR  M/SEC/PULSE
                     3D61E811
226 00048     72   9 00000000 CD04     DEC64  0               X ACCEL BIAS   PULSE/SEC
                     00000000
227 0004C     76   9 00000000 CD05     DEC64  0               Y ACCEL BIAS   PULSE/SEC
                     00000000
228 00050     80   9 00000000 CD06     DEC64  0               Z ACCEL BIAS   PULSE/SEC
                     00000000
229 00054     84   9 00000000 CD07     DEC64  1.0             B11 ACCEL MISALIGNMENT
                     40C00000
230 00058     88   9 00000000 CD08     DEC64  0               B12 ACCEL MISALIGNMENT
                     00000000
231 0005C     92   9 00000000 CD09     DEC64  0               B13 ACCEL MISALIGNMENT
                     00000000
232 00060     96   9 00000000 CD10     DEC64  0               B21 ACCEL MISALIGNMENT
                     00000000
233 00064    100   9 00000000 CD11     DEC64  1.0             B22 ACCEL MISALIGNMENT
                     40C00000
234 00068    104   9 00000000 CD12     DEC64  0               B23 ACCEL MISALIGNMENT
                     00000000
235 0006C    108   9 00000000 CD13     DEC64  0               B31 ACCEL MISALIGNMENT
                     00000000
236 00070    112   9 00000000 CD14     DEC64  0               B32 ACCEL MISALIGNMENT
                     00000000
237 00074    116   9 00000000 CD15     DEC64  1.0             B33 ACCEL MISALIGNMENT
                     40C00000
238 00078    120   9 00000000 CD16     DEC64  0               GYRO TORQUE,G INDEPEN,DYNE-CM
                     00000000
239 0007C    124   9 00000000 CD17     DEC64  0               GYRO TORQUE,G INDEPEN,DYNE-CM
                     00000000
240 00080    128   9 00000000 CD18     DEC64  0               GYRO TORQUE,G INDEPEN,DYNE-CM
                     00000000
241 00084    132   9 00000000 CD19     DEC64  0               G11 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                     00000000
242 00088    136   9 00000000 CD20     DEC64  0               G12 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                     00000000
243 0008C    140   9 00000000 CD21     DEC64  0               G13 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                     00000000
244 00090    144   9 00000000 CD22     DEC64  0               G21 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                     00000000
245 00094    148   9 00000000 CD23     DEC64  0               G22 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                     00000000
246 00098    152   9 00000000 CD24     DEC64  0               G23 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                     00000000
247 0009C    156   9 00000000 CD25     DEC64  0               G31 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                     00000000
248 000A0    160   9 00000000 CD26     DEC64  0               G32 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                     00000000
249 000A4    164   9 00000000 CD27     DEC64  0               G33 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
                     00000000
```

250	00A8	168	9	00000000 00000000 CD28	DEC64	0
251	00AC	172	9	00000000 00000000 CD29	DEC64	0
252	00B0	176	9	00000000 00000000 CD30	DEC64	0
253	00B4	180	9	00000000 00000000 CD31	DEC64	0
254	00B8	184	9	00000000 00000000 CD32	DEC64	0
255	00BC	188	9	00000000 00000000 CD33	DEC64	0
256	00C0	192	9	00000000 00000000 CD34	DEC64	0
257	00C4	196	9	00000000 00000000 CD35	DEC64	0
258	00C8	200	9	00000000 00000000 CD36	DEC64	0
259	00CC	204	9	00000000 00000000 CD37	DEC64	0
260	00D0	208	9	00000000 00000000 CD38	DEC64	0
261	00D4	212	9	00000000 00000000 CD39	DEC64	0
262	00D8	216	9	00000000 00000000 CD40	DEC64	0
263	00DC	220	9	00000000 00000000 CD41	DEC64	0
264	00E0	224	9	00000000 00000000 CD42	DEC64	0
265	00E4	228	9	00000000 00000000 CD43	DEC64	0
266	00E8	232	9	00000000 3FC00000 CD44	DEC64	0.25
267	00EC	236	9	00000000 00000000 CD45	DEC64	0
268	00F0	240	9	00000000 00000000 CD46	DEC64	0
269	00F4	244	9	00000000 00000000 CD47	DEC64	0
270	00F8	248	9	00000000 00000000 CD48	DEC64	0
271	00FC	252	9	00000000 00000000 CD49	DEC64	0
272	0100	256	9	00000000 00000000 CD50	DEC64	0
273	0104	260	9	00000000 00000000 CD51	DEC64	0

RAT GYRO TORQUE DYNE-CM

RAT GYRO TORQUE DYNE-CM

SPEED COMP,G INDEPENDENT DYNE-CM

SPEED COMP,G INDEPENDENT DYNE-CM

SPEED COMP,G INDEPENDENT DYNE-CM

SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2

SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2

SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2

SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2

SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2

SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2

SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2

SPEED COMP,G INDEPEN DYNE-CM/M/SEC**2

AIRP RAT SPEED COMP DYNE-CM

AIRP RAT SPEED COMP DYNE-CM

STARTING LOCUS PI RADIANS

BETA(IZ) MISALIGNMENT PI RADIANS

GIMBAL 1 RESOLVER BIAS PI RADIANS

GIMBAL 2 RESOLVER BIAS PI RADIANS

GIMBAL 3 RESOLVER BIAS PI RADIANS

GIMBAL 4 RESOLVER BIAS PI RADIANS

PLATFORM AZIMUTH ALIGN IN PI RADIANS

PLATFORM ELEVATION ALIGN IN PI RADIANS

```
VERSION K2040503     DECK NAME=*NAV   *                                                                 PAGE   6

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
            274 00108    264   9 855FF2F4 CO52       DEC64  .59594852     VERTICAL DAMPING CONSTANT,
                                 404C480A
                                          *                               0.59594852 IN M/SEC/M*2**31
            275 0010C    268   9 00000000 CO53       DEC64  0             VERTICAL VELOCITY GAIN     UNITLESS
                                 00000000
            276 00110    272   9 00000000 CO54       DEC64  0             LOADED HEADING             PI RADIANS
                                 00000000
            277 00114    276   9 00000000 CO55       DEC64  0             LOADED LATITUDE      PI RADIANS
                                 00000000
            278 00118    280   9 00000000 CO56       DEC64  0             LOADED LONGITUDE           PI RADIANS
                                 00000000
            279 0011C    284   9 69835158 CO57       DEC64  9.7803200     LOCAL GRAVITY              METERS/SEC**2
                                 424E3E18
            280 00120    288   9 0887E3F2 CO58       DEC64  83.661634     1/SCALE FACTOR             PULSES/M/SEC
                                 43034960
            281 00124    292   9 00000000 CO59       DEC64  656.0         ROTOR 1 SPEED       REVOLUTIONS/SEC
                                 45520000
            282 00128    296   9 00000000 CO60       DEC64  656.0         ROTOR 2 SPEED       REVOLUTIONS/SEC
                                 45520000
            283 0012C    300   9 00000000 CO61       DEC64  23.8125       BARO ALT SCALE FACTOR      METERS/BIT
                                 420F4000
            284 00130    304   9 00000000 CO62       DEC64  0             BARO ALTITUDE BIAS         BITS
                                 00000000
            285 00134    308   9 00018000 CO63       HEX    00018000      ALTIMETER / AHRS FLAGS     NONE
            286 00136    310   9 00000000            HEX    0
            287 00138    312   9 00000000 CO64       DEC64  0             ALTITUDE                   METERS
                                 00000000
                                          *
                                          *
            288                13                    USE    13
                                          *
            289                13                    ORG    BUFORG
            290 05100  20735  13          DECFLG     BSS    2             PDP-11 FLAG
            291 05102  20738  13          BTIME      BSS    4             TIME
            292 05106  20742  13          BLAT       BSS    4             LATITUDE
            293 0510A  20746  13          BLONG      BSS    4             LONGITUDE
            294 0510E  20750  13          BVV        BSS    12            VV,VE,AND VN
            295 0511A  20762  13          BVX        BSS    12            VX,VY,AND VZ
                                          *
                                          *
            296                 1                    USE    1
            297                                      EVEN
            298                                      ENTRY  IC,ID,IE,IF,IF2,IG,IH,IJ,IK,IL,IM
                                          *
            299 00000      0    1         GXDT       BSS    4             GRAVITY MODEL VARIABLES
            300 00004      4    1         GYDT       BSS    4
            301 00008      8    1         GZDT       BSS    4
            302 0000C     12    1         P          BSS    4
            303 00010     16    1         P3         BSS    4
            304 00014     20    1         P5         BSS    4
            305 00018     24    1         TEM3       BSS    4
            306 0001C     28    1         TEM4       BSS    4
            307 00020     32    1         TEM5       BSS    4
            308 00024     36    1         CCLG       BSS    4             COS(CELESTIAL LONGITUDE)
            309 00028     40    1         SCLG       BSS    4             SIN(GEOCENTRIC LATITUDE)
```

```
DIAGNOSTICS LINE ADRES OADRES LC  PROGRAM                              SOURCE
                                *
                                *
                                *
                                *DAMPING VECTOR, M/SEC
                                *
          310 0002C     44  1   LDVX     BSS    4
          311 00030     48  1   LDVY     BSS    4
          312 00034     52  1   LDVZ     BSS    4
          313 00038     56  1   DVI      BSS    12          ACCELEROMETER TO GYRO ROTATION VECTOR
          314 00044     68  1   F1       BSS    4           1-(SRT1/DC04)**2
          315 00048     72  1   F2       BSS    4           1-(SRT2/DC04)**2
          316 0004C     76  1   VV       BSS    4           VERTICAL VELOCITY IN LOCAL VERTICAL
          317 00050     80  1   VE       BSS    4           EAST VELOCITY IN LOCAL VERTICAL
          318 00054     84  1   VN       BSS    4           NORTH VELOCITY IN LOCAL VERTICAL
          319 00058     88  1   IND      BSS    2
                                *
                                *     EARTH RELATIVE VELOCITY
                                *
          320 00054     90  1   VXE      BSS    4
          321 0005E     94  1   VYE      BSS    4
          322 00062     98  1   VZE      BSS    4
                                *
          323 00066    102  1   GS       BSS    4           GROUND SPEED
          324 0006A    106  1   VEL2     BSS    4           VV**2+VE**2+VN**2
                                *
                                *     RETURN ADDRESS LOCATIONS
                                *
          325 0006E    110  1   IAM      BSS    2
          326 00070    112  1   ICM      BSS    2
          327 00070    112  1   IDM      EQU    ICM
          328 00070    112  1   IEM      EQU    ICM
          329 00070    112  1   IFM      EQU    ICM
          330 00072    114  1   IF2M     BSS    2
          331 00070    112  1   IGM      EQU    ICM
          332 00070    112  1   IHM      EQU    ICM
          333 00070    112  1   IJM      EQU    ICM
          334 00074    116  1   DUMMET   BSS    2
          335 00070    112  1   ILM      EQU    ICM
          336 00070    112  1   IAM      EQU    ICM
          337 00076    116  1   INM      BSS    2
          338 00078    120  1   NAVOR    BSS    2           NAVO RETURN ADDRESS LOCATION
                                *
          339 0007A    122  1   DELR     BSS    4           DELTA RADIUS IN METERS
                                *
          340               2              USE    2
                                *
                                *     45 DEGREE ROTATION MATRIX
                                *
          341 00000      0  2 00000000 R45M     DEC64  0
                               00000000
          342 00004      4  2 999960F7          DEC64  0.707106781   SQRT(2)/2
                               405A8279
          343 00008      8  2 00009F09          DEC64  -0.707106781  -SQTR(2)/2
                               C0257086
          344 0000C     12  2 00000000          DEC64  0
                               00000000
          345 00010     16  2 999960F7          DEC64  0.707106781   SQRT(2)/2
```

```
                  405A8279
346 00014   20  2 999660F7          DEC64   0.707106781    SQRT(2)/2
                  405A8279
347 00018   24  2 00000000          DEC64   1.0
                  40C00000
348 0001C   28  2 00000000          DEC64   0
                  00000000
349 00020   32  2 00000000          DEC64   0
                  00000000
                           *
                           *
                           *      GRAVITY CONSTANTS    DOUBLE PRECISION
                           *
350 00024   36  2 99900505 GCA0     HEX     99900505       A0=-1.536227137E-6
351 00026   38  2 8698E7D1          HEX     8698E7D1
352 00028   40  2 9BF18280 GCA1     HEX     9BF18280       A1=1.247433376E-8
353 0002A   42  2 33682759          HEX     33682759
354 0002C   44  2 04722F1E GCA2     HEX     04722F1E       A2=-1.593661308E-11
355 0002E   46  2 AE89E8F8          HEX     AE89E8F8
356 00030   48  2 66666666 GCA3     HEX     66666666       A3=0.2
357 00032   50  2 3F666666          HEX     3F666666
358 00034   52  2 66666666 GCA4     HEX     66666666       A4=0.4
359 00036   54  2 3FE66666          HEX     3FE66666
360 00038   56  2 6D064592 GCA5     HEX     6D064592       A5=0.4285714286
361 0003A   58  2 3FED860B          HEX     3FED860B
362 0003C   60  2 6D685212 GCA6     HEX     6D685212       A6=1.714285714
363 0003E   62  2 40ED860B          HEX     40ED860B
364 00040   64  2 00000000 RADE     DEC64   6378145.0      EQUATORIAL RADIUS IN METERS
                  466152A1
                           *
                           *    FLOATING AND FIXED POINT CONSTANTS
                           *
365 00044   68  2 41E00000 FSIX     DEC     6.0
366 00046   70  2 42480000 FNINE    DEC     9.0
367 00048   72  2 42500000 FTEN     DEC     10.0
                           *
                           *    SYSTEM CONSTANTS
                           *
368 0004A   74  2 5FED4660 KR1      DEC64   0.00503
                  3CD26959
369 0004E   78  2 00000000 KR3      DEC64   21385.0
                  47038900
370 00052   82  2 00000000 DC04     DEC64   656.0          REFERENCE ROTOR SPEED
                  45520000
371 00056   86  2 1C00465A DC42     HEX     1C00465A       =0.00462630681
372 00058   88  2 3CC8CC23          HEX     3CC8CC23
373 0005A   90  2 00835DEF DC43     HEX     00835DEF       =0.00654258584
374 0005C   92  2 3CE83198          HEX     3CE83198
```

```
VERSION K20A0503      DECK NAME=*NAV   *                                                    PAGE   8

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
                 376                                     ENTRY    IA
                 377                                     EVEN
                                              *
                                              *          NAVIGATION SUB-EXECUTIVE
                                              *
                                              *   THIS ROUTINE IS ENTERED EVERY 1/32 SECOND AND PROVIDES FOUR
                                              *   BRANCHES FOR A 1/8 SECOND COMPUTATION CYCLE.
                                              *
                                              *
R                378 0005E   94  2 0000006E IA        PTR      IAM
                 379 00060   96  2 64040000           JS       IB
                 380 00062   98  2 14000036 IA1       LDA      NSCH               NSCH=NSCH+1
                 381 00064  100  2 A400000A           ADD      ONE
                 382 00066  102  2 3C000036           STA      NSCH
                 383 00068  104  2 0841               SLL      1
                 384 00069  105  2       06C0         LXA      8
                 385 0006A  106  2 7440006C           RTA      IA1A+8
                 386 0006C  108  2 00000074 IA1A      PTR      IA2
                 387 0006E  110  2 00000082           PTR      IA3
                 388 00070  112  2 00000088           PTR      IA4
                 389 00072  114  2 0000008C           PTR      IA5
                 390 00074  116  2 0700      IA2      NOP
                 391 00075  117  2       0700         NOP
                                              ********************
                                              *
                                              *   PROFILE NEEDED? IF SO CALL DUMY
                                              *
                                              ********************
                 392 00076  118  2 64040098           JS       IC
                 393 00078  120  2 6404008E           JS       ID
                 394 0007A  122  2 640400CC           JS       IE
                 395 0007C  124  2 640401C8           JS       IF
                 396 0007E  126  2 6404022A           JS       IG
                 397 00080  128  2 7400006E           RTA      IAM
                 398 00082  130  2 6404024E IA3       JS       IH
                 399 00084  132  2 6404031E           JS       IJ
                 400 00086  134  2 7400006E           RTA      IAM
                 401 00088  136  2 640406A4 IA4       JS       NAVO               CALL NAV OUTPUT ROUTINE
                 402 0008A  138  2 7400006E           RTA      IAM
                 403 0008C  140  2 6404040C IA5       JS       IL
                 404 0008E  142  2 64040632           JS       IM
                 405 00090  144  2 6404066E           JS       RTAL
                 406 00092  146  2 14000008           LDA      NONE               NSCH=-1
                 407 00094  148  2 3C000036           STA      NSCH
                 408 00096  150  2 7400006E           RTA      IAM
```

```
VERSION K20A0503      DECK NAME=*NAV    *                                                  PAGE   9
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                             SOURCE
                                          *
                                          *
            410                                  EVEN
                                          *
                                          *    ACCELEROMETER BIAS AND SCALE FACTOR COMPUTATION.
                                          *    ACCELEROMETER NON-ORTHOGONALITY COMPENSATION.
                                          *
                                          *
            411 00098      152  2 00000070 IC    PTR     ICM
            412 0009A      154  2 64040000 IC1   JS      VECSUB
            413 0009C      156  2 6008           JRU     *+8
GENERATED                            0700
            414 0009E      158  2 00000014       PTR     DVXG
            415 000A0      160  2 00000038       PTR     CD040
            416 000A2      162  2 00000014       PTR     DVXG
            417 000A4      164  2 64040000       JS      MULD31
            418 000A6      166  2 6008           JRU     *+8
GENERATED                            0700
            419 000A8      168  2 0000003C       PTR     AB
            420 000AA      170  2 00000014       PTR     DVXG
            421 000AC      172  2 00000000       PTR     DVXI
            422 000AE      174  2 1400001C IC2   LDA     ZERO
            423 000B0      176  2 3C000014       STA     DVXG
            424 000B2      178  2 3C000016       STA     DVXG+2
            425 000B4      180  2 3C000018       STA     DVXG+4
            426 000B6      182  2 3C00001A       STA     DVXG+6
            427 000B8      184  2 3C00001C       STA     DVXG+8
            428 000BA      186  2 3C00001E       STA     DVXG+10
            429 000BC      188  2 74000070       RTA     ICM
```

```
VERSION K20A0503      DECK NAME=*NAV    *                                                              PAGE  10

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
                                          *
                                          *   ROTATION FROM PLATFORM FRAME TO NAVIGATION FRAME
                                          *
            431 0008E     190  2 00000070 ID        PTR     IDM
            432 000C0     192  2 64040000 ID1       JS      MULD31
            433 000C2     194  2 6008               JRU     *+8
GENERATED                              0700
            434 000C4     196  2 000000F2           PTR     AJ
            435 000C6     198  2 00000000           PTR     DVXI
            436 000C8     200  2 0000003E           PTR     DVX
            437 000CA     202  2 74000070           RTA     IDM
```

DIAGNOSTICS LINE ADRES DADRES LC PROGRAM SOURCE

```
                                        *   COMPUTATION OF GRAVITY MODEL
                                        *
                                        *
439                                         EVEN
440 000CC    204  2 00000070 IE         PTR     IEM
441 000CE    206  2 5C220040 IE1        LDX     4,RADE,M        LOAD XR4 WITH ADDRESS OF DIVISOR
442 000D0    208  2 1400007C            LDA     DELR+2
443 000D2    210  2 5400007A            LDB     DELR            LOAD (A,B) WITH DIVIDEND
444 000D4    212  2 64040000            JS      DVFD            (DELR/RADE)
445 000D6    214  2 3C0000AA            STA     TEM+2           SAVE (DELR/RADE)
446 000D8    216  2 7C0000A8            STB     TEM
447 000DA    218  2 5C2200A8            LDX      4,TEM,M
448 000DC    220  2 64040000            JS      MULFD           (DELR/RADE)**2
449 000DE    222  2 9C0000A8            AFD     TEM             (DELR/RADE)+(DELR/RADE)**2
450 000E0    224  2 3C0000AA            STA     TEM+2
451 000E2    226  2 7C0000A8            STB     TEM
452 000E4    228  2 1400001E            LDA     FONE
453 000E6    230  2 5400001C            LDB     ZERO
454 000E8    232  2 DC0000A8            SFD     TEM             1.0-(DELR/RADE)+(DELR/RADE)**2
455 000EA    234  2 3C00000E            STA     P+2             STORE RESULT IN P
456 000EC    236  2 7C00000C            STB     P
457 000EE    238  2 5C22000C IE2        LDX     4,P,M
458 000F0    240  2 64040000            JS      MULFD           P**2
459 000F2    242  2 3C000016            STA     P5+2
460 000F4    244  2 7C000014            STB     P5
461 000F6    246  2 64040000            JS      MULFD           P**3
462 000F8    248  2 3C000012            STA     P3+2
463 000FA    250  2 7C000010            STB     P3
464 000FC    252  2 5C220014            LDX      4,P5,M
465 000FE    254  2 64040000            JS      MULFD           P**5
466 00100    256  2 3C000016            STA     P5+2
467 00102    258  2 7C000014            STB     P5
468 00104    260  2 5C22002C            LDX      4,S2GC,M
469 00106    262  2 14000044            LDA     FSIX
470 00108    264  2 5400001C            LDB     ZERO
471 0010A    266  2 64040000            JS      MULFD           6.0*S2GC
472 0010C    268  2 3C0000AA            STA     TEM+2
473 0010E    270  2 7C0000A8            STB     TEM
474 00110    272  2 14000048            LDA     FTEN
475 00112    274  2 5400001C            LDB     ZERO
476 00114    276  2 64040000            JS      MULFD           10.0*S2GC
477 00116    278  2 3C0000B6            STA     TEM0+2
478 00118    280  2 7C0000B4            STB     TEM0
479 0011A    282  2 1400002E            LDA     S2GC+2
480 0011C    284  2 5400002C            LDB     S2GC
481 0011E    286  2 64040000            JS      MULFD           S2GC**2
482 00120    288  2 3C0000BA            STA     TEM1+2
483 00122    290  2 7C0000B8            STB     TEM1            SAVE S2GC**2
484 00124    292  2 5C2200B8            LDX     4,TEM1,M
485 00126    294  2 14000046            LDA     FNINE
486 00128    296  2 5400001C            LDB     ZERO
487 0012A    298  2 64040000            JS      MULFD           9.0*S2GC**2
488 0012C    300  2 3C0000BA            STA     TEM1+2          SAVE (9.0*S2GC**2)
489 0012E    302  2 140000AA            LDA     TEM+2
```

VERSION K20A0503 DECK NAME=*NAV *


```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM          SOURCE
          490 00130    304  2 540000A8      LDB   TEM
          491 00132    306  2 9C0000B6      AFD   TEM1          6.0*S2GC+9.0*S2GC**2
          492 00134    308  2 3C0000BE      STA   TEM2+2        SAVE IT
          493 00136    310  2 7C0000BC      STB   TEM2
          494 00138    312  2 1400003A      LDA   GCA5+2
          495 0013A    314  2 54000036      LDB   GCA5
          496 0013C    316  2 DC0000BC      SFD   TEM2          (GCA5-6.0*S2GC+9.0*S2GC**2)
          497 0013E    318  2 5C22002C      LDX   4,GCA2,M
          498 00140    320  2 64040000      JS    MULFD         GCA2*(GCA5-6.0*S2GC+9.0*S2GC**2)
          499 00142    322  2 3C0000BE      STA   TEM2+2
          500 00144    324  2 7C0000BC      STB   TEM2
          501 00146    326  2 14000032      LDA   GCA3+2
          502 00148    328  2 54000030      LDB   GCA3
          503 0014A    330  2 DC00002C      SFD   S2GC          (GCA3-S2GC)
          504 0014C    332  2 3C00001E      STA   TEM4+2        SAVE IT
          505 0014E    334  2 7C00001C      STB   TEM4
          506 00150    336  2 5C22001C      LDX   4,TEM4,M
          507 00152    338  2 1400002A      LDA   GCA1+2
          508 00154    340  2 54000028      LDB   GCA1
          509 00156    342  2 64040000      JS    MULFD         GCA1*(GCA3-S2GC)
          510 00158    344  2 5C220014      LDX   4,P5,M
          511 0015A    346  2 64040000      JS    MULFD         GCA1*(GCA3-S2GC)*P**5
          512 0015C    348  2 3C000022      STA   TEM5+2
          513 0015E    350  2 7C000020      STB   TEM5          SAVE IT
          514 00160    352  2 5C220010      LDX   4,P3,M
          515 00162    354  2 14000026      LDA   GCA0+2
          516 00164    356  2 54000024      LDB   GCA0
          517 00166    358  2 64040000      JS    MULFD         GCA0*P**3
          518 00168    360  2 3C00001A      STA   TEM3+2        SAVE IT
          519 0016A    362  2 7C000018      STB   TEM3
          520 0016C    364  2 DC000020      SFD   TEM5          GCA0*P**3-GCA1(GCA3-S2GC)*P**5
                                *
          521 0016E    366  2 9C0000BC      AFD   TEM2          GCA2*(GCA5-6*S2GC+9*S2GC**2)
                                *                             +GCA0*P**3-GCA1(GCA3-S2GC)*P**5
                                *
          522 00170    368  2 3C0000BE      STA   TEM2+2        STORE RESULT
          523 00172    370  2 7C0000BC      STB   TEM2
          524 00174    372  2 5C2200BC      LDX   4,TEM2,M
          525 00176    374  2 140000C2      LDA   X+2           LOAD A,B WITH X
          526 00178    376  2 540000C0      LDB   X
          527 0017A    378  2 64040000      JS    MULFD         MULTIPLY BY GRAVITY MODEL
          528 0017C    380  2 3C000002      STA   GXDT+2        STORE IN GXDT
          529 0017E    382  2 7C000000      STB   GXDT
          530 00180    384  2 140000C6      LDA   Y+2
          531 00182    386  2 540000C4      LDB   Y             LOAD A,B WITH Y
          532 00184    388  2 64040000      JS    MULFD         MULTIPLY BY GRAVITY MODEL
          533 00186    390  2 3C000006      STA   GYDT+2        STORE IN GYDT
          534 00188    392  2 7C000004      STB   GYDT
          535 0018A    394  2 140000B6      LDA   TEM0+2
          536 0018C    396  2 540000B4      LDB   TEM0
          537 0018E    398  2 9C0000B8      AFD   TEM1          10*S2GC+9*S2GC**2
          538 00190    400  2 3C0000BA      STA   TEM1+2        SAVE IT
          539 00192    402  2 7C0000B8      STB   TEM1
          540 00194    404  2 1400003E      LDA   GCA6+2
          541 00196    406  2 5400003C      LDB   GCA6
```

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VERSION K20A0503      DECK NAME=*NAV    *                                                                       PAGE  13

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                     SOURCE
            542 00198    408  2 9C000038        AFD     GCA5          (GCA6+GCA5)
            543 0019A    410  2 DC0000B8        SFD     TEM1          GCA6+GCA5-10*S2GC+9*S2GC**2
            544 0019C    412  2 5C22002C        LDX     4,GCA2,M
            545 0019E    414  2 64040000        JS      MULFD         GCA2*(GCA6+GCA5-10*S2GC+9*S2GC**2)
            546 001A0    416  2 3C0000BA        STA     TEM1+2        SAVE IT
            547 001A2    416  2 7C0000B8        STB     TEM1
            548 001A4    420  2 14000036        LDA     GCA4+2
            549 001A6    422  2 54000034        LDB     GCA4
            550 001A8    424  2 9C00001C        AFD     TEM4          (GCA4+GCA3-S2GC)
            551 001AA    426  2 5C220028        LDX     4,GCA1,M
            552 001AC    428  2 64040000        JS      MULFD         GCA1*(GCA4+GCA3-S2GC)
            553 001AE    430  2 5C220014        LDX     4,P5,M
            554 001B0    432  2 64040000        JS      MULFD         GCA1*(GCA4+GCA3-S2GC)*P**5
            555 001B2    434  2 3C00001E        STA     TEM4+2
            556 001B4    436  2 7C00001C        STB     TEM4
            557 001B6    438  2 1400001A        LDA     TEM3+2        LOAD (GCA0*P**3)
            558 001B8    440  2 54000018        LDB     TEM3
            559 001B4    442  2 DC00001C        SFD     TEM4          GCA0*P**3-GCA1(GCA4+GCA3-S2GC)*P**5
                                          *
            560 001BC    444  2 9C0000B8        AFD     TEM1          GCA2*(GCA6+GCA5-10*S2GC+9*S2GC**2)
                                          *                           +GCA0*P**3-GCA1(GCA4+GCA3-S2GC)**P**5
            561 001BE    445  2 5C2200C6        LDX     4,Z,M         MULTIPLY WHOLE THING BY Z
            562 001C0    448  2 64040000        JS      MULFD
            563 001C2    450  2 3C00000A        STA     GZDT+2        STORE RESULT IN GZDT
            564 001C4    452  2 7C000008        STB     GZDT
            565 001C6    454  2 74000070        RTA     IEM
```

VERSION K20A0503 DECK NAME=*NAV *


```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
                                 *
                                 *    VERTICAL DAMPING COMPUTATION
                                 *
                                 *
                                 *
                                 *
 567                                      EVEN
 568 001C8    456  2 00000070 IF         PTR    IFM
 569 001CA    458  2 64040200             JS     IF2
 570 001CC    460  2 5C28001A IF1         LDX    5,TEN
 571 001CE    462  2 14000002             LDA    RAD+2
 572 001D0    464  2 54000000             LDB    RAD
 573 001D2    466  2 DC000004             SFD    RXYZ            RAD-RXYZ
 574 001D4    468  2 3C0000B6             STA    TEM0+2
 575 001D6    470  2 7C0000B4             STB    TEM0
 576 001D8    472  2 14000012             LDA    ALT+2
 577 001DA    474  2 54000010             LDB    ALT
 578 001DC    476  2 DC0000B4             SFD    TEM0            ALT-(RAD-RXYZ)
 579 001DE    478  2 0400                 CFX                    FIX IT
 580 001DF    479  2      0850           SLL    16              SCALE TO 2**0
 581 001E0    480  2 3C01008D             STAM   046+1           046 DATA=ALT-(RAD-RXYZ)
 582 001E2    482  2 140000B6             LDA    TEM0+2
 583 001E4    484  2 540000B4             LDB    TEM0            (A,B)=(RAD-RXYZ)
 584 001E6    486  2 5C220108             LDX    4,CD52,M
 585 001E8    488  2 64040000             JS     MULFD           CD52*(RAD-RXYZ)
 586 001EA    490  2 3C0000AA             STA    TEM+2
 587 001EC    492  2 7C0000A8             STB    TEM
 588 001EE    494  2 5C2200A8               LDX   4,TEM,M        (XR4 )=ADDRESS OF ARGUEMENT
 589 001F0    496  2 168000C0 IF1A        LDA    X,5             LOAD A WITH X+2
 590 001F2    498  2 568000BE               LDB   X-2,5           LOAD B WITH X
 591 001F4    500  2 64040000             JS     MULFD           CD52*(RAD-RXYZ)*(X OR Y OR Z)
 592 001F6    502  2 7E80002A             STB    LDVX-2,5        STORE RESULT
 593 001F8    504  2 3E80002C             STA    LDVX,5
 594 001FA    506  2 6C290010             IMN    5,FOUR          DECREMENT POINTER FOR NEXT ARGUEMENT
 595 001FC    508  2 643001F0             JGU    IF1A            GO BACK FOR ANOTHER
 596 001FE    510  2 74000070             RTA    IFM
```

```
VERSION K20A0503      DECK NAME=*NAV   *                                                                  PAGE  15

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                         SOURCE
                                         *
                                         *    COMPUTE EARTH RADIUS AND DELTA RADIUS
                                         *
            598 00200    512  2 00000072 IF2      PTR    IF2M
            599 00202    514  2 14000032          LDA    C2GC+2
            600 00204    516  2 54000030          LDB    C2GC
            601 00206    518  2 5C22004A          LDX    4,KR1,M       KR1=.00503
            602 00208    520  2 64040000          JS     MULFD         .00503*C2GC
            603 0020A    522  2 9C00001C          AFD    DFONE         1.0+.00503*C2GC
            604 0020C    524  2 5C22002C          LDX    4,S2GC,M
            605 0020E    526  2 64040000          JS     MULFD         S2GC*(1+.00503*C2GC)
            606 00210    528  2 5C22004E          LDX    4,KR3,M       KR3= 21385.0
            607 00212    530  2 64040000          JS     MULFD         21385.*S2GC*(1+.00503*C2GC)
            608 00214    532  2 3C0000AA          STA    TEM+2
            609 00216    534  2 7C0000A8          STB    TEM
            610 00218    536  2 14000012          LDA    ALT+2
            611 0021A    538  2 54000010          LDB    ALT
            612 0021C    540  2 DC0000A8          SFD    TEM           ALT-(21385*S2GC*(1+.00503*C2GC))
            613 0021E    542  2 3C00007C          STA    DELR+2
            614 00220    544  2 7C00007A          STB    DELR
            615 00222    546  2 9C000040 IF3      AFD    RADE          RAD=DELR+RADE
            616 00224    548  2 3C000002          STA    RAD+2
            617 00226    550  2 7C000000          STB    RAD
            618 00228    552  2 74000072          RTA    IF2M
```

VERSION K20A0503 DECK NAME=*NAV *


```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                    SOURCE
                                  *
                                  *    THIS ROUTINE DOES DOUBLE INTEGRATION FOR VELOCITY AND DISTANCE
                                  *    AS FOLLOWS:
                                  *
                                  *    **  ** **  **      **    ** **   **
                                  *    * VX * * VX *      * GXDT * * DVX *
                                  *    * VY *+* VY *+DELT** GYDT *+* DVY *
                                  *    * VZ * * VZ *      * GZDT * * DVZ *
                                  *    **  ** **  **      **    ** **   **
                                  *
                                  *
                                  *    ** ** ** **      **   **    ** **  **  **
                                  *    * X * * X *      *    * LDVX * * VX *   *
                                  *    * Y *+* Y *+DELT**    * LDVY *+* VY *   *
                                  *    * Z * * Z *      *    * LDVZ * * VZ *   *
                                  *    ** ** ** **      **   **    ** **  **  **
                                  *
                                  *
620 0022A   554  2 00000070 IG     PTR   IGM
621 0022C   556  2 5C220030 IG1    LDX   4,DELT,M      (XR4)=ADDRESS OF DELT
622 0022E   558  2 5C2A000A        LDX   5,10,M        INITIALIZE INDEX
623 00230   560  2 16800000 IG1A   LDA   GXDT,5
624 00232   562  2 5680FFFE        LDB   GXDT-2,5
625 00234   564  2 64040000        JS    MULFD         GXDT(I)*DELT  I=1,3
626 00236   566  2 9E80003C        AFD   DVX-2,5
627 00238   568  2 9E800012        AFD   VX-2,5
628 0023A   570  2 3E800014        STA   VX,5          VX(I)=GXDT(I)+DVX(I)
629 0023C   572  2 7E800012        STB   VX-2,5
630 0023E   574  2 9E80002A        AFD   LDVX-2,5
631 00240   576  2 64040000        JS    MULFD         DELT*(LDVX(I)+VX(I))
632 00242   578  2 9E8000BE        AFD   X-2,5
633 00244   580  2 3E8000C0        STA   X,5           X(I)=X(I)+(DELT*LDVX(I)+VX(I))
634 00246   582  2 7E8000BE        STB   X-2,5
635 00248   584  2 6C2B0004        IMN   5,4,M
636 0024A   586  2 64300230        JGU   IG1A
637 0024C   588  2 74000070        RTA   IGM
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                        *
                                        *
                                        *    LATITUDE AND LONGITUDE COMPUTATION
                                        *
            539                              EVEN
            540 0024E    590  2 00000070 IH       PTR     IHM
            541 0025J    592  2 140000C2 IH1      LDA     X+2
            542 00252    594  2 540000C0          LDB     X
            543 00254    596  2 5C2200C0          LDX     4,X,M
            544 00256    598  2 64040000          JS      MULFD           X**2
            545 00258    600  2 3C0000AA          STA     TEM+2
            546 0025A    602  2 7C0000A8          STB     TEM             SAVE IT
            547 0025C    604  2 140000C6          LDA     Y+2
            548 0025E    606  2 540000C4          LDB     Y
            549 00260    608  2 5C2200C4          LDX     4,Y,M
            550 00262    610  2 64040000          JS      MULFD           Y**2
            551 00264    612  2 9C0000A8          AFD     TEM             X**2+Y**2
            552 00266    614  2 3C0000AA          STA     TEM+2
            553 00268    616  2 7C0000A8          STB     TEM             SAVE X**2+Y**2
                                        *
            554 0026A    618  2 64040000          JS      DECSQ           SQRT(X**2+Y**2)
                                        *
            555 0026C    620  2 3C0000B6          STA     TEM0+2
            556 0026E    622  2 7C0000B4          STB     TEM0            SAVE IT
            557 00270    624  2 140000CA          LDA     Z+2
            558 00272    626  2 540000C8          LDB     Z
            559 00274    628  2 5C22002C          LDX     4,KGDL,M
            560 00276    630  2 64040000          JS      MULFD           Z*KGDL
            561 00278    632  2 3C0000BA          STA     TEM1+2
            562 0027A    634  2 7C0000B8          STB     TEM1
            563 0027C    636  2 5C2200B4          LDX     4,TEM0,M
                                        *
            564 0027E    638  2 64040000          JS      DECATN          ATAN((Z*KGDL)/SQRT(X**2+Y**2))
                                        *
            565 00280    640  2 9C000024          AFD     LATB            LATB+ATAN((Z*KGDL)/SQRT(X**2+Y**2))
            566 00282    642  2 3C00000A          STA     LAT+2
            567 00284    644  2 7C000008          STB     LAT
                                        *
            568 00286    646  2 0400      IH2     CFX
            569 00287    647  2     0C02          SRAD    2               SCALE TO 2**-30
            570 00288    648  2 7C010079          STBM    042+1           042 DATA = MSW OF LATITUDE
            571 0028A    650  2 0810              SLLD    16
GENERATED                        0700
            572 0028C    652  2 7C01007B          STBM    043+1           043 DATA = LSW OF LATITUDE
                                        *
            573 0028E    654  2 1400005A IH3      LDA     TIME+2
            574 00290    656  2 54000058          LDB     TIME
            575 00292    658  2 DC00005C          SFD     T0              (TIME-T0)
            576 00294    660  2 5C220028          LDX     4,OMEG,M
            577 00296    662  2 64040000          JS      MULFD           (TIME-T0)*OMEG
            578 00298    664  2 DC000028          SFD     LG0             ((TIME-T0)*OMEG)-LG0
            579 0029A    666  2 3C0000BA          STA     TEM1+2
            580 0029C    668  2 7C0000B8          STB     TEM1
            581 0029E    670  2 140000C6          LDA     Y+2
```

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VERSION K20A0503      DECK NAME=*NAV   *                                                   PAGE  18

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                SOURCE
            682 002A0    672  2 540000C4          LDB    Y
            683 002A2    674  2 5C2200C0          LDX    4,X,M
                                         *
            684 002A4    676  2 64040000          JS     DECATN       ATAN(Y/X)
                                         *
            685 002A6    678  2 9C000020          AFD    LONB         LONB+ATAN(Y/X)
            686 002A8    680  2 3C0000BE          STA    TEM2+2
            687 002AA    682  2 7C0000BC          STB    TEM2
            688 002AC    684  2 DC000088          SFD    TEM1         (LONB+ATAN(Y/X))-(((TIME-T0)*OMEG)-LGO)
            689 002AE    686  2 3C00000E          STA    LONG+2
            690 002B0    688  2 7C00000C          STB    LONG
                                         *
            691 002B2    690  2 0400      IH4     CFX
            692 002B3    691  2     0C02          SRAD   2            SCALE TO 2**-30
            693 002B4    692  2 7C01007D          STBH   044+1        044 DATA = MSH OF LONGITUDE
            694 002B6    694  2 0810              SLLD   16
GENERATED                           0700
            695 002B8    696  2 7C01007F          STBH   045+1        045 DATA = LSH OF LONGITUDE
                                         *
            696 002BA    698  2 140000BE  IH5     LDA    TEM2+2       (A,B)=LONB+ATAN(Y/X)
            697 002BC    700  2 540000BC          LDB    TEM2
                                         *
            698 002BE    702  2 64040000          JS     SINCOS
            699 002C0    704  2 6004              JRU    *+4
GENERATED                           0700
            700 002C2    706  2 00000028          PTR    SCLG         SCLG=SIN(LONB+ATAN(Y/X))
                                         *
            701 002C4    708  2 7C000024  IH6     STB    CCLG         CCLG=COS(LONB+ATAN(Y/X))
            702 002C6    710  2 3C000026          STA    CCLG+2
            703 002C8    712  2 1400008A  IH7     LDA    TEM1+2       (A,B)=((TIME-T0)*OMEG)-LGO
            704 002CA    714  2 54000088          LDB    TEM1
                                         *
            705 002CC    716  2 64040000          JS     SINCOS
            706 002CE    718  2 6004              JRU    *+4
GENERATED                           0700
            707 002D0    720  2 00000000          PTR    SWT          SWT=SIN(((TIME-T0)*OMEG)-LGO)
                                         *
            708 002D2    722  2 7C000004  IH8     STB    CWT          CWT=COS(((TIME-T0)*OMEG)-LGO)
            709 002D4    724  2 3C000006          STA    CWT+2
            710 002D6    726  2 140000CA  IH9     LDA    Z+2
            711 002D8    728  2 540000C8          LDB    Z
            712 002DA    730  2 5C2200C8          LDX    4,Z,M
            713 002DC    732  2 64040000          JS     MULFD        Z**2
            714 002DE    734  2 9C0000A8          AFD    TEM          (X**2+Y**2+Z**2)
                                         *
            715 002E0    736  2 64040000          JS     DECSQ        SQRT(X**2+Y**2+Z**2)
                                         *
            716 002E2    738  2 3C000006          STA    RXYZ+2       RXYZ=SQRT(X**2+Y**2+Z**2)
            717 002E4    740  2 7C000004          STB    RXYZ
            718 002E6    742  2 140000CA  IH10    LDA    Z+2
            719 002E8    744  2 540000C8          LDB    Z
            720 002EA    746  2 5C220004          LDX    4,RXYZ,M
            721 002EC    748  2 64040000          JS     DVFD         Z/RXYZ
            722 002EE    750  2 3C000036          STA    SGCL+2       SGCL=Z/RXYZ
            723 002F0    752  2 7C000034          STB    SGCL
```

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VERSION K20A0503      DECK NAME=*NAV    *                                                                    PAGE  19

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
            724 002F2    754  2 5C220034 IH12    LDX     4,SGCL,M
            725 002F4    756  2 64040000         JS      MULFD          SGCL**2
            726 002F6    758  2 3C00002E         STA     S2GC+2         S2GC=SGCL**2
            727 002F8    760  2 7C00002C         STB     S2GC
            728 002FA    762  2 14000086 IH11    LDA     TEMU+2
            729 002FC    764  2 54000084         LDB     TEMU
            730 002FE    766  2 5C220004         LDX     4,RXYZ,M
            731 00300    768  2 64040000         JS      DVFD           SQRT(X**2+Y**2)/RXYZ
            732 00302    770  2 3C00003A         STA     CGCL+2         CGCL=SQRT(X**2+Y**2)/RXYZ
            733 00304    772  2 7C000038         STB     CGCL
            734 00306    774  2 5C220038 IH13    LDX     4,CGCL,M
            735 00308    776  2 64040000         JS      MULFD          CGCL**2
            736 0030A    778  2 3C000032         STA     C2GC+2         C2GC=CGCL**2
            737 0030C    780  2 7C000030         STB     C2GC
            738 0030E    782  2 1400000A IH14     LDA     LAT+2
            739 00310    784  2 54000008          LDB     LAT
                                        *
                                        *
            740 00312    786  2 64040000          JS     SINCOS
            741 00314    788  2 6004              JRU    *+4
GENERATED                           0700
            742 00316    790  2 00000008         PTR     SGDL           SGDL=SIN(LAT)
                                        *
            743 00318    792  2 3C00000E         STA     CGDL+2         CGDL=COS(LAT)
            744 0031A    794  2 7C00000C IH15    STB     CGDL
            745 0031C    796  2 74000070         RTA     IHM
```

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VERSION K20A0503      DECK NAME=*NAV    *                                                              PAGE  20

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
                                          *
                                          *
                                          *   COMPUTATION OF LOCAL VERTICAL CO-ORDINATES
                                          *   VV,VE,AND VN, AND GROUND SPEED
                                          *
                                          *
            747                                     EVEN
            748 0031E    798  2 00000070 IJ         PTR    IJ1
            749 00320    800  2 5C2A000C IJ1        LDX    5,A,M          XR5=ADDRESS OF MATRIX A
            750 00322    802  2 1400001C            LDA    ZERO
            751 00324    804  2 3A8F                STA    30,5           INSERT ZERO INTO A(2,3)
            752 00325    805  2     3A8E            STA    28,5
            753 00326    806  2 1400000A            LDA    SGDL+2
            754 00328    808  2 54000008            LDB    SGDL
            755 0032A    810  2 3A8D                STA    26,5           INSERT SGDL INTO A(1,3)
            756 0032B    811  2     7A8C            STB    24,5
            757 0032C    812  2 1400001C            LDA    ZERO
            758 0032E    814  2 5400001C            LDB    ZERO
            759 00330    816  2 DC000008            SFD    SGDL           ZERO - SGDL = -SGDL
            760 00332    818  2 5C220024            LDX    4,CCLG,M
            761 00334    820  2 64040000            JS     MULFD          -SGDL*CCLG
            762 00336    822  2 3A85                STA    10,5
            763 00337    823  2     7A84            STB    8,5            A(3,1) = -SGDL*CCLG
            764 00338    824  2 1201                LDA    2,4
            765 00339    825  2     5200            LDB    0,4
            766 0033A    826  2 3A89                STA    18,5
            767 0033B    827  2     7A88            STB    16,5           A(2,2) = CCLG
            768 0033C    828  2 1400000E            LDA    CGDL+2
            769 0033E    830  2 5400000C            LDB    CGDL
            770 00340    832  2 3A91                STA    34,5           A(3,3) = CGDL
            771 00341    833  2     7A90            STB    32,5
            772 00342    834  2 64040000            JS     MULFD          CGDL*CCLG
            773 00344    836  2 3A81                STA    2,5
            774 00345    837  2     7A80            STB    0,5            A(1,1) = CGDL*CCLG
            775 00346    838  2 5C220028            LDX    4,SCLG,M
            776 00348    840  2 1291                LDA    34,5
            777 00349    841  2     5290            LDB    32,5
            778 0034A    842  2 64040000            JS     MULFD          CGDL*SCLG
            779 0034C    844  2 3A87                STA    14,5
            780 0034D    845  2     7A86            STB    12,5           A(1,2) = CGDL*SCLG
            781 0034E    846  2 1400001C            LDA    ZERO
            782 00350    848  2 5400001C            LDB    ZERO
            783 00352    850  2 DC000028            SFD    SCLG           ZERO - SCLG = -SCLG
            784 00354    852  2 3A83                STA    6,5            A(2,1) = -SCLG
            785 00355    853  2     7A82            STB    4,5
            786 00356    854  2 5C220008            LDX    4,SGDL,M
            787 00358    856  2 64040000            JS     MULFD          -SGDL*SCLG
            788 0035A    858  2 3A8B                STA    22,5
            789 0035B    859  2     7A8A            STB    20,5           A(3,2) = -SGDL*SCLG
            790 0035C    860  2 5C2A0150            LDX    5,AP,M         INITIALIZE POINTER TO VECTOR AP
            791 0035E    862  2 140000C6            LDA    Y+2
            792 00360    864  2 540000C4            LDB    Y
            793 00362    866  2 5C220024            LDX    4,OMGA,M
            794 00364    868  2 64040000            JS     MULFD          Y*OMGA
```

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VERSION K20A0503      DECK NAME=*NAV    *                                                        PAGE  21

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                               SOURCE
            795 00366   870  2 9C000014          AFD     VX          VX+Y*OMGA
            796 00368   872  2 3A81              STA     2,5         INSERT VX+Y*OMGA INTO AP(1)
            797 00369   873  2       7A80        STB     0,5
            798 0036A   874  2 140000C2          LDA     X+2
            799 0036C   876  2 540000C0          LDB     X
            800 0036E   878  2 64040000          JS      MULFD       X*OMGA
            801 00370   880  2 3C0000AA          STA     TEM+2       STORE X*OMGA IN TEMP LOCATION
            802 00372   882  2 7C0000A8          STB     TEM
            803 00374   884  2 1400001A          LDA     VY+2        LOAD VY INTO (A,B)
            804 00376   886  2 54000018          LDB     VY
            805 00378   888  2 DC0000A8          SFD     TEM         VY-X*OMGA
            806 0037A   890  2 3A83              STA     6,5         INSERT VY-X*OMGA INTO AP(2)
            807 0037B   891  2       7A82        STB     4,5
            808 0037C   892  2 1400001E          LDA     VZ+2
            809 0037E   894  2 5400001C          LDB     VZ
            810 00380   896  2 3A85              STA     10,5        INSERT VZ INTO AP(3)
            811 00381   897  2       7A84        STB     8,5
                                          *
                                          *
            812 00382   898  2 64040000          JS      MULD31
            813 00384   900  2 6008              JRU     *+8
GENERATED                          0700
            814 00386   902  2 0000000C          PTR     A
            815 00388   904  2 00000150          PTR     AP
            816 0038A   906  2 0000004C          PTR     VV
                                          *
                                          *
            817 0038C   908  2 5C2A012C IJ2      LDX     5,TM,M
            818 0038E   910  2 1400001C          LDA     ZERO
            819 00390   912  2 3A8C              STA     24,5        TM(1,3)=TM(2,3)=TM(3,1)=TM(3,2)=0
            820 00391   913  2       3A8D        STA     26,5
            821 00392   914  2 3A8E              STA     28,5
            822 00393   915  2       3A8F        STA     30,5
            823 00394   916  2 3A84              STA     8,5
            824 00395   917  2       3A85        STA     10,5
            825 00396   918  2 3A8A              STA     20,5
            826 00397   919  2       3A8B        STA     22,5
            827 00398   920  2 5400001E          LDB     FONE
            828 0039A   922  2 7A91              STB     34,5        INSERT 1.0 INTO TM(3,3)
            829 0039B   923  2       3A90        STA     32,5
            830 0039C   924  2 14000006          LDA      CWT+2
            831 0039E   926  2 54000004          LDB     CWT
            832 003A0   928  2 3A81              STA     2,5         INSERT CWT INTO TM(1,1) AND TM(2,2)
            833 003A1   929  2       7A80        STB     0,5
            834 003A2   930  2 3A89              STA     18,5
            835 003A3   931  2       7A88        STB     16,5
            836 003A4   932  2 14000002          LDA     SWT+2
            837 003A6   934  2 54000000          LDB     SWT
            838 003A8   936  2 3A87              STA     14,5        INSERT SWT INTO TM(1,2)
            839 003A9   937  2       7A86        STB      12,5
            840 003AA   938  2 1400001C          LDA     ZERO
            841 003AC   940  2 5400001C          LDB     ZERO
            842 003AE   942  2 DC000000          SFD     SWT         ZERO - SWT = -SWT
            843 003B0   944  2 3A83              STA     6,5         INSERT -SWT INTO TM(2,1)
            844 003B1   945  2       7A82        STB     4,5
```

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VERSION K20A0503       DECK NAME=*NAV   *                                                              PAGE  22

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
                                          *
                                          *
            845 003B2    946  2 64040000          JS     MULD31
            846 003B4    948  2 6008              JRU    *+8
GENERATED                          0700
            847 003B6    950  2 0000012C          PTR    TM
            848 003B8    952  2 00000150          PTR    AP
            849 003BA    954  2 0000005A          PTR    VXE
                                          *
                                          *
            850 003BC    956  2 5C2A0000 IJ3      LDX    5,0,M
            851 003BE    958  2 5C220001          LDX    4,1,M
            852 003C0    960  2 1680004E IJ3A     LDA    VV+2,5
            853 003C2    962  2 5680004C          LDB    VV,5
            854 003C4    964  2 0400              CFX
            855 003C5    965  2     0803          SLLD   3              SCALE TO 2**-19
            856 003C6    966  2 7E010082          STBH   048,4          048,04A,OR 04C=LSH OF VELOCITY
            857 003C8    968  2 0870              SRLD   16
GENERATED                          0700
            858 003CA    970  2 7E010080          STBH   047,4          047,049,OR 04B=MSH OF VELOCITY
            859 003CC    972  2 6C2A0004          IMP    5,4,M
            860 003CE    974  2 6C220004          IMP    4,4,M
            861 003D0    976  2 2428000C          ICL    5,12,M
            862 003D2    978  2 643003D6          JGU    IJ4
            863 003D4    980  2 643003C0          JGU    IJ3A
                                          *
            864 003D6    982  2 1400001C IJ4      LDA    ZERO
            865 003D8    984  2 3C00006A          STA    VEL2
            866 003DA    986  2 3C00006C          STA    VEL2+2         SET VEL2 TO ZERO
            867 003DC    988  2 5C28001A          LDX    5,TEN
            868 003DE    990  2 5EA2004A IJ4A     LDX    4,VV-2,5,M     XR4 = BASE FOR VECTOR VV
            869 003E0    992  2 5680004A          LDB    VV-2,5         LOAD V(I) INTO (A,B)
            870 003E2    994  2 1680004C          LDA    VV,5
            871 003E4    996  2 64040000          JS     MULFD          VV*VV OR VE*VE OR VN*VN
            872 003E6    998  2 3E8000A8          STA    TEM,5
            873 003E8   1000  2 7E8000A6          STB    TEM-2,5        STORE V(I)*V(I) IN A TEMP LOCATION
            874 003EA   1002  2 9C00006A          AFD    VEL2           VEL2=VV*VV+VE*VE+VN*VN
            875 003EC   1004  2 3C00006C          STA    VEL2+2
            876 003EE   1006  2 7C00006A          STB    VEL2           STORE VEL2 SUM
            877 003F0   1008  2 6C290010          IMN    5,FOUR         DECREMENT POINTER FOR NEXT ELEMENT
            878 003F2   1010  2 643003DE          JGU    IJ4A
            879 003F4   1012  2 1400006C IJ5      LDA    VEL2+2
            880 003F6   1014  2 5400006A          LDB    VEL2
            881 003F8   1016  2 DC0000A8          SFD    TEM            VEL2-VV*VV
                                          *
                                          *
            882 003FA   1018  2 64040000          JS     DECSQ
                                          *
                                          *
            883 003FC   1020  2 3C000068          STA    GS+2           GS=SQRT(VEL2-VV*VV)
            884 003FE   1022  2 7C000066          STB    GS
                                          *
                                          *
            885 00400   1024  2 64040000 IJ6      JS     MUL33          VI(I,J)=A(I,J)AJ(I,J)
            886 00402   1026  2 6008              JRU    *+8
```

VERSION K20A0503 DECK NAME=*NAV *

DIAGNOSTICS GENERATED	LINE	ADRES	DADRES	LC	PROGRAM 0700	SOURCE	
	887	00404	1028	2	0000000C	PTR	A
	888	00406	1030	2	000000F2	PTR	AJ
	889	00408	1032	2	00000064	PTR	VI
	890	0040A	1034	2	74000070	RTA	IJM

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VERSION K2040503      DECK NAME=*NAV   *                                                              PAGE  24

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
                                          *
                                          *        GYRO DRIFT COMPENSATION COMPUTATION
                                          *
                                          *    THIS ROUTINE IS EXECUTED ONCE EVERY SECOND DURING BOTH ALIGN
                                          *    AND NAV. THE EXECUTION CYCLE IS SET BY A CONSTANT,DCON,WHICH IS
                                          *    INITIALIZED TO -8.
                                          *
            892                                    EVEN
            893 0040C   1036  2 00000070 IL        PTR    ILM
            894 0040E   1038  2 64040000 IL1       JS     VECADD         SDV(I)=SDV(I)+DVX(I)
            895 00410   1040  2 6008               JRU    *+8
GENERATED                             0700
            896 00412   1042  2 00000000           PTR    DVXI
            897 00414   1044  2 000000CC           PTR    SDVI
            898 00416   1046  2 000000CC           PTR    SDVI
                                          *
            899 00418   1048  2 1400000A IL2       LDA    ONE
            900 0041A   1050  2 A4000010           ADD    DCON
            901 0041C   1052  2 3C000010           STA    DCON          DCON = DCON+1
            902 0041E   1054  2 67200630 IL3       JL     IL15          JUMP OUT IF DCON < 0
            903 00420   1056  2 14000002 IL4       LDA    DCSK          DCON=-8
            904 00422   1058  2 3C000010           STA    DCON
            905 00424   1060  2 14000002 IL5       LDA    SRT1+2        DIVIDEND IN (A,B)
            906 00426   1062  2 54000000           LDB    SRT1
            907 00428   1064  2 5C22001C           LDX    4,DTDC,M      (XR4)=ADDRESS OF DIVISOR
            908 0042A   1066  2 64040000           JS     DVFD           SRT1=SRT1/DTDC
            909 0042C   1068  2 3C000002           STA    SRT1+2
            910 0042E   1070  2 7C000000           STB    SRT1
            911 00430   1072  2 14000006           LDA    SRT2+2
            912 00432   1074  2 54000004           LDB    SRT2
            913 00434   1076  2 64040000           JS    DVFD           SRT2=SRT2/DTDC
            914 00436   1078  2 3C000006           STA    SRT2+2
            915 00438   1080  2 7C000004           STB    SRT2
            916 0043A   1082  2 5C220052 IL6       LDX    4,DC04,M
            917 0043C   1084  2 64040000           JS     DVFD           SRT2/DC04
            918 0043E   1086  2 3C0000AA           STA    TEM+2          SAVE SRT2/DC04
            919 00440   1088  2 7C0000A8           STB    TEM
            920 00442   1090  2 14000002           LDA    SRT1+2
            921 00444   1092  2 54000000           LDB    SRT1
            922 00446   1094  2 64040000           JS     DVFD           SRT1/DC04
            923 00448   1096  2 3C000086           STA    TEM0+2         SAVE SRT1/DC04
            924 0044A   1098  2 7C000084           STB    TEM0
            925 0044C   1100  2 5C220084           LDX    4,TEM0,M
            926 0044E   1102  2 64040000           JS     MULFD         (SRT1/DC04)**2
            927 00450   1104  2 3C000086           STA    TEM0+2         SAVE (SRT1/DC04)**2
            928 00452   1106  2 7C000084           STB    TEM0
            929 00454   1108  2 140000AA           LDA    TEM+2
            930 00456   1110  2 540000A8           LDB    TEM
            931 00458   1112  2 5C2200A8           LDX    4,TEM,M
            932 0045A   1114  2 64040000           JS     MULFD         (SRT2/DC04)**2
            933 0045C   1116  2 3C0000AA           STA    TEM+2
            934 0045E   1118  2 7C0000A8           STB    TEM            SAVE (SRT2/DC04)**2
            935 00460   1120  2 1400001E           LDA    FONE           LOAD A WITH 1.0. COMPUTE F1
            936 00462   1122  2 5400001C           LDB    ZERO
```

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VERSION K20A0503      DECK NAME=*NAV   *                                                          PAGE  25

DIAGNOSTICS LINE ADRES OADRES LC  PROGRAM                                    SOURCE
            937 00464   1124  2 DC000084              SFD     TEMO           F1=1.0-(SRT1/DC04)**2
            938 00466   1126  2 3C000046              STA     F1+2
            939 00468   1128  2 7C000044              STB     F1
            940 0046A   1130  2 1400001E              LDA     FONE           COMPUTE F2
            941 0046C   1132  2 5400001C              LDB     ZERO
            942 0046E   1134  2 DC0000A8              SFD     TEM            F2=1.0-(SRT2/DC04)**2
            943 00470   1136  2 3C00004A              STA     F2+2
            944 00472   1138  2 7C000048              STB     F2
                                          *
                                          *    ACCELEROMETER TO GYRO CO-ORDINATE ROTATION
                                          *
            945 00474   1140  2 64040000 IL7          JS      MULD31         DV(I)=R45M(I,J)*SDV(I)
            946 00476   1142  2 6008                  JRU     *+8
GENERATED                          0700
            947 00478   1144  2 00000000              PTR     R45M
            948 0047A   1146  2 000000CC              PTR     SDVI
            949 0047C   1148  2 00000038              PTR     DVI
                                          *
                                          *
                                          *   G INDEPENDENT, SPEED INDEPENDENT
                                          *
            950 0047E   1150  2 5C2A0150 IL8          LDX     5,AP,M         XR5= BASE FOR MATRIX AP
            951 00480   1152  2 1400007A              LDA     CD16+2
            952 00482   1154  2 54000078              LDB     CD16
            953 00484   1156  2 3A81                  STA     2,5            AP(1)=CD16
            954 00485   1157  2     7A80              STB     0,5
            955 00486   1158  2 14000082              LDA     CD18+2
            956 00488   1160  2 54000080              LDB     CD18
            957 0048A   1162  2 3A83                  STA     6,5            AP(2)=CD18
            958 0048B   1163  2     7A82              STB     4,5
            959 0048C   1164  2 1400007E              LDA     CD17+2
            960 0048E   1166  2 5400007C              LDB     CD17
            961 00490   1168  2 3A85                  STA     10,5           AP(3)=CD17
            962 00491   1169  2     7A84              STB     8,5
            963 00492   1170  2 5C22001C              LDX     4,DTDC,M       (XR4)= ADDRESS OF DTDC
            964 00494   1172  2 5C28001A              LDX     5,TEN          INITIALIZE POINTER TO VECTOR AP(I)
            965 00496   1174  2 16800150 IL8A         LDA     AP,5
            966 00498   1176  2 5680014E              LDB     AP-2,5
            967 0049A   1178  2 64040000              JS      MULFD          DTDC*AP(I)
            968 0049C   1180  2 3E800150              STA     AP,5
            969 0049E   1182  2 7E80014E              STB     AP-2,5
            970 004A0   1184  2 6C290010              IMN     5,FOUR            DECREMENT POINTER FOR NEXT ARGUEMENT
            971 004A2   1186  2 64300496              JGU     IL8A
            972 004A4   1188  2 5C220008              LDX     4,RATM,M
            973 004A6   1190  2 140000AE              LDA     CD29+2
            974 004A8   1192  2 540000AC              LDB     CD29
            975 004AA   1194  2 64040000              JS      MULFD          CD29*RATM
            976 004AC   1196  2 3C0000AA              STA     TEM+2
            977 004AE   1198  2 7C0000A8              STB     TEM            SAVE CD29*RATM
            978 004B0   1200  2 5C22000C              LDX     4,RATP,M
            979 004B2   1202  2 140000AA              LDA     CD28+2
            980 004B4   1204  2 540000A8              LDB     CD28
            981 004B6   1206  2 64040000              JS      MULFD          CD28*RATP
            982 004B8   1208  2 DC0000A8              SFD     TEM            CD28*RATP-CD29*RATM
            983 004BA   1210  2 9C000154              AFD     AP+4
```

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
             984 004BC   1212  2 3C000156          STA    AP+6      AP(2)=AP(2)+(CD28*RATP-CD29*RATM)
             985 004BE   1214  2 7C000154          STB    AP+4
                                          *
                                          *
                                          *   G DEPENDENT, SPEED INDEPENDENT
                                          *
             986 004C0   1216  2 64040000 IL9     JS     MULD31     AT(I)=GM(I,J)*DV(I)
             987 004C2   1218  2 6008             JRU    *+8
GENERATED                          0700
             988 004C4   1220  2 00000060        PTR    GM
             989 004C6   1222  2 00000038        PTR    DVI
             990 004C8   1224  2 0000015C        PTR    AT
                                          *
             991 004CA   1226  2 64040000        JS     VECADD     AP(I)=AP(I)+AT(I)
             992 004CC   1228  2 6008             JRU    *+8
GENERATED                          0700
             993 004CE   1230  2 0000015C        PTR    AT
             994 004D0   1232  2 00000150        PTR    AP
             995 004D2   1234  2 00000150        PTR    AP
                                          *
                                          *   G INDEPENDENT, SPEED DEPENDENT
                                          *
             996 004D4   1236  2 5C2A015C IL10    LDX    5,AT,M     XR5= BASE FOR VECTOR AT
             997 004D6   1238  2 5C220044        LDX    4,F1,M
             998 004D8   1240  2 140000B2        LDA    CD30+2
             999 004DA   1242  2 540000B0        LDB    CD30
            1000 004DC   1244  2 64040000        JS     MULFD      CD30*F1
            1001 004DE   1246  2 3A81            STA    2,5
            1002 004DF   1247  2     7A80        STB    0,5        INSERT CD30*F1 INTO AT(1)
            1003 004E0   1248  2 140000B6        LDA    CD31+2
            1004 004E2   1250  2 540000B4        LDB    CD31
            1005 004E4   1252  2 64040000        JS     MULFD      CD31*F1
            1006 004E6   1254  2 3A85            STA    10,5
            1007 004E7   1255  2     7A84        STB    8,5        INSERT CD31*F1 INTO AT(3)
            1008 004E8   1256  2 5C220008        LDX    4,RATM,M    ADDRESS OF RATM IN XR4
            1009 004EA   1258  2 140000E6        LDA    CD43+2
            1010 004EC   1260  2 540000E4        LDB    CD43
            1011 004EE   1262  2 64040000        JS     MULFD      CD43*RATM
            1012 004F0   1264  2 3C0000AA        STA    TEM+2
            1013 004F2   1266  2 7C0000A8        STB    TEM        SAVE CD43*RATM
            1014 004F4   1268  2 5C22000C        LDX    4,RATP,M   ADDRESS OF RATP IN XR4
            1015 004F6   1270  2 140000E2        LDA    CD42+2
            1016 004F8   1272  2 540000E0        LDB    CD42
            1017 004FA   1274  2 64040000        JS     MULFD      CD42*RATP
            1018 004FC   1276  2 DC0000A8        SFD    TEM        (CD42*RATP-CD43*RATM)
            1019 004FE   1278  2 3C0000AA        STA    TEM+2
            1020 00500   1280  2 7C0000A8        STB    TEM        SAVE (CD42*RATP-CD43*RATM)
            1021 00502   1282  2 5C220052        LDX    4,DC04,M
            1022 00504   1284  2 14000006        LDA    SRT2+2
            1023 00506   1286  2 54000004        LDB    SRT2
            1024 00508   1288  2 64040000        JS     DVFD       SRT2/DC04
            1025 0050A   1290  2 3C0000B6        STA    TEM0+2
            1026 0050C   1292  2 7C0000B4        STB    TEM0       SAVE (SRT2/DC04)
            1027 0050E   1294  2 1400001E        LDA    FONE
            1028 00510   1296  2 5400001C        LDB    ZERO
```

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            1029 00512  1298  2 0C000084          SFD    TEM0            (1.0-SRT2/DC04)
            1030 00514  1300  2 3C0000B6          STA    TEM0+2
            1031 00516  1302  2 7C000084          STB    TEM0            SAVE IT
            1032 00518  1304  2 5C220054          LDX    4,TEM0,M
            1033 0051A  1306  2 140000AA          LDA    TEM+2
            1034 0051C  1308  2 540000AB          LDB    TEM
            1035 0051E  1310  2 64040000          JS     MULFD           (1.0-SRT2/DC04)(CD42*RATP-CD43*RATM)
            1036 00520  1312  2 3C0000AA          STA    TEM+2
            1037 00522  1314  2 7C0000AB          STB    TEM             SAVE IT
            1038 00524  1316  2 5C220048          LDX    4,F2,M
            1039 00526  1318  2 1400008A          LDA    CD32+2
            1040 00528  1320  2 540000B6          LDB    CD32
            1041 0052A  1322  2 64040000          JS     MULFD           F2*CD32
            1042 0052C  1324  2 9C0000AB          AFD    TEM
            1043 0052E  1326  2 3A83              STA    6,5             STORE F2*CD32*(1-SRT2/DC04)
                                *                                        *(CD42*RATP-CD43*RATM) IN AT(2)
            1044 0052F  1327  2      7482         STB    4,5
                                *
            1045 00530  1328  2 64040000          JS     VECADD          AP(I)=AP(I)+AT(I)
            1046 00532  1330  2 6006              JRU    *+6
GENERATED                           0700
            1047 00534  1332  2 00000150          PTR    AT
            1048 00536  1334  2 00000150          PTR    AP
            1049 00538  1336  2 00000150          PTR    AP
                                *
                                *   G AND SPEED DEPENDENT
                                *
                                *
                                *   COMPUTE ELEMENTS FOR ROWS 1 & 3 AND INSERT IN A(I,J)
                                *
            1050 0053A  1338  2 5C2A000C IL11     LDX    5,A,M           XR5= BASE FOR MATRIX A(I,J)
            1051 0053C  1340  2 1400001A         LDA    TEN
            1052 0053E  1342  2 3C000058         STA    IND             INITIALIZE INDICATOR
            1053 00540  1344  2 5C220044         LDX    4,F1,M
            1054 00542  1346  2 5C18001C         LDA    3,ZERO          COUNTER FOR CDXX
            1055 00544  1348  2 598000BC IL11A   LDB    CD33,3          LOAD (A,B) WITH CDXX
            1056 00546  1350  2 158000BE         LDA    CD33+2,3
            1057 00548  1352  2 64040000         JS     MULFD           F1*CDXX
            1058 0054A  1354  2 3A81             STA    2,5
            1059 0054B  1355  2      7A80        STB    0,5             STORE IN A(I,J)
            1060 0054C  1356  2 6C2A000C         IMP    5,12,M          INCREMENT MATRIX POINTER
            1061 0054E  1358  2 6C18001D         IMP    3,FOUR
            1062 00550  1360  2 24190058         ICL    3,IND           CHECK FOR PROPER NUMBER OF ELEMENTS
            1063 00552  1362  2 64300556         JGU    IL11B
            1064 00554  1364  2 64300544         JGU    IL11A
            1065 00556  1366  2 6C24001C IL11B   IMN    5,24,M          DECREMENT XR5 FOR ELEMENTS OF ROW 3
            1066 00558  1368  2 14000058         LDA    IND
            1067 0055A  1370  2 A4020000         ADD    12,M            INCREMENT INDICATOR FOR ROW 3
            1068 0055C  1372  2 3C000058         STA    IND
            1069 0055E  1374  2 E4020022         SBU    34,M            CHECK FOR END OF MATRIX
            1070 00560  1376  2 619C             JN     IL11A
GENERATED                           0700
            1071 00562  1378  2 1400001A         LDA    TEN             RESTORE INDICATOR TO PROPER VALUE
            1072 00564  1380  2 3C000058         STA    IND
            1073 00566  1382  2 0698             LXA    3               XR3=INDEX FOR ROW 2 OF A(I,J)
```

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VERSION K20A0503     DECK NAME=*NAV   *                                                              PAGE  28

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                            SOURCE
GENERATED                                0700
            1074 00568    1384  2 5C2A000C          LDX    5,A,M      RESTORE XRS TO ADDRESS OF A
            1075 0056A    1385  2 6C2A001C          IMP    5,28,M
            1076 0056C    1386  2 1400001C          LDA    ZERO
            1077 0056E    1390  2 5400001C          LDB    ZERO
            1078 00570    1392  2 DC000048          SFD    F2         ZERO - F2 = -F2
            1079 00572    1394  2 3C00004A          STA    TEM+2
            1080 00574    1396  2 7C0000A8          STB    TEM
            1081 00576    1398  2 5C2200A8          LDX    4,TEM,M
            1082 00578    1400  2 15800004 IL11C    LDA    CD39,3
            1083 0057A    1402  2 55800002          LDB    CD39-2,3
            1084 0057C    1404  2 64040000          JS     MULFD      -F2*CDXX
            1085 0057E    1406  2 3A81              STA    2,5
            1086 0057F    1407  2     7A80          STB    0,5        INSERT -F2*CD39 IN A(I,J)
            1087 00580    1408  2 6C2B000C          IMN    5,12,M
            1088 00582    1410  2 6C1B0004          IMN    3,4,M      DECREMENT INDEX
            1089 00584    1412  2 64300578          JGU    IL11C
                                              *
            1090 00586    1414  2 64040000          JS     MULD31     AT(I)=A(I,J)*DV(I)
            1091 00588    1416  2 6008              JRU    *+8
GENERATED                                0700
            1092 0058A    1418  2 0000000C          PTR    A
            1093 0058C    1420  2 00000038          PTR    DVI
            1094 0058E    1422  2 0000015C          PTR    AT
                                              *
                                              *
            1095 00590    1424  2 64040000          JS     VECADD     AP(I)=AP(I)+AT(I)
            1096 00592    1426  2 6008              JRU    *+8
GENERATED                                0700
            1097 00594    1428  2 0000015C          PTR    AT
            1098 00596    1430  2 00000150          PTR    AP
            1099 00598    1432  2 00000150          PTR    AP
                                              *
                                              *    TRANSFER TO PLATFORM CO-ORDINATES
                                              *
            1100 0059A    1434  2 5C2A000C IL12     LDX    5,A,M
            1101 0059C    1436  2 1400001C          LDA    ZERO
            1102 0059E    1438  2 3A8C              STA    24,5       A(1,3)=A(2,3)=A(3,1)=A(3,2)=0
            1103 0059F    1439  2     3A8D          STA    26,5
            1104 005A0    1440  2 3A8E              STA    28,5
            1105 005A1    1441  2     3A8F          STA    30,5
            1106 005A2    1442  2 3A84              STA    8,5
            1107 005A3    1443  2     3A85          STA    10,5
            1108 005A4    1444  2 3A8A              STA    20,5
            1109 005A5    1445  2     3A8B          STA    22,5
            1110 005A6    1446  2 5C220000          LDX    4,SRT1,M
            1111 005A8    1448  2 14000058          LDA    DC42+2
            1112 005AA    1450  2 54000056          LDB    DC42
            1113 005AC    1452  2 64040000          JS     DVFD       DC42/SRT1
            1114 005AE    1454  2 3A81              STA    2,5
            1115 005AF    1455  2     7A80          STB    0,5        A(1,1)=A(2,1)=DC42/SRT1
            1116 005B0    1456  2 3A83              STA    6,5
            1117 005B1    1457  2     7A82          STB    4,5
            1118 005B2    1458  2 1400005C          LDA    DC43+2
            1119 005B4    1460  2 5400005A          LDB    DC43
```

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            1120 005B6   1462  2 64040000          JS     DVFU          DC43/SRT1
            1121 005B8   1464  2 3A91              STA    34,5
            1122 005B9   1465  2     7A90          STB    32,5          A(3,3)=DC43/SRT1
            1123 005BA   1466  2 5C220004          LDX    4,SRT2,M
            1124 005BC   1468  2 1400005B          LDA    DC42+2
            1125 005BE   1470  2 5400005B          LDB    DC42
            1126 005C0   1472  2 64040000          JS     DVFU          DC42/SRT2
            1127 005C2   1474  2 3A87              STA    14,5
            1128 005C3   1475  2     7A86          STB    12,5          A(1,2)=DC42/SRT2
            1129 005C4   1476  2 1400001C          LDA    ZERO
            1130 005C6   1478  2 5400001C          LDB    ZERO
            1131 005C8   1480  2 DA86              SFD    12,5          0-(DC42/SRT2)=-(DC42/SRT2)
            1132 005C9   1481  2     3A89          STA    18,5
            1133 005CA   1482  2 7A88              STB    16,5          INSERT IT IN A(2,2)
                                                *
GENERATED                          0700
            1134 005CC   1484  2 64040000          JS     MULD31        AT(I)=A(I,J)*AP(I)
            1135 005CE   1486  2 6008              JRU    *+8
GENERATED                          0700
            1136 005D0   1488  2 0000000C          PTR    A
            1137 005D2   1490  2 00000150          PTR    AP
            1138 005D4   1492  2 0000015C          PTR    AT
                                                *
                                                *
                                                *  CONSTRUCT UPDATE MATRIX DCAR
                                                *
                                                *
            1139 005D6   1494  2 5C2A000C IL13    LDX    5,DCAR,M
            1140 005D8   1496  2 1400001C          LDA    ZERO
            1141 005DA   1498  2 3A80              STA    0,5           DCAR(1,1)=DCAR(2,2)=DCAR(3,3)=0
            1142 005DB   1499  2     3A81          STA    2,5
            1143 005DC   1500  2 3A88              STA    16,5
            1144 005DD   1501  2     3A89          STA    18,5
            1145 005DE   1502  2 3A90              STA    32,5
            1146 005DF   1503  2     3A91          STA    34,5
                                                *
                                                *
                                                *  STORE NEGATIVE VALUES OF ANGLES IN AP(I)
                                                *
            1147 005E0   1504  2 5C28001A          LDX    5,TEN
            1148 005E2   1506  2 1400001C IL13B    LDA    ZERO
            1149 005E4   1508  2 5400001C          LDB    ZERO
            1150 005E6   1510  2 DE80015A          SFD    AT-2,5        ZERO - PHI = -PHI
            1151 005E8   1512  2 3E800150          STA    AP,5
            1152 005EA   1514  2 7E80014E          STB    AP-2,5        STORE ANGLE IN AP(I)
            1153 005EC   1516  2 6C290010          IMN    5,FOUR        DECREMENT POINTER FOR NEXT ANGLE
            1154 005EE   1518  2 643005E2          JGU    IL13B
            1155 005F0   1520  2 5C2A000C          LDX    5,DCAR,M      XR5= POINTER TO MATRIX DCAR
            1156 005F2   1522  2 5C22015C          LDX    4,AT,M        XR4= POINTER TO VECTOR AT
            1157 005F4   1524  2 5200              LDB    0,4
            1158 005F5   1525  2     1201          LDA    2,4
            1159 005F6   1526  2 7A8A              STB    20,5          INSERT PHI(X) IN DCAR(3,2)
            1160 005F7   1527  2     3A8B          STA    22,5
            1161 005F8   1528  2 5202              LDB    4,4
            1162 005F9   1529  2     1203          LDA    6,4
```

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VERSION K20A0503      DECK NAME=*NAV    *                                                    PAGE  30

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
            1163 005FA   1530  2 7A8C              STB    24,5         INSERT PHIY IN DCAR(1,3)
            1164 005FB   1531  2      3A8D         STA    26,5
            1165 005FC   1532  2 5204              LDB    8,4
            1166 005FD   1533  2      1205         LDA    10,4
            1167 005FE   1534  2 7A86              STB    12,5         INSERT PHIZ IN DCAR(1,2)
            1168 005FF   1535  2      3A87         STA    14,5
            1169 00600   1536  2 5C220150          LDX    4,AP,M
            1170 00602   1538  2 5200              LDB    0,4
            1171 00603   1539  2      1201         LDA    2,4
            1172 00604   1540  2 7A8E              STB    28,5         INSERT -PHI(X) IN DCAR(2,3)
            1173 00605   1541  2      3A8F         STA    30,5
            1174 00606   1542  2 5202              LDB    4,4
            1175 00607   1543  2      1203         LDA    6,4
            1176 00608   1544  2 7A84              STB    8,5          INSERT -PHIY IN DCAR(3,1)
            1177 00609   1545  2      3A85         STA    10,5
            1178 0060A   1546  2 5204              LDB    8,4
            1179 0060B   1547  2      1205         LDA    10,4
            1180 0060C   1548  2 7A82              STB    4,5          INSERT -PHIZ IN DCAR(2,1)
            1181 0060D   1549  2      3A83         STA    6,5
                                             *
                                             *  INITIALIZE SRT1,SRT2,RATP,RATM,SDVI,SDVJ,SDVK TO ZERO
                                             *
            1182 0060E   1550  2 1400001C IL14     LDA    ZERO
            1183 00610   1552  2 3C000000          STA    SRT1
            1184 00612   1554  2 3C000002          STA    SRT1+2
            1185 00614   1556  2 3C000004          STA    SRT2
            1186 00616   1558  2 3C000006          STA    SRT2+2
            1187 00618   1560  2 3C00000C          STA    RATP
            1188 0061A   1562  2 3C00000E          STA    RATP+2
            1189 0061C   1564  2 3C000008          STA    RATM
            1190 0061E   1566  2 3C00000A          STA    RATM+2
            1191 00620   1568  2 3C0000CC          STA    SDVI
            1192 00622   1570  2 3C0000CE          STA    SDVI+2
            1193 00624   1572  2 3C0000D0          STA    SDVI+4
            1194 00626   1574  2 3C0000D2          STA    SDVI+6
            1195 00628   1576  2 3C0000D4          STA    SDVI+8
            1196 0062A   1578  2 3C0000D6          STA    SDVI+10
            1197 0062C   1580  2 1400000C          LDA    TWO
            1198 0062E   1582  2 3C000012          STA    CHAJ
            1199 00630   1584  2 74000070 IL15     RTA    ILM
```

```
DIAGNOSTICS LINE AURES DADRES LC  PROGRAM                                          SOURCE
                                                  *
                                                  *     UPDATE AJ AND SA MATRICES
                                                  *
                                                  *
           1201                                        EVEN
           1202 00632   1586  2 00000070 IM            PTR    IMM
           1203 00634   1588  2 5C280012 IM1           LDX    5,CHAJ        TEST CHAJ FOR VALUE .NE. ZERO
           1204 00636   1590  2 242A0000               ICN    5,0,M
           1205 00638   1592  2 6430066C               JGU    IM5           JUMP OUT IF CHAJ = 0
           1206 0063A   1594  2 1400001C               LDA    ZERO
           1207 0063C   1596  2 3C000012               STA    CHAJ          INITIALIZE CHAJ TO ZERO
                                                  *
           1208 0063E   1598  2 64040000 IM2           JS     MUL33         D(I,J)=AJ(I,J)*DCAR(I,J)
           1209 00640   1600  2 6008                   JRU    *+8
GENERATED                         0700
           1210 00642   1602  2 000000F2               PTR    AJ
           1211 00644   1604  2 0000000C               PTR    DCAR
           1212 00646   1606  2 000000E4               PTR    D
                                                  *
                                                  *
           1213 00648   1608  2 64040000               JS     MATDAD        AJ(I,J)=AJ(I,J)+D(I,J)
           1214 0064A   1610  2 6008                   JRU    *+8
GENERATED                         0700
           1215 0064C   1612  2 000000F2               PTR    AJ
           1216 0064E   1614  2 000000E4               PTR    D
           1217 00650   1616  2 000000F2               PTR    AJ
                                                  *
           1218 00652   1618  2 5C280030 IM3           LDX    5,FLGN
           1219 00654   1620  2 242A0000               ICN    5,0,M         TEST FLGN FOR VALUE = 0
           1220 00656   1622  2 6430066C               JGU    IM5           JUMP OUT IF FLGN = 0
           1221 00658   1624  2 64040000 IM4           JS     MUL33         D(I,J)=SA(I,J)*DCAR(I,J)
           1222 0065A   1626  2 6008                   JRU    *+8
GENERATED                         0700
           1223 0065C   1628  2 00000108               PTR    SA
           1224 0065E   1630  2 0000000C               PTR    DCAR
           1225 00660   1632  2 000000E4               PTR    D
                                                  *
                                                  *
           1226 00662   1634  2 64040000               JS     MATDAD        SA(I,J)=SA(I,J)+D(I,J)
           1227 00664   1636  2 6008                   JRU    *+8
GENERATED                         0700
           1228 00666   1638  2 00000108               PTR    SA
           1229 00668   1640  2 000000E4               PTR    D
           1230 0066A   1642  2 00000108               PTR    SA
                                                  *
           1231 0066C   1644  2 74000070 IM5           RTA    IMM
           1232 00098    152  2          IIC           EQU    IC
           1233 000BE    190  2          IIE           EQU    ID
           1234 0040C   1036  2          IIF           EQU    IL
           1235 00632   1586  2          IIG           EQU    IM
           1236                                        ENTRY  IIC,IIE,IIF,IIG
```

```
VERSION K20A0503      DECK NAME=*NAV   *

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                        SOURCE
            1238                                    ENTRY   RTAL
            1239                                    EVEN
                                           *
                                           *        RETURN TO ALIGN DECISION (RTAL)
                                           *
                                           *   THIS ROUTINE IS EXECUTED ONCE EVERY 1/8 SECOND DURING NAV. IF
                                           *   THE SYSTEM MODE SWITCH IS EVER RESET TO AN ALIGN MODE THIS
                                           *   ROUTINE WILL DISABLE NAV AND ENABLE ALIGN. IT WILL ALSO STORE
                                           *   T(0) AS THE TIME THAT THE AJ MATRIX WAS LAST ROTATED FOR
                                           *   EARTH ROTATION.
                                           *
            1240 0066E   1646  2 00000076 RTAL      PTR     INM
                                           ********************
                                           *
                                           *   DPU PROCESSING
                                           *
                                           ********************
            1241 00670   1648  2 1400006C IN1       LDA     MODE
            1242 00672   1650  2 E4000010           SBU     FOUR
                                           *        JRN     IN1A        THIS CODE IS FOR IN AIR ALIGN
                                           *        RTA     IMN         MODE=4...IN AIR ALIGN,NOT IMPLEMENTED
            1243 00674   1652  2 6324     IN1A      JRL     IN3
GENERATED                          0700
            1244 00676   1654  2 1400005E IN2       LDA     T0+2
            1245 00678   1656  2 5400005C           LDB     T0          MODE > 4
            1246 0067A   1658  2 9C000038           AFD     D3032       SAVT=T0+3/32
            1247 0067C   1660  2 3C000034           STA     SAVT+2
            1248 0067E   1662  2 7C000032           STB     SAVT
            1249 00680   1664  2 5C2A0022           LDX     S,34,M
            1250 00682   1666  2 168000F2 IN2A      LDA     AJ,5
            1251 00684   1668  2 3E800108           STA     SA,5        SA(I,J)=AJ(I,J)
            1252 00686   1670  2 6C280002           IMN     S,2,M
            1253 00688   1672  2 64300682           JGU     IN2A
            1254 0068A   1674  2 64040000           JS      FENT
            1255 0068C   1676  2 14000030           LDA     FLGN
            1256 0068E   1678  2 A400000A           ADU     ONE
            1257 00690   1680  2 3C000030           STA     FLGN        FLGN=FLGN+1
            1258 00692   1682  2 14000006           LDA     NTWO
            1259 00694   1684  2 3C000036           STA     NSCH        NSCH=-2
            1260 00696   1686  2 74000076           RTA     IN1
            1261 00698   1688  2 1400006C IN3       LDA     MODE        MODE < 4
            1262 0069A   1690  2 3C000064           STA     NAVF        NAVF=MODE
                                           ********************
                                           *
                                           *   TURN OFF INS ALIGN LIGHT (NOT IMPLEMENTED)
                                           *
                                           ********************
            1263 0069C   1692  2 74000076 IN3A      RTA     INM
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                        *
                                        *    DUMMY SUBROUTINE 'DUMY'
                                        *
          1265                                  ENTRY  DUMY
          1266 0069E   1694  2 00000074 DUMY    PTR    DUMRET
          1267 006A0   1696  2 0700              NOP
          1268 006A1   1697  2      0700         NOP
          1269 006A2   1698  2 74000074         RTA    DUMRET
                                        *
                                        *
          1270 0069E   1694  2           IK     EQU    DUMY
          1271 0069E   1694  2           SPIN   EQU    DUMY
          1272 0069E   1694  2           BITE   EQU    DUMY
          1273 0069E   1694  2           CDPU   EQU    DUMY
          1274 0069E   1694  2           GASC   EQU    DUMY
          1275 0069E   1694  2           TKTH   EQU    DUMY
          1276 0069E   1694  2           TORK   EQU    DUMY
                                        *
          1277                                  ENTRY  SPIN
          1278                                  ENTRY  BITE
          1279                                  ENTRY  CDPU
          1280                                  ENTRY  GASC
          1281                                  ENTRY  TKTH
          1282                                  ENTRY  TORK
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
                                      *
                                      *   NAVIGATION OUTPUT ROUTINE,NAVO
                                      *
                                           ENTRY  NAVO
                                           EVEN
     006A4     1700  2 00000078 NAVO       PTR    NAVOR
     006A6     1702  2 1400005A            LDA    TIME+2       PICK UP TIME
     006A8     1704  2 54000058            LDB    TIME
     006AA     1706  2 DC0000D8            SFD    TLPO         GET DELTA T SINCE LAST OUTPUT
     006AC     1708  2 0400                CFX
     006AD     1709  2     06C0            LXA    8            GET INTEGER PART
     006AE     1710  2 24430168            ICL    8,360,M      TEST FOR 360 SECONDS
     006B0     1712  2 643006B4            JGU    NAVO1        GO FILL BUFFER
     006B2     1714  2 74000078            RTA    NAVOR        DELTA T .LT. 360 SECONDS - RETURN
     006B4     1716  2 1400000A NAVO1      LDA    ONE
     006B6     1718  2 A4005100            ADU    DECFLG       INCREMENT PDP-11 FLAG
     006B8     1720  2 3C005100            STA    DECFLG
     006BA     1722  2 1400005A            LDA    TIME+2
     006BC     1724  2 54000058            LDB    TIME
     006BE     1726  2 3C0000DA            STA    TLPO+2       UPDATE OUTPUT FLAG
     006C0     1728  2 7C0000D8            STB    TLPO
     006C2     1730  2 3C005104            STA    BTIME+2      PUT TIME IN BUFFER
     006C4     1732  2 7C005102            STB    BTIME
     006C6     1734  2 1400000A            LDA    LAT+2        PUT LATITUDE IN BUFFER
     006C8     1736  2 54000008            LDB    LAT
     006CA     1738  2 3C005108            STA    BLAT+2
     006CC     1740  2 7C005106            STB    BLAT
     006CE     1742  2 1400000E            LDA    LONG+2       PUT LONGITUDE IN BUFFER
     006D0     1744  2 5400000C            LDB    LONG
     006D2     1746  2 3C00510C            STA    BLONG+2
     006D4     1748  2 7C00510A            STB    BLONG
     006D6     1750  2 5C2A000A            LDX    5,10,M
     006D8     1752  2 1680004C NAVO2      LDA    VV,5         PUT VV,VE,AND VN IN BUFFER
     006DA     1754  2 3E80510E            STA    BVV,5
     006DC     1756  2 6C2B0002            IMN    5,2,M
     006DE     1758  2 643006D8            JGU    NAVO2
     006E0     1760  2 5C2A000A            LDX    5,10,M
     006E2     1762  2 16800014 NAVO3      LDA    VX,5
     006E4     1764  2 3E80511A            STA    BVX,5        PUT VX,VY, AND VZ IN BUFFER
     006E6     1766  2 6C2B0002            IMN    5,2,M
     006E8     1768  2 643006E2            JGU    NAVO3
     006EA     1770  2 74000078            RTA    NAVOR
                                           END
```

STATISTICS

TOTAL SHORTS 154
TOTAL LONGS 748
TOTAL INSTRUCTIONS 902
PERCENT SHORT 17.1
GENERATED NOPS 25
THEORETICAL PERCENT NOP LOADING 8.1
ACTUAL PERCENT NOP LOADING 1.7

```
    DECK NAME=*NAV    *                    *****ERROR MESSAGES*****

 LINE NUMBER                          DIAGNOSTIC
1    378.........................ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
```

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 1

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
0000C	12		5	A	116	117	749	814	887	1050	1074	1092	1100	1136			
0003C	60		6	AB	140	419											
000F2	242		4	AJ	111	434	888	1210	1215	1217	1250						
00010	16		7	ALT	159	576	577	610	611								
00150	336		7	AP	188	790	815	848	950	965	966	968	969	983	984	985	994
						995	1048	1049	1098	1099	1137	1151	1152	1169			
00036	54		5	ASCH	120	121											
0015C	348		7	AT	189	990	993	996	1047	1094	1097	1138	1150	1156			
0069E	1694		2	BITE	1272	1278											
05106	20742		13	BLAT	292	1306	1307										
0510A	20746		13	BLONG	293	1310	1311										
00030	48		4	BTE1	19												
00032	50		4	BTE3	20												
05102	20738		13	BTIME	291	1302	1303										
05100	20736			BUFORG	1	289											
0510E	20750		13	BVV	294	1314											
0511A	20762		13	BVX	295	1319											
00024	36		1	CCLG	308	701	702	760									
0069E	1694		2	CDPU	1273	1279											
0003C	60		9	CD01	223												
00040	64		9	CD02	224												
00044	68		9	CD03	225												
00038	56		5	CD040	122	415											
00048	72		9	CD04	226												
0004C	76		9	CD05	227												
00050	80		9	CD06	228												
00054	84		9	CD07	229												
00058	88		9	CD08	230												
0005C	92		9	CD09	231												
00060	96		9	CD10	232												
00064	100		9	CD11	233												
00068	104		9	CD12	234												
0006C	108		9	CD13	235												
00070	112		9	CD14	236												
00074	116		9	CD15	237												
00078	120		9	CD16	238	951	952										
0007C	124		9	CD17	239	959	960										
00080	128		9	CD18	240	955	956										
00084	132		9	CD19	241												
00088	136		9	CD20	242												
0008C	140		9	CD21	243												
00090	144		9	CD22	244												
00094	148		9	CD23	245												
00098	152		9	CD24	246												
0009C	156		9	CD25	247												
000A0	160		9	CD26	248												
000A4	164		9	CD27	249												
000A8	168		9	CD28	250	979	980										
000AC	172		9	CD29	251	973	974										
000B0	176		9	CD30	252	998	999										
000B4	180		9	CD31	253	1003	1004										
000B8	184		9	CD32	254	1039	1040										
000BC	188		9	CD33	255	1055	1056										

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 2

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES				
000C0	192	9	CD34	256					
000C4	196	9	CD35	257					
000C8	200	9	CD36	258					
000CC	204	9	CD37	259					
000D0	208	9	CD38	260					
000D4	212	9	CD39	261	1082	1083			
000D8	216	9	CD40	262					
000DC	220	9	CD41	263					
000E0	224	9	CD42	264	1015	1016			
000E4	228	9	CD43	265	1009	1010			
000E8	232	9	CD44	266					
000EC	236	9	CD45	267					
000F0	240	9	CD46	268					
000F4	244	9	CD47	269					
000F8	248	9	CD48	270					
000FC	252	9	CD49	271					
00100	256	9	CD50	272					
00104	260	9	CD51	273					
00108	264	9	CD52	274	584				
0010C	268	9	CD53	275					
00110	272	9	CD54	276					
00114	276	9	CD55	277					
00118	280	9	CD56	278					
0011C	284	9	CD57	279					
00120	288	9	CD58	280					
00124	292	9	CD59	281					
00128	296	9	CD60	282					
0012C	300	9	CD61	283					
00130	304	9	CD62	284					
00134	308	9	CD63	285					
00138	312	9	CD64	287					
00038	56	6	CGCL	139	732	733	734		
0003C	12	7	CGDL	158	196	743	744	768	769
00012	18	6	CHAJ	129	1198	1203	1207		
00038	56	4	CIPM	23					
0003C	12	7	CL	196					
00000	0	9	CONCOM	197					
00052	82	4	CTR1	33					
00054	84	4	CTR2	34					
00056	86	4	CTR3	35					
00004	4	7	CWT	156	708	709	830	831	
00044	74	4	CYLE	29					
0002E	46	7	C1	166					
00032	50	7	C2	167					
00030	48	6	C2GC	137	599	600	736	737	
00036	54	7	C3	168					
0003A	58	7	C4	169					
000E4	228	7	D	183	190	1212	1216	1225	1229
00066	102	4	DATA	41					
0000C	12	5	DCAR	117	1139	1155	1211	1224	
00010	16	6	DCON	128	900	901	904		
00002	2	9	DCSK	199	903				
00052	82	2	DC04	370	916	1021			

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 3

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES										
00056	86	2	2	DC42	371	1111	1112	1124	1125							
0005A	90	2	2	DC43	373	1118	1119									
*****UNDEFINED*****				DECATN		664	684									
05100	20736		13	DECFLG	290	1296	1297									
*****UNDEFINED*****				DECSQ		654	715	882								
0007A	122	1	1	DELR	339	442	443	613	614							
00030	48	9	1	DELT	220	621										
0001C	28	9	1	DFONE	214	603										
00078	120	7	1	DG	178											
00024	36	4	1	DPDV	16											
00028	40	4	1	DPHV	17											
00020	32	4	1	DPVV	15											
0004E	78	4	1	DRFV	31											
0001C	28	9	1	DTDC	215	907	963									
00074	116	1	1	DUMRET	334	1266	1269									
0069E	1694		2	DUMY	1266	1265	1270	1271	1272	1273	1274	1275	1276			
*****UNDEFINED*****				DVFD		444	721	731	908	913	917	922	1024	1113	1120	1126
00038	56	1	1	DVI	313	949	989	1093								
0003E	62	4	1	DVX	26	436	626									
00014	20	4	1	DVXG	12	414	416	420	423	424	425	426	427	428		
00000	0	5	1	DVXI	113	421	435	896								
00042	66	4	1	DVY	27											
00018	24	4	1	DVYG	13											
00004	4	5	1	DVYJ	114											
00046	70	4	1	DVZ	28											
0001C	28	4	1	DVZG	14											
00008	8	5	1	DVZK	115											
00054	84	7	1	D1	177	192										
00034	52	9	1	D1032	221											
00038	56	9	1	D3032	222	1246										
00016	22	9	1	EIGHT	209											
0009C	156	7	1	E1	179											
000A8	168	7	1	E2	180											
00084	180	7	1	E3	181											
*****UNDEFINED*****				FENT		1254										
00030	48	5	1	FLGN	118	1218	1255	1257								
00046	70	2	1	FNINE	366	485										
0001E	30	9	1	FONE	213	452	827	935	940	1027						
00010	16	9	1	FOUR	206	594	877	970	1061	1153	1242					
00044	68	2	1	FSIX	365	469										
00048	72	2	1	FTEN	367	474										
00044	68	1	1	F1	314	938	939	997	1053							
00048	72	1	1	F2	315	943	944	1038	1078							
0069E	1694		2	GASC	1274	1280										
00024	36	2	1	GCA0	350	515	516									
00028	40	2	1	GCA1	352	507	508	551								
0002C	44	2	1	GCA2	354	497	544									
00030	48	2	1	GCA3	356	501	502									
00034	52	2	1	GCA4	358	548	549									
00038	56	2	1	GCA5	360	494	495	542								
0003C	60	2	1	GCA6	362	540	541									
00060	96	6	1	GM	141	988										
0002C	44	4	1	GMT	18											

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 4

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES
00066	102	1	GS	323	883 884
00000	0	1	GXDT	299	528 529 623 624
00004	4	1	GYDT	300	533 534
00008	8	1	GZDT	301	563 564
00050	80	4	HDGV	32	
0005E	94	2	IA	378	376
0006E	110	1	IAM	325	378 397 400 402 408
00062	98	2	IA1	380	
0006C	108	2	IA1A	386	385
00074	116	2	IA2	390	386
00082	130	2	IA3	398	387
00088	136	2	IA4	401	388
0008C	140	2	IA5	403	389
*****UNDEFINED*****			IB		379
00098	152	2	IC	411	298 392 1232
00070	112	1	ICM	326	327 328 329 331 332 333 335 336 411 429
0009A	154	2	IC1	412	
000AE	174	2	IC2	422	
000BE	190	2	ID	431	298 393 1233
00070	112	1	IDM	327	431 437
000C0	192	2	ID1	432	
000CC	204	2	IE	440	298 394
00070	112	1	IEM	326	440 565
000CE	206	2	IE1	441	
000EE	238	2	IE2	457	
001C8	456	2	IF	568	298 395
00070	112	1	IFM	329	568 596
001CC	460	2	IF1	570	
001F0	496	2	IF1A	589	595
00200	512	2	IF2	598	298 569
00072	114	1	IF2M	330	598 618
00222	546	2	IF3	615	
0022A	554	2	IG	620	298 396
00070	112	1	IGM	331	620 637
0022C	556	2	IG1	621	
00230	560	2	IG1A	623	636
0024E	590	2	IH	640	298 398
00070	112	1	IHM	332	640 745
00250	592	2	IH1	641	
002E6	742	2	IH10	718	
002FA	762	2	IH11	728	
002F2	754	2	IH12	724	
00306	774	2	IH13	734	
0030E	782	2	IH14	738	
0031A	794	2	IH15	744	
00286	646	2	IH2	668	
0028E	654	2	IH3	673	
00282	690	2	IH4	691	
0028A	698	2	IH5	696	
002C4	708	2	IH6	701	
002C8	712	2	IH7	703	
00202	722	2	IH8	708	
002D6	726	2	IH9	710	

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES				
00098	152		2	IIC	1232	1236				
0008E	190		2	IIE	1233	1236				
0040C	1036		2	IIF	1234	1236				
00632	1586		2	IIG	1235	1236				
0031E	798		2	IJ	748	298	399			
00070	112		1	IJM	333	748	890			
00320	800		2	IJ1	749					
0038C	908		2	IJ2	817					
003BC	956		2	IJ3	850					
003C0	960		2	IJ3A	852	863				
003D6	982		2	IJ4	864	862				
003DE	990		2	IJ4A	868	878				
003F4	1012		2	IJ5	879					
00400	1024		2	IJ6	885					
0069E	1694		2	IK	1270	298				
0040C	1036		2	IL	893	298	403	1234		
00070	112		1	ILM	335	893	1199			
0040E	1038		2	IL1	894					
004D4	1236		2	IL10	996					
00544	1348		2	IL11A	1055	1064	1070			
00556	1366		2	IL11B	1065	1063				
00578	1400		2	IL11C	1082	1089				
0053A	1338		2	IL11	1050					
0059A	1434		2	IL12	1100					
005E2	1506		2	IL13B	1148	1154				
00506	1494		2	IL13	1139					
0060E	1550		2	IL14	1182					
00630	1584		2	IL15	1199	902				
00418	1048		2	IL2	899					
0041E	1054		2	IL3	902					
00420	1056		2	IL4	903					
00424	1060		2	IL5	905					
0043A	1082		2	IL6	916					
00474	1140		2	IL7	945					
0047E	1150		2	IL8	950					
00496	1174		2	IL8A	965	971				
004C0	1216		2	IL9	986					
00632	1586		2	IM	1202	298	404	1235		
00070	112		1	IMM	336	1202	1231			
00634	1588		2	IM1	1203					
0063E	1598		2	IM2	1208					
00652	1618		2	IM3	1218					
00658	1624		2	IM4	1221					
0066C	1644		2	IM5	1231	1205	1220			
00058	88		1	IND	319	1052	1062	1066	1068	1072
00076	118		1	INM	337	1240	1260	1263		
00670	1648		2	IN1	1241					
00674	1652		2	IN1A	1243					
00676	1654		2	IN2	1244					
00682	1666		2	IN2A	1250	1253				
00698	1688		2	IN3	1261	1243				
0069C	1692		2	IN3A	1263					
00060	96		4	ITER	38					

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 6

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
000E4	228	7		J3X3	190												
0002C	44	9		KGDL	219	659											
0004A	74	2		KR1	368	601											
0004E	78	2		KR3	369	606											
0004E	78	7		KSN1	174												
00050	80	7		KSN2	175												
00052	82	7		KSN3	176												
00150	336	7		K3X3	191												
00008	8	6		LAT	126	666	667	738	739	1304	1305						
00024	36	6		LATB	134	665											
00024	36	7		LCA1	193												
00028	40	7		LCA4	194												
0002C	44	1		LDVX	310	592	593	630									
00030	48	1		LDVY	311												
00034	52	1		LDVZ	312												
00028	40	6		LGO	135	678											
0006E	110	4		LITE	45												
00020	32	6		LONB	133	685											
0000C	12	6		LONG	127	689	690	1308	1309								
00054	84	7		L3X3	192												
00000	0	7		MATCOM	154												
*****UNDEFINED*****				MATDAD		1213	1226										
0006C	108	4		MODE	44	1241	1261										
*****UNDEFINED*****				MULD31		417	432	812	845	945	986	1090	1134				
*****UNDEFINED*****				MULFD		448	458	461	465	471	476	481	487	498	509	511	517
						527	532	545	552	554	562	585	591	602	605	607	625
						631	644	650	660	677	713	725	735	761	772	778	787
						794	800	871	926	932	967	975	981	1000	1005	1011	1017
						1035	1041	1057	1084								
*****UNDEFINED*****				MUL33		885	1208	1221									
00064	100	4		NAVF	40	1262											
00078	120	1		NAVOR	338	1286	1294	1322									
00684	1716	2		NAVO1	1295	1293											
00608	1752	2		NAVO2	1313	1316											
006E2	1762	2		NAVO3	1318	1321											
006A4	1700	2		NAVO	1286	401	1284										
00004	4	9		NFOUR	200												
00000	0	5		NIACOM	112												
00000	0	6		NICOM	123												
00018	24	9		NINE	210												
0002C	44	7		NMO	165												
00008	8	9		NONE	202	406											
00036	54	5		NSCH	121	380	382	407	1259								
00006	6	9		NTWO	201	1258											
00000	0	9		N64	198												
000C0	192	7		OC	182												
00028	40	9		OMEG	218	676											
00024	36	9		OMGA	217	793											
0000A	10	9		ONE	203	381	899	1256	1295								
00020	32	9		ONHLF	216												
000AC	172	4		O14	76												
00094	148	4		O18	64												
000A4	164	4		O21	72												

XREF 1 DECK NAME=*NAV * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 7

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES
000A6	166	4	022		73	
000A2	162	4	023		71	
000A8	168	4	024		74	
000CA	202	4	025		91	
00096	150	4	030		65	
00098	152	4	031		66	
0009A	154	4	032		67	
0009C	156	4	033		68	
0009E	158	4	034		69	
000A0	160	4	035		70	
00086	134	4	04A		57	
00088	136	4	04B		58	
0008A	138	4	04C		59	
000B2	178	4	04D		79	
000B4	180	4	04E		80	
00072	114	4	04F		47	
00074	116	4	040		48	
00076	118	4	041		49	
00078	120	4	042		50	670
0007A	122	4	043		51	672
0007C	124	4	044		52	693
0007E	126	4	045		53	695
0008C	140	4	046		60	581
00080	128	4	047		54	858
00082	130	4	048		55	856
00084	132	4	049		56	
000D2	210	4	05A		95	
000C4	196	4	05B		88	
000C6	198	4	05D		89	
000C8	200	4	05E		90	
00086	182	4	050		81	
00088	184	4	051		82	
000BA	186	4	052		83	
000BC	188	4	053		84	
000BE	190	4	054		85	
000C0	192	4	055		86	
000C2	194	4	056		87	
000D6	214	4	057		97	
000D8	216	4	058		98	
000DA	218	4	059		99	
000EA	234	4	06A		107	
000EC	236	4	06B		108	
0008E	142	4	06C		61	
00090	144	4	06D		62	
00092	146	4	06E		63	
000CC	204	4	060		92	
00004	212	4	062		96	
000DC	220	4	063		100	
000DE	222	4	064		101	
000E0	224	4	065		102	
000E2	226	4	066		103	
000E4	228	4	067		104	
000E6	230	4	068		105	

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
000E8	232	4	069		106												
00080	176	4	071		78												
000AE	174	4	072		77												
0000C	12	1	P		302	455	456	457									
00062	98	4	PHAS		39												
00068	104	4	PUSH		42												
00010	16	1	P3		303	462	463	514									
00014	20	1	P5		304	459	460	464	466	467	510	553					
00000	0	6	RAD		124	571	572	616	617								
00040	64	2	RADE		364	441	615										
0003A	58	4	RAT		24												
0003C	60	4	RATL		25												
00008	8	4	RATM		8	972	1008	1189	1190								
0000C	12	4	RATP		9	978	1014	1187	1188								
00014	20	7	RES1		160												
00018	24	7	RES2		161												
0001C	28	7	RES3		162												
00020	32	7	RES4		163												
00010	16	4	ROT1		10												
00012	18	4	ROT2		11												
0066E	1646	2	RTAL		1240	405	1238										
00004	4	6	RXYZ		125	573	716	717	720	730							
00034	52	4	R1CT		21												
00036	54	4	R2CT		22												
00000	0	2	R45M		341	947											
00108	264	7	SA		184	1223	1228	1230	1251								
00032	50	5	SAVT		119	1247	1248										
00028	40	1	SCLG		309	700	775	783									
000CC	204	6	SDVI		150	897	898	948	1191	1192	1193	1194	1195	1196			
000D0	208	6	SDVJ		151												
000D4	212	6	SDVK		152												
00014	20	9	SEVEN		208												
00034	52	6	SGCL		138	722	723	724									
00008	8	7	SGDL		157	195	742	753	754	759	786						
*****UNDEFINED*****				SINCOS		698	705	740									
00012	18	9	SIX		207												
00008	8	7	SL		195												
0069E	1694	2	SPIN		1271	1277											
00024	36	7	SRA		164	193	194										
00000	0	4	SRT1		6	905	906	909	910	920	921	1110	1183	1184			
00004	4	4	SRT2		7	911	912	914	915	1022	1023	1123	1185	1186			
00000	0	7	S*T		155	707	836	837	842								
003E	62	7	S1		170												
00042	66	7	S2		171												
002C	44	6	S2GC		136	468	479	480	503	604	726	727					
00046	70	7	S3		172												
0004A	74	7	S4		173												
00048	168	6	TEM		143	445	446	447	449	450	451	454	472	473	489	490	586
						587	588	608	609	612	645	646	651	652	653	714	801
						802	805	872	873	881	918	919	929	930	931	933	934
						942	976	977	982	1012	1013	1018	1019	1020	1033	1034	1036
						1037	1042	1079	1080	1081							
00084	180	6	TEM0		144	477	478	535	536	574	575	578	582	583	655	656	663

XREF 1 DECK NAME=*NAV *

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RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES												
						728	729	923	924	925	927	928	937	1025	1026	1029	1030
						1031	1032										
000B8	184		6	TEM1	145	482	483	484	488	491	537	538	539	543	546	547	560
						661	662	679	680	688	703	704					
000BC	188		6	TEM2	146	492	493	496	499	500	521	522	523	524	686	687	696
						697											
00018	24		1	TEM3	305	518	519	557	558								
0001C	28		1	TEM4	306	504	505	506	550	555	556	559					
00020	32		1	TEM5	307	512	513	520									
0001A	26		9	TEN	211	570	867	964	1051	1071	1147						
0006A	106		4	TEST	43												
0000E	14		9	THREE	205												
00058	88		4	TIME	36	673	674	1287	1288	1298	1299						
0069E	1694		2	TKTH	1275	1281											
00008	216		6	TLPO	153	1289	1300	1301									
0012C	300		7	TM	185	817	847										
00070	112		4	TMPR	46												
00150	336		7	TM1	186	188	189	191									
0069E	1694		2	TORK	1276	1282											
0000C	12		9	TWO	204	1197											
0005C	92		4	TO	37	675	1244	1245									
00050	80		1	VE	317												
*****UNDEFINED*****				VECADD		894	991	1045	1095								
*****UNDEFINED*****				VECSUB		412											
00174	372		7	VECT	187												
0006A	106		1	VEL2	324	865	866	874	875	876	879	880					
00054	84		1	VN	318												
0004C	76		4	VRTV	30												
0004C	76		1	VV	316	816	852	853	868	869	870	1313					
00014	20		6	VX	130	627	628	629	795	1318							
0005A	90		1	VXE	320	849											
00018	24		6	VY	131	803	804										
0005E	94		1	VYE	321												
0001C	28		6	VZ	132	808	809										
00062	98		1	VZE	322												
00084	132		6	V1	142	889											
00000	0		4	WLDCOM	5												
000C0	192		6	X	147	525	526	589	590	632	633	634	641	642	643	683	798
						799											
000C4	196		6	Y	148	530	531	647	648	649	681	682	791	792			
000C8	200		6	Z	149	561	657	658	710	711	712	718	719				
0001C	28		9	ZERO	212	214	215	422	453	470	475	486	750	757	758	781	782
						818	840	841	864	936	941	1028	1054	1076	1077	1101	1129
						1130	1140	1148	1149	1182	1206						

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                                           PAGE   1

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                          $FAP SUBLIB                                          SUBLIB
              1             20                 USE     20
              2                                EVEN
                                          ********************************************************************
                                          *                                                                  *
                                          *    GEANS MATH SUBROUTINE LIBRARY. ALL SUBROUTINES IN THIS LIBRARY  *
                                          *    RETURN A DOUBLE PRECISION RESULT EXCEPT MULS33, WHICH IS        *
                                          *    SINGLE PRECISION. THE ADDRESS OF TEMPORARY STORAGE MUST BE      *
                                          *    LOADED INTO XR6 BEFORE ANY CALLS.                               *
                                          *                                                                  *
                                          ********************************************************************
                                          *
                                          *    CONSTANTS FOR SINCOS ROUTINE
                                          *
              3 00000       0 20 40E487EF A1SC      DEC     1.57079673
              4 00002       2 20 C02D5106 A3SC      DEC     -.64596486
              5 00004       4 20 3ED19AD6 A5SC      DEC     .079692215
              6 00006       6 20 BCB362FB A7SC      DEC     -.0046761082
              7 00008       8 20 3A4FBE60 A9SC      DEC     .00015209895
              8 0000A      10 20 00800000 C1S23     SCALEB   1,8
              9 0000C      12 20 00000001 ONE       DEC     1
             10 0000E      14 20 00000002 TWO       DEC     2
             11 00010      16 20 00000003 THREE     DEC     3
             12 00012      18 20 00000000 DFONE  DEC      0                DOUBLE PRECISION 1.0
             13 00014      20 20 40C00000 FONE   DEC      1.0
             14 00012      18 20          ZERO   EQU     DFONE
             15 00016      22 20 C0000000 FMONE     DEC     -1.0
                                          *
                                          *   CONSTANTS FOR DECSQ ROUTINE
                                          *
             16 00018      24 20 007FFFFF MANTIS    HEX     007FFFFF
             17 0001A      26 20 FFFFFFFF NONE      HEX     FFFFFFFF
             18 0001C      28 20 20000000 BIT2      HEX     20000000
             19 0001E      30 20 00400000 BIT9      HEX     00400000
             20 00020      32 20 7F800000 EXPMQK    HEX     7F800000
             21 00022      34 20 7FFFFFFC XC        HEX     7FFFFFFC
             22 00024      36 20 7FFFFFFE XE        HEX     7FFFFFFE
             23 00026      38 20 4A95AA20 C1        SCALEB  0.5826924,0
             24 00028      40 20 356A55DF C2        SCALEB  0.41730760,0
             25 0002A      42 20 99FCEF32 SQRT2     HEX     99FCEF32        SQRT(2) TO 18 DIGITS
             26 0002C      44 20 40DA8279           HEX     40DA8279
                                          *
                                          *
                                          *
                                          *    CONSTANTS FOR DECATN ROUTINE
                                          *
             27 0002E      46 20 7FFFFFFC A1TN      HEX     7FFFFFFC        0.99999999984,M=0
             28 00030      48 20 AAAAB20C A3TN      HEX     AAAAB20C        -0.3333328936,M=-1
             29 00032      50 20 6661DBA9 A5TN      HEX     6661DBA9        0.1999653478,M=-2
             30 00034      52 20 B76E8FCC A7TN      HEX     B76E8FCC        -0.1417346061,M=-2
             31 00036      54 20 61329723 A9TN      HEX     61329723        0.0949195495,M=-3
             32 00038      56 20 807FFFFF FRACMS    HEX     807FFFFF        FRACTION MASK
             33 00016      22 20          BIT01     EQU     FMONE           BITS ZERO AND ONE ON,ALL OTHERS OFF
             34 0003A      58 20 4F800000 E31       HEX     4F800000        EXPONENT OF 31
             35 0003C      60 20 0F800000 C31S23    SCALEB   31,8
```

VERSION K20A0503 DECK NAME=*SUBL1B*

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
              36 0003E     62 20 15D88CFD IRT3T    HEX    15D88CFD      1.0/SQRT(3) = .577350269
              37 00040     64 20 4049E69D         HEX    4049E69D
              38 00042     66 20 5149153F PI      HEX    5149153F      3.141592654
              39 00044     68 20 416487ED         HEX    416487ED
              40 00046     70 20 5149153F PIO2    HEX    5149153F      PI/2 = 1.570796327
              41 00048     72 20 40E487ED         HEX    40E487ED
              42 0004A     74 20 430548E0 PIO6    HEX    430548E0      PI/6 = SCALEB  0.5235987757,0
              43 0004C     76 20 A1D7B43A RT3T    HEX    A1D7B43A      SQRT(3) = 1.732050808
              44 0004E     78 20 40EED9EB         HEX    40EED9EB
              45 00050     80 20 78A12F18 YLIMIT  HEX    78A12F18      0.267949192   2-SQRT(3)
              46 00052     82 20 3FC49851         HEX    3FC49851
                                                 *
                                                 *     CONSTANTS FOR EXP
                                                 *
              47 00054     84 20 94CC9179 LOG2E   HEX 94CC9179    DECD  1.442695041
              48 00056     86 20 40DC551D         HEX   40DC551D
              49 00058     88 20 FC0CAB5F LN2D2   HEX   FC0CAB5F    DECD  0.346573903
              50 0005A     90 20 3FD8B90B         HEX   3FD8B90B
              51 0005C     92 20 1A96481A A0D     HEX    1A96481A      DECD   12.015016753875
              52 0005E     94 20 42601EC1         HEX    42601EC1
              53 00060     96 20 8D839F86 A1D     HEX    8D839F86       DECD   601.8042666979565
              54 00062     98 20 454B39BC         HEX    454B39BC
              55 00064    100 20 7AC80C87 B1D     HEX    7AC80C87      DECD  60.090190731926
              56 00066    102 20 43782E2D         HEX    43782E2D
                                                 *
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                                         PAGE   3

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                        *******************************************************************
                                        *                                                                 *
                                        *    SINCOS ROUTINE. COMPUTES SINE AND COSINE.                    *
                                        *    CALLING CONVENTION IS AS FOLLOWS.                            *
                                        *******  JS     SINCOS                                            *
                                        *******  JRU    *+4                                               *
                                        *******  PTR    SINE                                              *
                                        *                                                                 *
                                        *    INPUT ARGUEMENT IS IN THE (A,B) REGISTERS.IT IS A DOUBLE     *
                                        *    PRECISION ANGLE IN PI RADIANS. THE SINE OUTPUT IS STORED     *
                                        *    IN THE LOCATION INDICATED BY THE POINTER IN THE CALL. THE    *
                                        *    COSINE IS RETURNED IN THE (A,B) REGISTERS.                   *
                                        *                                                                 *
                                        *******************************************************************
         58                                       EVEN
         59                                       ENTRY   SINCOS
         60                20                     USE     20
         61                24                     TEMP    24
         62 00000        0 24           SINSV     BSS     2
         63 00002        2 24           TOSC      BSS     2
         64 00004        4 24           T1SC      BSS     2
         65 00006        6 24           T2SC      BSS     2
         66 00008        8 24           T3SC      BSS     2
         67 0000A       10 24           T4SC      BSS     2
         68 0000C       12 24           T5SC      BSS     2
         69 0000E       14 24           T6SC      BSS     2
         70 00010       16 24           X1SV      BSS     2
         71 00012       18 24           X4SV      BSS     2
         72 00014       20 24           COMRTN    BSS     2
         73 00016       22 24           SCTURN    BSS     2
         74                20                     USE     PREVIOUS
R        75 00068      104 20 03000000  SINCOS    PTR     0,6
         76 0006A      106 20 6C330016            IMN     6,22,M
         77 00000        0 24                     UBASE   6,SINSV
         78 0006C      108 20 1F080010            STX     1,X1SV
         79 0006E      110 20 5C0A0000            LDX     1,A1SC,M
         80 00000        0 20                     BASE    1,A1SC
         81 00070      112 20 A085                ADU     C1S23          CONVERT ANGLE TO PI RADIANS
         82 00071      113 20     3B03            STA     T2SC
         83 00072      114 20 7B02                STB     T1SC
         84 00073      115 20     0400            CFX
         85 00074      116 20 3B01                STA     TOSC
         86 00075      117 20     5089            LDB     ZERO
         87 00076      118 20 0480                CXF
         88 00077      119 20     DB02            SFD     T1SC           SEPARATE FRACTION FROM INTEGER
         89 00078      120 20 3B03                STA     T2SC
         90 00079      121 20     7B02            STB     T1SC
         91 0007A      122 20 1F200012            STX     4,X4SV
         92 0007C      124 20 5F200016            LDX     4,SCTURN
         93 0007E      126 20 36040002            LAE     2,4,I
         94 00080      128 20 06A0                LXA     4
         95 00081      129 20     108B            LDA     FMONE
         96 00082      130 20 5089                LDB     ZERO
         97 00083      131 20     DB02            SFD     T1SC
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                  PAGE   4

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                           SOURCE
             98 00084    132 20 3B05                 STA    T4SC
             99 00085    133 20     7B04             STB    T3SC
            100 00086    134 20 1303                 LDA    T2SC
GENERATED                          0700
            101 00088    136 20 640400C4             JS     B1IS2
            102 0008A    138 20 3B07                 STA    T6SC
            103 0008B    139 20     7B06             STB    T5SC
            104 0008C    140 20 1305                 LDA    T4SC
            105 0008D    141 20     3B03             STA    T2SC
            106 0008E    142 20 640400C4             JS     B1IS2
            107 00090    144 20 3B05                 STA    T4SC
            108 00091    145 20     7B04             STB    T3SC
                                            *
                                            *   DETERMINE QUADRANT OF ANGLE
                                            *
            109 00092    146 20 1301                 LDA    T0SC
            110 00093    147 20     8088             AND    THREE
            111 00094    148 20 A0CC                 ADD    SCDTB
            112 00095    149 20     3B01             STA    T0SC
            113 00096    150 20 7301                 RTA    T0SC
GENERATED                          0700
            114 00098    152 20 0000009A SCDTB       PTR    SCDTJ
            115 0009A    154 20 600B     SCDTJ       JRU    SCQ1
            116 0009B    155 20     6013             JRU    SCQ2
            117 0009C    156 20 601A                 JRU    SCQ3
            118 0009D    157 20     1305 SCQ4        LDA    T4SC
            119 0009E    158 20 5304                 LDB    T3SC
            120 0009F    159 20     3A01             STA    2,4
            121 000A0    160 20 7A00                 STB    0,4
            122 000A1    161 20     1089             LDA    ZERO
            123 000A2    162 20 5089                 LDB    ZERO
            124 000A3    163 20     DB06             SFD    T5SC
            125 000A4    164 20 6018                 JRU    SCEX
            126 000A5    165 20     1089 SCQ1        LDA    ZERO
            127 000A6    166 20 5089                 LDB    ZERO
            128 000A7    167 20     DB06             SFD    T5SC
            129 000A8    168 20 3A01                 STA    2,4
            130 000A9    169 20     7A00             STB    0,4
            131 000AA    170 20 1089                 LDA    ZERO
            132 000AB    171 20     5089             LDB    ZERO
            133 000AC    172 20 DB04                 SFD    T3SC
            134 000AD    173 20     600F             JRU    SCEX
            135 000AE    174 20 1089     SCQ2        LDA    ZERO
            136 000AF    175 20     5089             LDB    ZERO
            137 000B0    176 20 DB04                 SFD    T3SC
            138 000B1    177 20     3A01             STA    2,4
            139 000B2    178 20 7A00                 STB    0,4
            140 000B3    179 20     1307             LDA    T6SC
            141 000B4    180 20 5306                 LDB    T5SC
            142 000B5    181 20     6007             JRU    SCEX
            143 000B6    182 20 1307     SCQ3        LDA    T6SC
            144 000B7    183 20     5306             LDB    T5SC
            145 000B8    184 20 3A01                 STA    2,4
            146 000B9    185 20     7A00             STB    0,4
            147 000BA    186 20 1305                 LDA    T4SC
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                      PAGE    5

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                       SOURCE
             148 000BB    187 20      5304           LDB     T3SC
             149 000BC    188 20 5F200012 SCEX       LDX     4,X4SV
             150 000BE    190 20 5F080010            LDX     1,X1SV
             151 000C0    192 20 6C320016            IMP     6,22,M
             152 000C2    194 20 7300                RTA     0,6
                                          *
                                          *   EXPANSION OF POLYNOMIAL
                                          *
GENERATED                             0700
             153 000C4    196 20 03000014 B1IS2      PTR     COMRTN
             154 000C6    198 20 9303                MLF     T2SC
             155 000C7    199 20      3802           STA     T1SC
             156 000C8    200 20 9084                MLF     A9SC
             157 000C9    201 20      B883           ADF     A7SC
             158 000CA    202 20 9302                MLF     T1SC
             159 000CB    203 20      B882           ADF     A5SC
             160 000CC    204 20 9302                MLF     T1SC
             161 000CD    205 20      B881           ADF     A3SC
             162 000CE    206 20 9302                MLF     T1SC
             163 000CF    207 20      B880           ADF     A1SC
             164 000D0    208 20 9303                MLF     T2SC
             165 000D1    209 20      730A           RTA     COMRTN
             166                                     DBASE   1
             167                                     DBASE   6
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                                     PAGE   6

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                 SOURCE
                                       ******************************************************************
                                       *    SQUARE ROOT ROUTINE.                                        *
                                       *    CALLING CONVENTION IS AS FOLLOWS.                           *
                                       *******  JS      DECSQ                                           *
                                       *                                                                *
                                       *    INPUT ARGUEMENT IS A DOUBLE PRECISION NUMBER IN THE (A,B)   *
                                       *    REGISTERS. OUTPUT IS THE SQUARE ROOT OF THE INPUT RETURNED  *
                                       *    IN THE (A,B) REGISTERS.                                     *
                                       *                                                                *
                                       ******************************************************************
           169                                         ENTRY  DECSQ
           170                                         EVEN
           171              20                         USE    20
           172              24                         TEMP   24
           173 00018     24 24             DSQSV       BSS    2
           174 0001A     26 24             SQT1        BSS    2
           175 0001C     28 24             SQT2        BSS    2
           176 0001E     30 24             SQT4        BSS    2
           177 00020     32 24             M           BSS    2
           178 00022     34 24             Y0          BSS    2
           179 00024     36 24             TEMP        BSS    2
           180 00026     38 24             TEMP2       BSS    2
           181 00028     40 24             DSQRTN      BSS    2
           182              20                         USE    PREVIOUS
           183 00002    210 20 03000000  DECSQ         PTR    0,6
           184 000D4    212 20 6C330010                IMN    6,16,M
           185 00018     24 24                         UBASE  6,DSQSV
           186 000D6    214 20 1F080002                STX    1,SQT1
           187 000D8    216 20 5C0A0000                LDX    1,A1SC,M
           188 00000      0 20                         BASE   1,A1SC
           189 000DA    218 20 1F100004                STX    2,SQT2
           190 000DC    220 20 1F200006                STX    4,SQT4
           191 000DE    222 20 633B                    JRL    IMARG          CHECK FOR NEGATIVE ARGUEMENT
           192 000DF    223 20     6102                JRN    DECS1
           193 000E0    224 20 6030                    JRU    OUT            CHECK FOR ZERO
           194 000E1    225 20     3806  DECS1         STA    TEMP           SAVE UPPER HALF OF ARG.
           195 000E2    226 20 808C                    AND    MANTIS         MASK OFF FRACTION
           196 000E3    227 20     0808                SLLD   8              LEFT JUSTIFY
           197 000E4    228 20 3804                    STA    M              STORE FRACTION IN M
           198 000E5    229 20     A086                ADU    ONE            CLEAR CARRY BIT
           199 000E6    230 20 1304                    LDA    M
           200 000E7    231 20     E091                SBU    XC             CHECK MAGNITUDE OF FRACTION
           201 000E8    232 20 6304                    JRL    DECS3
           202 000E9    233 20     0861                SRLD   1
           203 000EA    234 20 A092                    ADU    XE
           204 000EB    235 20     6011                JRU    DECS4
           205 000EC    236 20 1304      DECS3         LDA    M
           206 000ED    237 20     D093                MUL    C1             0.5826924*M
           207 000EE    238 20 A094                    ADU    C2             0.41730760+0.5826924*M
           208 000EF    239 20     3805                STA    Y0             INITIAL APPROX FOR SQRT(M),Y0
           209 000F0    240 20 5C120002                LDX    2,2,M          SETS UP COUNTER FOR ITERATION
           210 000F2    242 20 1304      DECS2         LDA    M
           211 000F3    243 20     F305                DVD    Y0             M/Y0
           212 000F4    244 20 A305                    ADU    Y0             Y0+M/Y0
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                          PAGE   7

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                     SOURCE
            213 000F5   245 20       0861          SRLD   1             (Y0+M/Y0)/2
            214 000F6   246 20 3805                STA    Y0
GENERATED                            0700
            215 000F8   248 20 6C130001            IMN    2,1,M         DECREMENT COUNTER
            216 000FA   250 20 643000F2            JGU    DECS2
            217 000FC   252 20 0868        DECS4   SRLD   8             SHIFT FRACTION RIGHT
            218 000FD   253 20       3807          STA    TEMP2         STORE SIGNIFICANT PART OF NUMBER
            219 000FE   254 20 5C10001A            LDX    2,NONE        LOAD XR2 WITH FLAG
            220 00100   256 20 1306                LDA    TEMP
            221 00101   257 20       8090          AND    EXPMQK        ISOLATE EXPONENT
            222 00102   258 20 0C61                SRC    1             DIVIDE BY 2
            223 00103   259 20       A08E          ADU    BIT2          ADD EXPONENT SIGN BIT
            224 00104   260 20 8C00001E            SAM    BIT9,L        CHECK FOR ODD EXPONENT
            225 00106   262 20 6C120001            IMP    2,1,M
            226 00108   264 20 C307                LOR    TEMP2         ADD FRACTION
GENERATED                            0700
            227 0010A   266 20 5C22002A            LDX    4,SQRT2,M
            228 0010C   268 20 6C130001            IMN    2,1,M
            229 0010E   270 20 640401CC            JS     MULFD         IF EXPONENT ODD MULTIPLY BY SQRT(2)
            230 00110   272 20 5F100004 OUT        LDX    2,SQT2
            231 00112   274 20 5F200006            LDX    4,SQT4
            232 00114   276 20 5F080002            LDX    1,SQT1
            233 00116   278 20 6C320010            IMP    6,16,M
            234 00118   280 20 7300                RTA    0,6
            235 00119   281 20       1089 IMARG    LDA    ZERO
            236 0011A   282 20 5089                LDB    ZERO          RETURN ZERO FOR NEGATIVE ARG.
            237 0011B   283 20       6088          JRU    OUT
            238                                        DBASE  1
            239                                        DBASE  6
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                                          PAGE   8

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
                                           *******************************************************************
                                           *                                                                 *
                                           *    ARC TANGENT ROUTINE. TAKES AS INPUT TWO INPUTS, ARCTAN(Y/X).  *
                                           *    CALLING CONVENTION IS AS FOLLOWS.                            *
                                           *******  LDX     4,X,M                                            *
                                           *******  JS      DECATN                                           *
                                           *                                                                 *
                                           *    THE DIVIDEND IS PASSED IN THE (A,B) REGISTERS. THE ADDRESS OF *
                                           *    THE DIVISOR IS IN XR4. THE OUTPUT IS IN PI RADIANS AND IS    *
                                           *    RETURNED IN THE (A,B) REGISTERS.                             *
                                           *                                                                 *
                                           *******************************************************************
            241                                         ENTRY   DECATN
            242                                         EVEN
                                           *
                                           *    ARC TANGENT ROUTINE
                                           *
            243               20                        USE     20
            244               24                        TEMP    24
            245 0002A      42 24               ATNSV    BSS     2
            246 0002C      44 24               DETN1    BSS     2
            247 0002E      46 24               DETN4    BSS     2
            248 00030      48 24               QLOC     BSS     2
            249 00032      50 24               TEM1     BSS     4
            250 00036      54 24               ARG      BSS     4
            251 0003A      58 24               ZTN      BSS     4
            252 0003E      62 24               ZT2N     BSS     2
            253 00040      64 24               C        BSS     2
            254 00042      66 24               ATNYT    BSS     4
            255 00046      70 24               YTURN    BSS     2
            256 00048      72 24               ATNRTN   BSS     2
            257               20                        USE     PREVIOUS
            258 0011C     284 20 03000000 DECATN        PTR     0,6
            259 0011E     286 20 6C33001E               IMN     6,30,M
            260 0002A      42 24                        UBASE   6,ATNSV
            261 00120     288 20 1F080002               STX     1,DETN1
            262 00122     290 20 5C0A0000               LDX     1,A1SC,M
            263 00000       0 20                        BASE    1,A1SC
            264 00124     292 20 1F200004               STX     4,DETN4
            265 00126     294 20 3B04                   STA     TEM1
            266 00127     295 20     620B               JRG     QUAD12        IS ARG IN QUAD 1 OR 2
            267 00128     296 20 1201                   LDA     2,4
            268 00129     297 20     6205               JRG     QUAD4
            269 0012A     298 20 340001A1               LAE     QD3
            270 0012C     300 20 3B03                   STA     QLOC
            271 0012D     301 20     600E               JRU     START
            272 0012E     302 20 340001A3 QUAD4         LAE     QD4
            273 00130     304 20 3B03                   STA     QLOC
            274 00131     305 20     600A               JRU     START
            275 00132     306 20 1201     QUAD12        LDA     2,4
            276 00133     307 20     6205               JRG     QUAD1
            277 00134     308 20 3400019D               LAE     QD2
            278 00136     310 20 3B03                   STA     QLOC
            279 00137     311 20     6004               JRU     START
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            280 0013B    312 20 340001A6 QUAD1   LAE    QD1
            281 0013A    314 20 3803             STA    QLOC
            282 0013B    315 20     1304 START   LDA    TEM1
            283 0013C    316 20 640401F6         JS     DVFD        Y/X
                                 *
                                 *    CHECK FOR THE FOLLOWING CONDITIONS
                                 *    0/1.0,1.0/0,0/-1.0,-1.0/0
                                 *
            284 0013E    318 20 610D             JRN    ATN1        IS Y .GT. 0
            285 0013F    319 20     1201         LDA    2,4         NO
            286 00140    320 20 6106             JRN    ATN0        IS X .GT. 0
            287 00141    321 20     10A4         LDA    PIO2+2
            288 00142    322 20 50A3             LDB    PIO2
            289 00143    323 20     380D         STA    ATNYT+2
            290 00144    324 20 780C             STB    ATNYT
            291 00145    325 20     7303         RTA    QLOC
            292 00146    326 20 1089     ATN0    LDA    ZERO        X IS .GT.0
            293 00147    327 20     5089         LDB    ZERO
            294 00148    328 20 380D             STA    ATNYT+2
            295 00149    329 20     780C         STB    ATNYT
            296 0014A    330 20 7303             RTA    QLOC
            297 0014B    331 20     6206 ATN1    JRG    ATN2
            298 0014C    332 20 3805             STA    TEM1+2
            299 0014D    333 20     7804         STB    TEM1
            300 0014E    334 20 1089             LDA    ZERO
            301 0014F    335 20     5089         LDB    ZERO
            302 00150    336 20 D804             SFD    TEM1        ARG=ABS(ARG)
            303 00151    337 20     3807 ATN2    STA    ARG+2
            304 00152    338 20 7806             STB    ARG
            305 00153    339 20     D889         SFD    DFONE
            306 00154    340 20 6204             JRG    ATN3        IS ARG .GT. 1.0
            307 00155    341 20     1307         LDA    ARG+2
            308 00156    342 20 5306             LDB    ARG
            309 00157    343 20     6007         JRU    ATN31
            310 00158    344 20 108A     ATN3    LDA    FONE
            311 00159    345 20     5089         LDB    ZERO
            312 0015A    346 20 5F22000C         LDX    4,ARG,M
            313 0015C    348 20 640401F6         JS     DVFD        1.0/ARG
            314 0015E    350 20 3809     ATN31   STA    ZTN+2
            315 0015F    351 20     7808         STB    ZTN         Z=ARG OR 1.0/ARG
            316 00160    352 20 D8A8             SFD    YLIMIT      YLIMIT=2.0-SQRT(3)
            317 00161    353 20     6208         JRG    ATN4
            318 00162    354 20 1309             LDA    ZTN+2
            319 00163    355 20     5308         LDB    ZTN
            320 00164    356 20 64040188         JS     YCOMP
            321 00166    358 20 1089             LDA    ZERO
            322 00167    359 20     3808         STA    C           C=0
            323 00168    360 20 6018             JRU    ATN5
            324 00169    361 20     1309 ATN4    LDA    ZTN+2
            325 0016A    362 20 5308             LDB    ZTN
            326 0016B    363 20     98A6         AFD    RT3T        Y+SQRT(3)
            327 0016C    364 20 3805             STA    TEM1+2
            328 0016D    365 20     7804         STB    TEM1
            329 0016E    366 20 1309             LDA    ZTN+2
            330 0016F    367 20     5308         LDB    ZTN
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                               PAGE  10

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                              SOURCE
             331 00170    368 20 D89F               SFD     IRT3T           Y-1.0/SQRT(3)
GENERATED                           0700
             332 00172    370 20 5C22004C           LDX     4,RT3T,M
             333 00174    372 20 640401CC           JS      MULFD           (Y-(1.0/SQRT(3)))*SQRT(3)
             334 00176    374 20 5F220008           LDX     4,TEM1,M
             335 00178    376 20 640401F6           JS      DVFD            (Y-1.0/SQRT(3))*SQRT(3)/(Y+SQRT(3))
             336 0017A    378 20 3809               STA     ZTN+2
             337 0017B    379 20     7808           STB     ZTN
             338 0017C    380 20 640401B8           JS      YCOMP
             339 0017E    382 20 10A5               LDA     PI06
             340 0017F    383 20     3808           STA     C               C=PI/6
             341 00180    384 20 1098      ATN5     LDA     A9TN
             342 00181    385 20     D30A           MUL     ZT2N            A9*Z2
             343 00182    386 20 0E41               SRA     1,4
             344 00183    387 20     A09A           ADU     A7TN            A9*Z2+A7
             345 00184    388 20 D30A               MUL     ZT2N            (A9*Z2+A7)*Z2
             346 00185    389 20     0E40           SRA     0,4
             347 00186    390 20 A099               ADU     A5TN            (A9*Z2+A7)*Z2+A5
             348 00187    391 20     D30A           MUL     ZT2N            (A9*Z2+A7)*Z2+A5)*Z2
             349 00188    392 20 0E41               SRA     1,4
             350 00189    393 20     A098           ADU     A3TN            (A9*Z2+A7)*Z2+A5)*Z2+A3)
             351 0018A    394 20 D30A               MUL     ZT2N            (A9*Z2+A7)*Z2+A5)*Z2+A3)*Z2
             352 0018B    395 20     0E41           SRA     1,4
             353 0018C    396 20 A097               ADU     A1TN            (A9*Z2+A7)*Z2+A5)*Z2+A3)*Z2+A1
             354 0018D    397 20     D308           MUL     ZTN             (A9*Z2+A7)*Z2+A5)*Z2+A3)*Z2+A1)*Z
             355 0018E    398 20 5F200008           LDX     4,TEM1
             356 00190    400 20 0E40               SRA     0,4
             357 00191    401 20     A30B           ADU     C               (A9*Z2+A7)*Z2+A5)*Z2+A3)*Z2+A1)*Z+C
             358 00192    402 20 0480               CXF
             359 00193    403 20     E09E           SBU     C31S23          CORRECT FOR IMPLICIT MULTIPLY BY 2**31
             360 00194    404 20 380D               STA     ATNYT+2
             361 00195    405 20     780C           STB     ATNYT
             362 00196    406 20 1307               LDA     ARG+2
             363 00197    407 20     5306           LDB     ARG
             364 00198    408 20 D889               SFD     DFONE
             365 00199    409 20     6218           JRG     ATN6
             366 0019A    410 20 130D               LDA     ATNYT+2
             367 0019B    411 20     530C           LDB     ATNYT
             368 0019C    412 20 7303               RTA     QLOC
             369 0019D    413 20     10A2 QD2       LDA     PI+2
             370 0019E    414 20 50A1               LDB     PI
             371 0019F    415 20     D80C           SFD     ATNYT
             372 001A0    416 20 6006               JRU     QD1
             373 001A1    417 20     98A1 QD3       AFD     PI
             374 001A2    418 20 6004               JRU     QD1
             375 001A3    419 20     1089 QD4       LDA     ZERO
             376 001A4    420 20 5089               LDB     ZERO
             377 001A5    421 20     D80C           SFD     ATNYT
             378 001A6    422 20 5C220042 QD1       LDX     4,PI,M
             379 001A8    424 20 640401F6           JS      DVFD            ATNYT/PI,ANSWER RETURNED IN PI RADIANS
             380 001AA    426 20 5F200004           LDX     4,DETN4
             381 001AC    428 20 5F080002           LDX     1,DETN1
             382 001AE    430 20 6C32001E           IMP     6,30,M
             383 001B0    432 20 7300               RTA     0,6
```

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VERSION K20A0503      DECK NAME=*SUBLIB*                                                          PAGE  11

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
            384 001B1     433 20      10A4 ATN6      LDA    PI02+2
            385 001B2     434 20 50A3                LDB    PI02
            386 001B3     435 20      DB0C           SFD    ATNYT        ATNYT=PI/2-ATNYT
            387 001B4     436 20 3B0D                STA    ATNYT+2
            388 001B5     437 20      7B0C           STB    ATNYT
            389 001B6     438 20 7303                RTA    QLOC
                                         *
                                         *
                                         *
GENERATED                             0700
            390 001B8     440 20 0300001C YCOMP      PTR    YTURN
            391 001BA     442 20 8090                AND    EXPMQK       ISOLATE EXPONENT
            392 001BB     443 20      C08B           LOR    BIT01        ADD SIGN
            393 001BC     444 20 0C56                SRA    22           SHIFT AND MULTIPLY BY 2
            394 001BD     445 20      3B04           STA    TEM1
            395 001BE     446 20 1089                LDA    ZERO
            396 001BF     447 20      E304           SBU    TEM1
            397 001C0     448 20 06A0                LXA    4
            398 001C1     449 20      0C41           SRA    1            DIVIDE BY 2
            399 001C2     450 20 3B04                STA    TEM1         SAVE EXPONENT OF Z
            400 001C3     451 20      1309           LDA    ZTN+2
            401 001C4     452 20 809C                AND    FRACMS       ISOLATE FRACTION
            402 001C5     453 20      C09D           LOR    E31          CORRECT FOR IMPLICIT MULTIPLY BY 2**31
            403 001C6     454 20 0400                CFX
            404 001C7     455 20      3B08           STA    ZTN
            405 001C8     456 20 D308                MUL    ZTN          Z**2
            406 001C9     457 20      3B0A           STA    ZT2N
            407 001CA     458 20 730E                RTA    YTURN
            408                                      DBASE  1
            409                                      DBASE  6
```

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VERSION K20A0503     DECK NAME=*SUBLIB*                                                          PAGE  12

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
                                          ******************************************************************
                                          *                                                                *
                                          *    SUBROUTINE MULFD. HYBRID DOUBLE PRECISION MULTIPLY ROUTINE  *
                                          *    CALLING CONVENTION IS AS FOLLOWS.                           *
                                          *******  LDX     4,ARG,M                                         *
                                          *******  JS      MULFD                                           *
                                          *                                                                *
                                          *    THE MULTIPLICAND IS PASSED IN THE (A,B) REGISTERS. ADDRESS OF *
                                          *    THE MULTIPLIER IS IN XR4. OUTPUT IS RETURNED IN THE (A,B)   *
                                          *    REGISTERS.                                                  *
                                          *                                                                *
                                          ******************************************************************
GENERATED                           0700
            411                                      EVEN
            412                                      ENTRY  MULFD
            413              20                      USE    20
            414              24                      TEMP    24
            415 0004A     74 24             TAB      BSS    4
            416 0004E     78 24             TXB      BSS    2
            417 00050     80 24             TXA      BSS    2
            418 00052     82 24             TYB      BSS    2
            419 00054     84 24             TYA      BSS    2
            420 00056     86 24             RETM     BSS    2
            421              20                      USE    PREVIOUS
            422 001CC    460 20 03000000 MULFD      PTR    0,6
            423 001CE    462 20 6C33000C            IMN    6,12,M
            424 0004A     74 24                      UBASE  6,TAB
            425 001D0    464 20 6102                 JRN    XNZ               CHECK FOR MULTIPLIER=0
            426 001D1    465 20     6021             JRU    PRODZ
            427 001D2    466 20 3B03        XNZ      STA    TXA
GENERATED                           0700
            428 001D4    468 20 14020000             LDA    0,M
            429 001D6    470 20 3B02                 STA    TXB
            430 001D7    471 20     3B04             STA    TYB
            431 001D8    472 20 1303                 LDA    TXA
            432 001D9    473 20     DB02             SFD    TXB
            433 001DA    474 20 3B02                 STA    TXB
            434 001DB    475 20     1201             LDA    2,4
            435 001DC    476 20 6102                 JRN    YNZ
            436 001DD    477 20     6015             JRU    PRODZ
            437 001DE    478 20 5200        YNZ      LDB    0,4
            438 001DF    479 20     3B05             STA    TYA
            439 001E0    480 20 DB04                 SFD    TYB
            440 001E1    481 20     3B04             STA    TYB
            441 001E2    482 20 9303                 MLF    TXA
            442 001E3    483 20     3B01             STA    TAB+2
            443 001E4    484 20 7B00                 STB    TAB
            444 001E5    485 20     1305             LDA    TYA
            445 001E6    486 20 9302                 MLF    TXB
            446 001E7    487 20     9B00             AFD    TAB
            447 001E8    488 20 3B01                 STA    TAB+2
            448 001E9    489 20     7B00             STB    TAB
            449 001EA    490 20 1305                 LDA    TYA
            450 001EB    491 20     9303             MLF    TXA
```

VERSION K2040503 DECK NAME=*SUBLIB*

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
              451 001EC    492 20 9800      NUFLO    AFD    TAB
GENERATED                          0700
              452 001EE    494 20 6C32000C MULOUT    IMP    6,12,M
              453 001F0    496 20 7300               RTA    0,6
GENERATED                          0700
              454 001F2    498 20 54020000 PRODZ     LDB    0,M
              455 001F4    500 20 6086               JRU    MULOUT
              456                                    DBASE  6
```

```
VERSION K2040503      DECK NAME=*SUBLIB*
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                           SOURCE
                                            *******************************************************************
                                            *                                                                 *
                                            *    DVFD ROUTINE. HYBRID DOUBLE PRECISION DIVIDE ROUTINE.        *
                                            *    CALLING CONVENTION IS AS FOLLOWS.                            *
                                            ******    LDX     4,DVSR,M                                        *
                                            ********  JS      DVFD                                            *
                                            *                                                                 *
                                            *    THE DIVIDEND IS PASSED IN THE (A,B) REGISTERS. THE ADDRESS OF *
                                            *    THE DIVISOR IS IN XR4. OUTPUT IS RETURNED IN THE (A,B)       *
                                            *    REGISTERS.                                                   *
                                            *                                                                 *
                                            *******************************************************************
GENERATED                               0700
        458                                            EVEN
        459                                            ENTRY   DVFD
        460             20                             USE     20
        461             24                             TEMP    24
        462 00058    88 24                  TAC        BSS     4
        463 0005C    92 24                  TA         BSS     4
        464 00060    96 24                  TB         BSS     4
        465 00064   100 24                  TP         BSS     4
        466 00068   104 24                  TQ         BSS     4
        467 0006C   108 24                  RETD       BSS     2
        468             20                             USE     PREVIOUS
        469 001F6   502 20 03000000 DVFD               PTR     0,5
        470 001F8   504 20 6C330014                    IMN     6,20,M
        471 00058    88 24                             UBASE   6,TAC
        472 001FA   506 20 6102                        JRN     NZ1
        473 001FB   507 20     6023                    JRU     Z000
        474 001FC   508 20 3801     NZ1                STA     TAC+2
        475 001FD   509 20     7800                    STB     TAC
        476 001FE   510 20 14020000                    LDA     0,M
        477 00200   512 20 3802                        STA     TA
        478 00201   513 20     3808                    STA     TQ
        479 00202   514 20 1201                        LDA     2,4
        480 00203   515 20     6102                    JRN     NZ2
        481 00204   516 20 601A                        JRU     Z000
        482 00205   517 20     3803 NZ2                STA     TA+2
        483 00206   518 20 5200                        LDB     0,4
        484 00207   519 20     D802                    SFD     TA
        485 00208   520 20 3804                        STA     TB
        486 00209   521 20     1301                    LDA     TAC+2
        487 0020A   522 20 5300                        LDB     TAC
        488 0020B   523 20     B303                    DVF     TA+2
        489 0020C   524 20 3809                        STA     TQ+2
        490 0020D   525 20     9304                    MLF     TB
        491 0020E   526 20 3807                        STA     TP+2
        492 0020F   527 20     7806                    STB     TP
        493 00210   528 20 1309                        LDA     TQ+2
        494 00211   529 20     9303                    MLF     TA+2
        495 00212   530 20 9806                        AFD     TP
        496 00213   531 20     3807                    STA     TP+2
        497 00214   532 20 7806                        STB     TP
        498 00215   533 20     1301                    LDA     TAC+2
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                        PAGE  15

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                               SOURCE
            499 00216    534 20 5300                LDB    TAC
            500 00217    535 20     DB06            SFD    TP
            501 00218    536 20 B303                DVF    TA+2
            502 00219    537 20     9B08            AFD    TQ
            503 0021A    538 20 6C320014 DVDOUT     IMP    6,20,M
            504 0021C    540 20 7300                RTA    0,6
GENERATED                           0700
            505 0021E    542 20 54020000 ZQUO       LDB    0,M
            506 00220    544 20 6086                JRU    DVDOUT
            507                                     DBASE  6
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                                        PAGE  16

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
                                          ****************************************************************************
                                          *                                                                          *
                                          *    EXPONENTIAL SUBROUTINE.                                               *
                                          *    CALLING CONVENTION IS AS FOLLOWS.                                     *
                                          *******  JS      EXP                                                       *
                                          *                                                                          *
                                          *    INPUT ARGUEMENT IS A DOUBLE PRECISION NUMBER IN THE (A,B)             *
                                          *    REGISTERS. OUTPUT IS RETURNED IN THE (A,B) REGISTERS.                 *
                                          *                                                                          *
                                          ****************************************************************************
            509                                       ENTRY     EXP
GENERATED                             0700
            510                                       EVEN
            511               20                      USE      20
            512               24                      TEMP      24
            513 0006E     110 24              EXPSV   BSS     2
            514 00070     112 24              XTD1    BSS    4
            515 00074     116 24              XTD2    BSS    4
            516 00078     120 24              N       BSS     2
            517 0007A     122 24              YD      BSS     2
            518 0007C     124 24              Y       BSS     2
            519 0007E     126 24              Z       BSS     4
            520 00082     130 24              EXR1       BSS     2
            521 00084     132 24              EXR4       BSS     2
            522 00086     134 24              EXPRTN BSS     2
            523               20                      USE       PREVIOUS
            524 00222     546 20 03000000 EXP         PTR       0,6
            525 00224     548 20 6C330018               IMN      6,24,M
            526 0006E     110 24                        UBASE   6,EXPSV
            527 00226     550 20 1F200016               STX      4,EXR4
            528 00228     552 20 1F080014               STX      1,EXR1
            529 0022A     554 20 5C0A0000               LDX      1,A1SC,M
            530 00000       0 20                        BASE     1,A1SC
            531 0022C     556 20 5C220054         LDX     4,LOG2E,M
            532 0022E     558 20 640401CC         JS      MULFD
            533 00230     560 20 7801             STB     XTD1
            534 00231     561 20     3802         STA     XTD1+2
            535 00232     562 20 0400             CFX
            536 00233     563 20     5089         LDB      ZERO
            537 00234     564 20 0857             SLL     23
            538 00235     565 20     3805         STA      N
            539 00236     566 20 0C57             SRA     23
            540 00237     567 20     0480         CXF
            541 00238     568 20 7803             STB     XTD2
            542 00239     569 20     3804         STA     XTD2+2
            543 0023A     570 20 5301             LDB     XTD1
            544 0023B     571 20     1302         LDA     XTD1+2
            545 0023C     572 20 0803             SFD     XTD2
GENERATED                             0700
            546 0023E     574 20 5C220058         LDX 4,LN2D2,M
            547 00240     576 20 640401CC         JS      MULFD
            548 00242     578 20 7806             STB      YD
            549 00243     579 20     3807         STA      Y
            550 00244     580 20 5F22000C         LDX     4,YD,M
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            551 00246    582 20 640401CC        JS    MULFD
            552 00248    584 20 9882            AFD    B1D
            553 00249    585 20      3802       STA   XTD1+2
            554 0024A    586 20 7801            STB   XTD1
            555 0024B    587 20      50B0       LDB    A1D
            556 0024C    588 20 10B1            LDA    A1D+2
GENERATED                           0700
            557 0024E    590 20 5F220002        LDX   4,XTD1,M
            558 00250    592 20 640401F6        JS    DVFD
            559 00252    594 20 9806            AFD    YD
            560 00253    595 20      D8AE       SFD    A0D
            561 00254    596 20 3802            STA   XTD1+2
            562 00255    597 20      7801       STB   XTD1
            563 00256    598 20 1307            LDA    Y
            564 00257    599 20      5306       LDB    YD
            565 00258    600 20 6102            JN    EXP1
            566 00259    601 20      6003       JU    EXP2
            567 0025A    602 20 A085     EXP1   ADU   C1S23
GENERATED                           0700
            568 0025C    604 20 5F220002 EXP2   LDX   4,XTD1,M
            569 0025E    606 20 640401F6        JS    DVFD
            570 00260    608 20 D889            SFD     DFONE
            571 00261    609 20      3B09       STA   Z+2
            572 00262    610 20 7B08            STB    Z
GENERATED                           0700
            573 00264    612 20 5F220010        LDX   4,Z,M
            574 00266    614 20 640401CC        JS    MULFD
            575 00268    616 20 A305            ADU    N
GENERATED                           0700
            576 0026A    618 20 5F200016          LDX    4,EXR4
            577 0026C    620 20 5F080014          LDX    1,EXR1
            578 0026E    622 20 6C320018          IMP    6,24,M
            579 00270    624 20 7300            RTA    0,6
            580                                   DBASE  1
            581                                   DBASE  6
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                      PAGE  18

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                          *
                                          *
                                          *********VECTOR ADD ROUTINE
                                          *********CALLING SEQUENCE
                                          **********JS       VECADD
                                          **********JRU     *+8
                                          **********PTR       V1
                                          **********PTR       V2
                                          **********PTR       V3
                                          *
GENERATED                            0700
          583                                       EVEN
          584                                       ENTRY    VECADD
          585               20                      USE      20
          586               24                      TEMP     24
          587 00088     136 24            VECA3     BSS      2
          588 0008A     138 24            VECA4     BSS      2
          589 0008C     140 24            VECA5     BSS      2
          590 0008E     142 24            VECATN    BSS      2
          591               20                      USE      PREVIOUS
          592 00272     626 20 03000000   VECADD    PTR      0,6
          593 00274     628 20 6C330006             IMN      6,6,M
          594 00088     136 24                        UBASE   6,VECA3
          595 00276     630 20 1F180000             STX      3,VECA3
          596 00278     632 20 1F200002             STX      4,VECA4
          597 0027A     634 20 1F280004             STX      5,VECA5
          598 0027C     636 20 5F280006             LDX      5,VECATN
          599 0027E     638 20 36840006             LAE      6,5,I          POINTER TO RESULTANT VECTOR V3
          600 00280     640 20 06A0                 LXA      4
GENERATED                               0700
          601 00282     642 20 36840004             LAE      4,5,I          POINTER TO VECTOR V2
          602 00284     644 20 0698                 LXA      3
GENERATED                               0700
          603 00286     646 20 36840002             LAE      2,5,I          POINTER TO VECTOR V1
          604 00288     648 20 06A8                 LXA      5
          605 00289     649 20     1281             LDA      2,5
          606 0028A     650 20 5280                 LDB      0,5
          607 0028B     651 20     9980             AFD      0,3
          608 0028C     652 20 3A01                 STA      2,4
          609 0028D     653 20     7A00             STB      0,4
          610 0028E     654 20 1283                 LDA      6,5           NEXT ELEMENT
          611 0028F     655 20     5282             LDB      4,5
          612 00290     656 20 9982                 AFD      4,3
          613 00291     657 20     3A03              STA     6,4            STORE RESULTS
          614 00292     658 20 7A02                 STB      4,4
          615 00293     659 20     1285             LDA      10,5
          616 00294     660 20 5284                 LDB      8,5
          617 00295     661 20     9984              AFD     8,3
          618 00296     662 20 3A05                 STA      10,4
          619 00297     663 20     7A04             STB      8,4
          620 00298     664 20 5F180000             LDX      3,VECA3
          621 0029A     666 20 5F200002             LDX      4,VECA4
          622 0029C     668 20 5F280004             LDX      5,VECA5
          623 0029E     670 20 6C320006             IMP      6,6,M
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                              PAGE  19

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                        SOURCE
            624 002A0     672 20 7300         RTA      0.6
            625                                DBASE   6
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                                    PAGE  20
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
                                            *
                                            *
                                            ********
                                            ********VECTOR SUBTRACT ROUTINE
                                            ********CALLING SEQUENCE
                                            ********JS       VECSUB
                                            ********JRU      *+8
                                            ********PTR      V1
                                            ********PTR      V2
                                            ********PTR      V3
                                            ********
GENERATED                          0700
            627                                      EVEN
            628                                      ENTRY   VECSUB
            629               20                     USE     20
            630               24                     TEMP    24
            631 00090     144 24            VECS3    BSS     2
            632 00092     146 24            VECS4    BSS     2
            633 00094     148 24            VECS5    BSS     2
            634 00096     150 24            VECSTN   BSS     2
            635               20                     USE     PREVIOUS
            636 002A2     674 20 03000000   VECSUB   PTR     0,6
            637 002A4     676 20 6C330006            IMN     6,6,M
            638 00090     144 24                      UBASE   6,VECS3
            639 002A6     678 20 1F180000            STX     3,VECS3
            640 002A8     680 20 1F200002            STX     4,VECS4
            641 002AA     682 20 1F280004            STX     5,VECS5
            642 002AC     684 20 5F280006            LDX     5,VECSTN
            643 002AE     686 20 36840006            LAE     6,5,I           POINTER TO RESULTANT VECTOR V3
            644 002B0     688 20 06A0                LXA     4
GENERATED                          0700
            645 002B2     690 20 36840004            LAE     4,5,I           POINTER TO VECTOR V2
            646 002B4     692 20 0698                LXA     3
GENERATED                          0700
            647 002B6     694 20 36840002            LAE     2,5,I           POINTER TO VECTOR V1
            648 002B8     696 20 06A8                LXA     5
            649 002B9     697 20     1281            LDA     2,5
            650 002BA     698 20 52B0                LDB     0,5
            651 002BB     699 20     0980            SFD     0,3
            652 002BC     700 20 3A01                STA     2,4
            653 002BD     701 20     7A00            STB     0,4
            654 002BE     702 20 1283                LDA     6,5
            655 002BF     703 20     52B2            LDB     4,5
            656 002C0     704 20 0982                SFD     4,3
            657 002C1     705 20     3A03            STA     6,4
            658 002C2     706 20 7A02                STB     4,4
            659 002C3     707 20     1285            LDA     10,5
            660 002C4     708 20 52B4                LDB     8,5
            661 002C5     709 20     0984            SFD     8,3
            662 002C6     710 20 3A05                STA     10,4
            663 002C7     711 20     7A04            STB     8,4
            664 002C8     712 20 5F180000            LDX     3,VECS3
            665 002CA     714 20 5F200002            LDX     4,VECS4
            666 002CC     716 20 5F280004            LDX     5,VECS5
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                        PAGE  21

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
             667 002CE     718 20 6C320006        IMP      6,6,M
             668 00200     720 20 7300            RTA      0,6
             669                                    DBASE  6
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                              PAGE  22
DIAGNOSTICS LINE ADRES UADRES LC  PROGRAM                                   SOURCE
                                                *
                                                *
                                                *********
                                                *******    THIS SUBROUTINE ADDS TWO 3X3 MATRICIES
                                                *********CALLING SEQUENCE
                                                *********JS      MATDAD
                                                *********JRU      *+8
                                                *********PTR      V1
                                                *********PTR      V2
                                                *********PTR      V3
                                                *********
GENERATED                             0700
         671                                         EVEN
         672                                         ENTRY    MATDAD
         673                20                       USE      20
         674                24                       TEMP      24
         675 00098     152 24               MATD2   BSS      2
         676 0009A     154 24               MATD3   BSS      2
         677 0009C     156 24               MATD4   BSS      2
         678 0009E     158 24               MATD5   BSS      2
         679 000A0     160 24               MATRTN  BSS      2
         680                20                       USE      PREVIOUS
         681 002D2     722 20 03000000 MATDAD  PTR      0,6
         682 002D4     724 20 6C330006         IMN      6,8,M
         683 00098     152 24                    UBASE   6,MATD2
         684 002D6     726 20 1F100000           STX     2,MATD2          SAVE REGISTERS
         685 002D8     728 20 1F180002         STX      3,MATD3
         686 002DA     730 20 1F200004         STX      4,MATD4
         687 002DC     732 20 1F280006         STX      5,MATD5
         688 002DE     734 20 5F100008         LDX      2,MATRTN
         689 002E0     736 20 35040002         LAE      2,2,I            POINTER TO MATRIX V1
         690 002E2     738 20 0698              LXA      3
GENERATED                             0700
         691 002E4     740 20 35040004         LAE      4,2,I            POINTER TO MATRIX V2
         692 002E6     742 20 0640              LXA      4
GENERATED                             0700
         693 002E8     744 20 35040006         LAE      6,2,I            POINTER TO RESULTANT MATRIX V3
         694 002EA     746 20 0648              LXA      5
GENERATED                             0700
         695 002EC     748 20 5C120002          LDX      2,2,M           INITIALIZE LOOP COUNTER
         696 002EE     750 20 1181     MATLOP  LDA      2,3
         697 002EF     751 20     5180          LDB      0,3
         698 002F0     752 20 9400              AFD      0,4
         699 002F1     753 20     3A81          STA      2,5
         700 002F2     754 20 7A80              STB      0,5
         701 002F3     755 20     1183          LDA      6,3
         702 002F4     756 20 5182              LDB      4,3
         703 002F5     757 20     9A02          AFD      4,4
         704 002F6     758 20 3A83              STA      6,5
         705 002F7     759 20     7A82          STB      4,5
         706 002F8     760 20 1185              LDA      10,3
         707 002F9     761 20     5184          LDB      8,3
         708 002FA     762 20 9A04              AFD      8,4
         709 002FB     763 20     3A85          STA      10,5
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                              PAGE  23

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
             710 002FC     764 20 7A84              STB     8,5
GENERATED                            0700
             711 002FE     766 20 6C1A000C          IMP     3,12,M
             712 00300     768 20 6C22000C          IMP     4,12,M
             713 00302     770 20 6C2A000C          IMP     5,12,M
             714 00304     772 20 6C130001            IMN    2,1,M        DECREMENT FOR NEXT PASS
             715 00306     774 20 643002EE          JGU     MATLOP
             716 00308     776 20 5F100000            LDX    2,MATD2      RESTORE REGISTERS FOR EXIT
             717 0030A     778 20 5F180002          LDX     3,MATD3
             718 0030C     780 20 5F200004          LDX     4,MATD4
             719 0030E     782 20 5F280006          LDX     5,MATD5
             720 00310     784 20 6C320008          IMP     6,8,M
             721 00312     786 20 7300              RTA     0,6
             722                                      DBASE  6
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                SOURCE
                                          *
                                          *    SINGLE PRECISION 3X3 MATRIX MULTIPLY ROUTINE
                                          *    OPERATES ON THE SECOND WORD OF A DOUBLE PRECISION NUMBER.   *
                                          *    CALLING CONVENTION IS AS FOLLOWS.                          *
                                          ******** JS      MULS33                                        *
                                          *******  JRU     *+8
                                          ******** PTR     M1
                                          ******** PTR     M2
                                          ******** PTR     M3
                724                               ENTRY   MULS33
                725                 20            USE     20
                726                 24            TEMP    24
                727 000A2     162 24        MULSX2  BSS     2
                728 000A4     164 24        MULSX3  BSS     2
                729 000A6     166 24        MULSX4  BSS     2
                730 000A8     168 24        MULSX5  BSS     2
                731 000AA     170 24        MULEND  BSS     2
                732 000AC     172 24        MULSTN  BSS     2
                733                 20            USE     PREVIOUS
GENERATED                                0700
                734 00314     788 20 03000000 MULS33  PTR     0,6
                735 00316     790 20 6C33000A         IMN     6,10,M
                736 000A2     162 24                  UBASE   6,MULSX2
                737 00318     792 20 1F100000         STX     2,MULSX2
                738 0031A     794 20 1F180002         STX     3,MULSX3
                739 0031C     796 20 1F200004         STX     4,MULSX4
                740 0031E     798 20 1F280006         STX     5,MULSX5
                741 00320     800 20 5F10000A         LDX     2,MULSTN
                742 00322     802 20 35040002         LAE     2,2,I
                743 00324     804 20 0698             LXA     3               (XR3)=ADDRESS OF MATRIX A
GENERATED                                0700
                744 00326     806 20 35040004         LAE     4,2,I
                745 00328     808 20 06A0             LXA     4               (XR4)=ADDRESS OF MATRIX B
GENERATED                                0700
                746 0032A     810 20 35040006         LAE     6,2,I
                747 0032C     812 20 06A8             LXA     5               (XR5)=ADDRESS OF MATRIX C
GENERATED                                0700
                748 0032E     814 20 6C2A0020         IMP     5,32,M
                749 00330     816 20 1F28000B         STX     5,MULEND        END OF MATRIX FLAG
                750 00332     818 20 6C2B0020         IMN     5,32,M
                751 00334     820 20 5C120002         LDX     2,2,M           (XR2)=LOOP COUNTER
                752 00336     822 20 1181     MULS11  LDA     2,3
                753 00337     823 20      9201        MLF     2,4
                754 00338     824 20 3A81             STA     2,5
                755 00339     825 20      1187        LDA     14,3
                756 0033A     826 20 9203             MLF     6,4
                757 0033B     827 20      BA81        ADF     2,5
                758 0033C     828 20 3A81             STA     2,5
                759 0033D     829 20      118D        LDA     26,3
                760 0033E     830 20 9205             MLF     10,4
                761 0033F     831 20      BA81        ADF     2,5
                762 00340     832 20 3A81             STA     2,5
GENERATED                                0700
                763 00342     834 20 6C1A0004         IMP     3,4,M
```

VERSION K20A0503 DECK NAME=*SUBLIB*

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM		SOURCE	
764	00344	836	20	6C2A0004		IMP	5,4,M
765	00346	838	20	6C130001		IMN	2,1,M
766	00348	840	20	64300336		JGU	MULS11
767	0034A	842	20	5C120002		LDX	2,2,M
768	0034C	844	20	6C18000C		IMN	3,12,M
769	0034E	846	20	6C22000C		IMP	4,12,M
770	00350	848	20	27290008		ICL	5,MULEND
771	00352	850	20	64300356		JGU	MULS22
772	00354	852	20	64300336		JGU	MULS11
773	00356	854	20	5F100000	MULS22	LDX	2,MULSX2
774	00358	856	20	5F180002		LDX	3,MULSX3
775	0035A	858	20	5F200004		LDX	4,MULSX4
776	0035C	860	20	5F280006		LDX	5,MULSX5
777	0035E	862	20	6C32000A		IMP	6,10,M
778	00360	864	20	7300		RTA	0,6
779						DBASE	6

VERSION K20A0503 DECK NAME=*SUBLIB*

DIAGNOSTICS LINE ADRES DADRES LC PROGRAM SOURCE

```
                                        *
                                        *
                                        **********THIS PROGRAM MULT. A 3X3 BY A 3X3 MATRIX
                                        **********THE CALLING SEQUENCE US AS FOLLOWS
                                        **********     JS      MUL33
                                        ***********  JRU     *+8
                                        **********     PTR     M1
                                        **********     PTR     M2
                                        **********     PTR     M3
GENERATED                                       0700
          781                                           EVEN
          782                                           ENTRY   MUL33
          783                 20                        USE     20
          784                 24                        TEMP    24
          785 000AE     174   24          MU3SV   BSS     2
          786 00080     176   24          MU32    BSS     2
          787 00082     178   24          MU33    BSS     2
          788 00084     180   24          MU34    BSS     2
          789 00086     182   24          MU35    BSS     2
          790 00088     184   24          MULKT   BSS     2                   END ADDRESS FOR MUL33
          791 0008A     186   24          MU3RTN  BSS     2
          792                 20                        USE     PREVIOUS
          793 00362     866   20 03000000 MUL33   PTR     0,6
          794 00364     868   20 6C33000C           IMN     6,12,M
          795 000AE     174   24                    UBASE   6,MU3SV
          796 00366     870   20 1F100002           STX     2,MU32              SAVE REGISTERS
          797 00368     872   20 1F180004           STX     3,MU33
          798 0036A     874   20 1F200006           STX     4,MU34
          799 0036C     876   20 1F280008           STX     5,MU35
          800 0036E     878   20 5F10000C           LDX     2,MU3RTN            X2=RETURN ADDR.
          801 00370     880   20 35040002           LAE     2,2,I
          802 00372     882   20 0648               LXA     5                   X5= PTR TO INPUT MAT 1 =I
GENERATED                               0700
          803 00374     884   20 35040004           LAE     4,2,I
          804 00376     886   20 0640               LXA     4                   X4=PTR TO INPUT MAT 2 = J
GENERATED                               0700
          805 00378     888   20 35040006           LAE     6,2,I
          806 0037A     890   20 0698               LXA     3                   X3=PTR TO OUTPUT MAT =K
GENERATED                               0700
          807 0037C     892   20 5C120002             LDX     2,2,M             INITIALIZE LOOP COUNTER
          808 0037E     894   20 6C1A0020           IMP     3,32,M
          809 00380     896   20 1F18000A           STX     3,MULKT             SAVE END OF OUTPUT MATRIX
          810 00382     898   20 6C180020           IMN     3,32,M
          811 00384     900   20 1281     MUL33A    LDA     2,5                 COMPUTE ONE ELEMENT OF OUTPUT
          812 00385     901   20      5280          LDB     0,5
          813 00386     902   20 640401CC           JS      MULFD
          814 00388     904   20 3981               STA     2,3
          815 00389     905   20      7980          STB     0,3
          816 0038A     906   20 1287               LDA     14,5
          817 0038B     907   20      5286          LDB     12,5
          818 0038C     908   20 6C220004           IMP     4,4,M               INCREMENT XR4
          819 0038E     910   20 640401CC           JS      MULFD
          820 00390     912   20 9980               AFD     0,3
          821 00391     913   20      3981          STA     2,3
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            822 00392    914 20 7980            STB     0,3
            823 00393    915 20     1280        LDA     26,5
            824 00394    916 20 528C            LDB     24,5
GENERATED                       0700
            825 00396    918 20 6C220004        IMP     4,4,M      INCREMENT XR4
            826 00398    920 20 640401CC        JS      MULFD
            827 00039A   922 20 9980            AFD     0,3
            828 00039B   923 20     3981        STA     2,3
            829 00039C   924 20 7980            STB     0,3
GENERATED                       0700
            830 00039E   926 20 6C230008          IMN   4,8,M      SET POINTERS FOR NEXT PASS
            831 003A0    928 20 6C140004          IMP   3,4,M
            832 003A2    930 20 6C2A0004          IMP   5,4,M
            833 003A4    932 20 6C130001          IMN   2,1,M      DECREMENT LOOP COUNTER
            834 003A6    934 20 643003B4          JGU   MUL33A
            835 003A8    936 20 5C120002          LDX   2,2,M      RESET LOOP COUNTER AND POINTERS
            836 003AA    938 20 6C22000C          IMP   4,12,M
            837 003AC    940 20 6C2B000C          IMN   5,12,M
            838 003AE    942 20 2719000A          ICL   3,MULKT    CHECK FOR END OF MATRIX
            839 003B0    944 20 643003B4          JGU   MUL33C
            840 003B2    946 20 60AE              JU    MUL33A
GENERATED                       0700
            841 003B4    948 20 5F100002 MUL33C LDX     2,MU32       RESTORE REGS.
            842 003B6    950 20 5F180004        LDX     3,MU33
            843 003B8    952 20 5F200006        LDX     4,MU34
            844 003BA    954 20 5F280008        LDX     5,MU35
            845 003BC    956 20 6C32000C          IMP   6,12,M
            846 003BE    958 20 7300            RTA     0,6
            847                                   DBASE  6
```

```
VERSION K20A0503      DECK NAME=*SUBLIB*                                                                  PAGE  28

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
                                                  *
                                                  *
                                                  ********* THIS PROGRAM MUL A3X3 MATRIX BY A3X1 VECTOR
                                                  *********  THE CALLING SEQUENCE IS AS FOLLOWS
                                                  *********  JS   MULD31
                                                  **********  JRU      *+8
                                                  *********  PTR  M1
                                                  *********  PTR  V1
                                                  *********  PTR  V2
GENERATED                               0700
            849                                        EVEN
            850                                        ENTRY     MULD31
            851               20                       USE      20
            852               24                       TEMP      24
            853 000BC     188 24               MUL1SV BSS      2
            854 000BE     190 24               MULS2  BSS      2
            855 000C0     192 24               MULS3  BSS      2
            856 000C2     194 24               MULS4  BSS      2
            857 000C4     196 24               MULS5  BSS      2
            858 000C6     198 24               MUL1TN BSS      2
            859               20                       USE      PREVIOUS
            860 003C0     960 20 03000000  MULD31 PTR      0,6
            861 003C2     962 20 6C33000A         IMN      6,10,M
            862 000BC     188 24                    UBASE  6,MUL1SV
            863 003C4     964 20 1F100002         STX      2,MULS2          SAVE REGISTERS
            864 003C6     966 20 1F180004         STX      3,MULS3
            865 003C8     968 20 1F200006         STX      4,MULS4
            866 003CA     970 20 1F280008         STX      5,MULS5
            867 003CC     972 20 5F10000A         LDX      2,MUL1TN
            868 003CE     974 20 35040002         LAE     2,2,I           X5=PTR TO MATRIX=I
            869 003D0     976 20 06A8             LXA     5
GENERATED                               0700
            870 003D2     978 20 35040004         LAE     4,2,I           X4=PTR TO INPUT VECTOR=J
            871 003D4     980 20 06A0             LXA     4
GENERATED                               0700
            872 003D6     982 20 35040006         LAE     6,2,1           X3=PTR TO OUTPUT VECTOR=K
            873 003D8     984 20 0698             LXA     3
GENERATED                               0700
            874 003DA     986 20 5C120002         LDX      2,2,M           X2=ELEMENT COUNT
            875 003DC     988 20 1281      MUL31D LDA      2,5            DOUBLE PRECISION WORD
            876 003DD     989 20       5280       LDB      0,5
            877 003DE     990 20 640401CC         JS       MULFD
            878 003E0     992 20 3981             STA      2,3
            879 003E1     993 20       7980       STB      0,3
            880 003E2     994 20 1287             LDA      14,5
            881 003E3     995 20       5286       LDB      12,5
            882 003E4     996 20 6C220004         IMP      4,4,M       IX4=IX4+4
            883 003E6     998 20 640401CC         JS       MULFD
            884 003E8    1000 20 9980             AFD      0,3
            885 003E9    1001 20       3981       STA      2,3
            886 003EA    1002 20 7980             STB      0,3
            887 003EB    1003 20       1280       LDA      26,5
            888 003EC    1004 20 528C             LDB      24,5
GENERATED                               0700
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            889 003EE   1006 20 6C220004        IMP     4,4,M      IX4=IX4+4
            890 003F0   1008 20 640401CC        JS      MULFD
            891 003F2   1010 20 9980            AFD     0,3
            892 003F3   1011 20      3981       STA     2,3
            893 003F4   1012 20 7980            STB     0,3
GENERATED                           0700
            894 003F6   1014 20 6C230008        IMN     4,8,M
            895 003F8   1016 20 6C130001        IMN     2,1,M
            896 003FA   1018 20 64300408        JGU     MUL31C
            897 003FC   1020 20 5F100002        LDX     2,MULS2    RESTORE REGISTERS
            898 003FE   1022 20 5F180004        LDX     3,MULS3
            899 00400   1024 20 5F200006        LDX     4,MULS4
            900 00402   1026 20 5F280008        LDX     5,MULS5
            901 00404   1028 20 6C32000A        IMP     6,10,M
            902 00406   1030 20 7300            RTA     0,6
GENERATED                           0700
            903 00408   1032 20 6C1A0004 MUL31C IMP     3,4,M      K=K+4
            904 0040A   1034 20 6C2A0004        IMP     5,4,M
            905 0040C   1036 20 60B0            JU      MUL31D
            906                                   DBASE  6
            907                                   END
```

STATISTICS

```
TOTAL SHORTS   436
TOTAL LONGS    224
TOTAL INSTRUCTIONS    660
PERCENT SHORT   66.1
GENERATED NOPS     49
THEORETICAL PERCENT NOP LOADING   13.7
ACTUAL PERCENT NOP LOADING     5.3
```

```
DECK NAME=*SUBLIB*                              *****ERROR MESSAGES*****

LINE NUMBER                         DIAGNOSTIC
1      75...........................ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
```

XREF 1 DECK NAME=*SUBLIB* SRC 2000 CROSS REFERENCE DICTIONARY PAGE 1

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
00036	54	24		ARG	250	303	304	307	308	312	362	363					
00048	72	24		ATNRTN	256												
0002A	42	24		ATNSV	245	260											
00042	66	24		ATNYT	254	289	290	294	295	360	361	366	367	371	377	386	387
						388											
00146	326	20		ATN0	292	286											
00148	331	20		ATN1	297	284											
00151	337	20		ATN2	303	297											
0015E	350	20		ATN31	314	309											
00158	344	20		ATN3	310	306											
00169	361	20		ATN4	324	317											
00180	384	20		ATN5	341	323											
001B1	433	20		ATN6	384	365											
0005C	92	20		AUD	91	560											
00060	96	20		AUD	53	555	556										
00000	0	20		AUSC	3	79	80	163	187	188	262	263	529	530			
0002E	46	20		AUTN	27	353											
00002	2	20		A3SC	4	161											
00030	48	20		A3TN	28	350											
00004	4	20		A5SC	5	159											
00032	50	20		A5TN	29	347											
00006	6	20		A7SC	6	157											
00034	52	20		A7TN	30	344											
00008	8	20		A9SC	7	156											
00036	54	20		A9TN	31	341											
00016	22	20		BIT01	33	392											
0001C	28	20		BIT2	18	223											
0001E	30	20		BIT9	19	224											
00064	100	20		BUD	55	552											
000C4	196	20		BUIS2	153	101	106										
00040	64	24		C	253	322	340	357									
00014	20	24		COMRTN	72	153	165										
00026	38	20		C1	23	206											
0000A	10	20		C1S23	8	81	567										
00028	40	20		C2	24	207											
0003C	60	20		C31S23	35	359											
0011C	284	20		DECATN	258	241											
000D2	210	20		DECS0	183	169											
000E1	225	20		DECS1	194	192											
000F2	242	20		DECS2	210	216											
000EC	236	20		DECS3	205	201											
000FC	252	20		DECS4	217	204											
0002C	44	24		DETN1	246	261	381										
0002E	46	24		DETN4	247	264	380										
00012	18	20		DFONE	12	14	305	364	570								
00028	40	24		DSQRTN	161												
00018	24	24		DSQSV	173	165											
0021A	538	20		DVDOUT	503	506											
001F6	502	20		DVFD	469	283	313	335	379	459	558	569					
00222	546	20		EXP	524	509											
00020	32	20		EXPMOK	20	221	391										
00086	134	24		EXPRTN	522												
0006E	110	24		EXPSV	513	526											

XREF 1 DECK NAME=*SUBLIB* SAC 2000 CROSS REFERENCE DICTIONARY PAGE 2

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES										
0025A	602		20	EXP1	567	565										
0025C	604		20	EXP2	568	566										
00082	130		24	EXM1	520	528	577									
00084	132		24	EXM4	521	527	576									
0003A	58		20	E31	34	402										
00015	22		20	FMONE	15	33	95									
00014	20		20	FONE	13	310										
00036	56		20	FRACMS	32	401										
00119	281		20	IMARG	235	191										
0003E	62		20	IRT3T	36	331										
00058	88		20	LN2U2	49	546										
00054	84		20	LOG2E	47	531										
00020	32		24	M	177	197	199	205	210							
00018	24		20	MANTIS	16	195										
002D2	722		20	MATDAD	681	672										
00098	152		24	MATD2	675	683	684	716								
0009A	154		24	MATD3	676	685	717									
0009C	156		24	MATD4	677	686	718									
0009E	158		24	MATD5	678	687	719									
002EE	750		20	MATLOP	696	715										
000A0	160		24	MATMTN	679	688										
003C0	960		20	MULD31	860	850										
000AA	170		24	MULEND	731	749	770									
001CC	460		20	MULFD	422	229	333	412	532	547	551	574	813	819	826	877	883
						890										
000B8	184		24	MULKT	740	809	838									
001C8	454		20	MULOUT	452	455										
000AC	172		24	MULSIN	732	741										
000A2	162		24	MULSX2	727	736	737	773								
000A4	164		24	MULSX3	728	738	774									
000A6	166		24	MULSX4	729	739	775									
000A8	168		24	MULSX5	730	740	776									
00336	822		20	MULS11	752	766	772									
000BE	190		24	MULS2	854	863	897									
00356	854		20	MULS22	773	771										
000C0	192		24	MULS3	855	864	898									
00314	788		20	MULS33	734	724										
000C2	194		24	MULS4	856	865	899									
000C4	196		24	MULS5	857	866	900									
000BC	188		24	MULISV	853	862										
000C5	197		24	MULITN	858	867										
00408	1032		20	MUL31C	903	896										
003DC	988		20	MUL31D	875	905										
00362	866		20	MUL33	793	782										
00384	900		20	MUL33A	811	834	840									
00384	900		20	MUL33C	841	839										
000BA	186		24	MU3RTN	791	800										
000AE	174		24	MU3SV	785	795										
000B0	176		24	MU32	786	796	841									
000B2	178		24	MU33	787	797	842									
000B4	180		24	MU34	788	798	843									
000B6	182		24	MU35	789	799	844									
00078	120		24	N	516	538	575									

XREF 1 DECK NAME=SUBLIB SRC 2000 CROSS REFERENCE DICTIONARY PAGE 3

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
0001A	26	20	NONE	17	219											
001EC	492	20	NOFLO	451												
001FC	508	20	NZ1	474	472											
00205	517	20	NZ2	482	480											
0000C	12	20	ONE	9	198											
00110	272	20	OUT	230	193	237										
00042	66	20	PI	38	369	370	373	378								
00046	70	20	PI02	40	287	288	384	385								
0004A	74	20	PI06	42	334											
001F2	498	20	PRODZ	454	426	436										
00180	422	20	Q01	378	280	372	374									
00190	413	20	Q02	369	277											
001A1	417	20	Q03	373	269											
001A3	419	20	Q04	375	272											
00030	48	24	QLOC	248	270	273	278	281	291	296	368	389				
00138	312	20	QUAD1	280	276											
00132	305	20	QUAD12	275	266											
0012E	302	20	QUAD4	272	268											
0006C	108	24	RETD	467												
00055	85	24	RETM	420												
0004C	76	20	RT3T	43	326	332										
00098	152	20	SCDT8	114	111											
0009A	154	20	SCDTJ	115	114											
000BC	188	20	SCEX	149	125	134	142									
000A5	165	20	SCJ1	126	115											
000AE	174	20	SCJ2	135	116											
000B5	182	20	SCJ3	143	117											
0009D	157	20	SCJ4	118												
00016	22	24	SCTURN	73	96											
00068	104	20	SINCOS	75	59											
00000	0	24	SINSV	62	77											
0002A	42	20	SQRT2	25	227											
0001A	26	24	SQT1	174	186	232										
0001C	28	24	SQT2	175	189	230										
0001E	30	24	SQT4	176	190	231										
00138	315	20	START	282	271	274	279									
0005C	92	24	TA	463	477	482	484	488	494	501						
0004A	74	24	TAB	415	424	442	443	446	447	448	451					
00058	88	24	TAC	462	471	474	475	486	487	498	499					
00060	96	24	TH	464	485	490										
00026	38	24	TEMP2	180	218	225										
00024	36	24	TEMP	179	194	220										
00032	50	24	TEM1	249	265	292	298	299	302	327	328	334	355	394	396	399
00010	16	20	THREE	11	110											
00064	100	24	TP	465	491	492	495	496	497	500						
00068	104	24	TQ	466	478	489	493	502								
0000E	14	20	TWO	10												
00050	80	24	TXA	417	427	431	441	450								
0004E	78	24	TXB	416	429	432	433	445								
00054	84	24	TYA	419	435	444	449									
00052	82	24	TYB	418	430	439	440									
00002	2	24	T0SC	63	85	109	112	113								
00004	4	24	T1SC	64	83	88	90	97	155	158	160	162				

SKC 2000 CROSS REFERENCE DICTIONARY

XREF 1 DECK NAME=*SUBLIB*

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES
00006	5	24	T2SC	65 82 89 100 105 154 164
00008	8	24	T3SC	66 99 108 119 133 137 148
0000A	10	24	T4SC	67 98 104 107 118 147
0000C	12	24	T5SC	68 103 124 128 141 144
0000E	14	24	T6SC	69 102 140 143
00272	626	20	VECADD	542 584
0008E	142	24	VECATN	590 598
00088	136	24	VECA3	587 594 595 620
0008A	138	24	VECA4	588 596 621
0008C	140	24	VECA5	589 597 622
00096	150	24	VECSTN	634 642
002A2	674	20	VECSUB	636 628
00090	144	24	VECS3	631 638 639 664
00092	146	24	VECS4	632 640 665
00094	148	24	VECS5	633 641 666
00022	34	20	XC	21 200
00024	36	20	XE	22 203
001D2	466	20	XNZ	427 425
00070	112	24	XTD1	514 533 534 543 544 553 554 557 561 562 568
00074	116	24	XTD2	515 541 542 545
00010	16	24	X1SV	70 78 150
00012	18	24	X4SV	71 91 149
0007C	124	24	Y	518 549 563
001B8	440	20	YCOMP	390 320 338
0007A	122	24	YD	517 548 550 559 564
00050	80	20	YLIMIT	45 316
001DE	478	20	YNZ	437 435
00046	70	24	YTURN	255 390 407
00022	34	24	Y0	178 208 211 212 214
0007E	126	24	Z	519 571 572 573
00012	18	20	ZERO	14 86 96 122 123 126 127 131 132 135 136 235 236 292 293 300 301 311 321 375 376 395 536
0021E	542	20	ZOOO	505 473 481
0003A	58	24	ZTN	251 314 315 318 319 324 325 329 330 336 337 354 400 404 405
0003E	62	24	ZT2N	252 342 345 348 351 406

VERSION R2040503 DECK NAME=*INIT *

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DIAGNOSTICS LINE ADRES OADRES LC  PROGRAM                                SOURCE
                                   $FAP INIT
                                   *
                                   *
                                   *    INITIALIZATION DATA AREA
                                   *
                                   *
                                   *    GEANS WORLD COMMON VARIABLES DATA AREA
                                   *
     1                        4    WLDCOM   COMMON  4
                                   *
     2 00000       0    4         SRT1     BSS     4          GYRO ROTOR 1 SPEED ACCUMULATION
     3 00004       4    4         SRT2     BSS     4          GYRO ROTOR 2 SPEED ACCUMULATION
     4 00008       8    4         RATM     BSS     4          NEGATIVE R.A.I. PULSE ACCUMULATION
     5 0000C      12    4         RATP     BSS     4          POSITIVE R.A.I. PULSE ACCUMULATION
     6 00010      16    4         ROT1     BSS     2          GYRO 1 ROTOR SPEED ( REV/SECOND )
     7 00012      18    4         ROT2     BSS     2          GYRO 2 ROTOR SPEED ( REV/SECOND )
     8 00014      20    4         DVAG     BSS     4          ACCUMULATED DELT VX
     9 00018      24    4         DVYG     BSS     4          ACCUMULATED DELT VY
    10 0001C      28    4         DVZG     BSS     4          ACCUMULATED DELT VZ
    11 00020      32    4         DPVV     BSS     4          DOPPLER VERTICAL VELOCITY ACCUMULATION
    12 00024      36    4         DPDV     BSS     4          DOPPLER DRIFT     VELOCITY ACCUMULATION
    13 00028      40    4         DPHV     BSS     4          DOPPLER HEADING   VELOCITY ACCUMULATION
    14 0002C      44    4         GMT      BSS     4          GREENWICH MEAN TIME
    15 00030      48    4         BTE1     BSS     2          BITE ACTUAL STATE MASK WORD 1
    16 00032      50    4         BTE3     BSS     2          BITE ACTUAL STATE MASK WORD 3
    17 00034      52    4         R1CT     BSS     2          COUNTER FOR ROTOR 1 SPEED FAULT
    18 00036      54    4         R2CT     BSS     2          COUNTER FOR ROTOR 2 SPEED FAULT
    19 00038      56    4         CIPM     BSS     2          INPUT POWER MONITOR COUNTER
    20 0003A      58    4         RAT      BSS     2          REDUNDANT AXIS TORQUING (PULSES)
    21 0003C      60    4         RATL     BSS     2          COUNTER FOR RAT
    22 0003E      62    4         DVX      BSS     4          INPUT DELTA VX
    23 00042      66    4         DVY      BSS     4          INPUT DELTA VY
    24 00046      70    4         DVZ      BSS     4          INPUT DELTA VZ
    25 0004A      74    4         CYLE     BSS     2          OUT-OF-TIME FLAG
    26 0004C      76    4         VRTV     BSS     2          DOPPLER VERTICAL VELOCITY
    27 0004E      78    4         DRFV     BSS     2          DOPPLER DRIFT     VELOCITY
    28 00050      80    4         HDGV     BSS     2          DOPPLER HEADING   VELOCITY
    29 00052      82    4         CTM1     BSS     2          PHASE TIMER
    30 00054      84    4         CTM2     BSS     2          INTERNAL SEQUENCING COUNTER
    31 00056      86    4         CTM3     BSS     2          INTERNAL SEQUENCING COUNTER
    32 00058      88    4         TIME     BSS     4          TIME FROM SYSTEM TURN ON (SECONDS)
    33 0005C      92    4         T0       BSS     4          TIME AT ENTRY TO NAV
    34 00060      96    4         ITER     BSS     2          ITERATION COUNTER
    35 00062      98    4         PHAS     BSS     2          AUTOMATIC SEQUENCING PHASE
    36 00064     100    4         NAVF     BSS     2          IN-NAVIGATION MODE FLAG (2/3 - MAN/AUTO)
    37 00066     102    4         DATA     BSS     2          SYSTEM DATA SWITCH (0-7)
    38 00068     104    4         PUSH     BSS     2          PUSHBUTTON SWITCH (0-31)
    39 0006A     106    4         TEST     BSS     2          PRESS TO TEST SWITCH (0/-1)
    40 0006C     108    4         MODE     BSS     2          SYSTEM MODE SWITCH
    41 0006E     110    4         LITE     BSS     2          CDU LIGHTS (SOFTWARE)
    42 00070     112    4         TMPR     BSS     2          TEMP STORAGE LOCATION
                                   *
                                   *    SOOL DATA AREA
                                   *
    43 00072     114    4         04F      BSS     2      01  FRAME MARKER
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VERSION K20A0503 DECK NAME=*INIT *

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM				SOURCE	
44	00074	116	4		040	BSS	2	02	MSH OF GMT
45	00076	118	4		041	BSS	2	03	LSH OF GMT
46	00078	120	4		042	BSS	2	04	MSH OF LATITUDE
47	0007A	122	4		043	BSS	2	05	LSH OF LATITUDE
48	0007C	124	4		044	BSS	2	06	MSH OF LONGITUDE
49	0007E	126	4		045	BSS	2	07	LSH OF LONGITUDE
50	00080	128	4		047	BSS	2	08	MSH OF VERTICAL VELOCITY
51	00082	130	4		048	BSS	2	09	LSH OF VERTICAL VELOCITY
52	00084	132	4		049	BSS	2	10	MSH OF EAST VELOCITY
53	00086	134	4		04A	BSS	2	11	LSH OF EAST VELOCITY
54	00088	136	4		04B	BSS	2	12	MSH OF NORTH VELOCITY
55	0008A	138	4		04C	BSS	2	13	LSH OF NORTH VELOCITY
56	0008C	140	4		046	BSS	2	14	I.N.S. ALTITUDE
57	0008E	142	4		06C	BSS	2	15	AHRS HEADING
58	00090	144	4		060	BSS	2	16	AHRS PITCH
59	00092	146	4		06E	BSS	2	17	AHRS ROLL
60	00094	148	4		018	BSS	2	18	RESET,IMU,DPU,EAU,CDU,DCU,BATT BITE BITS
61	00096	150	4		030	BSS	2	19	3RD,4TH,5TH,6TH, RIGHT NUMERIC
62	00098	152	4		031	BSS	2	20	4 DISCRETES; R.ALPHA; 1ST,2ND R. NUMERIC
63	0009A	154	4		032	BSS	2	21	2ND,3RD,4TH,5TH LEFT NUMERIC
64	0009C	156	4		033	BSS	2	22	1ST,2ND WAYPOINT; L. ALPHA; 1ST L.NUMERIC
65	0009E	158	4		034	BSS	2	23	1ST,2ND FROM< 1ST,2ND TO
66	000A0	160	4		035	BSS	2	24	CDU/ACDU DISPLAY LIGHTS
67	000A2	162	4		023	BSS	2	25	HEADING
68	000A4	164	4		021	BSS	2	26	PITCH
69	000A6	166	4		022	BSS	2	27	ROLL
70	000A8	168	4		024	BSS	2	28	STEERING SIGNAL
71	000AA	170	4			BSS	2	29	BLANK
72	000AC	172	4		014	BSS	2	30	SEQ CNT,G1,2 RED,G1,2 TERM SHUTDOWN BITS
73	000AE	174	4		072	BSS	2	31	TORQUE FOR GIMBALS 1 AND 2
74	000B0	176	4		071	BSS	2	32	TORQUE FOR GIMBALS 3 AND 4
75	000B2	178	4		040	BSS	2	33	ROTOR 1,2, ROTOR SPEED
76	000B4	180	4		04E	BSS	2	34	RAT AND VERTICAL VELOCITY
77	000B6	182	4		050	BSS	2	35	-,+ DELTA VX
78	000B8	184	4		051	BSS	2	36	-,+ DELTA VY
79	000BA	186	4		052	BSS	2	37	-,+ DELTA VZ
80	000BC	188	4		053	BSS	2	38	GIMBAL 1 RESOLVER
81	000BE	190	4		054	BSS	2	39	GIMBAL 2 RESOLVER
82	000C0	192	4		055	BSS	2	40	GIMBAL 3 RESOLVER
83	000C2	194	4		056	BSS	2	41	GIMBAL 4 RESOLVER
84	000C4	196	4		058	BSS	2	42	DATA,MODE,TST AND PUSHBUTTON SWITCHES
85	000C6	198	4		059	BSS	2	43	BITE BITS
86	000C8	200	4		05E	BSS	2	44	BITE BITS
87	000CA	202	4		025	BSS	2	45	BAROMETRIC ALTITUDE AND BITE BITS
88	000CC	204	4		060	BSS	2	46	DRIFT AND HEADING VELOCITY
89	000CE	206	4			BSS	2	47	SPARE
90	000D0	208	4			BSS	2	48	SPARE
91	000D2	210	4		05A	BSS	2	49	DELTA LATITUDE (FIX)
92	000D4	212	4		062	BSS	2	50	DELTA LONGITUDE (FIX)
93	000D6	214	4		057	BSS	2	51	VERTICAL DIFFERENCE VELOCITY
94	000D8	216	4		058	BSS	2	52	CROSS TRACK DIFFERENCE VELOCITY
95	000DA	218	4		059	BSS	2	53	ALONG TRACK DIFFERENCE VELOCITY
96	000DC	220	4		063	BSS	2	54	A11 ALIGNMENT MATRIX
97	000DE	222	4		064	BSS	2	55	A21 ALIGNMENT MATRIX
98	000E0	224	4		065	BSS	2	56	A31 ALIGNMENT MATRIX

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VERSION K20A0503      DECK NAME=*INIT  *                                                                    PAGE   3

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                            SOURCE
             99 000E2   226  4          066       BSS      2          57   A12 ALIGNMENT MATRIX
            100 000E4   228  4          067       BSS      2          58   A22 ALIGNMENT MATRIX
            101 000E6   230  4          068       BSS      2          59   A32 ALIGNMENT MATRIX
            102 000E8   232  4          069       BSS      2          60   A13 ALIGNMENT MATRIX
            103 000EA   234  4          06A       BSS      2          61   A23 ALIGNMENT MATRIX
            104 000EC   236  4          06B       BSS      2          62   A33 ALIGNMENT MATRIX
            105 000EE   238  4                    BSS      2          63   SPARE
            106 000F0   240  4                    BSS      2          64   SPARE
            107 000F2   242  4          AJ        BSS      36              ALIGNMENT MATRIX
                                        *
            108                  5      NIACOM    COMMON 5                 NAV.INIT.AND ALIGN COMMON DATA
                                        *
                                        *   DELTA V'S IN I.J.K SPACE IN M/SEC/CC
                                        *
            109 00000     0  5          DVXI      BSS      4
            110 00004     4  5          DVYJ      BSS      4
            111 00008     8  5          DVZK      BSS      4
            112 0000C    12  5          A         BSS      36              TEMP 3X3 MATRIX A
            113 0000C    12  5          DCAR      EQU      A
            114 00030    48  5          FLGN      BSS      2               SAVE AJ(I.J) FLAG
            115 00032    50  5          SAVT      BSS      4               TIME OF LAST AJ ROTATION
            116 00036    54  5          ASCH      BSS      2               ALIGNMENT SCHEDULER
            117 00036    54  5          NSCH      EQU      ASCH            NAVIGATION SCHEDULER
            118 00038    56  5          CD04D     BSS      12              CD0(I)*DELT    I=4.6
                                        *
            119                  6      NICOM     COMMON 6                 NAV AND INIT COMMON DATA
                                        *
            120 00000     0  6          RAD       BSS      4               RADIUS IN METERS
            121 00004     4  6          RXYZ      BSS      4               SQRT(X**2+Y**2+Z**2)
            122 00008     8  6          LAT       BSS      4               EARTH RELATIVE LATITUDE
            123 0000C    12  6          LONG      BSS      4               EARTH RELATIVE LONGITUDE
            124 00010    16  6          DCON      BSS      2               CLOCK CYCLE COUNTER
            125 00012    18  6          CHAJ      BSS      2
                                        *
                                        *   VELOCITY IN INERTIAL SPACE IN M/SEC
                                        *
            126 00014    20  6          VX        BSS      4
            127 00018    24  6          VY        BSS      4
            128 0001C    28  6          VZ        BSS      4
            129 00020    32  6          LONB      BSS      4               LONGITUDE DISPLAY BIAS
            130 00024    36  6          LATB      BSS      4               LATITUDE DISPLAY BIAS
            131 00028    40  6          LGO       BSS      4               LONGITUDE AT ENTRY TO NAV
            132 0002C    44  6          S2GC      BSS      4               (SIN(GEOCENTRIC LATITUDE))**2
            133 00030    48  6          C2GC      BSS      4               (COS(GEOCENTRIC LATITUDE))**2
            134 00034    52  6          SGCL      BSS      4               SIN(GEOCENTRIC LATITUDE)
            135 00038    56  6          CGCL      BSS      4               COS(GEOCENTRIC LATITUDE)
            136 0003C    60  6          AB        BSS      36              (SCALE FACTOR)*(ALPHA-BETA) MATRIX AB
            137 00060    96  6          GM        BSS      36
            138 00084   132  6          VI        BSS      36              POSITION UPDATE MATRIX
            139 000A8   168  6          TEM       BSS      12
            140 000B4   180  6          TEM0      BSS      4
            141 000B8   184  6          TEM1      BSS      4
            142 000BC   188  6          TEM2      BSS      4
                                        *  POSITION IN INERTIAL SPACE. METERS
                                        *
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VERSION K20A0503     DECK NAME=*INIT  *                                                                    PAGE   4

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            143 000C0   192  6         X         BSS     4
            144 000C4   196  6         Y         BSS     4
            145 000C8   200  6         Z         BSS     4
                                       *
                                       *   SUMMATION OF DELTA V'S IN I.J.K SPACE IN M/SEC/CC
                                       *
            146 000CC   204  6         SDVI      BSS     4
            147 000D0   208  6         SDVJ      BSS     4
            148 000D4   212  6         SDVK      BSS     4
            149 000D8   216  6         TLPO      BSS     4              TIME OF LAST PRINTOUT
                                       *
            150                  8     IACOM     COMMON  8              INIT AND ALIGN DECKS COMMON DATA
                                       *
            151 00000     0  8         VAXI      BSS     12
            152 0000C    12  8         AK1T      BSS     4              G*DT*COS(LAT)
            153 00010    16  8         AK2T      BSS     4              G*DT*SIN(LAT)
            154 00014    20  8         PHA       BSS     4              PHASE ANGLE LAG OF FILTER IN PI RAD
            155 00018    24  8         VAX       BSS     12             SUM OF DVX.DVY.DVZ ERRORS IN M/SEC
            156 0001C    28  8         VAY       EQU     VAX+4
            157 00020    32  8         VAZ       EQU     VAX+8
            158 00024    36  8         NCCD      BSS     2              NUMBER OF CLOCK CYCLES COUNTING FROM
                                       *                                A NEGATIVE NUMBER
            159 00026    38  8         SAMI      BSS     2              SELECT ALIGN MODE INDEX
            160 00028    40  8         MCSI      BSS     2              MODE C SOLUTION INDEX
            161 0002A    42  8         NCCU      BSS     4              NUMBER OF COMPUTER CYCLES INTO MODE
            162 0002E    46  8         XA        BSS     8
            163 00036    54  8         XB        BSS     8
            164 0003E    62  8         XC        BSS     8
            165 00046    70  8         YA1       BSS     4              SUMMATION (EDVX)
            166 0004A    74  8         YA2       BSS     4              SUMMATION (EDVX*SIN(THR))
            167 0004E    78  8         YB1       BSS     4              SUMMATION (EDVY)
            168 00052    82  8         YB2       BSS     4              SUMMATION (EDVY*OMEGA*TIME)
            169 00056    86  8         YC1       BSS     4              SUMMATION (EDVZ*COS(THR))
            170 0005A    90  8         YC2       BSS     4              SUMMATION (EDVZ*SIN(THR))
            171 00046    70  8         YA        EQU     YA1
            172 0005E    94  8         VTB       BSS     4              LOCAL GRAVITY*8.0
            173 00062    98  8         VTC       BSS     4              GL*DELT
            174 00066   102  8         VC1X      BSS     36
            175 00072   114  8         VC2X      EQU     VC1X+12
            176 0007E   126  8         VC3X      EQU     VC1X+24
            177 0008A   138  8         VF1X      BSS     36
            178 00096   150  8         VF2X      EQU     VF1X+12
            179 000A2   162  8         VF3X      EQU     VF1X+24
                                       *
                                       *
            180                  7     MATCOM    COMMON  7              MATRIX.VECTOR.AND MISCELLANEOUS DATA
                                       *
            181 00000     0  7         SWT       BSS     4              SIN(OMEGA T)
            182 00004     4  7         CWT       BSS     4              COS(OMEGA T)
            183 00008     8  7         SGDL      BSS     4              SIN(GEODETIC LATITUDE)
            184 0000C    12  7         CGDL      BSS     4              COS(GEODETIC LATITUDE)
            185 00010    16  7         ALT       BSS     4              ALTITUDE
                                       *
                                       *    GIMBAL RESOLVER POSITION (BIAS EXCLUDED)
                                       *
```

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VERSION K20A0503     DECK NAME=*INIT  *                                                          PAGE   5

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
            186 00014    20  7        RES1     BSS    4
            187 00018    24  7        RES2     BSS    4
            188 0001C    28  7        RES3     BSS    4
            189 00020    32  7        RES4     BSS    4
            190 00024    36  7        SRA      BSS    8          SUM OF 1-(G KNOWN)/(G ACCELERATION)
            191 0002C    44  7        N40      BSS    2
                                      *
                                      *    COSINES OF CORRECTED GIMBAL ANGLES
                                      *
            192 0002E    46  7        C1       BSS    4
            193 00032    50  7        C2       BSS    4
            194 00036    54  7        C3       BSS    4
            195 0003A    58  7        C4       BSS    4
                                      *
                                      *    SINES OF CORRECTED GIMBAL ANGLES
                                      *
            196 0003E    62  7        S1       BSS    4
            197 00042    66  7        S2       BSS    4
            198 00046    70  7        S3       BSS    4
            199 0004A    74  7        S4       BSS    4
                                      *
            200 0004E    78  7        KSN1     BSS    2          GAIN COLUMN INDEX
            201 00050    80  7        KSN2     BSS    2          GAIN COLUMN INDEX
            202 00052    82  7        KSN3     BSS    2          GAIN COLUMN INDEX
            203 00054    84  7        D1       BSS    36         TEMP 3X3 MATRIX
            204 00078   120  7        DG       BSS    36         TOTAL GIMBAL AND THEN TSP2
                                      *
                                      *    STATE MATRIX ( STORED ROW MAJOR ORDER )
                                      *****      E11 = PSI = HEADING
                                      *****      E12 = THETA = PITCH
                                      *****      E13 = PHI = ROLL
                                      *
                                      *
            205 0009C   156  7        E1       BSS    12
            206 000A8   168  7        E2       BSS    12
            207 000B4   180  7        E3       BSS    12
            208 000C0   192  7        OC       BSS    36         VEHICLE TO CASE TRANSFORMATION MATRIX
            209 000E4   228  7        D        BSS    36         TEMP 3X3 MATRIX
            210 00108   264  7        SA       BSS    36         SAVE AJ MATRIX
            211 0012C   300  7        TM       BSS    36         TEMP 3X3 MATRIX
            212 00150   336  7        TM1      BSS    36         TEMP 3X3 MATRIX
            213 00174   372  7        VECT     BSS    34         TABLE OF SUBROUTINE CALLS
            214 00150   336  7        AP       EQU    TM1        TEMP 3X1 VECTOR
            215 0015C   348  7        AT       EQU    TM1+12     TEMP 3X1 VECTOR
            216 000E4   228  7        J3X3     EQU    D
            217 00150   336  7        K3X3     EQU    TM1
            218 00054    84  7        L3X3     EQU    D1
            219 00024    36  7        LCA1     EQU    SRA        LAST GIMBAL 1 COMMAND
            220 00028    40  7        LCA4     EQU    SRA+4      LAST GIMBAL 4 COMMAND
            221 00008     8  7        SL       EQU    SGDL       SIN(LAT) GEODETIC
            222 0000C    12  7        CL       EQU    CGDL       COS(LAT) GEODETIC
                                      *
                                      *
                                      *    GEANS WORLD COMMON CONSTANTS DATA AREA
                                      *
```

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VERSION K20A0503      DECK NAME=*INIT  *                                                               PAGE   6

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
             223              9            CONCOM    COMMON  9
                                           *
             224 00000     0  9 FFFFFFC0 N64       DEC     -64
             225                                   EVEN
R            226 00002     2  9            DCSK      BSS     2
             227 00004     4  9            NFOUR     BSS     2
             228 00006     6  9            NTWO      BSS     2
             229 00008     8  9            NONE      BSS     2
             230 0000A    10  9            ONE       BSS     2
             231 0000C    12  9            TWO       BSS     2
             232 0000C    12  9            FASI      EQU     TWO         10/15 MINUTE (2/3) FINE ALIGNMENT POINTER
             233 0000E    14  9            THREE     BSS     2
             234 00010    16  9            FOUR      BSS     2
             235 00012    18  9            SIX       BSS     2
             236 00014    20  9            SEVEN     BSS     2
             237 00016    22  9            EIGHT     BSS     2
             238 00018    24  9            NINE      BSS     2
             239 0001A    26  9            TEN       BSS     2
             240 0001C    28  9            ZERO      BSS     2
             241 0001E    30  9            FONE      BSS     2
             242 0001C    28  9            DFONE     EQU     ZERO
             243                                   EVEN
             244 00020    32  9            ONHLF     BSS     4
             245 00024    36  9            OMGA      BSS     4           EARTH ROTATION RATE  RAD/SEC
             246 00028    40  9            OMEG      BSS     4            EARTH RATE   PI RAD/SEC
             247 0002C    44  9            KGDL      BSS     4           GEODETIC LATITUDE CONSTANT
             248 00030    48  9            DELT      BSS     4           DELTA TIME = 1/8 SECOND
             249 00034    52  9            D1032     BSS     4           DOUBLE PRECISION 1/32
             250 00038    56  9            D3032     BSS     4           =3/32
                                           *
                                           *    CALIBRATION DATA.    CD01-CD64
                                           *
             251                                   EVEN
             252 0003C    60  9            CD01      BSS     4           X ACCEL SCALE FACTOR  M/SEC/PULSE
             253 00040    64  9            CD02      BSS     4           Y ACCEL SCALE FACTOR  M/SEC/PULSE
             254 00044    68  9            CD03      BSS     4           Z ACCEL SCALE FACTOR  M/SEC/PULSE
             255 00048    72  9            CD04      BSS     4           X ACCEL BIAS   PULSE/SEC
             256 0004C    76  9            CD05      BSS     4           Y ACCEL BIAS   PULSE/SEC
             257 00050    80  9            CD06      BSS     4           Z ACCEL BIAS   PULSE/SEC
             258 00054    84  9            CD07      BSS     4           B11 ACCEL MISALIGNMENT
             259 00058    88  9            CD08      BSS     4           B12 ACCEL MISALIGNMENT
             260 0005C    92  9            CD09      BSS     4           B13 ACCEL MISALIGNMENT
             261 00060    96  9            CD10      BSS     4           B21 ACCEL MISALIGNMENT
             262 00064   100  9            CD11      BSS     4           B22 ACCEL MISALIGNMENT
             263 00068   104  9            CD12      BSS     4           B23 ACCEL MISALIGNMENT
             264 0006C   108  9            CD13      BSS     4           B31 ACCEL MISALIGNMENT
             265 00070   112  9            CD14      BSS     4           B32 ACCEL MISALIGNMENT
             266                                   EVEN
             267 00074   116  9            CD15      BSS     4           B33 ACCEL MISALIGNMENT
             268 00078   120  9            CD16      BSS     4           GYRO TORQUE.G INDEPEN.DYNE-CM
             269 0007C   124  9            CD17      BSS     4           GYRO TORQUE.G INDEPEN.DYNE-CM
             270 00080   128  9            CD18      BSS     4           GYRO TORQUE.G INDEPEN.DYNE-CM
             271 00084   132  9            CD19      BSS     4           G11 GYRO TORQUE.G DEPEN.DYNE-CM/SEC**2
             272 00088   136  9            CD20      BSS     4           G12 GYRO TORQUE.G DEPEN.DYNE-CM/SEC**2
             273 0008C   140  9            CD21      BSS     4           G13 GYRO TORQUE.G DEPEN.DYNE-CM/SEC**2
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VERSION K2040503      DECK NAME=*INIT  *                                                                                      PAGE   7

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                                         SOURCE
            274 00090   144  9          CD22     BSS   4          G21 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            275 00094   148  9          CD23     BSS   4          G22 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            276 00098   152  9          CD24     BSS   4          G23 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            277 0009C   156  9          CD25     BSS   4          G31 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            278 000A0   160  9          CD26     BSS   4          G32 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            279 000A4   164  9          CD27     BSS   4          G33 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            280 000A8   168  9          CD28     BSS   4          RAT GYRO TORQUE  DYNE-CM
            281 000AC   172  9          CD29     BSS   4          RAT GYRO TORQUE  DYNE-CM
            282 000B0   176  9          CD30     BSS   4          SPEED COMP,G INDEPENDENT  DYNE-CM
            283 000B4   180  9          CD31     BSS   4          SPEED COMP,G INDEPENDENT  DYNE-CM
            284 000B8   184  9          CD32     BSS   4          SPEED COMP,G INDEPENDENT  DYNE-CM
            285 000BC   188  9          CD33     BSS   4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            286 000C0   192  9          CD34     BSS   4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            287 000C4   196  9          CD35     BSS   4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            288 000C8   200  9          CD36     BSS   4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            289 000CC   204  9          CD37     BSS   4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            290 000D0   208  9          CD38     BSS   4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            291 000D4   212  9          CD39     BSS   4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            292                                  EVEN
            293 000D8   216  9          CD40     BSS   4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            294 000DC   220  9          CD41     BSS   4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            295 000E0   224  9          CD42     BSS   4          A18P RAT SPEED COMP  DYNE-CM
            296 000E4   228  9          CD43     BSS   4          A19P RAT SPEED COMP  DYNE-CM
            297 000E8   232  9          CD44     BSS   4          STARTING LOCUS            PI RADIANS
            298 000EC   236  9          CD45     BSS   4          BETA(1Z) MISALIGNMENT   PI RADIANS
            299 000F0   240  9          CD46     BSS   4          GIMBAL 1 RESOLVER BIAS  PI RADIANS
            300 000F4   244  9          CD47     BSS   4          GIMBAL 2 RESOLVER BIAS  PI RADIANS
            301 000F8   248  9          CD48     BSS   4          GIMBAL 3 RESOLVER BIAS  PI RADIANS
            302 000FC   252  9          CD49     BSS   4          GIMBAL 4 RESOLVER BIAS  PI RADIANS
            303 00100   256  9          CD50     BSS   4          PLATFORM AZIMUTH ALIGN IN PI RADIANS
            304 00104   260  9          CD51     BSS   4          PLATFORM ELEVATION ALIGN IN PI RADIANS
            305 00108   264  9          CD52     BSS   4          VERTICAL DAMPING CONSTANT,
                                        *                         0.59594852 IN M/SEC/M*2**31
            306 0010C   268  9          CD53     BSS   4          VERTICAL VELOCITY GAIN    UNITLESS
            307 00110   272  9          CD54     BSS   4          LOADED HEADING            PI RADIANS
            308 00114   276  9          LATL     BSS   4          LOADED LATITUDE IN PI RADIANS = CD55
            309 00114   276  9          CD55     EQU   LATL
            310 00118   280  9          LONL     BSS   4          LOADED LONGITUDE IN PI RADIANS = CD56
            311 00118   280  9          CD56     EQU   LONL
            312 0011C   284  9          GL       BSS   4          LOCAL GRAVITY IN METERS/SEC**2 = CD57
            313 0011C   284  9          CD57     EQU   GL
            314 00120   288  9          CD58     BSS   4          1/SCALE FACTOR            PULSES/M/SEC
            315 00124   292  9          CD59     BSS   4          ROTOR 1 SPEED       REVOLUTIONS/SEC
            316 00128   296  9          CD60     BSS   4          ROTOR 2 SPEED       REVOLUTIONS/SEC
            317 0012C   300  9          CD61     BSS   4          BARO ALT SCALE FACTOR   METERS/BIT
            318 00130   304  9          CD62     BSS   4          BARO ALTITUDE BIAS      BITS
            319 00134   308  9          CD63     BSS   4          ALTIMETER / AHRS FLAGS  NONE
            320 00138   312  9          CD64     BSS   4          ALTITUDE                METERS
                                        *
            321                                  EVEN
            322                  1               USE   1
            323 00000     0  1          IBM      BSS   2          RETURN ADDRESS LOCATION FOR ATTITUDE
            324 00002     2  1          IOM      BSS   2          RETURN ADDRESS LOCATION FOR FENT
            325 00004     4  1          IIOM     BSS   2          RETURN ADDRESS LOCATION FOR RSET
            326 00006     6  1          IISM     BSS   2          RETURN ADDRESS LOCATION FOR NAVI
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VERSION K20A0503      DECK NAME=*INIT  *                                                                          PAGE    8

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                              SOURCE
            327 00008     8  1             FG         BSS     36              TEMP - FIRST HALF GIMBAL ANGLE
            328 0002C    44  1             LG         BSS     36              TEMP - LAST HALF GIMBAL ANGLE
                                           *
                                           *     RESIDUAL ATTITUDE ANGLES
                                           *
            329 00050    80  1             RT1        BSS     4
            330 00054    84  1             RT2        BSS     4
            331 00058    88  1             RT3        BSS     4
            332 00050    80  1             RT         EQU     RT1
            333 0005C    92  1             RTL        BSS     12
            334 00068   104  1             HEAD       BSS     4               HEADING
                                           *
            335               2                       USE     2
                                           *
            336 00000     0  2 FFFFE3E0 N7200         DEC     -7200
            337 00002     2  2 FFFFED40 N4800         DEC     -4800
            338 00004     4  2 FFFFF970 N1680         DEC     -1680
            339 00006     6  2 FFFFFB50 N1200         DEC     -1200
            340 00008     8  2 00000000 RMX           DEC     0
            341 0000A    10  2 00000000 DRMX          DEC     0
            342 0000C    12  2 3FC00000 DEG45         DEC     0.25            45 DEGREES IN PI RADIANS
            343 0000E    14  2 FC24FF12 DEG49         DEC64   0.27222222      49 DEGREE LATITUDE REFERENCE,PI RADIANS
                                 3FC5B05A
            344 00012    18  2 00000000 DF8           DEC64   8.0             DOUBLE PRECISION 8.0
                                 42400000
R           345 00016    22  2 64040000 JNAV          JS      IA
            346 00018    24  2 64040000 JALN          JS      IIA
                                           *
                                           *     GAIN MATRIX KS(I.J) (STORED IN ROW MAJOR ORDER)
                                           *
            347 0001A    26  2 00000000 KS1           DEC64   1.0
                                 40C00000
            348 0001E    30  2 D58C8EEF               DEC64   0.999997
                                 407FFFE6
            349 00022    34  2 CEFED634               DEC64   0.999297
                                 407FE8F6
            350 00026    38  2 18EF49CF               DEC64   0.956890
                                 407A785F
            351 0002A    42  2 9AC8C8C0               DEC64   0.795909
                                 4065E058
            352 0002E    46  2 4E3FFEF3               DEC64   0.673358
                                 40563098
            353 00032    50  2 9A8CDEA0               DEC64   0.543539
                                 404592AF
            354 00036    54  2 E5F871F8               DEC64   0.465173
                                 3FF71593
            355 0003A    58  2 64668 1E5              DEC64   0.377862
                                 3FE0B890
            356 0003E    62  2 ABEAD4F5               DEC64   0.332072
                                 3FD502AB
            357 00042    66  2 00000000 KS2           DEC64   0
                                 00000000
            358 00046    70  2 160F3F96               DEC64   32.025727
                                 434000D2C
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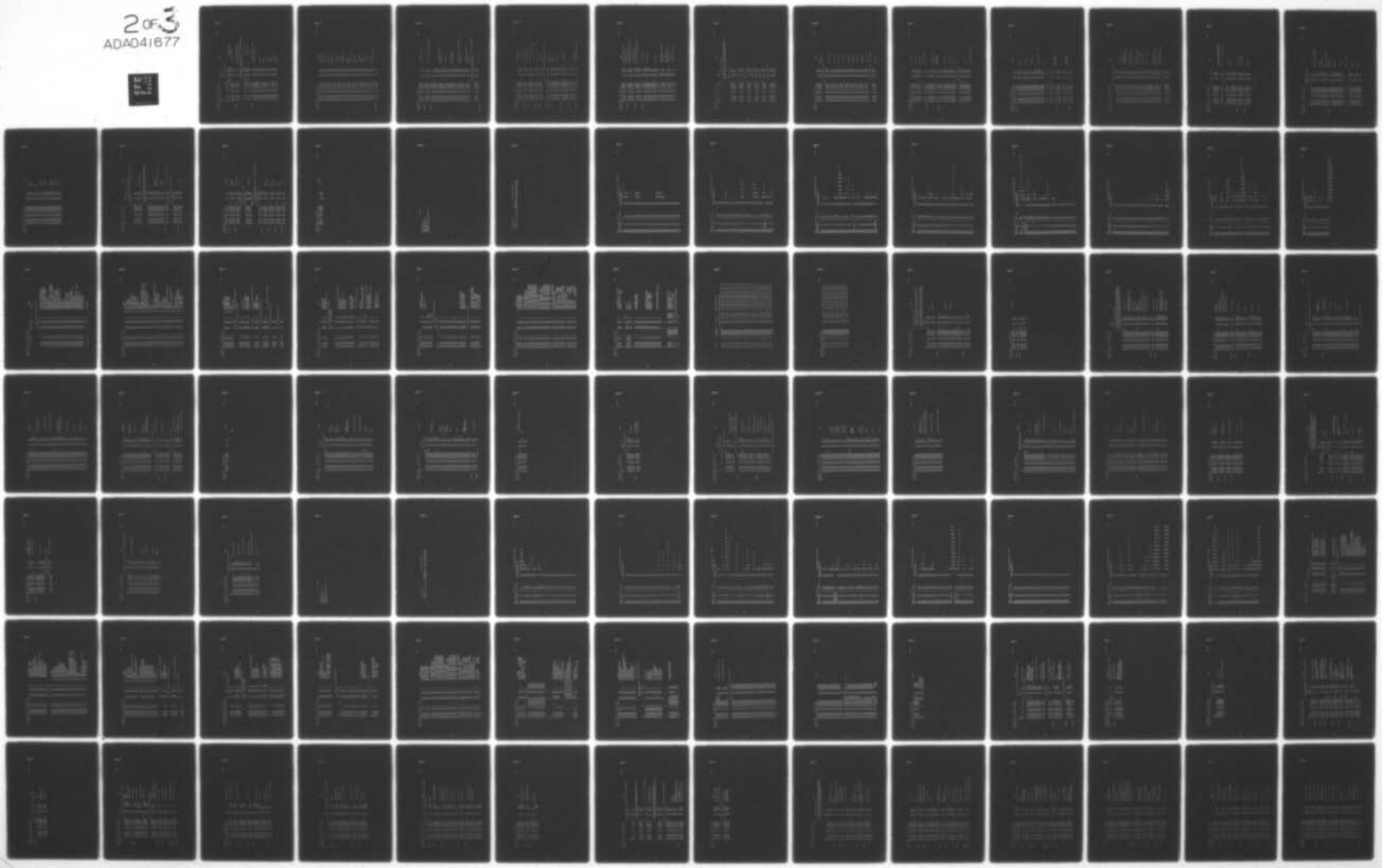
VERSION K20A0503 DECK NAME=*INIT *

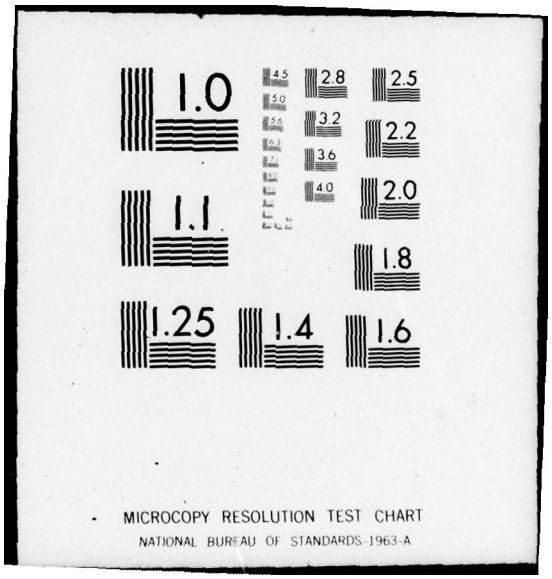
DIAGNOSTICS LINE	ADRES	UADRES	LC	PROGRAM		SOURCE	
359	0004A	74	2	CH6848BE 435FB4B9		DEC64	47.852980
360	0004E	78	2	4E2F37FA 43449570		DEC64	34.291964
361	00052	82	2	2C94B380 42C10127		DEC64	16.251126
362	00056	86	2	B5675579 424DDEC0		DEC64	9.733766
363	0005A	90	2	7942DB3D 41D6871F		DEC64	5.407989
364	0005E	94	2	58601366 41737CFE		DEC64	3.509008
365	00062	98	2	37E6F71A 4144344C		DEC64	2.131384
366	00066	102	2	9F98B718 40E29A1B		DEC64	1.540656
367	0006A	106	2	00000000 00000000	KS3	DEC64	0
368	0006E	110	2	C41DD1A0 40EA14CE		DEC64	1.557520
369	00072	114	2	EB1C432C 457F66E2		DEC64	1019.2152
370	00076	118	2	1A75CD0A 4541DE69		DEC64	526.95033
371	0007A	122	2	4F616723 4444443B		DEC64	137.15806
372	0007E	126	2	B4E0B68C 43726386		DEC64	57.194433
373	00082	130	2	61D4306C 42054B85		DEC64	21.417501
374	00086	134	2	E1198AE8 4257B1ED		DEC64	10.938442
375	0008A	138	2	302F72B4 41C89428		DEC64	4.536174
376	0008E	142	2	DC50CE4E 413346F1		DEC64	2.614129

AD-A041 677 AIR FORCE AVIONICS LAB WRIGHT-PATTERSON AFB OHIO F/G 17/7
CONVERSION OF COMPUTER SOFTWARE FOR THE GIMBALLED ELECTROSTATIC--ETC(U)
FEB 77 W MIKULSKI, W E SHEPHARD

UNCLASSIFIED AFAL-TR-77-8-VOL-2 NL

2 OF 3
ADA041677




1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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VERSION K2040503      DECK NAME=*INIT  *                                                              PAGE  10

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            378                                   ENTRY  FENT
            379                                   ENTRY  IB
            380                                   EVEN
                                          *
                                          *    ATTITUDE (NAV) ROUTINE
                                          *
            381 00092    146  2 00000000 IB       PTR    IBM
            382 00094    148  2 5400001C          LDB    ZERO
                                         *IB1**** LDA    CD46+2                     REMOVED 26 AUG. 74
                                         ******** AFD    RES1+2                     REMOVED 26 AUG. 74
            383 00096    150  2 1400001C IB1      LDA    RES1+2
            384 00098    152  2 FC00000C          SBF    DEG45        CD46+RES1-45 DEGREES
            385 0009A    154  2 64040000          JS     SINCOS
            386 0009C    156  2 6004              JRU    *+4
GENERATED                         0700
            387 0009E    158  2 0000003E          PTR    S1           S1=SIN(CD46+RES1-45 DEGREES)
            388 000A0    160  2 3C000030          STA    C1+2
            389 000A2    162  2 7C00002E          STB    C1           C1=COS(CD46+RES1-45 DEGREES)
                                          *
                                          *    THE FOLLOWING CODE ASSUMES CD47,CD48,CD49 AND RES2,RES3,RES4 ARE
                                          *    IN CONTIGUOUS LOCATIONS OF CORE.
                                          *
            390 000A4    164  2 5C2A000A          LDX    5,10,M
                                         *IB1A*** LDA    CD47,5                     REMOVED 26 AUG. 74
            391 000A6    166  2 16800018 IB1A     LDA    RES2,5
            392 000A8    168  2 5400001C          LDB    ZERO
                                         ******** AFD    RES2,5                     REMOVED 26 AUG. 74
            393 000AA    170  2 64040000          JS     SINCOS
            394 000AC    172  2 6004              JRU    *+4
GENERATED                         0700
            395 000AE    174  2 02800040          PTR    S2-2,5       S(K)=SIN(CD4(I)+RES(J))  K=2,3,4
            396 000B0    176  2 3E800032          STA    C2,5
            397 000B2    178  2 7E800030          STB    C2-2,5       C(K)=COS(CD4(I)+RES(J))
            398 000B4    180  2 6C2B0004          IMN    5,4,M
            399 000B6    182  2 643000A6          JGU    IB1A
            400 000B8    184  2 5C2A0008 IB2      LDX    5,FG,M
            401 000BA    186  2 1400001C          LDA    ZERO
            402 000BC    188  2 3A8A              STA    20,5         FG(3,2)=0
            403 000BD    189  2      3A8B         STA    22,5
            404 000BE    190  2 5400001C          LDB    ZERO
            405 000C0    192  2 FC000040          SBF    S1+2         S1=-S1
            406 000C2    194  2 3C0000A8          STA    TEM          TEM=-S1
            407 000C4    196  2 14000030          LDA    C1+2
            408 000C6    198  2 5400001C          LDB    ZERO
            409 000C8    200  2 3A89              STA    18,5         FG(2,2)=C1
            410 000C9    201  2      7A88         STB    16,5
            411 000CA    202  2 940000A8          MLF    TEM          -S1*C1
            412 000CC    204  2 3A8D              STA    26,5
            413 000CD    205  2      7A8C         STB    24,5         FG(1,3)=-S1*C1
            414 000CE    206  2 14000034          LDA    C2+2
            415 000D0    208  2 5400001C          LDB    ZERO
            416 000D2    210  2 3A91              STA    34,5         FG(3,3)=C2
            417 000D3    211  2      7A90         STB    32,5
            418 000D4    212  2 940000A8          MLF    TEM          -S1*C2
```

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VERSION K20A0503      DECK NAME=*INIT  *                                                          PAGE  11

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                           SOURCE
            419 00006    214  2 3A83                 STA    6,5
            420 00007    215  2       7A82           STB    4,5         FG(2,1)=-S1*C2
            421 00003    216  2 14000034             LDA    C2+2
            422 0000A    218  2 94000030             MLF    C1+2        C1*C2
            423 0000C    220  2 3A81                 STA    2,5
            424 0000D    221  2       7A80           STB    0,5         FG(1,1)=C1*C2
            425 000DE    222  2 14000040             LDA    S1+2
            426 000E0    224  2 5400001C             LDB    ZERO
            427 000E2    226  2 3A87                 STA    14,5        FG(1,2)=S1
            428 000E3    227  2       7A86           STB    12,5
            429 000E4    228  2 94000044             MLF    S2+2        S1*S2
            430 000E6    230  2 3A8F                 STA    30,5
            431 000E7    231  2       7A8E           STB    28,5        FG(2,3)=S1*S2
            432 000E8    232  2 14000044             LDA    S2+2
            433 000EA    234  2 5400001C             LDB    ZERO
            434 000EC    236  2 3A85                 STA    10,5
            435 000ED    237  2       7A84           STB    8,5         FG(3,1)=S2
            436 000EE    238  2 5C2A002C             LDX    5,LG,M
            437 000F0    240  2 14000048             LDA    S3+2
            438 000F2    242  2 3A8F                 STA    30,5        LG(2,3)=S3
            439 000F3    243  2       7A8E           STB    28,5
            440 000F4    244  2 9400004C             MLF    S4+2        S3*S4
            441 000F6    246  2 3A85                 STA    10,5        LG(3,1)=S3*S4
            442 000F7    247  2       7A84           STB    8,5
            443 000F8    248  2 1400001C             LDA    ZERO
            444 000FA    250  2 3A8D                 STA    26,5        LG(1,3)=0
            445 000FB    251  2       3A8C           STA    24,5
            446 000FC    252  2 FC000038             SBF    C3+2        C3=-C3
            447 000FE    254  2 9400004C             MLF    S4+2        -C3*S4
            448 00100    256  2 3A83                 STA    6,5
            449 00101    257  2       7A82           STB    4,5         LG(2,1)=-C3*S4
            450 00102    258  2 14000038             LDA    C3+2
            451 00104    260  2 5400001C             LDB    ZERO
            452 00106    262  2 3A91                 STA    34,5        LG(3,3)=C3
            453 00107    263  2       7A90           STB    32,5
            454 00108    264  2 9400003C             MLF    C4+2        C4*C3
            455 0010A    266  2 3A89                 STA    18,5
            456 0010B    267  2       7A88           STB    16,5        LG(2,2)=C4*C3
            457 0010C    268  2 1400001C             LDA    ZERO
            458 0010E    270  2 FC000048             SBF    S3+2        S3=-S3
            459 00110    272  2 9400003C             MLF    C4+2        -S3*C4
            460 00112    274  2 3A8B                 STA    22,5
            461 00113    275  2       7A8A           STB    20,5        LG(3,2)=-S3*C4
            462 00114    276  2 1400003C             LDA    C4+2
            463 00116    278  2 5400001C             LDB    ZERO
            464 00118    280  2 3A81                 STA    2,5         LG(1,1)=C4
            465 00119    281  2       7A80           STB    0,5
            466 0011A    282  2 1400004C             LDA    S4+2
            467 0011C    284  2 3A87                 STA    14,5        LG(1,2)=S4
            468 0011D    285  2       7A86           STB    12,5
            469 0011E    286  2 64040000 I53         JS     MULS33      TM(I,J)=V1(I,J)*FG(I,J)
            470 00120    288  2 6008                 JRU    *+8
GENERATED                          0700
            471 00122    290  2 00000084             PTR    V1
            472 00124    292  2 00000008             PTR    FG
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VERSION K20A0503      DECK NAME=*INIT  *                                                                          PAGE  12

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                              SOURCE
            473 00126   294  2 0000012C          PTR    TM
            474 00128   296  2 64040000          JS     MULS33        TM1(I,J)=TM(I,J)*LG(I,J)
            475 0012A   298  2 6008              JRU    *+8
GENERATED                              0700
            476 0012C   300  2 0000012C          PTR    TM
            477 0012E   302  2 0000002C          PTR    LG
            478 00130   304  2 00000150          PTR    TM1
            479 00132   306  2 64040000          JS     MULS33        DG(I,J)=V1(I,J)*FG(I,J)*LG(I,J)*OC(I,J)
            480 00134   308  2 6008              JRU    *+8
GENERATED                              0700
            481 00136   310  2 00000150          PTR    TM1
            482 00138   312  2 000000C0          PTR    OC
            483 0013A   314  2 00000078          PTR    DG
            484 0013C   316  2 5C2A0078 IB4      LDX    5,DG,M
            485 0013E   318  2 5EA20020          LDX    4,32,5,M
            486 00140   320  2 128F              LDA    30,5
            487 00141   321  2     528E          LDB    28,5
            488 00142   322  2 64040000          JS     DECATN        CPSI=ATAN(DG(2,3)/DG(3,3))
            489 00144   324  2 DC00009C          SFD    E1
            490 00146   326  2 3C000052          STA    RT1+2         RT1=CPSI-E(1,1)
            491 00148   328  2 7C000050          STB    RT1
            492 0014A   330  2 5EA20018          LDX    4,24,5,M
            493 0014C   332  2 128D              LDA    26,5
            494 0014D   333  2     928D          MLF    26,5          DG(1,3)**2
            495 0014E   334  2 3C0000AA          STA    TEM+2
            496 00150   336  2 7C0000A8          STB    TEM
            497 00152   338  2 1400001E          LDA    FONE
            498 00154   340  2 5400001C          LDB    ZERO
            499 00156   342  2 DC0000A8          SFD    TEM           (1.0-DG(1,3)**2)
            500 00158   344  2 64040000          JS     DECSQ         SQRT(1.0-DG(1,3)**2)
            501 0015A   346  2 3C0000AA          STA    TEM+2
            502 0015C   348  2 7C0000A8          STB    TEM
            503 0015E   350  2 5C2200A8          LDX    4,TEM,M
            504 00160   352  2 128D              LDA    26,5
            505 00161   353  2     528C          LDB    24,5
            506 00162   354  2 64040000          JS     DECATN        CTHE=ATAN(DG(1,3)/SQRT(1.0-DG(1,3)**2)
            507 00164   356  2 DC0000A0          SFD    E1+4
            508 00166   358  2 3C000056          STA    RT2+2         RT2=CTHE-E(1,2)
            509 00168   360  2 7C000054          STB    RT2
            510 0016A   362  2 5EA20000          LDX    4,0,5,M
            511 0016C   364  2 1287              LDA    14,5
            512 0016D   365  2     5286          LDB    12,5
            513 0016E   366  2 64040000          JS     DECATN        CPHI=ATAN(DG(1,2)/DG(1,1))
            514 00170   368  2 DC0000A4          SFD    E1+8
            515 00172   370  2 3C00005A          STA    RT3+2         RT3=CPHI-E(1,3)
            516 00174   372  2 7C000058          STB    RT3
                                            *
                                            *   SET UP XR8 AND XR9 FOR DO LOOP  I=1,3. XR8 FOR DOUBLE PRECISION
                                            *   VARIABLES, XR9 FOR SINGLE PRECISION.
                                            *
            517 00176   374  2 5C420000 IB5      LDX    8,0,M
            518 00178   376  2 5C4A0000          LDX    9,0,M
            519 0017A   378  2 14400052 IB5A     LDA    RT+2,8
            520 0017C   380  2 6208              JRG    IB5B          IS RT(I) .GE. 0
GENERATED                              0700
```

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VERSION K20A0503      DECK NAME=*INIT  *                                                         PAGE  13

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
            521 0017E    382  2 1400001C          LDA    ZERO          NO  TAKE ABS(RT(I))
            522 00180    384  2 5400001C          LDB    ZERO
            523 00182    386  2 FC400052          SBF    RT+2,8
            524 00184    388  2 FC000008 I85B     SBF    RMX
            525 00186    390  2 621E              JRG    I85D          IS ABS(RT(I)) .GE. RMX
GENERATED                          0700
            526 00188    392  2 14400052          LDA    RT+2,8        NO  (RT(I)-RTL(I))
            527 0018A    394  2 FC40005E          SBF    RTL+2,8
            528 0018C    396  2 6208              JRG    I85C          IS (RT(I)-RTL(I)) .GE. 0
GENERATED                          0700
            529 0018E    398  2 3C0000A8          STA    TEM
            530 00190    400  2 1400001C          LDA    ZERO          NO  TAKE ABS(RT(I)-RTL(I))
            531 00192    402  2 FC0000A8          SBF    TEM
            532 00194    404  2 FC00000A I85C     SBF    DRMX
            533 00196    406  2 620E              JRG    I85D          IS ABS(RT(I)-RTL(I)) .GE. DRMX
GENERATED                          0700
            534 00198    408  2 1448004E          LDA    KSN1,9
            535 0019A    410  2 E4000018          SBU    NINE
            536 0019C    412  2 6316              JRL    I85E          NO. IS KSN(I) < 9
GENERATED                          0700
            537 0019E    414  2 14000018          LDA    NINE
            538 001A0    416  2 3C48004E          STA    KSN1,9        YES. KSN(I)=9
            539 001A2    418  2 601E              JRU    I85G
                                         *
                                         *   ABS(RT(I)) .GE. RMX AND ABS(RT(I)-RTL(I)) .GE. DRMX
                                         *
GENERATED                          0700
            540 001A4    420  2 1448004E I85D     LDA    KSN1,9
            541 001A6    422  2 6114              JRN    I85F          IS KSN(I)=0
GENERATED                          0700
            542 001A8    424  2 1400001C          LDA    ZERO          YES
            543 001AA    426  2 3C4000AA          STA    E2+2,8         E2(I)=0
            544 001AC    428  2 3C4000A6          STA    E2,8
            545 001AE    430  2 3C4000B6          STA    E3+2,8         E3(I)=0
            546 001B0    432  2 3C4000B4          STA    E3,8
            547 001B2    434  2 1448004E I85E     LDA    KSN1,9
            548 001B4    436  2 A400000A          ADU    ONE            KSN(I)=KSN(I)+1
            549 001B6    438  2 3C48004E          STA    KSN1,9
            550 001B8    440  2 6008              JRU    I85G
GENERATED                          0700
            551 001BA    442  2 1448004E I85F     LDA    KSN1,9
            552 001BC    444  2 E400000A          SBU    ONE
            553 001BE    446  2 3C48004E          STA    KSN1,9         KSN(I)=KSN(I)-1
            554 001C0    448  2 1C4000A8 I85G     STX    8,TEM
            555 001C2    450  2 34000050          LAE    RT
            556 001C4    452  2 A40000A8          ADU    TEM
            557 001C6    454  2 0640              LXA    4
GENERATED                          0700
            558 001C8    456  2 1448004E          LDA    KSN1,9
            559 001CA    458  2 0842              SLL    2
            560 001CB    459  2     06A8          LXA    5
            561 001CC    460  2 1680006C          LDA    KS3+2,5
            562 001CE    462  2 9201              MLF    2,4       RT(I)*KS(KSN(I)+1,3)
GENERATED                          0700
            563 001D0    464  2 BC4000B6          ADF    E3+2,8         E3(I)=E3(I)+RT(I)*KS(KSN(I)+1,3)
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VERSION K20A0503      DECK NAME=*INIT  *                                                           PAGE  14

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
            564 001D2   466  2 3C4000B6        STA   E3+2,8
            565 001D4   468  2 7C4000B4        STB   E3,8        E3(I)=E3(I)+RT(I)*(KSN(I)+1,3)
            566 001D6   470  2 16800044        LDA   KS2+2,5
            567 001D8   472  2 9201            MLF   2,4         RT(I)*KS(KSN(I)+1,2)
GENERATED                          0700
            568 001DA   474  2 8C4000B6        ADF   E3+2,8      E3(I)+RT(I)*KS(KSN(I)+1,2)
            569 001DC   476  2 8C4000AA        ADF   E2+2,8
            570 001DE   478  2 3C4000AA        STA   E2+2,8      E2(I)=E2(I)+E3(I)+RT(I)*KS(KSN(I)+1,2)
            571 001E0   480  2 7C4000A8        STB   E2,8
            572 001E2   482  2 1680001C        LDA   KS1+2,5
            573 001E4   484  2 9201            MLF   2,4         RT(I)*KS(KSN(I)+1,1)
GENERATED                          0700
            574 001E6   486  2 8C4000AA        ADF   E2+2,8      E2(I)+RT(I)*KS(KSN(I)+1,1)
            575 001E8   488  2 8C40009E        ADF   E1+2,8
            576 001EA   490  2 3C40009E        STA   E1+2,8      E1(I)=E1(I)+E2(I)+RT(I)*KS(KSN(I)+1,1)
            577 001EC   492  2 7C40009C        STB   E1,8
            578 001EE   494  2 14400052        LDA   RT+2,8
            579 001F0   496  2 6208            JRG   IB5H
GENERATED                          0700
            580 001F2   498  2 1400001C        LDA   ZERO        NO  TAKE ABS(RT(I))
            581 001F4   500  2 5400001C        LDB   ZERO
            582 001F6   502  2 FC400052        SBF   RT+2,8
            583 001F8   504  2 3C40005E IB5H   STA   RTL+2,8
            584 001FA   506  2 7C40005C        STB   RTL,8       RTL(I)=ABS(RT(I))
            585 001FC   508  2 6C420004        IMP   8,4,M
            586 001FE   510  2 6C4A0002        IMP   9,2,M
            587 00200   512  2 244A0006        ICN   9,6,M
            588 00202   514  2 64300206        JGU   IB6
            589 00204   516  2 6430017A        JGU   IBSA
            590 00206   518  2 1400009C IB6    LDA   E1
            591 00208   520  2 5400009E        LDB   E1+2
            592 0020A   522  2 3C000068        STA   HEAD        HEAD=E(1,1)
            593 0020C   524  2 7C00006A        STB   HEAD+2
                                         *
            594 0020E   526  2 5400001C        LDB   ZERO
            595 00210   528  2 0400            CFX
            596 00211   529  2     0C01        SRAD  1           SCALE TO 2**-15
            597 00212   530  2 7C0100A3        STBH  023+1       023 DATA = E(1,1) = HEADING
            598 00214   532  2 5400001C        LDB   ZERO
            599 00216   534  2 140000A8        LDA   E2          (A) = E(1,2)
            600 00218   536  2 0400            CFX
            601 00219   537  2     0C01        SRAD  1           SCALE IT TO 2**-15
            602 0021A   538  2 7C0100A5        STBH  021+1       021 DATA = E(1,2) = PITCH
            603 0021C   540  2 5400001C        LDB   ZERO
            604 0021E   542  2 14000084        LDA   E3          (A) = E(1,3)
            605 00220   544  2 0400            CFX
            606 00221   545  2     0C01        SRAD  1
            607 00222   546  2 7C0100A7        STBH  022+1       022 DATA = E(1,3) = ROLL
                                         *
            608 00224   548  2 74000000        RTA   IBM
```

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VERSION K20A0503       DECK NAME=*INIT  *                                                               PAGE  15

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
            610                                     EVEN
            611 00226     550  2 00000002 FENT      PTR     IO4
                                          *
                                          *         SUBROUTINE FENT (FIRST ENTRY)
                                          *
                                          *  THIS ROUTINE IS USED TO INITIALIZE ALIGNMENT AND DRIFT
                                          *  COMPUTATION UPON FIRST ENTRY AFTER SYSTEM RUN-UP. THIS ROUTINE
                                          *  CALLS ALIGN RESET (RSET) TO FULLY INITIALIZE ALIGN MODE.
                                          *
                                          *
                                          *  CLEAR MATRIX A(I,J)
                                          *
            612 00228     552  2 5C2A0022 IO1       LDX     5,34,M
            613 0022A     554  2 1400001C           LDA     ZERO
            614 0022C     556  2 3E80000C IO1A      STA     A,5
            615 0022E     558  2 6C280002           IMN     5,2,M
            616 00230     560  2 6430022C           JGU     IO1A
                                          *
                                          *  CLEAR VECTOR SDVI
                                          *
            617 00232     562  2 5C2A000A           LDX     5,10,M
            618 00234     564  2 3E8000CC IO1B      STA     SDVI,5
            619 00236     566  2 6C280002           IMN     5,2,M
            620 00238     568  2 64300234           JGU     IO1B
                                          *
                                          *  CLEAR VECTOR VAXI
                                          *
            621 0023A     570  2 5C2A000A           LDX     5,10,M
            622 0023C     572  2 3E800000 IO1C      STA     VAXI,5
            623 0023E     574  2 6C280002           IMN     5,2,M
            624 00240     576  2 6430023C           JGU     IO1C
                                          *
                                          *  CLEAR VECTOR DVXI
                                          *
            625 00242     578  2 5C2A000A           LDX     5,10,M
            626 00244     580  2 3E800000 IO1D      STA     DVXI,5
            627 00246     582  2 6C280002           IMN     5,2,M
            628 00248     584  2 64300244           JGU     IO1D
                                          *
                                          *  CLEAR VECTOR DVXG
                                          *
            629 0024A     586  2 5C2A000A           LDX     5,10,M
            630 0024C     588  2 3E800014 IO1E      STA     DVXG,5
            631 0024E     590  2 6C280002           IMN     5,2,M
            632 00250     592  2 6430024C           JGU     IO1E
                                          *
                                          *  CLEAR SRT1,SRT2,RATP,RATM
                                          *
            633 00252     594  2 3C000000           STA     SRT1
            634 00254     596  2 3C000002           STA     SRT1+2
            635 00256     598  2 3C000004           STA     SRT2
            636 00258     600  2 3C000006           STA     SRT2+2
            637 0025A     602  2 3C00000C           STA     RATP
            638 0025C     604  2 3C00000E           STA     RATP+2
```

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            639 0025E    606  2 3C000008        STA    RATM
            640 00260    606  2 3C00000A        STA    RATM+2
            641 00262    610  2 3C000012        STA    CHAJ          CHAJ=0
            642 00264    612  2 14000002        LDA    DCSK
            643 00266    614  2 3C000010        STA    DCON          RESET DCON TO -8
                                 *
                                 *    INITIALIZE MATRIX GM(I,J)
                                 *
            644 00268    616  2 5C2A0060 I02    LDX    5,GM,M
            645 0026A    618  2 14000086        LDA    CD19+2
            646 0026C    620  2 54000084        LDB    CD19
            647 0026E    622  2 3A81            STA    2,5           GM(1,1)= CD19
            648 0026F    623  2      7A80       STB    0,5
            649 00270    624  2 1400001C        LDA    ZERO
            650 00272    626  2 5400001C        LDB    ZERO
            651 00274    628  2 DC00009C        SFD    CD25
            652 00276    630  2 3AB3            STA    6,5           GM(2,1) = -CD25
            653 00277    631  2      7AB2       STB    4,5
            654 00279    632  2 1400009C        LDA    CD22+2
            655 0027A    634  2 54000098        LDB    CD22
            656 0027C    636  2 3AA5            STA    10,5          GM(3,1)= CD22
            657 0027D    637  2      7AA4       STB    8,5
            658 0027E    638  2 1400008A        LDA    CD20+2
            659 00280    640  2 54000088        LDB    CD20
            660 00282    642  2 3AB7            STA    14,5          GM(1,2)= CD20
            661 00283    643  2      7AB6       STB    12,5
            662 00284    644  2 1400001C        LDA    ZERO
            663 00286    646  2 5400001C        LDB    ZERO
            664 00288    648  2 DC0000A0        SFD    CD26
            665 0028A    650  2 3AC9            STA    18,5          GM(2,2)=-CD26
            666 0028B    651  2      7AC8       STB    16,5
            667 0028C    652  2 14000096        LDA    CD23+2
            668 0028E    654  2 54000094        LDB    CD23
            669 00290    656  2 3ADB            STA    22,5          GM(3,2)= CD23
            670 00291    657  2      7ADA       STB    20,5
            671 00292    658  2 1400008E        LDA    CD21+2
            672 00294    660  2 5400008C        LDB    CD21
            673 00296    662  2 3AED            STA    26,5          GM(1,3)= CD21
            674 00297    663  2      7AEC       STB    24,5
            675 00298    664  2 1400001C        LDA    ZERO
            676 0029A    666  2 5400001C        LDB    ZERO
            677 0029C    668  2 DC0000A4        SFD    CD27
            678 0029E    670  2 3AFF            STA    30,5          GM(2,3)=-CD27
            679 0029F    671  2      7AFE       STB    28,5
            680 002A0    672  2 1400009A        LDA    CD24+2
            681 002A2    674  2 54000098        LDB    CD24
            682 002A4    676  2 3A91            STA    34,5          GM(3,3)= CD24
            683 002A5    677  2      7A90       STB    32,5
                                 *
                                 *    INITIALIZE MATRIX A(I,I)  VALUES ON DIAGONAL
                                 *
            684 002A6    678  2 5C2A000C        LDX    5,A,M
            685 002A8    680  2 1400003E        LDA    CD01+2
            686 002AA    682  2 5400003C        LDB    CD01
            687 002AC    684  2 3A81            STA    2,5           A(1,1)= CD01
```

```
VERSION K20A0503     DECK NAME=*INIT  *                                                                  PAGE  17

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
            688 002A0     685  2     7A80          STB    0,5
            689 002AE     686  2 14000042          LDA    CD02+2
            690 002B0     688  2 54000040          LDB    CD02
            691 002B2     690  2 3A89              STA    18,5        A(2,2)= CD02
            692 002B3     691  2     7A88          STB    16,5
            693 002B4     692  2 14000046          LDA    CD03+2
            694 002B6     694  2 54000044          LDB    CD03
            695 002B8     696  2 3A91              STA    34,5        A(3,3)= CD03
            696 002B9     697  2     7A90          STB    32,5
                                          *
                                          *
            697 002BA     698  2 64040000          JS     MUL33       AB(I,J)=TM(I,J)*A(I,J)
            698 002BC     700  2 6008              JRU    *+8
GENERATED                            0700
            699 002BE     702  2 00000054          PTR    CD07
            700 002C0     704  2 0000000C          PTR    A
            701 002C2     706  2 0000003C          PTR    AB
            702 002C4     708  2 14000116 I03      LDA    LATL+2
            703 002C6     710  2 54000114          LDB    LATL
            704 002C8     712  2 3C00000A          STA    LAT+2       INITIALIZE LAT TO LATL
            705 002CA     714  2 7C000008          STB    LAT
                                          *
            706 002CC     716  2 64040000          JS     SINCOS      SGDL=SIN(LAT)
            707 002CE     718  2 6004              JRU    *+4         CGDL=COS(LAT)
GENERATED                            0700
            708 002D0     720  2 00000008          PTR    SGDL
            709 002D2     722  2 3C00000E          STA    CGDL+2
            710 002D4     724  2 7C00000C          STB    CGDL
                                          *
            711 002D6     726  2 5C22011C          LDX    4,GL,M
            712 002D8     728  2 64040000          JS     MULFD       AK1T=CGDL*GL
            713 002DA     730  2 3C00000E          STA    AK1T+2
            714 002DC     732  2 7C00000C          STB    AK1T
            715 002DE     734  2 1400000A          LDA    SGDL+2
            716 002E0     736  2 54000008          LDB    SGDL
            717 002E2     738  2 64040000          JS     MULFD       AK2T=SGDL*GL
            718 002E4     740  2 3C000012          STA    AK2T+2
            719 002E6     742  2 7C000010          STB    AK2T
            720 002E8     744  2 1400001C I04      LDA    ZERO
            721 002EA     746  2 3C000014          STA    PHA         PHA=0
            722 002EC     748  2 3C000016          STA    PHA+2
                                          *
                                          *   CLEAR VC(I)X AND VF(I)X    I=1,3
                                          *
            723 002EE     750  2 5C2A0046          LDX    5,70,M
            724 002F0     752  2 3E800066 I04A     STA    VC1X,5
            725 002F2     754  2 6C2B0002          IMN    5,2,M
            726 002F4     756  2 643002F0          JGU    I04A
            727 002F6     758  2 5C2A0022          LDX    5,34,M
            728 002F8     760  2 3E9000F2 I04B     STA    AJ,5        AJ(I,J)=0
            729 002FA     762  2 6C2B0002          IMN    5,2,M
            730 002FC     764  2 643002F8          JGU    I04B
            731 002FE     766  2 5C2A00F2          LDX    5,AJ,M
            732 00300     768  2 1400001E          LDA    FONE
            733 00302     770  2 3A81              STA    2,5         AJ(1,1)=AJ(2,2)=AJ(3,3)=1.0
```

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VERSION K20A0503      DECK NAME=*INIT  *

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
             734 00303    771  2      3A89        STA    18,5
             735 00304    772  2  3A91            STA    34,5
GENERATED                              0700
             736 00306    774  2  1400005A        LDA    TIME+2
             737 00308    776  2  54000058        LDB    TIME
             738 0030A    778  2  3C00005E        STA    T0+2
             739 0030C    780  2  7C00005C        STB    T0             T0=TIME
             740 0030E    782  2  5C220012        LDX    4,DF8,M
             741 00310    784  2  1400011E        LDA    GL+2
             742 00312    786  2  5400011C        LDB    GL
             743 00314    788  2  64040000        JS     MULFD
             744 00316    790  2  3C000060        STA    VTB+2          VTB=GL*8.0
             745 00318    792  2  7C00005E        STB    VTB
             746 0031A    794  2  5C220030        LDX    4,DELT,M
             747 0031C    796  2  1400011E        LDA    GL+2
             748 0031E    798  2  5400011C        LDB    GL
             749 00320    800  2  64040000        JS     MULFD
             750 00322    802  2  3C000064        STA    VTC+2          VTC=GL*DELT
             751 00324    804  2  7C000062        STB    VTC
             752 00326    806  2  5C2A000A        LDX    5,10,M
             753 00328    808  2  16800048 I04C   LDA    CD04,5
             754 0032A    810  2  56800046        LDB    CD04-2,5
             755 0032C    812  2  64040000        JS     MULFD
             756 0032E    814  2  3E800038        STA    CD040,5        CD0(I)D=CD0(I)*DELT    I=4,6
             757 00330    816  2  7E800036        STB    CD040-2,5
             758 00332    818  2  6C280004        IMN    5,4,M
             759 00334    820  2  64300328        JGU    I04C
             760 00336    822  2  14000008        LDA    NONE
             761 00338    824  2  3C00002C        STA    NMO            NMO=-1
                                           *
                                           *
             762 0033A    826  2  64040470        JS     RSET
                                           *
                                           *
             763 0033C    828  2  14000102 I05    LDA    CD50+2
             764 0033E    830  2  54000100        LDB    CD50
                                           *
                                           *
             765 00340    832  2  64040000        JS     SINCOS         TEM=SIN(CD50)
             766 00342    834  2  6004            JRU    *+4            TEM0=COS(CD50)
GENERATED                              0700
             767 00344    836  2  000000A8        PTR    TEM
             768 00346    838  2  3C000086        STA    TEM0+2
             769 00348    840  2  7C000084        STB    TEM0
                                           *
                                           *
             770 0034A    842  2  14000106        LDA    CD51+2
             771 0034C    844  2  54000104        LDB    CD51
                                           *
             772 0034E    846  2  64040000        JS     SINCOS         TEM1=SIN(CD51)
             773 00350    848  2  6004            JRU    *+4            TEM2=COS(CD51)
GENERATED                              0700
             774 00352    850  2  00000088        PTR    TEM1
             775 00354    852  2  3C00008E        STA    TEM2+2
             776 00356    854  2  7C00008C        STB    TEM2
```

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VERSION K20A0503      DECK NAME=*INIT  *                                                    PAGE  19
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                        SOURCE
                                          *
                                          *
                                          *   INITIALIZE MATRIX OC(I,J)
                                          *
           777 00358    856  2 5C2A00C0        LDX    5,OC,M
           778 0035A    858  2 5C2200BC        LDX    4,TEM2,M
           779 0035C    860  2 3AB1            STA    2,5
           780 0035D    861  2      7AB0       STB    0,5          OC(1,1)=COS(CD51)
           781 0035E    862  2 140000B6        LDA    TEM0+2
           782 00360    864  2 540000B4        LDB    TEM0
           783 00362    866  2 3AB9            STA    18,5         OC(2,2)=COS(CD50)
           784 00363    867  2      7AB8       STB    16,5
           785 00364    868  2 64040000        JS     MULFD        COS(CD51)*COS(CD50)
           786 00366    870  2 3A91            STA    34,5         OC(3,3)=COS(CD51)*COS(CD50)
           787 00367    871  2      7A90       STB    32,5
           788 00368    872  2 140000AA        LDA    TEM+2
           789 0036A    874  2 540000A8        LDB    TEM
           790 0036C    876  2 64040000        JS     MULFD        COS(CD51)*SIN(CD50)
           791 0036E    878  2 3A8B            STA    22,5
           792 0036F    879  2      7A8A       STB    20,5         OC(3,2)=COS(CD51)*SIN(CD50)
           793 00370    880  2 1400001C        LDA    ZERO
           794 00372    882  2 5400001C        LDB    ZERO
           795 00374    884  2 3AB3            STA    6,5          OC(2,1)=0
           796 00375    885  2      7AB2       STB    4,5
           797 00376    886  2 DC0000A8        SFD    TEM          0-SIN(CD50)=-SIN(CD50)
           798 00378    888  2 3ABF            STA    30,5
           799 00379    889  2      7ABE       STB    28,5         OC(2,3)= -SIN(CD50)
           800 0037A    890  2 140000BA        LDA    TEM1+2
           801 0037C    892  2 540000B8        LDB    TEM1
           802 0037E    894  2 3AB5            STA    10,5         OC(3,1)= SIN(CD51)
           803 0037F    895  2      7AB4       STB    8,5
           804 00380    896  2 1400001C        LDA    ZERO
           805 00382    898  2 5400001C        LDB    ZERO
           806 00384    900  2 DC0000B8        SFD    TEM1         0-SIN(CD51)= -SIN(CD51)
           807 00386    902  2 3C0000BA        STA    TEM1+2
           808 00388    904  2 7C0000B8        STB    TEM1
           809 0038A    906  2 5C2200B8        LDX    4,TEM1,M
           810 0038C    908  2 140000AA        LDA    TEM+2
           811 0038E    910  2 540000A8        LDB    TEM
           812 00390    912  2 64040000        JS     MULFD        -SIN(CD51)*SIN(CD50)
           813 00392    914  2 3AB7            STA    14,5
           814 00393    915  2      7AB6       STB    12,5         OC(1,2)= -SIN(CD51)*SIN(CD50)
           815 00394    916  2 140000B6        LDA    TEM0+2
           816 00396    918  2 540000B4        LDB    TEM0
           817 00398    920  2 64040000        JS     MULFD        -SIN(CD51)*COS(CD50)
           818 0039A    922  2 3ABD            STA    26,5
           819 0039B    923  2      7ABC       STB    24,5         OC(1,3)= -SIN(CD51)*COS(CD50)
                                          *
                                          *   CLEAR MATRIX E(I,J)
                                          *
           820 0039C    924  2 5C2A0022        LDX    5,34,M
           821 0039E    926  2 1400001C        LDA    ZERO
           822 003A0    928  2 3E80009C IO5A   STA    E1,5
           823 003A2    930  2 6C280002        IMN    5,2,M
           824 003A4    932  2 643003A0        JGO    IO5A
```

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VERSION K20A0503      DECK NAME=*INIT  *                                                              PAGE  20

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
                                            *
                                            *     CLEAR KSN1,KSN2,KSN3
                                            *
            825 003A6     934  2 3C00004E         STA    KSN1
            826 003A8     936  2 3C000050         STA    KSN2
            827 003AA     938  2 3C000052         STA    KSN3
            828 003AC     940  2 14000004         LDA    NFOUR
            829 003AE     942  2 3C000036         STA    ASCH             ASCH=-4. SETS ALIGN SCHEDULER FOR
                                            *                              1/8 SECOND ACCUMULATION OF DELTA V
                                            *
            830 003B0     944  2 14000018         LDA    JALN
            831 003B2     946  2 3C00017A         STA    VECT+6           ENTRY 4 OF VECT = CALL TO ALIGN
                                            *
                                            *     HSIO= DUMMY
                                            *
            832 003B4     948  2 5C2A0078         LDX    5,DG,M
            833 003B6     950  2 1400001C         LDA    ZERO
            834 003B8     952  2 3A86             STA    12,5             DG(1,2)=0
            835 003B9     953  2     3A87         STA    14,5
            836 003BA     954  2 3A84             STA    8,5              DG(3,1)=0
            837 003BB     955  2     3A85         STA    10,5
            838 003BC     956  2 1400006A         LDA    HEAD+2
            839 003BE     958  2 54000068         LDB    HEAD
            840 003C0     960  2 64040000         JS     SINCOS
            841 003C2     962  2 6004             JRU    *+4
GENERATED                           0700
            842 003C4     964  2 02800014         PTR    20,5             DG(3,2)=SIN(HEAD)
            843 003C6     966  2 1400001C         LDA    ZERO
            844 003C8     968  2 5400001C         LDB    ZERO
            845 003CA     970  2 DABA             SFD    20,5             DG(3,2)=-SIN(HEAD)
            846 003CB     971  2     3A8B         STA    22,5
            847 003CC     972  2 7A8A             STB    20,5
GENERATED                           0700
            848 003CE     974  2 1400001E         LDA    FONE
            849 003D0     976  2 5400001C         LDB    ZERO
            850 003D2     978  2 3A81             STA    2,5              DG(1,1)=1.0
            851 003D3     979  2     7A80         STB    0,5
            852 003D4     980  2 74000002         RTA    IOM
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                      *
                                      *    SUBROUTINE NAVI
                                      *    NAVIGATION INITIALIZATION
                                      *
              854                            ENTRY   NAVI
              855                            EVEN
              856 003D6    982  2 00000006 NAVI   PTR     IISM
              857 003D8    984  2 14000016        LDA     JNAV
              858 003DA    986  2 3C00017A        STA     VECT+6        ENTRY 4 OF VECT = CALL TO NAV
              859 003DC    988  2 1400000A        LDA     ONE
              860 003DE    990  2 3C000064        STA     NAVF          SET NAV FLAG FOR NAVIGATION
              861 003E0    992  2 5C22000C        LDX     4,CGDL,M
              862 003E2    994  2 1400002E        LDA     KGDL+2
              863 003E4    996  2 5400002C        LDB     KGDL
              864 003E6    998  2 64040000        JS      MULFD         (CGDL*KGDL)
              865 003E8   1000  2 3C0000B6        STA     TEM0+2
              866 003EA   1002  2 7C0000B4        STB     TEM0          TEM0=(CGDL*KGDL)
              867 003EC   1004  2 5C2200B4        LDX     4,TEM0,M
              868 003EE   1006  2 1400000A        LDA     SGDL+2
              869 003F0   1008  2 54000008        LDB     SGDL
              870 003F2   1010  2 64040000        JS      DECATN        TEM0=ATAN(SGDL/(CGDL*KGDL))
              871 003F4   1012  2 64040000        JS      SINCOS
              872 003F6   1014  2 6004            JRU     *+4           SGCL=SIN(TEM0)
GENERATED                                 0700
              873 003F8   1016  2 00000034        PTR     SGCL          CGCL=COS(TEM0)
              874 003FA   1018  2 3C00003A        STA     CGCL+2
              875 003FC   1020  2 7C000038        STB     CGCL
              876 003FE   1022  2 5C220038        LDX     4,CGCL,M
              877 00400   1024  2 64040000        JS      MULFD         C2GC=CGCL**2
              878 00402   1026  2 3C000032        STA     C2GC+2
              879 00404   1028  2 7C000030        STB     C2GC
              880 00406   1030  2 5C220034        LDX     4,SGCL,M
              881 00408   1032  2 14000036        LDA     SGCL+2
              882 0040A   1034  2 54000034        LDB     SGCL
              883 0040C   1036  2 64040000        JS      MULFD         S2GC=SGCL**2
              884 0040E   1038  2 3C00002E        STA     S2GC+2
              885 00410   1040  2 7C00002C        STB     S2GC
                                      *
                                      *
              886 00412   1042  2 64040000        JS      IF2           COMPUTE DELR AND RAD
                                      *
                                      *
              887 00414   1044  2 5C220000        LDX     4,RAD,M
              888 00416   1046  2 1400003A        LDA     CGCL+2
              889 00418   1048  2 54000038        LDB     CGCL
              890 0041A   1050  2 64040000        JS      MULFD         X=RAD*CGCL
              891 0041C   1052  2 3C0000C2        STA     X+2
              892 0041E   1054  2 7C0000C0        STB     X
              893 00420   1056  2 14000036        LDA     SGCL+2
              894 00422   1058  2 54000034        LDB     SGCL
              895 00424   1060  2 64040000        JS      MULFD         Z=RAD*SGCL
              896 00426   1062  2 3C0000CA        STA     Z+2
              897 00428   1064  2 7C0000C8        STB     Z
              898 0042A   1066  2 1400001C        LDA     ZERO
```

VERSION K20A0503 DECK NAME=*INIT *

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM			SOURCE
899	0042C	1068	2	3C0000C6	STA	Y+2	Y=0
900	0042E	1070	2	3C0000C4	STA	Y	
901	00430	1072	2	3C000026	STA	LATB+2	LATB=0
902	00432	1074	2	3C000024	STA	LATB	
903	00434	1076	2	3C000022	STA	LONB+2	LONB=0
904	00436	1078	2	3C000020	STA	LONB	
905	00438	1080	2	3C000016	STA	VX+2	VX=0
906	0043A	1082	2	3C000014	STA	VX	
907	0043C	1084	2	3C00001E	STA	VZ+2	VZ=0
908	0043E	1086	2	3C00001C	STA	VZ	
909	00440	1088	2	5C220024	LDX	4,OMGA,M	
910	00442	1090	2	140000C2	LDA	X+2	
911	00444	1092	2	540000C0	LDB	X	
912	00446	1094	2	64040000	JS	MULFD	X*OMGA
913	00448	1096	2	3C00001A	STA	VY+2	
914	0044A	1098	2	7C000018	STB	VY	VY=OMGA*X
915	0044C	1100	2	14000002	LDA	RAD+2	
916	0044E	1102	2	54000000	LDB	RAD	
917	00450	1104	2	3C000006	STA	RXYZ+2	RXYZ=RAD
918	00452	1106	2	7C000004	STB	RXYZ	
919	00454	1108	2	1400011A	LDA	LONL+2	
920	00456	1110	2	54000118	LDB	LONL	
921	00458	1112	2	3C00000E	STA	LONG+2	
922	0045A	1114	2	7C00000C	STB	LONG	LONG=LONL
923	0045C	1116	2	3C00002A	STA	LGO+2	
924	0045E	1118	2	7C000028	STB	LGO	LGO=LONL
925	00460	1120	2	1400005A	LDA	TIME+2	
926	00462	1122	2	54000058	LDB	TIME	
927	00464	1124	2	0C000038	SFD	D3032	TIME=TIME-3/32
928	00466	1126	2	3C00005E	STA	T0+2	
929	00468	1128	2	7C00005C	STB	T0	
930	0046A	1130	2	3C0000DA	STA	TLP0+2	TLP0=T0
931	0046C	1132	2	7C0000D8	STB	TLP0	
932	0046E	1134	2	74000006	RTA	IISM	

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VERSION K20A0503      DECK NAME=*INIT  *                                                                   PAGE  23

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            934                                     EVEN
            935                                     ENTRY   RSET
                                             *
                                             *          SUBROUTINE RSET (ALIGNMENT RESET)
                                             *
                                             *     THIS ROUTINE SELECTS THE SOLUTION TIME AND MODE FOR THE
                                             *     ALIGNMENT.
                                             *
                                             *
            936 00470    1136  2 00000004 RSET      PTR     IIQM
            937 00472    1138  2 1400001C IIQ1      LDA     ZERO
            938 00474    1140  2 3C000024           STA     SRA
            939 00476    1142  2 3C000026           STA     SRA+2            SRA=0
            940 00478    1144  2 5C2A000A           LDX     5,10,M
            941 0047A    1146  2 3E800018 IIQ1A     STA     VAX,5            CLEAR VAX,VAY,&VAZ
            942 0047C    1148  2 6C2B0002           IMN     5,2,M
            943 0047E    1150  2 6430047A           JGU     IIQ1A
                                             *
                                             *     CLEAR YA1,YA2,YB1,YB2,YC1,YC2,XA1,XA2,XB1,XB2,XC1,XC2.
                                             *     NOTE: THESE LOCATIONS ARE CONSIDERED TO BE IN CONTIGUOUS
                                             *     LOCATIONS OF CORE
                                             *
            944 00480    1152  2 5C2A002E           LDX     5,46,M
            945 00482    1154  2 3E80002E IIQ1B     STA     XA,5
            946 00484    1156  2 6C2B0002           IMN     5,2,M
            947 00486    1158  2 64300482           JGU     IIQ1B
            948 00488    1160  2 5C28002C IIQ2      LDX     5,NMO
            949 0048A    1162  2 6C2A0001           IMP     5,1,M
            950 0048C    1164  2 1C28002C           STX     5,NMO            NMO=NMO+1
            951 0048E    1166  2 242A0000           ICN     5,0,M            CHECK FOR NMO=0
            952 00490    1168  2 643004EC           JGU     IIQ2A
            953 00492    1170  2 24280004           ICL     5,4,M            CHECK FOR NMO.GE.1 OR .LE.3
            954 00494    1172  2 643004A0           JGU     IIQ2B
            955 00496    1174  2 14000000           LDA     N64
            956 00498    1176  2 3C000024           STA     NCCD             NCCD=-64
            957 0049A    1178  2 1400000A           LDA     ONE
            958 0049C    1180  2 3C000026           STA     SAMI             SAMI=1
            959 0049E    1182  2 605C               JRU     IIQ3A
GENERATED                              0700
            960 004A0    1184  2 24280007 IIQ2B     ICL     5,7,M            CHECK FOR NMO.GE.4 OR .LE.6
            961 004A2    1186  2 643004C0           JGU     IIQ2C
                                             ********************
                                             *
                                             *     SET UP COARSE SOLUTION SCALING SHIFTS
                                             *
                                             ********************
            962 004A4    1188  2 1400000A           LDA     LAT+2
            963 004A6    1190  2 54000008           LDB     LAT
            964 004A8    1192  2 DC00000E           SFD     DEG49
            965 004AA    1194  2 620C               JRG     IIQ2B1
GENERATED                              0700
            966 004AC    1196  2 14000006           LDA     N1200
            967 004AE    1198  2 3C000024           STA     NCCD             NCCD=-1200
            968 004B0    1200  2 1400001C           LDA     ZERO
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
          969 004B2   1202  2 3C000028          STA    MCSI          MCSI=0
          970 004B4   1204  2 6042              JRU    IIQ3
GENERATED                     0700
          971 004B6   1206  2 14000004 IIQ2B1   LDA    N1680
          972 004B8   1208  2 3C000024          STA    NCCD          NCCD=-1680
          973 004BA   1210  2 1400000A          LDA    ONE
          974 004BC   1212  2 3C000028          STA    MCSI          MCSI=1
          975 004BE   1214  2 6038              JRU    IIQ3
GENERATED                     0700
          976 004C0   1216  2 242A0007 IIQ2C    ICN    5,7,M         CHECK FOR NMO=7
          977 004C2   1218  2 64300402          JGU    IIQ2D
          978 004C4   1220  2 1400001C          LDA    ZERO
          979 004C6   1222  2 3C000030          STA    FLGN          FLGN=0
                                 ********************
                                 *
                                 *    I.N.S. NOT ALIGN LIGHT OFF
                                 *
                                 ********************
          980 004C8   1224  2 1400005A          LDA    TIME+2
          981 004CA   1226  2 54000058          LDB    TIME
          982 004CC   1228  2 9C000034          AFD    D1032         SAVT=TIME+1/32
          983 004CE   1230  2 3C000034          STA    SAVT+2
          984 004D0   1232  2 7C000032          STB    SAVT
          985 004D2   1234  2                IIQ2D   EQU    *
                                 ********************
                                 *
                                 *    SET UP FINE SOLUTION SCALING SHIFTS...  FIDDLE WITH BITE BITS
                                 *    FOR IMU,VAC,ROT,AND UNR
                                 *
                                 ********************
          986 004D2   1234  2 1400000C          LDA    FASI
          987 004D4   1236  2 E400000E          SBU    THREE
          988 004D6   1238  2 610C              JRN    IIQ2D1
GENERATED                     0700
          989 004D8   1240  2 1400000E          LDA    THREE
          990 004DA   1242  2 3C000028          STA    MCSI          MCSI=3
          991 004DC   1244  2 14000000          LDA    N7200
          992 004DE   1246  2 3C000024          STA    NCCD          NCCD=-7200
          993 004E0   1248  2 6016              JU     IIQ3
GENERATED                     0700
          994 004E2   1250  2 1400000C IIQ2D1   LDA    TWO
          995 004E4   1252  2 3C000028          STA    MCSI          MCSI=2
          996 004E6   1254  2 14000002          LDA    N4800
          997 004E8   1256  2 3C000024          STA    NCCD          NCCD=-4800
          998 004EA   1258  2 600C              JRU    IIQ3
GENERATED                     0700
          999 004EC   1260  2 14000002 IIQ2A    LDA    DCSK
         1000 004EE   1262  2 3C000024          STA    NCCD          NCCD=-8
         1001 004F0   1264  2 1400001C          LDA    ZERO
         1002 004F2   1266  2 3C000026          STA    SAMI          SAMI=0
         1003 004F4   1268  2 6006              JRU    IIQ3A
GENERATED                     0700
         1004 004F6   1270  2 1400000C IIQ3     LDA    TWO
         1005 004F8   1272  2 3C000026          STA    SAMI          SAMI=2
         1006 004FA   1274  2 1400001C IIQ3A    LDA    ZERO
```

VERSION K20A0503 DECK NAME=*INIT *


```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            1007 004FC   1276  2 3C00002A        STA    NCCU       NCCU=0
            1008 004FE   1278  2 3C00002C        STA    NCCU+2
            1009 00500   1280  2 74000004        RTA    IIQM
            1010                                 END
```

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STATISTICS

TOTAL SHORTS   138
TOTAL LONGS    484
TOTAL INSTRUCTIONS   622
PERCENT SHORT   22.2
GENERATED NOPS   34
THEORETICAL PERCENT NOP LOADING   10.1
ACTUAL PERCENT NOP LOADING    3.0
```

```
    DECK NAME=*INIT  *                      *****ERROR MESSAGES*****

 LINE NUMBER                        DIAGNOSTIC
1     226.........................ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
2     345.........................ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
```

XREF 1 DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 1

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES			
0000C	12		5	A	112	113	614	684	700
0003C	60		6	AB	136	701			
000F2	242		4	AJ	107	728	731		
0000C	12		8	AK1T	152	713	714		
00010	16		8	AK2T	153	718	719		
00010	16		7	ALT	185				
00150	336		7	AP	214				
00036	54		5	ASCH	116	117	829		
0015C	348		7	AT	215				
00030	48		4	BTE1	15				
00032	50		4	BTE3	16				
0003C	60		9	CD01	252	685	686		
00040	64		9	CD02	253	689	690		
00044	68		9	CD03	254	693	694		
00038	56		5	CD040	118	756	757		
00048	72		9	CD04	255	753	754		
0004C	76		9	CD05	256				
00050	80		9	CD06	257				
00054	84		9	CD07	258	699			
00058	88		9	CD08	259				
0005C	92		9	CD09	260				
00060	96		9	CD10	261				
00064	100		9	CD11	262				
00068	104		9	CD12	263				
0006C	108		9	CD13	264				
00070	112		9	CD14	265				
00074	116		9	CD15	267				
00078	120		9	CD16	268				
0007C	124		9	CD17	269				
00080	128		9	CD18	270				
00084	132		9	CD19	271	645	646		
00088	136		9	CD20	272	658	659		
0008C	140		9	CD21	273	671	672		
00090	144		9	CD22	274	654	655		
00094	148		9	CD23	275	667	668		
00098	152		9	CD24	276	680	681		
0009C	156		9	CD25	277	651			
000A0	160		9	CD26	278	664			
000A4	164		9	CD27	279	677			
000A8	168		9	CD28	280				
000AC	172		9	CD29	281				
000B0	176		9	CD30	282				
000B4	180		9	CD31	283				
000B8	184		9	CD32	284				
000BC	188		9	CD33	285				
000C0	192		9	CD34	286				
000C4	196		9	CD35	287				
000C8	200		9	CD36	288				
000CC	204		9	CD37	289				
000D0	208		9	CD38	290				
000D4	212		9	CD39	291				
000D8	216		9	CD40	293				
000DC	220		9	CD41	294				

XREF 1 DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 2

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES				
000E0	224		9	CD42	295					
000E4	228		9	CD43	296					
000E8	232		9	CD44	297					
000EC	236		9	CD45	298					
000F0	240		9	CD46	299					
000F4	244		9	CD47	300					
000F8	248		9	CD48	301					
000FC	252		9	CD49	302					
00100	256		9	CD50	303	763	764			
00104	260		9	CD51	304	770	771			
00108	264		9	CD52	305					
0010C	268		9	CD53	306					
00110	272		9	CD54	307					
00114	276		9	CD55	309					
00118	280		9	CD56	311					
0011C	284		9	CD57	313					
00120	288		9	CD58	314					
00124	292		9	CD59	315					
00128	296		9	CD60	316					
0012C	300		9	CD61	317					
00130	304		9	CD62	318					
00134	308		9	CD63	319					
00138	312		9	CD64	320					
00038	56		6	CGCL	135	874	875	876	888	889
0000C	12		7	CGUL	184	222	709	710	861	
00012	18		6	CMAJ	125	641				
00038	56		4	CIPM	19					
0000C	12		7	CL	222					
00000	0		9	CONCOM	223					
00052	82		4	CTR1	29					
00054	84		4	CTR2	30					
00056	86		4	CTR3	31					
00004	4		7	CWT	182					
0004A	74		4	CYLE	25					
0002E	46		7	C1	192	388	389	407	422	
00032	50		7	C2	193	396	397	414	421	
00030	48		6	C2GC	133	878	879			
00036	54		7	C3	194	446	450			
0003A	58		7	C4	195	454	459	462		
000E4	228		7	D	209	216				
00066	102		4	DATA	37					
0000C	12		5	DCAR	113					
00010	16		6	DCON	124	643				
00002	2		9	DCSK	226	642	999			
*****UNDEFINED*****				DECATN		488	506	513	870	
*****UNDEFINED*****				DECSW		500				
0000C	12		2	DEG45	342	384				
0000E	14		2	DEG49	343	964				
00030	48		9	DELT	248	746				
0001C	28		9	DFONE	242					
00012	18		2	DF8	344	740				
00078	120		7	DG	204	483	484	832		
00024	36		4	DPDV	12					

XREF 1 DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 3

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES								
00028	40	4	DPHV	13									
00020	32	4	DPVV	11									
0004E	78	4	DRFV	27									
0000A	10	2	DRMX	341	532								
0003E	62	4	DVX	22									
00014	20	4	DVXG	8	630								
00000	0	5	DVXI	109	626								
00042	66	4	DVY	23									
00018	24	4	DVYG	9									
00004	4	5	DVYJ	110									
00046	70	4	DVZ	24									
0001C	28	4	DVZG	10									
00008	8	5	DVZK	111									
00054	84	7	D1	203	218								
00034	52	9	D1032	249	982								
00038	56	9	D3032	250	927								
00016	22	9	EIGHT	237									
0009C	156	7	E1	205	489	507	514	575	576	577	590	591	822
000A8	168	7	E2	206	543	544	569	570	571	574	599		
00084	180	7	E3	207	545	546	563	564	565	568	604		
0000C	12	9	FASI	232	986								
00226	550	2	FENT	611	378								
00008	8	1	FG	327	400	472							
00030	48	5	FLGN	114	979								
0001E	30	9	FONE	241	497	732	848						
00010	16	9	FOUR	234									
0011C	284	9	GL	312	313	711	741	742	747	748			
00060	96	6	GM	137	644								
0002C	44	4	GMT	14									
00050	80	4	HDGV	28									
00068	104	1	HEAD	334	592	593	838	839					
*****UNDEFINED*****			IA		345								
00000	0	8	IACOM	150									
00092	146	2	IB	381	379								
00000	0	1	IBM	323	381	608							
00096	150	2	IB1	383									
000A6	166	2	IB1A	391	399								
00088	184	2	IB2	400									
0011E	285	2	IB3	469									
0013C	316	2	IB4	484									
00176	374	2	IB5	517									
0017A	378	2	IB5A	519	589								
00184	388	2	IB5B	524	520								
00194	404	2	IB5C	532	528								
001A4	420	2	IB5D	540	525	533							
00182	434	2	IB5E	547	536								
0018A	442	2	IB5F	551	541								
001C0	448	2	IB5G	554	539	550							
001F8	504	2	IB5H	583	579								
00206	518	2	IB6	590	588								
*****UNDEFINED*****			IF2		886								
*****UNDEFINED*****			IIA		346								
00004	4	1	IIQM	325	936	1009							

XREF] DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 4

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES							
0047A	1146		2	IIQ1A	941	943							
00482	1154		2	IIQ1B	945	947							
00472	1138		2	IIQ1	937								
004EC	1260		2	IIQ2A	999	952							
004A0	1184		2	IIQ2B	960	954							
004B6	1206		2	IIQ2B1	971	965							
004C0	1216		2	IIQ2C	976	961							
004D2	1234		2	IIQ2D	985	977							
004E2	1250		2	IIQ2D1	994	988							
00488	1160		2	IIQ2	948								
004FA	1274		2	IIQ3A	1006	959	1003						
004F6	1270		2	IIQ3	1004	970	975	993	998				
00006	6		1	IISM	326	856	932						
00002	2		1	IOM	324	611	852						
00228	552		2	IO1	612								
0022C	556		2	IO1A	614	616							
00234	564		2	IO1B	618	620							
0023C	572		2	IO1C	622	624							
00244	580		2	IO1D	626	628							
0024C	588		2	IO1E	630	632							
00268	616		2	IO2	644								
002C4	708		2	IO3	702								
002E8	744		2	IO4	720								
002F0	752		2	IO4A	724	726							
002F8	760		2	IO4B	728	730							
00328	808		2	IO4C	753	759							
0033C	828		2	IO5	763								
003A0	928		2	IO5A	822	824							
00060	96		4	ITER	34								
00018	24		2	JALN	346	830							
00016	22		2	JNAV	345	857							
000E4	228		7	J3X3	216								
0002C	44		9	KGDL	247	862	863						
0004E	78		7	KSN1	200	534	538	540	547	549	551	553	558	825
00050	80		7	KSN2	201	826							
00052	82		7	KSN3	202	827							
0001A	26		2	KS1	347	572							
00042	66		2	KS2	357	566							
0006A	106		2	KS3	367	561							
00150	336		7	K3X3	217								
00008	8		6	LAT	122	704	705	962	963				
00024	36		6	LATB	130	901	902						
00114	276		9	LATL	308	309	702	703					
00024	36		7	LCA1	219								
00028	40		7	LCA4	220								
0002C	44		1	LG	328	436	477						
00028	40		6	LGO	131	923	924						
0006E	110		4	LITE	41								
00020	32		6	LONB	129	903	904						
0000C	12		6	LONG	123	921	922						
00118	280		9	LONL	310	311	919	920					
00054	84		7	L3X3	218								
00000	0		7	MATCOM	180								

XREF 1 DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 5

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
00028	40		8	MCSI	160	969	974	990	995								
0006C	108		4	MODE	40												
*****UNDEFINED*****				MULFD		712	717	743	749	755	785	790	812	817	864	877	883
						890	895	912									
*****UNDEFINED*****				MULS33		469	474	479									
*****UNDEFINED*****				MUL33		697											
00064	100		4	NAVF	36	860											
003D6	982		2	NAVI	856	854											
00024	36		8	NCCD	158	956	967	972	992	997	1000						
0002A	42		8	NCCU	161	1007	1008										
00004	4		9	NFOUR	227	828											
00000	0		5	NIACOM	108												
00000	0		6	NICOM	119												
00018	24		9	NINE	238	535	537										
0002C	44		7	NMO	191	761	948	950									
00008	8		9	NONE	229	760											
00036	54		5	NSCH	117												
00006	6		9	NT#O	228												
00006	6		2	N1200	339	966											
00004	4		2	N1680	338	971											
00002	2		2	N4800	337	996											
00000	0		9	N64	224	955											
00000	0		2	N7200	336	991											
000C0	192		7	OC	208	482	777										
00028	40		9	OMEG	246												
00024	36		9	OMGA	245	909											
0000A	10		9	ONE	230	548	552	859	957	973							
00020	32		9	ONHLF	244												
000AC	172		4	O14	72												
00094	148		4	O18	60												
000A4	164		4	O21	68	602											
000A6	166		4	O22	69	607											
000A2	162		4	O23	67	597											
000A8	168		4	O24	70												
000CA	202		4	O25	87												
00096	150		4	O30	61												
00098	152		4	O31	62												
0009A	154		4	O32	63												
0009C	156		4	O33	64												
0009E	158		4	O34	65												
000A0	160		4	O35	66												
00086	134		4	O4A	53												
00088	136		4	O4B	54												
0008A	138		4	O4C	55												
00082	178		4	O4D	75												
00084	180		4	O4E	76												
00072	114		4	O4F	43												
00074	116		4	O40	44												
00076	118		4	O41	45												
00078	120		4	O42	46												
0007A	122		4	O43	47												
0007C	124		4	O44	48												
0007E	126		4	O45	49												

XREF 1 DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 6

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES					
0008C	140	4	046		56						
00080	128	4	047		50						
00082	130	4	048		51						
00084	132	4	049		52						
000D2	210	4	05A		91						
000C4	196	4	05B		84						
000C6	198	4	05D		85						
000C8	200	4	05E		86						
000A6	182	4	050		77						
000A8	184	4	051		78						
000AA	186	4	052		79						
000AC	188	4	053		80						
000AE	190	4	054		81						
000C0	192	4	055		82						
000C2	194	4	056		83						
00006	214	4	057		93						
00008	216	4	058		94						
000DA	218	4	059		95						
000EA	234	4	06A		103						
000EC	236	4	06B		104						
000AE	142	4	06C		57						
00090	144	4	06D		58						
00092	146	4	06E		59						
000CC	204	4	060		88						
000D4	212	4	062		92						
000DC	220	4	063		96						
000DE	222	4	064		97						
000E0	224	4	065		98						
000E2	226	4	066		99						
000E4	228	4	067		100						
000E6	230	4	068		101						
000E8	232	4	069		102						
000B0	176	4	071		74						
000AE	174	4	072		73						
00014	20	8	PHA		154	721	722				
00062	98	4	PHAS		35						
00068	104	4	PUSH		38						
00000	0	6	RAD		120	887	915	916			
0003A	58	4	RAT		20						
0003C	60	4	RATL		21						
00008	8	4	RATM		4	639	640				
0000C	12	4	RATP		5	637	638				
00014	20	7	RES1		186	383					
00018	24	7	RES2		187	391					
0001C	28	7	RES3		188						
00020	32	7	RES4		189						
00008	8	2	RMX		340	524					
00010	16	4	ROT1		6						
00012	18	4	ROT2		7						
00470	1136	2	RSET		936	762	935				
00050	80	1	RT		332	519	523	526	555	578	582
0005C	92	1	RTL		333	527	583	584			
00050	80	1	RT1		329	332	490	491			

XREF 1 DECK NAME=*INIT *

SKC 2000 CROSS REFERENCE DICTIONARY

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES
00054	84		1	RT2	330 506 509
00058	88		1	RT3	331 515 516
00004	4		6	RXYZ	121 917 918
00034	52		4	R1CT	17
00036	54		4	R2CT	18
00108	264		7	SA	210
00026	38		8	SAMI	159 958 1002 1005
00032	50		5	SAVT	115 983 984
000CC	204		6	SDVI	146 618
000D0	208		6	SDVJ	147
000D4	212		6	SDVK	148
00014	20		9	SEVEN	236
00034	52		6	SGCL	134 873 880 881 882 893 894
00008	8		7	SGDL	183 221 708 715 716 868 869
*****UNDEFINED*****				SINCOS	385 393 706 765 772 840 871
00012	18		9	SIA	235
00008	8		7	SL	221
00024	36		7	SMA	190 219 220 938 939
00000	0		4	SRT1	2 633 634
00004	4		4	SRT2	3 635 636
00000	0		7	SWT	181
0003E	62		7	S1	196 387 405 425
00042	66		7	S2	197 395 429 432
0002C	44		6	S2GC	132 884 885
00046	70		7	S3	198 437 458
0004A	74		7	S4	199 440 447 466
000A8	168		6	TEM	139 406 411 418 495 496 499 501 502 503 529 531 554 556 767 788 789 797 810 811
000B4	180		6	TEM0	140 768 769 781 782 815 816 865 866 867
000B8	184		6	TEM1	141 774 800 801 806 807 808 809
000BC	188		6	TEM2	142 775 776 778
0001A	26		9	TEN	239
000AA	106		4	TEST	39
0000E	14		9	THREE	233 987 989
0005B	88		4	TIME	32 736 737 925 926 980 981
00008	216		5	TLPO	149 930 931
0012C	300		7	T4	211 473 476
00070	112		4	TMPR	42
00150	336		7	T41	212 214 215 217 478 481
0000C	12		9	TWO	231 232 994 1004
0005C	92		4	T0	33 738 739 928 929
00018	24		8	VAX	155 156 157 941
00000	0		8	VAX1	151 622
0001C	28		8	VAY	156
00020	32		8	VAZ	157
00066	102		8	VC1X	174 175 176 724
00072	114		8	VC2X	175
0007E	126		8	VC3X	176
00174	372		7	VECT	213 831 858
0008A	138		8	VF1X	177 178 179
00096	150		8	VF2X	178
000A2	162		8	VF3X	179
0004C	76		4	VRTV	26

XREF 1 DECK NAME=*INIT * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 8

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES
0005E	94	8		VTB	172	744 745
00062	98	8		VTC	173	750 751
00014	20	6		VX	126	905 906
00018	24	6		VY	127	913 914
0001C	28	6		VZ	128	907 908
00084	132	6		V1	138	471
00000	0	4		WLDCOM	1	
000C0	192	6		X	143	891 892 910 911
0002E	46	8		XA	162	945
00036	54	8		XB	163	
0003E	62	8		XC	164	
000C4	196	6		Y	144	899 900
00046	70	8		YA	171	
00046	70	8		YA1	165	171
0004A	74	8		YA2	166	
0004E	78	8		YB1	167	
00052	82	8		YB2	168	
00056	86	8		YC1	169	
0005A	90	8		YC2	170	
000C8	200	6		Z	145	896 897
0001C	28	9		ZERO	240	242 382 392 401 404 408 415 426 433 443 451 457 463 498 521 522 530 542 580 581 594 598 603 613 649 650 662 663 675 676 720 793 794 804 805 821 833 843 844 849 898 937 968 978 1001 1006

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VERSION K20A0503      DECK NAME=*ALIGN *                                                             PAGE   1

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
                                  $FAP ALIGN
             1 05100  20736 -2    BUFORG   SETX   5100             BUFFER ORIGON
             2                             EVEN
                                  *
                                  *
                                  *
                                  *    GEANS WORLD COMMON VARIABLES DATA AREA
                                  *
             3                4   WLDCOM   COMMON  4
                                  *
             4 00000       0  4   SRT1     BSS    4                GYRO ROTOR 1 SPEED ACCUMULATION
             5 00004       4  4   SRT2     BSS    4                GYRO ROTOR 2 SPEED ACCUMULATION
             6 00008       8  4   RATM     BSS    4                NEGATIVE R.A.T. PULSE ACCUMULATION
             7 0000C      12  4   RATP     BSS    4                POSITIVE R.A.T. PULSE ACCUMULATION
             8 00010      16  4   ROT1     BSS    2                GYRO 1 ROTOR SPEED ( REV/SECOND )
             9 00012      18  4   ROT2     BSS    2                GYRO 2 ROTOR SPEED ( REV/SECOND )
            10 00014      20  4   DVXG     BSS    4                ACCUMULATED DELT VX
            11 00018      24  4   DVYG     BSS    4                ACCUMULATED DELT VY
            12 0001C      28  4   DVZG     BSS    4                ACCUMULATED DELT VZ
            13 00020      32  4   DPVV     BSS    4                DOPPLER VERTICAL VELOCITY ACCUMULATION
            14 00024      36  4   DPDV     BSS    4                DOPPLER DRIFT    VELOCITY ACCUMULATION
            15 00028      40  4   DPHV     BSS    4                DOPPLER HEADING  VELOCITY ACCUMULATION
            16 0002C      44  4   GMT      BSS    4                GREENWICH MEAN TIME
            17 00030      48  4   BTE1     BSS    2                BITE ACTUAL STATE MASK WORD 1
            18 00032      50  4   BTE3     BSS    2                BITE ACTUAL STATE MASK WORD 3
            19 00034      52  4   R1CT     BSS    2                COUNTER FOR ROTOR 1 SPEED FAULT
            20 00036      54  4   R2CT     BSS    2                COUNTER FOR ROTOR 2 SPEED FAULT
            21 00038      56  4   CIPM     BSS    2                INPUT POWER MONITOR COUNTER
            22 0003A      58  4   RAT      BSS    2                REDUNDANT AXIS TORQUING (PULSES)
            23 0003C      60  4   RATL     BSS    2                COUNTER FOR RAT
            24 0003E      62  4   DVX      BSS    4                INPUT DELTA VX
            25 00042      66  4   DVY      BSS    4                INPUT DELTA VY
            26 00046      70  4   DVZ      BSS    4                INPUT DELTA VZ
            27 0004A      74  4   CYLE     BSS    2                OUT-OF-TIME FLAG
            28 0004C      76  4   VRTV     BSS    2                DOPPLER VERTICAL VELOCITY
            29 0004E      78  4   DRFV     BSS    2                DOPPLER DRIFT    VELOCITY
            30 00050      80  4   HDGV     BSS    2                DOPPLER HEADING  VELOCITY
            31 00052      82  4   CTR1     BSS    2                PHASE TIMER
            32 00054      84  4   CTR2     BSS    2                INTERNAL SEQUENCING COUNTER
            33 00056      86  4   CTR3     BSS    2                INTERNAL SEQUENCING COUNTER
            34 00058      88  4   TIME     BSS    4                TIME FROM SYSTEM TURN ON (SECONDS)
            35 0005C      92  4   T0       BSS    4                TIME AT ENTRY TO NAV
            36 00060      96  4   ITER     BSS    2                ITERATION COUNTER
            37 00062      98  4   PHAS     BSS    2                AUTOMATIC SEQUENCING PHASE
            38 00064     100  4   NAVF     BSS    2                IN-NAVIGATION MODE FLAG (2/3 - MAN/AUTO)
            39 00066     102  4   DATA     BSS    2                SYSTEM DATA SWITCH (0-7)
            40 00068     104  4   PUSH     BSS    2                PUSHBUTTON SWITCH (0-31)
            41 0006A     106  4   TEST     BSS    2                PRESS TO TEST SWITCH (0/-1)
            42 0006C     108  4   MODE     BSS    2                SYSTEM MODE SWITCH
            43 0006E     110  4   LITE     BSS    2                CDU LIGHTS (SOFTWARE)
            44 00070     112  4   TMPR     BSS    2                TEMP STORAGE LOCATION
                                  *
                                  *    SODL DATA AREA
                                  *
            45 00072     114  4   04F      BSS    2         01     FRAME MARKER
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VERSION X20A0503 DECK NAME=*ALIGN *

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM				SOURCE	
46	00074	116	4		040	BSS	2	02	MSH OF GMT
47	00076	118	4		041	BSS	2	03	LSH OF GMT
48	00078	120	4		042	BSS	2	04	MSH OF LATITUDE
49	0007A	122	4		043	BSS	2	05	LSH OF LATITUDE
50	0007C	124	4		044	BSS	2	06	MSH OF LONGITUDE
51	0007E	126	4		045	BSS	2	07	LSH OF LONGITUDE
52	00080	128	4		047	BSS	2	08	MSH OF VERTICAL VELOCITY
53	00082	130	4		048	BSS	2	09	LSH OF VERTICAL VELOCITY
54	00084	132	4		049	BSS	2	10	MSH OF EAST VELOCITY
55	00086	134	4		04A	BSS	2	11	LSH OF EAST VELOCITY
56	00088	136	4		04B	BSS	2	12	MSH OF NORTH VELOCITY
57	0008A	138	4		04C	BSS	2	13	LSH OF NORTH VELOCITY
58	0008C	140	4		046	BSS	2	14	I.N.S. ALTITUDE
59	0008E	142	4		06C	BSS	2	15	AHRS HEADING
60	00090	144	4		06D	BSS	2	16	AHRS PITCH
61	00092	146	4		06E	BSS	2	17	AHRS ROLL
62	00094	148	4		018	BSS	2	18	RESET,IMU,DPU,EAU,CDU,DCU,BATT BITE BITS
63	00096	150	4		030	BSS	2	19	3RD,4TH,5TH,6TH, RIGHT NUMERIC
64	00098	152	4		031	BSS	2	20	4 DISCRETES; R.ALPHA; 1ST,2ND R. NUMERIC
65	0009A	154	4		032	BSS	2	21	2ND,3RD,4TH,5TH LEFT NUMERIC
66	0009C	156	4		033	BSS	2	22	1ST,2ND WAYPOINT; L. ALPHA; 1ST L.NUMERIC
67	0009E	158	4		034	BSS	2	23	1ST,2ND FROM< 1ST,2ND TO
68	000A0	160	4		035	BSS	2	24	CDU/ACDU DISPLAY LIGHTS
69	000A2	162	4		023	BSS	2	25	HEADING
70	000A4	164	4		021	BSS	2	26	PITCH
71	000A6	166	4		022	BSS	2	27	ROLL
72	000A8	168	4		024	BSS	2	28	STEERING SIGNAL
73	000AA	170	4			BSS	2	29	BLANK
74	000AC	172	4		014	BSS	2	30	SEQ CNT,G1,2 RED,G1,2 TERM SHUTDOWN BITS
75	000AE	174	4		072	BSS	2	31	TORQUE FOR GIMBALS 1 AND 2
76	000B0	176	4		071	BSS	2	32	TORQUE FOR GIMBALS 3 AND 4
77	000B2	178	4		04D	BSS	2	33	ROTOR 1,2, ROTOR SPEED
78	000B4	180	4		04E	BSS	2	34	RAT AND VERTICAL VELOCITY
79	000B6	182	4		050	BSS	2	35	-,+ DELTA VX
80	000B8	184	4		051	BSS	2	36	-,+ DELTA VY
81	000BA	186	4		052	BSS	2	37	-,+ DELTA VZ
82	000BC	188	4		053	BSS	2	38	GIMBAL 1 RESOLVER
83	000BE	190	4		054	BSS	2	39	GIMBAL 2 RESOLVER
84	000C0	192	4		055	BSS	2	40	GIMBAL 3 RESOLVER
85	000C2	194	4		056	BSS	2	41	GIMBAL 4 RESOLVER
86	000C4	196	4		058	BSS	2	42	DATA,MODE,TST AND PUSHBUTTON SWITCHES
87	000C6	198	4		05D	BSS	2	43	BITE BITS
88	000C8	200	4		05E	BSS	2	44	BITE BITS
89	000CA	202	4		025	BSS	2	45	BAROMETRIC ALTITUDE AND BITE BITS
90	000CC	204	4		060	BSS	2	46	DRIFT AND HEADING VELOCITY
91	000CE	206	4			BSS	2	47	SPARE
92	000D0	208	4			BSS	2	48	SPARE
93	00002	210	4		05A	BSS	2	49	DELTA LATITUDE (FIX)
94	00004	212	4		062	BSS	2	50	DELTA LONGITUDE (FIX)
95	00006	214	4		057	BSS	2	51	VERTICAL DIFFERENCE VELOCITY
96	00008	216	4		058	BSS	2	52	CROSS TRACK DIFFERENCE VELOCITY
97	0000A	218	4		059	BSS	2	53	ALONG TRACK DIFFERENCE VELOCITY
98	0000C	220	4		063	BSS	2	54	A11 ALIGNMENT MATRIX
99	0000E	222	4		064	BSS	2	55	A21 ALIGNMENT MATRIX
100	000E0	224	4		065	BSS	2	56	A31 ALIGNMENT MATRIX

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VERSION K20A0503     DECK NAME=*ALIGN *                                                              PAGE    3

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
             101 000E2   226  4          066      BSS    2         57   A12 ALIGNMENT MATRIX
             102 000E4   228  4          067      BSS    2         58   A22 ALIGNMENT MATRIX
             103 000E6   230  4          068      BSS    2         59   A32 ALIGNMENT MATRIX
             104 000E8   232  4          069      BSS    2         60   A13 ALIGNMENT MATRIX
             105 000EA   234  4          06A      BSS    2         61   A23 ALIGNMENT MATRIX
             106 000EC   236  4          06B      BSS    2         62   A33 ALIGNMENT MATRIX
             107 000EE   238  4                   BSS    2         63   SPARE
             108 000F0   240  4                   BSS    2         64   SPARE
             109 000F2   242  4          AJ       BSS    36             ALIGNMENT MATRIX
                                         *
             110                5        NIACOM   COMMON 5              NAV,INIT,AND ALIGN COMMON DATA
                                         *
                                         *    DELTA V'S IN I,J,K SPACE IN M/SEC/CC
                                         *
             111 00000     0  5          DVXI     BSS    4
             112 00004     4  5          DVYJ     BSS    4
             113 00008     8  5          DVZK     BSS    4
             114 0000C    12  5          A        BSS    36             TEMP 3X3 MATRIX A
             115 0000C    12  5          DCAR     EQU    A
             116 00030    48  5          FLGN     BSS    2              SAVE AJ(I,J) FLAG
             117 00032    50  5          SAVT     BSS    4              TIME OF LAST AJ ROTATION
             118 00036    54  5          ASCH     BSS    2              ALIGNMENT SCHEDULER
             119 00036    54  5          NSCH     EQU    ASCH           NAVIGATION SCHEDULER
             120 00038    56  5          CD04D    BSS    12             CD0(I)*DELT    I=4,6
                                         *
                                         *
             121                7        MATCOM   COMMON 7              MATRIX,VECTOR,AND MISCELLANEOUS DATA
                                         *
             122 00000     0  7          SWT      BSS    4              SIN(OMEGA T)
             123 00004     4  7          CWT      BSS    4              COS(OMEGA T)
             124 00008     8  7          SGDL     BSS    4              SIN(GEODETIC LATITUDE)
             125 0000C    12  7          CGDL     BSS    4              COS(GEODETIC LATITUDE)
             126 00010    16  7          ALT      BSS    4              ALTITUDE
                                         *
                                         *    GIMBAL RESOLVER POSITION (BIAS EXCLUDED)
                                         *
             127 00014    20  7          RES1     BSS    4
             128 00018    24  7          RES2     BSS    4
             129 0001C    28  7          RES3     BSS    4
             130 00020    32  7          RES4     BSS    4
             131 00024    36  7          SRA      BSS    8              SUM OF 1-(G KNOWN)/(G ACCELERATION)
             132 0002C    44  7          NMO      BSS    2
                                         *
                                         *    COSINES OF CORRECTED GIMBAL ANGLES
                                         *
             133 0002E    46  7          C1       BSS    4
             134 00032    50  7          C2       BSS    4
             135 00036    54  7          C3       BSS    4
             136 0003A    58  7          C4       BSS    4
                                         *
                                         *    SINES OF CORRECTED GIMBAL ANGLES
                                         *
             137 0003E    62  7          S1       BSS    4
             138 00042    66  7          S2       BSS    4
             139 00046    70  7          S3       BSS    4
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VERSION K20A0503        DECK NAME=*ALIGN *                                                              PAGE   4

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                       SOURCE
            140 0004A      74  7           S4       BSS    4
                                           *
            141 0004E      78  7           KSN1     BSS    2             GAIN COLUMN INDEX
            142 00050      80  7           KSN2     BSS    2             GAIN COLUMN INDEX
            143 00052      82  7           KSN3     BSS    2             GAIN COLUMN INDEX
            144 00054      84  7           D1       BSS    36            TEMP 3X3 MATRIX
            145 00078     120  7           DG       BSS    36            TOTAL GIMBAL AND THEN TSP2
                                           *
                                           *    STATE MATRIX ( STORED ROW MAJOR ORDER )
                                           *****        E11 = PSI = HEADING
                                           *****        E12 = THETA = PITCH
                                           *****        E13 = PHI = ROLL
                                           *
                                           *
            146 0009C     156  7           E1       BSS    12
            147 000A8     168  7           E2       BSS    12
            148 000B4     180  7           E3       BSS    12
            149 000C0     192  7           DC       BSS    36            VEHICLE TO CASE TRANSFORMATION MATRIX
            150 000E4     228  7           D        BSS    36            TEMP 3X3 MATRIX
            151 00108     264  7           SA       BSS    36            SAVE AJ MATRIX
            152 0012C     300  7           TM       BSS    36            TEMP 3X3 MATRIX
            153 00150     336  7           TM1      BSS    36            TEMP 3X3 MATRIX
            154 00174     372  7           VECT     BSS    34            TABLE OF SUBROUTINE CALLS
            155 00150     336  7           AP       EQU    TM1           TEMP 3X1 VECTOR
            156 0015C     348  7           AT       EQU    TM1+12        TEMP 3X1 VECTOR
            157 000E4     228  7           J3X3     EQU    D
            158 00150     336  7           K3X3     EQU    TM1
            159 00054      84  7           L3X3     EQU    D1
            160 00024      36  7           LCA1     EQU    SRA           LAST GIMBAL 1 COMMAND
            161 00028      40  7           LCA4     EQU    SRA+4         LAST GIMBAL 4 COMMAND
            162 00008       8  7           SL       EQU    SGDL          SIN(LAT) GEODETIC
            163 0000C      12  7           CL       EQU    CGDL          COS(LAT) GEODETIC
                                           *
                                           *
            164                 8          IACOM    COMMON  8            INIT AND ALIGN DECKS COMMON DATA
                                           *
            165 00000       0  8           VAXI     BSS    12
            166 0000C      12  8           AK1T     BSS    4             G*DT*COS(LAT)
            167 00010      16  8           AK2T     BSS    4             G*DT*SIN(LAT)
            168 00014      20  8           PHA      BSS    4             PHASE ANGLE LAG OF FILTER IN PI RAD
            169 00018      24  8           VAX      BSS    12            SUM OF DVX,DVY,DVZ ERRORS IN M/SEC
            170 0001C      28  8           VAY      EQU    VAX+4
            171 00020      32  8           VAZ      EQU    VAX+8
            172 00024      36  8           NCCD     BSS    2             NUMBER OF CLOCK CYCLES COUNTING FROM
                                           *                             A NEGATIVE NUMBER
            173 00026      38  8           SAMI     BSS    2             SELECT ALIGN MODE INDEX
            174 00028      40  8           MCSI     BSS    2             MODE C SOLUTION INDEX
            175 0002A      42  8           NCCU     BSS    4             NUMBER OF COMPUTER CYCLES INTO MODE
            176 0002E      46  8           XA       BSS    8
            177 00036      54  8           XB       BSS    8
            178 0003E      62  8           XC       BSS    8
            179 00046      70  8           YA1      BSS    4             SUMMATION (EDVX)
            180 0004A      74  8           YA2      BSS    4             SUMMATION (EDVX*SIN(THR))
            181 0004E      78  8           YB1      BSS    4             SUMMATION (EDVY)
            182 00052      82  8           YB2      BSS    4             SUMMATION (EDVY*OMEGA*TIME)
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VERSION K20A0503      DECK NAME=*ALIGN *                                                                    PAGE   5

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                         SOURCE
            183 00056    86  8              YC1      BSS    4           SUMMATION (EDVZ*COS(THR))
            184 0005A    90  8              YC2      BSS    4           SUMMATION (EDVZ*SIN(THR))
            185 00046    70  8              YA       EQU    YA1
            186 0005E    94  8              VTB      BSS    4           LOCAL GRAVITY*8.0
            187 00062    98  8              VTC      BSS    4           GL*DELT
            188 00066   102  8              VC1X     BSS    36
            189 00072   114  8              VC2X     EQU    VC1X+12
            190 0007E   126  8              VC3X     EQU    VC1X+24
            191 0008A   138  8              VF1X     BSS    36
            192 00096   150  8              VF2X     EQU    VF1X+12
            193 000A2   162  8              VF3X     EQU    VF1X+24
                                            *
                                            *    GEANS WORLD COMMON VARIABLES DATA AREA
                                            *
            194                  9          CONCOM   COMMON  9
                                            *
            195 00000     0  9 FFFFFFC0 N64          DEC    -64
            196                                      EVEN
R           197 00002     2  9              DCSK     BSS    2
            198 00004     4  9              NFOUR    BSS    2
            199 00006     6  9              NTWO     BSS    2
            200 00008     8  9              NONE     BSS    2
            201 0000A    10  9              ONE      BSS    2
            202 0000C    12  9              TWO      BSS    2
            203 0000E    14  9              THREE    BSS    2
            204 00010    16  9              FOUR     BSS    2
            205 00012    18  9              SIX      BSS    2
            206 00014    20  9              SEVEN    BSS    2
            207 00016    22  9              EIGHT    BSS    2
            208 00018    24  9              NINE     BSS    2
            209 0001A    26  9              TEN      BSS    2
            210 0001C    28  9              ZERO     BSS    2
            211 0001E    30  9              FONE     BSS    2
            212 0001C    28  9              DFONE    EQU    ZERO
            213                                      EVEN
            214 00020    32  9              ONHLF    BSS    4
            215 00024    36  9              OMGA     BSS    4           EARTH ROTATION RATE  RAD/SEC
            216 00028    40  9              OMEG     BSS    4            EARTH RATE   PI RAD/SEC
            217 0002C    44  9              KGDL     BSS    4           GEODETIC LATITUDE CONSTANT
            218 00030    48  9              DELT     BSS    4           DELTA TIME = 1/8 SECOND
            219 00034    52  9              D1032    BSS    4           DOUBLE PRECISION 1/32
            220 00038    56  9              D3032    BSS    4           =3/32
                                            *
                                            *    CALIBRATION DATA.     CD01-CD64
                                            *
            221                                      EVEN
            222 0003C    60  9              CD01     BSS    4           X ACCEL SCALE FACTOR  M/SEC/PULSE
            223 00040    64  9              CD02     BSS    4           Y ACCEL SCALE FACTOR  M/SEC/PULSE
            224 00044    68  9              CD03     BSS    4           Z ACCEL SCALE FACTOR  M/SEC/PULSE
            225 00048    72  9              CD04     BSS    4           X ACCEL BIAS   PULSE/SEC
            226 0004C    76  9              CD05     BSS    4           Y ACCEL BIAS   PULSE/SEC
            227 00050    80  9              CD06     BSS    4           Z ACCEL BIAS   PULSE/SEC
            228 00054    84  9              CD07     BSS    4           B11 ACCEL MISALIGNMENT
            229 00058    88  9              CD08     BSS    4           B12 ACCEL MISALIGNMENT
            230 0005C    92  9              CD09     BSS    4           B13 ACCEL MISALIGNMENT
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VERSION K20A0503      DECK NAME=*ALIGN *                                                              PAGE    6

DIAGNOSTICS LINE ADRES UADRES LC  PROGRAM                                       SOURCE
            231 00060    96  9          CD10    BSS    4            B21 ACCEL MISALIGNMENT
            232 00064   100  9          CD11    BSS    4            B22 ACCEL MISALIGNMENT
            233 00068   104  9          CD12    BSS    4            B23 ACCEL MISALIGNMENT
            234 0006C   108  9          CD13    BSS    4            B31 ACCEL MISALIGNMENT
            235 00070   112  9          CD14    BSS    4            B32 ACCEL MISALIGNMENT
            236                                 EVEN
            237 00074   116  9          CD15    BSS    4            B33 ACCEL MISALIGNMENT
            238 00078   120  9          CD16    BSS    4            GYRO TORQUE,G INDEPEN,DYNE-CM
            239 0007C   124  9          CD17    BSS    4            GYRO TORQUE,G INDEPEN,DYNE-CM
            240 00080   128  9          CD18    BSS    4            GYRO TORQUE,G INDEPEN,DYNE-CM
            241 00084   132  9          CD19    BSS    4            G11 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            242 00088   136  9          CD20    BSS    4            G12 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            243 0008C   140  9          CD21    BSS    4            G13 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            244 00090   144  9          CD22    BSS    4            G21 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            245 00094   148  9          CD23    BSS    4            G22 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            246 00098   152  9          CD24    BSS    4            G23 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            247 0009C   156  9          CD25    BSS    4            G31 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            248 000A0   160  9          CD26    BSS    4            G32 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            249 000A4   164  9          CD27    BSS    4            G33 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            250 000A8   168  9          CD28    BSS    4            RAT GYRO TORQUE  DYNE-CM
            251 000AC   172  9          CD29    BSS    4            RAT GYRO TORQUE  DYNE-CM
            252 000B0   176  9          CD30    BSS    4            SPEED COMP,G INDEPENDENT  DYNE-CM
            253 000B4   180  9          CD31    BSS    4            SPEED COMP,G INDEPENDENT  DYNE-CM
            254 000B8   184  9          CD32    BSS    4            SPEED COMP,G INDEPENDENT  DYNE-CM
            255 000BC   188  9          CD33    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            256 000C0   192  9          CD34    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            257 000C4   196  9          CD35    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            258 000C8   200  9          CD36    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            259 000CC   204  9          CD37    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            260 000D0   208  9          CD38    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            261 000D4   212  9          CD39    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            262                                 EVEN
            263 000D8   216  9          CD40    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            264 000DC   220  9          CD41    BSS    4            SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            265 000E0   224  9          CD42    BSS    4            A18P RAT SPEED COMP  DYNE-CM
            266 000E4   228  9          CD43    BSS    4            A19P RAT SPEED COMP  DYNE-CM
            267 000E8   232  9          CD44    BSS    4            STARTING LOCUS         PI RADIANS
            268 000EC   236  9          CD45    BSS    4            BETA(1Z) MISALIGNMENT   PI RADIANS
            269 000F0   240  9          CD46    BSS    4            GIMBAL 1 RESOLVER BIAS  PI RADIANS
            270 000F4   244  9          CD47    BSS    4            GIMBAL 2 RESOLVER BIAS  PI RADIANS
            271 000F8   248  9          CD48    BSS    4            GIMBAL 3 RESOLVER BIAS  PI RADIANS
            272 000FC   252  9          CD49    BSS    4            GIMBAL 4 RESOLVER BIAS  PI RADIANS
            273 00100   256  9          CD50    BSS    4            PLATFORM AZIMUTH ALIGN IN PI RADIANS
            274 00104   260  9          CD51    BSS    4            PLATFORM ELEVATION ALIGN IN PI RADIANS
            275 00108   264  9          CD52    BSS    4            VERTICAL DAMPING CONSTANT,
                                        *                           0.59594852 IN M/SEC/M*2**31
            276 0010C   268  9          CD53    BSS    4            VERTICAL VELOCITY GAIN    UNITLESS
            277 00110   272  9          CD54    BSS    4            LOADED HEADING          PI RADIANS
            278 00114   276  9          CD55    BSS    4            LOADED LATITUDE         PI RADIANS
            279 00118   280  9          CD56    BSS    4            LOADED LONGITUDE        PI RADIANS
            280 0011C   284  9          CD57    BSS    4            LOCAL GRAVITY           METERS/SEC**2
            281 0011C   284  9          VT      EQU    CD57         VT=LOCAL GRAVITY
            282 00120   288  9          CD58    BSS    4            1/SCALE FACTOR          PULSES/M/SEC
            283 00124   292  9          CD59    BSS    4            ROTOR 1 SPEED      REVOLUTIONS/SEC
            284 00128   296  9          CD60    BSS    4            ROTOR 2 SPEED      REVOLUTIONS/SEC
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VERSION K20A0503      DECK NAME=*ALIGN *                                                                PAGE    7

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                         SOURCE
            285 0012C   300  9           CD61      BSS    4               BARO ALT SCALE FACTOR   METERS/BIT
            286 00130   304  9           CD62      BSS    4               BARO ALTITUDE BIAS      BITS
            287 00134   308  9           CD63      BSS    4               ALTIMETER / AHRS FLAGS  NONE
            288 00138   312  9           CD64      BSS    4               ALTITUDE                METERS
                                         *
            289                13                  USE    13
                                         *
            290                13                  ORG    BUFORG
            291 05100 20736 13           DECFLG    BSS    2               PDP-11 FLAG
            292 05102 20738 13           BTIME     BSS    4               TIME
            293 05106 20742 13           BSX       BSS    12              SX,SY,AND SZ
            294 05112 20754 13           BAJ       BSS    36              MATRIX AJ
            295 05136 20790 13           BNMO      BSS    2               NMO FLAG
                                         *
            296                 1                  USE    1
                                         *
            297 00000     0  1           IIAM      BSS    2               RETURN ADDRESS LOCATION
            298 00002     2  1           IIDM      BSS    2               RETURN ADDRESS LOCATION
            299 00004     4  1           IIHM      BSS    2               RETURN ADDRESS LOCATION
            300 00006     6  1           IIKM      BSS    2
            301 00008     8  1           IIMM      BSS    2
            302 0000A    10  1           IIM3M     BSS    2
            303 0000C    12  1           IIOM      BSS    2
            304 0000E    14  1           IIPM      BSS    2
            305 00010    16  1           IIRM      BSS    2
            306 00012    18  1           IIR5M     BSS    2
            307 00014    20  1           ALNOR     BSS    2               ALNO RETURN ADDRESS LOCATION
            308 00016    22  1           CTHR      BSS    4               COS(EARTH MOTION ANGLE(THR))
            309 0001A    26  1           STHR      BSS    4               SIN(EARTH MOTION ANGLE(THR))
            310 0001E    30  1           RDVX      BSS    4               REFERENCE DVX   M/SEC/CC
            311 00022    34  1           RDVY      BSS    4               REFERENCE DVY   M/SEC/CC
            312 00026    38  1           RDVZ      BSS    4               REFERENCE DVZ   M/SEC/CC
            313 0002A    42  1           TEM       BSS    4
            314 0002E    46  1           TEM0      BSS    4
            315 00032    50  1           TEM2      BSS    4
            316 00036    54  1           TEM4      BSS    4
            317 0003A    58  1           DPTO      BSS    4               TEMP STORAGE FOR MULTIPLIER
            318 0003E    62  1           ACM       BSS    4               *ALIGN   AVERAGE(1-(G KNOWN)/(G ACCEL))
            319 00042    66  1           SX        BSS    4
            320 00046    70  1           SY        BSS    4
            321 0004A    74  1           SZ        BSS    4
                                         *
                                         *
            322                 2                  USE    2
                                         *
                                         *
            323 00000     0  2 C5C6F41A  PHC       HEX    C5C6F41A        COARSE FILTER PHASE ANGLE LAG,
            324 00002     2  2 39D83A28            HEX    39D83A28        0.00008414 PI RAD
            325 00004     4  2 4933FB85  PHF       HEX    4933FB85        FINE FILTER PHASE ANGLE LAG,
            326 00006     6  2 3B60374D            HEX    3B60374D        0.00073407 PI RAD
            327 00008     8  2 00000000  FKF       DEC64  0.01171875      FINE FILTER TIME CONSTANT
                               3D600000
            328 0000C    12  2 00000000  FKC       DEC64  0.09375         COARSE FILTER TIME CONSTANT
                               3EE00000
            329 00010    16  2 8C2A0F86  WOPP      DEC64  2.901440688E-06  EARTH MOVEMENT PI RAD/SEC*DELT
                               37615B2F
            330 00010    16  2           WDT       EQU    WOPP
```

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331 00014     20  2 00000000 0F8       DEC64  8.0            DOUBLE PRECISION 8.0
                    42400000
                          *
                          *     MATRIX LSSC(3,3,4) - FOR LEAST SQUARES SOLUTION
                          *
332 00018     24  2 D1FD1E8A LSSC      DEC64  .0031015155    A11 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    3C65A165
333 0001C     28  2 83738A67           DEC64  -.43541314     A12 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    BF9088C3
334 00020     32  2 FE43675D           DEC64  83.584381      A22 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    43D39599
335 00024     36  2 30FF1DCF           DEC64  .0033375035    B11 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    3C6D5002
336 00028     40  2 F4E6187E           DEC64  -.45749599     B12 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    BF8AE18A
337 0002C     44  2 96EDE0AE           DEC64  83.581613      B22 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    43D394E4
338 00030     48  2 92FA8021           DEC64  .0031014623    C11 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    3C65A0F3
339 00034     52  2 6659D12D           DEC64  -.43539325     C12 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    BF903A11
340 00038     56  2 88CFBFC6           DEC64  83.579845      C22 COARSE LEAST SQUARE SOL'N (LAT > 49)
                    43D39470
341 0003C     60  2 589B915A           DEC64  .0022618870    A11 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    3C4A1E15
342 00040     64  2 618805FC           DEC64  -.22532000     A12 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    BF0CA2D8
343 00044     68  2 2AC32228           DEC64  30.461785      A22 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    42F9D8DE
344 00048     72  2 42151224           DEC64  .0023830795    B11 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    3C4E1688
345 0004C     76  2 ECC1DFB4           DEC64  -.23336071     B12 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    BF0884F1
346 00050     80  2 9668E7AC           DEC64  30.459761      B22 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    42F9D6C8
347 00054     84  2 9F053E58           DEC64  .0022618075    C11 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    3C4A1D6A
348 00058     88  2 F56069CE           DEC64  -.22529930     C12 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    BF0CA591
349 0005C     92  2 2DCF4620           DEC64  30.458451      C22 COARSE LEAST SQUARE SOL'N (LAT < 49)
                    42F90574
350 00060     96  2 8CFA60C4           DEC64  .70883538E-03  A11 FINE LEAST SQUARE SOL'N (OPTION 2)
                    3A5CE891
351 00064    100  2 685655A3           DEC64  -.025572440    A12 FINE LEAST SQUARE SOL'N (OPTION 2)
                    BD97415A
352 00068    104  2 C2176724           DEC64  1.3065874      A22 FINE LEAST SQUARE SOL'N (OPTION 2)
                    40D39F20
353 0006C    108  2 37E24B62           DEC64  .83359380E-03  B11 FINE LEAST SQUARE SOL'N (OPTION 2)
                    3A6D42C4
354 00070    112  2 5750B899           DEC64  -.028575624    B12 FINE LEAST SQUARE SOL'N (OPTION 2)
                    BD8AF449
355 00074    116  2 CD340198           DEC64  1.3059618      B22 FINE LEAST SQUARE SOL'N (OPTION 2)
                    40D394E0
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VERSION K20A0503 DECK NAME=*ALIGN *

DIAGNOSTICS LINE	ADRES	OADRES	LC	PROGRAM	SOURCE		
356	00078	120	2	F5C042DC 3B5CE33F	DEC64	.70867687E-03	C11 FINE LEAST SQUARE SOL'N (OPTION 2)
357	0007C	124	2	23576A6D BD9752E6	DEC64	-.025555707	C12 FINE LEAST SQUARE SOL'N (OPTION 2)
358	00080	128	2	19462220 4003BEBB	DEC64	1.3055866	C22 FINE LEAST SQUARE SOL'N (OPTION 2)
359	00084	132	2	E898FA72 3B4172A6	DEC64	.49932754E-03	A11 FINE LEAST SQUARE SOL'N (OPTION 3)
360	00088	136	2	BD22A48A BD1F32C4	DEC64	-.011816612	A12 FINE LEAST SQUARE SOL'N (OPTION 3)
361	0008C	140	2	FB1E18EF 3FE32C59	DEC64	.3873955	A22 FINE LEAST SQUARE SOL'N (OPTION 3)
362	00090	144	2	35220F36 3B48D53C	DEC64	.55567131E-03	B11 FINE LEAST SQUARE SOL'N (OPTION 3)
363	00094	148	2	3978F286 BD17F770	DEC64	-.012699395	B12 FINE LEAST SQUARE SOL'N (OPTION 3)
364	00098	152	2	93228713 3FE30F42	DEC64	.3869516	B22 FINE LEAST SQUARE SOL'N (OPTION 3)
365	0009C	156	2	5D95C856 3B416911	DEC64	.49904191E-03	C11 FINE LEAST SQUARE SOL'N (OPTION 3)
366	000A0	160	2	717F9586 BD1F59CC	DEC64	-.011798001	C12 FINE LEAST SQUARE SOL'N (OPTION 3)
367	000A4	164	2	51AF1F3C 3FE2FD20	DEC64	.3866749	C22 FINE LEAST SQUARE SOL'N (OPTION 3)

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VERSION K20A0503     DECK NAME=*ALIGN *                                                                              PAGE   9

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
                                              *
                                              *    SUB EXECUTIVE FOR ALIGNMENT
                                              *
                                              *    THIS ROUTINE IS ENTERED EVERY 1/32 SECOND WHEN THE SYSTEM IS
                                              *    IN ALIGN. IT CYCLES THROUGH FOUR BRANCHES TO PROVIDE A 1/8
                                              *    SECOND COMPUTATION CYCLE.
                                              *
                                              *    THE SUB-EXEC PROVIDES AN ALIGN BYPASS,WHEN NSCH IS LESS THAN
                                              *    ZERO, SO THAT SYNCHRONIZATION TO THE 1/8 SECOND CYCLE MAY BE
                                              *    INITIATED UPON FIRST ENTRY TO ALIGN AND MAINTAINED UPON RE-ENTRY
                                              *    FROM NAV.
                                              *
           369                                           EVEN
           370                                           ENTRY  IIA
R          371 000A8    168  2 00000000 IIA              PTR    IIAM
           372 000AA    170  2 1400001C IIA1             LDA    ZERO
           373 000AC    172  2 3C000064                  STA    NAVF              NAVF=0
           374 000AE    174  2 14000036                  LDA    ASCH
           375 000B0    176  2 A400000A                  ADU    ONE
           376 000B2    178  2 3C000036                  STA    ASCH              ASCH=ASCH+1
           377 000B4    180  2 6350                      JRL    IIA5A
           378 000B5    181  2      0841                 SLL    1
           379 000B6    182  2 06C0                      LXA    8
GENERATED                          0700
           380 000B8    184  2 744000BA                  RTA    IIA1A,8
           381 000BA    186  2 000000C2 IIA1A            PTR    IIA2
           382 000BC    188  2 000000DA                  PTR    IIA3
           383 000BE    190  2 000000DE                  PTR    IIA4
           384 000C0    192  2 00000102                  PTR    IIA5
           385 000C2    194  2 1400002C IIA2             LDA    NCCU+2
           386 000C4    196  2 5400002A                  LDB    NCCU
           387 000C6    198  2 9C00001C                  AFD    DFONE             NCCU=NCCU+1
           388 000C8    200  2 3C00002C                  STA    NCCU+2
           389 000CA    202  2 7C00002A                  STB    NCCU
           390 000CC    204  2 14000024                  LDA    NCCD
           391 000CE    206  2 A400000A                  ADU    ONE               NCCD=NCCD+1
           392 000D0    208  2 3C000024                  STA    NCCD
           393 000D2    210  2 64040000                  JS    IIC
           394 000D4    212  2 64040106                  JS     IID
           395 000D6    214  2 64040000                  JS     IIE
           396 000D8    216  2 74000000                  RTA    IIAM
           397 000DA    218  2 64040000 IIA3             JS     IIF
           398 000DC    220  2 74000000                  RTA    IIAM
           399 000DE    222  2 64040000 IIA4             JS     IIG
           400 000E0    224  2 640401A6                  JS     IIH
           401 000E2    226  2 14000024                  LDA    NCCD
           402 000E4    228  2 6320                      JRL    IIA5A
GENERATED                          0700
           403 000E6    230  2 14000026                  LDA    SAMI
           404 000E8    232  2 0841                      SLL    1
           405 000E9    233  2      06C0                 LXA    8
           406 000EA    234  2 744000EC                  RTA    IIA4A,8
           407 000EC    236  2 000000F2 IIA4A            PTR    IIA4B
           408 000EE    238  2 000000F6                  PTR    IIA4C
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VERSION K20A0503      DECK NAME=*ALIGN *                                                    PAGE  10

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                               SOURCE
            409 000F0    240  2 000000FA          PTR      IIA4D
            410 000F2    242  2 640402C8 IIA4B    JS       IIK
            411 000F4    244  2 6008              JRU      IIA4E
GENERATED                          0700
            412 000F6    246  2 64040322 IIA4C    JS       IIM
            413 000F8    248  2 6004              JRU      IIA4E
GENERATED                          0700
            414 000FA    250  2 640403A6 IIA4D    JS       IIJ
            415 000FC    252  2 64040486 IIA4E    JS       IIP
            416 000FE    254  2 64040000          JS       RSET
            417 00100    256  2 74000000          RTA      IIAM
            418 00102    258  2 64040550 IIA5     JS       IIR
            419 00104    260  2 74000000 IIA5A    RTA      IIAM
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VERSION K20A0503      DECK NAME=*ALIGN *                                                          PAGE  11

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
            421                                    ENTRY   IID
            422                                    EVEN
                                          *
                                          *    SUBROUTINE LPF (LOW PASS FILTER)
                                          *
                                          *    THIS ROUTINE CALCULATES THE FILTERED VALUES OF THE DELTA V'S,
                                          *    WHICH ARE USED IN MODE C ALIGN. BOTH THE FINE AND COARSE FILTERS
                                          *    ARE INITIALIZED IN MODE A ALIGN AND ARE COMPUTED DURING MODE B
                                          *    ALIGN IN ORDER TO ALLOW THEM TO SETTLE. ONCE THE COARSE FILTER
                                          *    IS NO LONGER USED, IT IS NO LONGER COMPUTED.
                                          *
            423 00106   262  2 00000002 IID      PTR    IIDM
            424 00108   264  2 5C220008 IID1     LDX    4,FKF,M
            425 0010A   266  2 5C2A000A          LDX    5,10,M        INITIALIZE POINTER
            426 0010C   268  2 16800000 IID1A    LDA    DVXI,5
            427 0010E   270  2 5680FFFE          LDB    DVXI-2,5
            428 00110   272  2 DE800088          SFD    VF1X-2,5      DVX(L)-VF(M)X   L=I,J,K; M=1,2,3
            429 00112   274  2 64040000          JS     MULFD         FKF*(DVX(L)-VF1(M)X)
            430 00114   276  2 9E800088          AFD    VF1X-2,5      VF(M)X=VF(M)X+FKF*(DVX(L)-VF(M)X)
            431 00116   278  2 3E80008A          STA    VF1X,5
            432 00118   280  2 7E800088          STB    VF1X-2,5
            433 0011A   282  2 6C280004          IMN    5,4,M         DECREMENT POINTER
            434 0011C   284  2 6430010C          JGU    IID1A
            435 0011E   286  2 5C42000C IID2     LDX    8,12,M        (XR8)=I    I=2,3
            436 00120   288  2 5C4A0000          LDX    9,0,M         (XR9)=I-1
            437 00122   290  2 1448008C IID2A    LDA    VF1X+2,9      (A,B)=VF(I-1)X
            438 00124   292  2 5448008A          LDB    VF1X,9
            439 00126   294  2 DC40008A          SFD    VF1X,8        VF(I-1)X-VF(I)X
            440 00128   296  2 64040000          JS     MULFD         FKF*(VF(I-1)X-VF(I)X)
            441 0012A   298  2 9C40008A          AFD    VF1X,8
            442 0012C   300  2 3C40008C          STA    VF1X+2,8      VF(I)X=VF(I)X+FKF*(VF(I-1)X-VF(I)X)
            443 0012E   302  2 7C40008A          STB    VF1X,8
            444 00130   304  2 6C4A0004          IMP    9,4,M         INCREMENT POINTER FOR Y,Z
            445 00132   306  2 6C420004          IMP    8,4,M
            446 00134   308  2 24430022          ICL    8,34,M        CHECK FOR END OF MATRIX
            447 00136   310  2 6430013A          JGU    IID3
            448 00138   312  2 6096              JU     IID2A
GENERATED                         0700
            449 0013A   314  2 1400002C IID3     LDA    NMO
            450 0013C   316  2 E4000014          SBU    SEVEN
            451 0013E   318  2 6252              JG    IID7           CHECK FOR NMO .GE. 7
GENERATED                         0700
            452 00140   320  2 5C22000C IID4     LDX    4,FKC,M
            453 00142   322  2 5C2A000A          LDX    5,10,M        INITIALIZE POINTER
            454 00144   324  2 16800000 IID4A    LDA    DVXI,5
            455 00146   326  2 5680FFFE          LDB    DVXI-2,5
            456 00148   328  2 DE800064          SFD    VC1X-2,5      DVX(L)-VC(M)X    L=I,J,K; M=1,2,3
            457 0014A   330  2 64040000          JS     MULFD         FKC*(DVX(L)-VC(M)X)
            458 0014C   332  2 9E800064          AFD    VC1X-2,5      VC(M)X=VC(M)X+FKC*(DVX(L)-VC(M)X)
            459 0014E   334  2 3E800066          STA    VC1X,5
            460 00150   336  2 7E800064          STB    VC1X-2,5
            461 00152   338  2 6C280004          IMN    5,4,M         DECREMENT POINTER
            462 00154   340  2 64300144          JGU    IID4A
            463 00156   342  2 5C42000C IID5     LDX    8,12,M        (XR8)=I    I=2,3
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VERSION K20A0503       DECK NAME=*ALIGN *                                                                   PAGE  12

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                         SOURCE
            464 00158    344  2 5C4A0000            LDX    9,0,M           (XR9)=I-1
            465 0015A    346  2 14480068 IID5A      LDA    VC1X+2,9        (A,B)=VC(I-1)X
            466 0015C    348  2 54480066            LDB    VC1X,9
            467 0015E    350  2 DC400066            SFD    VC1X,8          VC(I-1)X-VC(I)X
            468 00160    352  2 64040000            JS     MULFD           FKC*(VC(I-1)X-VC(I)X)
            469 00162    354  2 9C400066            AFD    VC1X,8
            470 00164    356  2 3C400068            STA    VC1X+2,8        VC(I)X=VC(I)X+FKC*(VC(I-1)X-VC(I)X)
            471 00166    358  2 7C400066            STB    VC1X,8
            472 00168    360  2 6C4A0004            IMP    9,4,M           INCREMENT POINTERS FOR Y,Z
            473 0016A    362  2 6C420004            IMP    8,4,M
            474 0016C    364  2 24430022            ICL    8,34,M          CHECK FOR END OF MATRIX
            475 0016E    366  2 64300172            JGU    IID6
            476 00170    368  2 6096                JU     IID5A
GENERATED                          0700
            477 00172    370  2 1400002C IID6       LDA    NMO             CHECK FOR NMO .LE. 3
            478 00174    372  2 E4000010            SBU    FOUR
            479 00176    374  2 6330                JL     IID8
GENERATED                          0700
            480 00178    376  2 5C2A000A            LDX    5,10,M
            481 0017A    378  2 1680007E IID6A      LDA    VC3X,5
            482 0017C    380  2 5680007C            LDB    VC3X-2,5
            483 0017E    382  2 3E800000            STA    DVXI,5          DVX(I)=VC(3)X
            484 00180    384  2 7E80FFFE            STB    DVXI-2,5
            485 00182    386  2 6C2B0004            IMN    5,4,M
            486 00184    388  2 6430017A            JGU    IID6A
            487 00186    390  2 14000002            LDA    PHC+2
            488 00188    392  2 54000000            LDB    PHC
            489 0018A    394  2 3C000016            STA    PHA+2           PHA=PHC
            490 0018C    396  2 7C000014            STB    PHA
            491 0018E    398  2 6018                JU     IID8
GENERATED                          0700
            492 00190    400  2 5C2A000A IID7       LDX    5,10,M
            493 00192    402  2 168000A2 IID7A      LDA    VF3X,5
            494 00194    404  2 568000A0            LDB    VF3X-2,5
            495 00196    406  2 3E800000            STA    DVXI,5          DVX(I)=VF(3)X
            496 00198    408  2 7E80FFFE            STB    DVXI-2,5
            497 0019A    410  2 6C2B0004            IMN    5,4,M
            498 0019C    412  2 64300192            JGU    IID7A
            499 0019E    414  2 14000006            LDA    PHF+2
            500 001A0    416  2 54000004            LDB    PHF
            501 001A2    418  2 3C000016            STA    PHA+2           PHA=PHF
            502 001A4    420  2 7C000014            STB    PHA
            503 001A6    422  2 74000002 IID8       RTA    IIDM
```

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VERSION K20A0503     DECK NAME=*ALIGN *                                                                      PAGE  13

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
            505                                          ENTRY    IIH
            506                                          EVEN
                                                  *
                                                  *    REFERENCE PROFILE - COMPUTE REFERENCE DELTA V'S RDVX,RDVY,
                                                  *    AND RDVZ.
                                                  *
            507 001A8    424  2 00000004 IIH      PTR    IIHM
            508 001AA    426  2 5C220010 IIH1     LDX    4,WDT,M
            509 001AC    428  2 1400002C          LDA    NCCU+2
            510 001AE    430  2 5400002A          LDB    NCCU
            511 001B0    432  2 DC000020          SFD    ONHLF          (NCCU-0.5)
            512 001B2    434  2 64040000          JS     MULFD          WDT*(NCCU-0.5)
            513 001B4    436  2 DC000014          SFD    PHA            (WDT*(NCCU-0.5)-PHA)
            514 001B6    438  2 64040000          JS     SINCOS
            515 001B8    440  2 6004              JRU    *+4
GENERATED                          0700
            516 001BA    442  2 0000001A          PTR    STHR           SIN(WDT*(NCCU-0.5)-PHA)
            517 001BC    444  2 3C000018          STA    CTHR+2
            518 001BE    446  2 7C000016          STB    CTHR           COS(WDT*(NCCU-0.5)-PHA)
            519 001C0    448  2 5C22000C IIH2     LDX    4,AK1T,M
            520 001C2    450  2 14000018          LDA    CTHR+2
            521 001C4    452  2 54000016          LDB    CTHR
            522 001C6    454  2 64040000          JS     MULFD
            523 001C8    456  2 3C000020          STA    RDVX+2         RDVX = AK1T*CTHR
            524 001CA    458  2 7C00001E          STB    RDVX
            525 001CC    460  2 1400001C          LDA    STHR+2
            526 001CE    462  2 5400001A          LDB    STHR
            527 001D0    464  2 64040000          JS     MULFD
            528 001D2    466  2 3C000024          STA    RDVY+2         RDVY=AK1T*STHR
            529 001D4    468  2 7C000022          STB    RDVY
            530 001D6    470  2 14000012          LDA    AK2T+2
            531 001D8    472  2 54000010          LDB    AK2T
            532 001DA    474  2 3C000028          STA    RDVZ+2         RDVZ=AK2T
            533 001DC    476  2 7C000026          STB    RDVZ
            534 001DE    478  2 5C220030          LDX    4,DELT,M
            535 001E0    480  2 5C2A000A          LDX    5,10,M
            536 001E2    482  2 1680001E IIH2A    LDA    RDVX,5
            537 001E4    484  2 5680001C          LDB    RDVX-2,5
            538 001E6    486  2 64040000          JS     MULFD
            539 001E8    488  2 3E80001E          STA    RDVX,5         RDVX(I)=DELT*RDVX(I)     I=1,3
            540 001EA    490  2 7E80001C          STB    RDVX-2,5
            541 001EC    492  2 6C2B0004          IMN    5,4,M
            542 001EE    494  2 643001E2          JGU    IIH2A
            543 001F0    496  2 14000026 IIH3     LDA    SAMI
            544 001F2    498  2 0841              SLL    1
            545 001F3    499  2     06C0          LXA    8
            546 001F4    500  2 744001F6          RTA    IIH3A,8
            547 001F6    502  2 0000029E IIH3A    PTR    IIJ
            548 001F8    504  2 00000284          PTR    IIL
            549 001FA    506  2 000001FC          PTR    IIN
                                                  *
                                                  *    SUMMING FOR LEAST SQUARES SOLUTION
                                                  *
            550 001FC    508  2          IIN      EQU    *
```

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VERSION K20A0503      DECK NAME=*ALIGN *                                                       PAGE  14

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                     SOURCE
            551 001FC   508  2 1400001C IIN1     LDA   ZERO
            552 001FE   510  2 3C00002C          STA   TEM+2          CLEAR SUM
            553 00200   512  2 3C00002A          STA   TEM
            554 00202   514  2 5C2A000A          LDX   5,10,M
            555 00204   516  2 5EA2003C          LDX   4,DVX-2,5,M
            556 00206   518  2 1680003E IIN1A    LDA   DVX,5
            557 00208   520  2 5680003C          LDB   DVX-2,5
            558 0020A   522  2 64040000          JS    MULFD          DVX(I)*DVX(I)   I=1,3
            559 0020C   524  2 9C00002A          AFD   TEM
            560 0020E   526  2 3C00002C          STA   TEM+2          (DVX**2+DVY**2+DVZ**2)
            561 00210   528  2 7C00002A          STB   TEM
            562 00212   530  2 6C230004          IMN   4,4,M
            563 00214   532  2 6C280004          IMN   5,4,M
            564 00216   534  2 64300206          JGU   IIN1A
            565 00218   536  2 64040000          JS    DECSQ
            566 0021A   538  2 3C00002C          STA   TEM+2          SQRT(DVX**2+DVY**2+DVZ**2)
            567 0021C   540  2 7C00002A          STB   TEM
            568 0021E   542  2 5C22002A          LDX   4,TEM,M
            569 00220   544  2 14000064          LDA   VTC+2
            570 00222   546  2 54000062          LDB   VTC
            571 00224   548  2 64040000          JS    DVFD           VTC/SQRT(DVX**2+DVY**2+DVZ**2)
            572 00226   550  2 3C00003C          STA   DPTO+2
            573 00228   552  2 7C00003A          STB   DPTO
            574 0022A   554  2 5C22003A          LDX   4,DPTO,M
            575 0022C   556  2 5C2A000A          LDX   5,10,M
            576 0022E   558  2 1680003E IIN1B    LDA   DVX,5
            577 00230   560  2 5680003C          LDB   DVX-2,5
            578 00232   562  2 64040000          JS    MULFD          DPTO*DVX(I)   I=1,3
            579 00234   564  2 DE80001C          SFD   RDVX-2,5       DPTO*DVX(I)-RDVX(I)
            580 00236   566  2 3E80002E          STA   TEMO,5
            581 00238   568  2 7E80002C          STB   TEMO-2,5       TEMO(I)=DPTO*DVX(I)-RDVX(I)
            582 0023A   570  2 6C2B0004          IMN   5,4,M
            583 0023C   572  2 6430022E          JGU   IIN1B
            584 0023E   574  2 1400001E          LDA   FONE
            585 00240   576  2 5400001C          LDB   ZERO
            586 00242   578  2 DC00003A          SFD   DPTO
            587 00244   580  2 9C000024          AFD   SRA            SRA=(SRA+1.0-DPTO)
            588 00246   582  2 3C000026          STA   SRA+2
            589 00248   584  2 7C000024          STB   SRA
            590 0024A   586  2 14000030          LDA   TEMO+2
            591 0024C   588  2 5400002E          LDB   TEMO
            592 0024E   590  2 9C000046          AFD   YA1
            593 00250   592  2 3C000048          STA   YA1+2          YA1=YA1+TEMO
            594 00252   594  2 7C000046          STB   YA1
            595 00254   596  2 5C22001A          LDX   4,STHR,M
            596 00256   598  2 14000030          LDA   TEMO+2
            597 00258   600  2 5400002E          LDB   TEMO
            598 0025A   602  2 64040000          JS    MULFD          STHR*TEMO
            599 0025C   604  2 9C00004A          AFD   YA2
            600 0025E   606  2 3C00004C          STA   YA2+2          YA2=YA2+STHR*TEMO
            601 00260   608  2 7C00004A          STB   YA2
            602 00262   610  2 14000038          LDA   TEM4+2
            603 00264   612  2 54000036          LDB   TEM4
            604 00266   614  2 64040000          JS    MULFD          STHR*TEM4
            605 00268   616  2 9C00005A          AFD   YC2
```

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VERSION K20A0503      DECK NAME=*ALIGN *                                                                    PAGE  15

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                              SOURCE
            606 0026A     618  2 3C00005C          STA      YC2+2           YC2=YC2+STHR*TEM4
            607 0026C     620  2 7C00005A          STB      YC2
            608 0026E     622  2 5C220016          LDX      4,CTHR,M
            609 00270     624  2 14000038          LDA      TEM4+2
            610 00272     626  2 54000036          LDB      TEM4
            611 00274     628  2 64040000          JS       MULFD           TEM4*CTHR
            612 00276     630  2 9C000056          AFD      YC1             YC1=YC1+TEM4*CTHR
            613 00278     632  2 3C000058          STA      YC1+2
            614 0027A     634  2 7C000056          STB      YC1
            615 0027C     636  2 14000034          LDA      TEM2+2
            616 0027E     638  2 54000032          LDB      TEM2
            617 00280     640  2 9C00004E          AFD      YB1             YB1=YB1+TEM2
            618 00282     642  2 3C000050          STA      YB1+2
            619 00284     644  2 7C00004E          STB      YB1
            620 00286     646  2 5C220030          LDX      4,DELT,M
            621 00288     648  2 1400002C          LDA      NCCU+2
            622 0028A     650  2 5400002A          LDB      NCCU
            623 0028C     652  2 64040000          JS       MULFD           NCCU*DELT
            624 0028E     654  2 5C220032          LDX      4,TEM2,M
            625 00290     656  2 64040000          JS       MULFD           TEM2*(NCCU*DELT)
            626 00292     658  2 5C220024          LDX      4,OMGA,M
            627 00294     660  2 64040000          JS       MULFD           TEM2*(NCCU*DELT)*OMGA
            628 00296     662  2 9C000052          AFD      YB2             YB2=YB2+TEM2*(NCCU*DELT)*OMGA
            629 00298     664  2 3C000054          STA      YB2+2
            630 0029A     666  2 7C000052          STB      YB2
            631 0029C     668  2 74000004          RTA      IIHM
                                              *
                                              *   SUMMING FOR EARTH POLAR AXIS SOLUTION
                                              *
            632 0029E     670  2              IIJ      EQU      *
            633 0029E     670  2 64040000 IIJ1     JS       VECADD          VAXI(I)=VAXI(I)+DVXI(I)
            634 002A0     672  2 6008              JRU      *+8
GENERATED                          0700
            635 002A2     674  2 00000000          PTR      VAXI
            636 002A4     676  2 00000000          PTR      DVXI
            637 002A6     678  2 00000000          PTR      VAXI
            638 002A8     680  2 64040000          JS       VECADD          VAX(I)=VAX(I)+DVX(I)
            639 002AA     682  2 6008              JRU      *+8
GENERATED                          0700
            640 002AC     684  2 00000018          PTR      VAX
            641 002AE     686  2 0000003E          PTR      DVX
            642 002B0     688  2 00000018          PTR      VAX
            643 002B2     690  2 74000004          RTA      IIHM
                                              *
                                              *   SUMMING FOR LOCAL LEVEL SOLUTION
                                              *
            644 002B4     692  2              IIL      EQU      *
            645 002B4     692  2 5C2A000A          LDX      5,10,M          INITIALIZE LOOP COUNTER
            646 002B6     694  2 1680003E IIL1     LDA      DVX,5
            647 002B8     696  2 5680003C          LDB      DVX-2,5
            648 002BA     698  2 DE80001C          SFD      RDVX-2,5        DVX(I)-RDVX(I)
            649 002BC     700  2 9E800016          AFD      VAX-2,5         VAX(I)=VAX(I)+DVX(I)-RDVX(I)
            650 002BE     702  2 3E800018          STA      VAX,5
            651 002C0     704  2 7E800016          STB      VAX-2,5
            652 002C2     706  2 6C2B0004          IMN      5,4,M           DECREMENT COUNTER FOR NEXT ELEMENT
```

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VERSION K20A0503      DECK NAME=*ALIGN *                                                    PAGE  16

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
             653 002C4    708  2 64300286        JGU    IIL1
             654 002C6    710  2 74000004        RTA    IIHM
```

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VERSION K20A0503      DECK NAME=*ALIGN *                                                              PAGE  17

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
            656                                      ENTRY  IIK
            657                                      EVEN
                                              *
                                              *   EARTH POLAR AXIS SOLUTION
                                              *
            658 002C8    712  2 00000006 IIK    PTR    IIKM
            659 002CA    714  2 5C22000C IIK2   LDX    4,AKIT,M
            660 002CC    716  2 1400001A        LDA    VAX+2
            661 002CE    718  2 54000018        LDB    VAX
            662 002D0    720  2 64040000        JS     DVFD            VAX/AKIT
            663 002D2    722  2 3C000034        STA    TEM2+2
            664 002D4    724  2 7C000032        STB    TEM2            TEM2=VAX/AKIT
            665 002D6    726  2 1400001E        LDA    VAY+2
            666 002D8    728  2 5400001C        LDB    VAY
            667 002DA    730  2 64040000        JS     DVFD            VAY/AKIT
            668 002DC    732  2 3C000030        STA    TEM0+2
            669 002DE    734  2 7C00002E        STB    TEM0            TEM0=VAY/AKIT
            670 002E0    736  2 5C22002E IIK3   LDX    4,TEM0,M
            671 002E2    738  2 64040000        JS     MULFD           TEM0**2
            672 002E4    740  2 3C00002C        STA    TEM+2
            673 002E6    742  2 7C00002A        STB    TEM
            674 002E8    744  2 5C220032        LDX    4,TEM2,M
            675 002EA    746  2 14000034        LDA    TEM2+2
            676 002EC    748  2 54000032        LDB    TEM2
            677 002EE    750  2 64040000        JS     MULFD           TEM2**2
            678 002F0    752  2 9C00002A        AFD    TEM             (TEM0**2+TEM2**2)
            679 002F2    754  2 64040000        JS     DECSW           SQRT(TEM0**2+TEM2**2)
            680 002F4    756  2 3C00002C        STA    TEM+2
            681 002F6    758  2 7C00002A        STB    TEM
            682 002F8    760  2 5C22002A        LDX    4,TEM,M
            683 002FA    762  2 14000030        LDA    TEM0+2
            684 002FC    764  2 5400002E        LDB    TEM0
            685 002FE    766  2 64040000        JS     DVFD            TEM0/SQRT(TEM0**2+TEM2**2)
            686 00300    768  2 3C000002        STA    SWT+2
            687 00302    770  2 7C000000        STB    SWT
            688 00304    772  2 14000034        LDA    TEM2+2
            689 00306    774  2 54000032        LDB    TEM2
            690 00308    776  2 64040000        JS     DVFD            TEM2/SQRT(TEM0**2+TEM2**2)
            691 0030A    778  2 3C000006        STA    CWT+2
            692 0030C    780  2 7C000004        STB    CWT
            693 0030E    782  2 1400001C IIK4   LDA    ZERO
            694 00310    784  2 5C2A000A        LDX    5,10,M
            695 00312    786  2 3E800042 IIK4A  STA    SX,5            SX=SY=SZ=0
            696 00314    788  2 6C2B0002        IMN    5,2,M
            697 00316    790  2 64300312        JGU    IIK4A
            698 00318    792  2 3C000040        STA    ACM+2
            699 0031A    794  2 3C00003E        STA    ACM             ACM=0
            700 0031C    796  2 3C000016        STA    PHA+2
            701 0031E    798  2 3C000014        STA    PHA             PHA=0
            702 00320    800  2 74000006        RTA    IIKM
```

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VERSION K20A0503      DECK NAME=*ALIGN *                                                                     PAGE  18

DIAGNOSTICS LINE ADRES UADRES LC  PROGRAM                                              SOURCE
            704                                    ENTRY  IIM
            705                                    EVEN
                                           *
                                           *    LOCAL LEVEL SOLUTION
                                           *
            706 00322     802  2 00000008 IIM       PTR     IIMM
            707 00324     804  2 5C22005E IIMI      LDX     4,VTB,M
            708 00326     806  2 5C2A000A           LDX     5,10,M
            709 00328     808  2 16800018 IIM1A     LDA     VAX,5
            710 0032A     810  2 56800016           LDB     VAX-2,5
            711 0032C     812  2 64040000           JS      DVFD          VAX(I)/VTB
            712 0032E     814  2 3E80002E           STA     TEM0,5        TEM0(I)=VTB*VAX(I)
            713 00330     816  2 7E80002C           STB     TEM0-2,5
            714 00332     818  2 6C280004           IMN     5,4,M
            715 00334     820  2 64300328           JGU     IIM1A
            716 00336     822  2 5C220032 IIM2      LDX     4,TEM2,M
            717 00338     824  2 1400000E           LDA     CGDL+2
            718 0033A     826  2 5400000C           LDB     CGDL
            719 0033C     828  2 64040000           JS      MULFD         TEM2*CGDL
            720 0033E     830  2 3C00004C           STA     SZ+2
            721 00340     832  2 7C00004A           STB     SZ            SZ=TEM2*CGDL
            722 00342     834  2 1400000A           LDA     SGDL+2
            723 00344     836  2 54000008           LDB     SGDL
            724 00346     838  2 64040000           JS      MULFD         TEM2*SGDL
            725 00348     840  2 3C000044           STA     SX+2
            726 0034A     842  2 7C000042           STB     SX            SX=TEM2*SGDL
            727 0034C     844  2 1400001C           LDA     ZERO
            728 0034E     846  2 5400001C           LDB     ZERO
            729 00350     848  2 DC000042           SFD     SX            SX=-SX
            730 00352     850  2 3C000044           STA     SX+2
            731 00354     852  2 7C000042           STB     SX
            732 00356     854  2 5C22002E           LDX     4,TEM0,M
            733 00358     856  2 14000030           LDA     TEM0+2
            734 0035A     858  2 5400002E           LDB     TEM0
            735 0035C     860  2 64040000           JS      MULFD         TEM0**2
            736 0035E     862  2 3C00002C           STA     TEM+2
            737 00360     864  2 7C00002A           STB     TEM
            738 00362     866  2 5C220036           LDX     4,TEM4,M
            739 00364     868  2 14000038           LDA     TEM4+2
            740 00366     870  2 54000036           LDB     TEM4
            741 00368     872  2 64040000           JS      MULFD         TEM4**2
            742 0036A     874  2 9C00002A           AFD     TEM           (TEM0**2+TEM4**2)
            743 0036C     876  2 64040000           JS      DECSQ         SQRT(TEM0**2+TEM4**2)
            744 0036E     878  2 3C00002C           STA     TEM+2
            745 00370     880  2 7C00002A           STB     TEM
            746 00372     882  2 14000038           LDA     TEM4+2
            747 00374     884  2 630A               JL      IIM2A
GENERATED                            0700
            748 00376     886  2 1400001C           LDA     ZERO
            749 00378     888  2 5400001C           LDB     ZERO
            750 0037A     890  2 DC00002A           SFD     TEM           INVERT SIGN OF TEM
            751 0037C     892  2 6006               JU      IIM2B
GENERATED                            0700
            752 0037E     894  2 1400002C IIM2A      LDA     TEM+2
```

VERSION K20A0503 DECK NAME=*ALIGN *

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM				SOURCE
753	00380	896	2	5400002A		LDB	TEM	
754	00382	898	2	3C000048	IIM2B	STA	SY+2	SY=-SIGN(TEM4)*SQRT(TEM0**2+TEM4**2)
755	00384	900	2	7C000046		STB	SY	
756	00386	902	2	1400001C		LDA	ZERO	
757	00388	904	2	3C000040		STA	ACM+2	ACM=0
758	0038A	906	2	3C00003E		STA	ACM	
759	0038C	908	2	64040390		JS	IIM3	
760	0038E	910	2	74000008		RTA	IIMM	

```
VERSION K20A0503     DECK NAME=*ALIGN *                                                          PAGE  20
                                                                       SOURCE
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM
            762                                    ENTRY  IIM3
            763                                    EVEN
                                           *
                                           *   IIM3 COMPUTES SWT AND CWT
                                           *
            764 00390    912  2 0000000A IIM3    PTR    IIM3M
            765 00392    914  2 5C220010         LDX    4,WOPP,M
            766 00394    916  2 1400002C         LDA    NCCU+2
            767 00396    918  2 5400002A         LDB    NCCU
            768 00398    920  2 64040000         JS     MULFD          (WOPP*NCCUD)
            769 0039A    922  2 64040000         JS     SINCOS
            770 0039C    924  2 6004             JRU    *+4
GENERATED                          0700
            771 0039E    926  2 00000000         PTR    SWT            SWT=SIN(WOPP*NCCU)
            772 003A0    928  2 3C000006         STA    CWT+2
            773 003A2    930  2 7C000004         STB    CWT            CWT=COS(WOPP*NCCU)
            774 003A4    932  2 7400000A         RTA    IIM3M
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
             776                          EVEN
             777                          ENTRY  IIO
                                  *
                                  *    LEAST SQUARES SOLUTION
                                  *
             778 003A6    934  2 0000000C IIO      PTR    IIOM
                                  *
                                  *    COMPUTE OFFSET FOR MATRIX LSSC
                                  *
             779 003A8    936  2 3400001A IIO1     LAE    LSSC
             780 003AA    938  2 3C00002A          STA    TEM
             781 003AC    940  2 14000028          LDA    MCSI
             782 003AE    942  2 64020024          MUL    36,M          MULTIPLY MCSI BY OFFSET CONSTANT
             783 003B0    944  2 0500              EAB
             784 003B1    945  2      0861        SRLD   1             GIVES AN INTEGER MULTIPLE
             785 003B2    946  2 A400002A          ADD    TEM
             786 003B4    948  2 06C0              LXA    8             (XR8)=ADDRESS OF LSSC(MCSI)
                                  *
                                  *    XA,XB,XC,AND YA,YB,YC ARE IN CONTIGUOUS LOCATIONS OF CORE
                                  *
GENERATED                               0700
             787 003B6    950  2 5C4A0002          LDX    9,2,M
             788 003B8    952  2 5C1A002E          LDX    3,XA,M
             789 003BA    954  2 5C2A0046          LDX    5,YA,M
             790 003BC    956  2 5EA20000 IIO1A    LDX    4,0,5,M       (XR4)=ADDRESS OF YA(1)
             791 003BE    958  2 14400002          LDA    2,8
             792 003C0    960  2 54400000          LDB    0,8
             793 003C2    962  2 64040000          JS     MULFD         A(1,1)*YA(1)
             794 003C4    964  2 3981                STA    2,3
             795 003C5    965  2      7980        STB    0,3
             796 003C6    966  2 5EA20004          LDX    4,4,5,M       (XR4)=ADDRESS OF YA(2)
             797 003C8    968  2 14400006          LDA    6,8
             798 003CA    970  2 54400004          LDB    4,8
             799 003CC    972  2 64040000          JS     MULFD         A(1,2)*YA(2)
             800 003CE    974  2 9980              AFD    0,3
             801 003CF    975  2      3981        STA    2,3           XA(1)=A(1,1)*YA(1)+A(1,2)*YA(2)
             802 003D0    976  2 7980              STB    0,3
GENERATED                               0700
             803 003D2    978  2 5EA20000          LDX    4,0,5,M       (XR4)=ADDRESS OF YA(1)
             804 003D4    980  2 14400006          LDA    6,8
             805 003D6    982  2 54400004          LDB    4,8
             806 003D8    984  2 64040000          JS     MULFD         A(2,1)*YA(1)B...A(1,2)=A(2,1)
             807 003DA    986  2 3983              STA    6,3
             808 003DB    987  2      7982        STB    4,3
             809 003DC    988  2 5EA20004          LDX    4,4,5,M       (XR4)=ADDRESS OF YA(2)
             810 003DE    990  2 1440000A          LDA    10,8
             811 003E0    992  2 54400008          LDB    8,8
             812 003E2    994  2 64040000          JS     MULFD         A(2,2)*YA(2)
             813 003E4    996  2 9982              AFD    4,3
             814 003E5    997  2      3983        STA    6,3           XA(2)=A(2,1)*YA(1)+A(2,2)*YA(2)
             815 003E6    998  2 7982              STB    4,3
                                  *
                                  *    INCREMENT REGISTERS FOR NEXT PASS THROUGH LOOP
                                  *
```

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VERSION K20A0503      DECK NAME=*ALIGN *                                                              PAGE  22

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
GENERATED                            0700
            816 003E8    1000  2 6C1A0008          IMP    3,8,M
            817 003EA    1002  2 6C2A0008          IMP    5,8,M
            818 003EC    1004  2 6C42000C          IMP    8,12,M
            819 003EE    1006  2 6C480001          IMN    9,1,M
            820 003F0    1008  2 643003BC          JGU    II01A
            821 003F2    1010  2 5C22000C II02     LDX    4,AK1T,M
            822 003F4    1012  2 14000044          LDA    XC+6
            823 003F6    1014  2 54000042          LDB    XC+4
            824 003F8    1016  2 64040000          JS     DVFD        XC(2)/AK1T
            825 003FA    1018  2 3C000044          STA    SX+2
            826 003FC    1020  2 7C000042          STB    SX          SX=XC(2)/AK1T
            827 003FE    1022  2 1400001C          LDA    ZERO
            828 00400    1024  2 5400001C          LDB    ZERO
            829 00402    1026  2 DC000032          SFD    XA+4        XA(2)=-XA(2)
            830 00404    1028  2 64040000          JS     DVFD        -XA(2)/AK1T
            831 00406    1030  2 3C00004C          STA    SZ+2
            832 00408    1032  2 7C00004A          STB    SZ          SZ=-XA(2)/AK1T
            833 0040A    1034  2 1400001C          LDA    ZERO
            834 0040C    1036  2 5400001C          LDB    ZERO
            835 0040E    1038  2 DC00003E          SFD    XC          XC(1)=-XC(1)
            836 00410    1040  2 64040000          JS     DVFD        -XC(1)/AK1T
            837 00412    1042  2 3C000048          STA    SY+2
            838 00414    1044  2 7C000046          STB    SY          SY=-XC(1)/AK1T
            839 00416    1046  2 5C2A000A          LDX    5,10,M
            840 00418    1048  2 5C220014          LDX    4,DF8,M
            841 0041A    1050  2 16800042 II02A    LDA    SX,5
            842 0041C    1052  2 56800040          LDB    SX-2,5
            843 0041E    1054  2 64040000          JS     MULFD       SX=SX*8.0
            844 00420    1056  2 3E800042          STA    SX,5        SY=SY*8.0
            845 00422    1058  2 7E800040          STB    SX-2,5      SZ=SZ*8.0
            846 00424    1060  2 6C280004          IMN    5,4,M
            847 00426    1062  2 6430041A          JGU    II02A
            848 00428    1064  2 5C22002A          LDX    4,NCCU,M
            849 0042A    1066  2 14000026          LDA    SRA+2
            850 0042C    1068  2 54000024          LDB    SRA
            851 0042E    1070  2 64040000          JS     DVFD        SRA/NCCU
            852 00430    1072  2 3C000040          STA    ACM+2
            853 00432    1074  2 7C00003E          STB    ACM         ACM=SRA/NCCU
            854 00434    1076  2 5C22000C          LDX    4,CGDL,M
            855 00436    1078  2 1400004C          LDA    SZ+2
            856 00438    1080  2 5400004A          LDB    SZ
            857 0043A    1082  2 64040000          JS     MULFD       SZ*CGDL
            858 0043C    1084  2 3C000030          STA    TEM0+2
            859 0043E    1086  2 7C00002E          STB    TEM0
            860 00440    1088  2 5C220062          LDX    4,VTC,M
            861 00442    1090  2 14000038          LDA    XB+2
            862 00444    1092  2 54000036          LDB    XB
            863 00446    1094  2 64040000          JS     DVFD        XB(1)/VT
            864 00448    1096  2 3C000034          STA    TEM2+2
            865 0044A    1098  2 7C000032          STB    TEM2
            866 0044C    1100  2 5C220008          LDX    4,SGDL,M
            867 0044E    1102  2 14000044          LDA    SX+2
            868 00450    1104  2 54000042          LDB    SX
            869 00452    1106  2 64040000          JS     MULFD       SX*SGDL
```

VERSION K20A0503 DECK NAME=*ALIGN *

DIAGNOSTICS	LINE	ADRES	DADRES	LC	PROGRAM			SOURCE
	870	00454	1108	2	3C000038	STA	TEM4+2	
	871	00456	1110	2	7C000036	STB	TEM4	
	872	00458	1112	2	14000030	LDA	TEM0+2	
	873	0045A	1114	2	5400002E	LDB	TEM0	
	874	0045C	1116	2	DC000032	SFD	TEM2	SZ*CGDL-XB(1)/VT
	875	0045E	1118	2	DC000036	SFD	TEM4	SZ*CGDL-XB(1)/VT-SX*SGDL
	876	00460	1120	2	3C000030	STA	TEM0+2	
	877	00462	1122	2	7C00002E	STB	TEM0	
	878	00464	1124	2	64040000	JS	MULFD	SGDL*(SZ*CGDL-XB(1)/VT-SX*SGDL)
	879	00466	1126	2	9C000042	AFD	SX	
	880	00468	1128	2	3C000044	STA	SX+2	SX=SX+SGDL*(SZ*CGDL-XB(1)/VT-SX*SGDL)
	881	0046A	1130	2	7C000042	STB	SX	
	882	0046C	1132	2	5C22000C	LDX	4,CGDL,M	
	883	0046E	1134	2	14000030	LDA	TEM0+2	
	884	00470	1136	2	5400002E	LDB	TEM0	
	885	00472	1138	2	64040000	JS	MULFD	CGDL*(SZ*CGDL-XB(1)/VT-SX*SGDL)
	886	00474	1140	2	3C000030	STA	TEM0+2	
	887	00476	1142	2	7C00002E	STB	TEM0	
	888	00478	1144	2	1400004C	LDA	SZ+2	
	889	0047A	1146	2	5400004A	LDB	SZ	
	890	0047C	1148	2	DC00002E	SFD	TEM0	
	891	0047E	1150	2	3C00004C	STA	SZ+2	SZ=SZ-CGDL*(SZ*CGDL-XB(1)/VT-SX*SGDL)
	892	00480	1152	2	7C00004A	STB	SZ	
	893	00482	1154	2	64040390	JS	IIM3	
	894	00484	1156	2	7400000C	RTA	IIOM	

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                SOURCE
                                      *
                                      *    COMPUTE DELTA A MATRIX AND DELTA AJ MATRIX
                                      *    (SUBROUTINES COM AND CDAM)
                                      *
  896                                       ENTRY  IIP
  897                                       EVEN
  898 00486   1158  2 0000000E IIP     PTR    IIPM
  899 00488   1160  2 5C2A000A IIP1    LDX    5,10,M
  900 0048A   1162  2 5EA20040 IIP1A    LDX    4,SX-2,5,M
  901 0048C   1164  2 16800042          LDA    SX,5
  902 0048E   1166  2 56800040          LDB    SX-2,5
  903 00490   1168  2 64040000          JS     MULFD          SX(I)**2    I=1,3
  904 00492   1170  2 3E80002E          STA    TEM0,5
  905 00494   1172  2 7E80002C          STB    TEM0-2,5
  906 00496   1174  2 1400001E          LDA    FONE
  907 00498   1176  2 5400001C          LDB    ZERO
  908 0049A   1178  2 DE80002C          SFD    TEM0-2,5       (1.0-SX(I)**2)
  909 0049C   1180  2 64040000          JS     DECSQ          SQRT(1.0-SX(I)**2)
  910 0049E   1182  2 3E80002E          STA    TEM0,5
  911 004A0   1184  2 7E80002C          STB    TEM0-2,5       TEM0=SQRT(1.0-SX(I)**2)
  912 004A2   1186  2 6C2B0004          IMN    5,4,M
  913 004A4   1188  2 6430048A          JGU    IIP1A
  914 004A6   1190  2 5C2A012C IIP2    LDX    5,TM,M
  915 004A8   1192  2 1400001C          LDA    ZERO
  916 004AA   1194  2 3A8C              STA    24,5           TM(1,3)=TM(2,3)=TM(3,1)=TM(3,2)=0
  917 004AB   1195  2      3A8D         STA    26,5
  918 004AC   1196  2 3A8E              STA    28,5
  919 004AD   1197  2      3A8F         STA    30,5
  920 004AE   1198  2 3A84              STA    8,5
  921 004AF   1199  2      3A85         STA    10,5
  922 004B0   1200  2 3A8A              STA    20,5
  923 004B1   1201  2      3A8B         STA    22,5
  924 004B2   1202  2 5400001E          LDB    FONE
  925 004B4   1204  2 3A90              STA    32,5
  926 004B5   1205  2      7A91         STB    34,5           TM(3,3)=1.0
  927 004B6   1206  2 14000038          LDA    TEM4+2
  928 004B8   1208  2 54000036          LDB    TEM4
  929 004BA   1210  2 3A81              STA    2,5
  930 004BB   1211  2      7A80         STB    0,5
  931 004BC   1212  2 3A89              STA    18,5           TM(1,1)=TM(2,2)=TEM4
  932 004BD   1213  2      7A88         STB    16,5
  933 004BE   1214  2 1400004C          LDA    SZ+2
  934 004C0   1216  2 5400004A          LDB    SZ
  935 004C2   1218  2 3A87              STA    14,5           TM(1,2)=SZ
  936 004C3   1219  2      7A86         STB    12,5
  937 004C4   1220  2 1400001C          LDA    ZERO
  938 004C6   1222  2 5400001C          LDB    ZERO
  939 004C8   1224  2 DC00004A          SFD    SZ             SZ=-SZ
  940 004CA   1226  2 3A83              STA    6,5
  941 004CB   1227  2      7A82         STB    4,5            TM(2,1)=-SZ
  942 004CC   1228  2 5C2A0150          LDX    5,TM1,M
  943 004CE   1230  2 1400001C          LDA    ZERO
  944 004D0   1232  2 3A86              STA    12,5           TM1(1,2)=TM1(2,1)=TM1(3,2)=TM1(2,3)=0
  945 004D1   1233  2      3A87         STA    14,5
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VERSION K20A0503     DECK NAME=*ALIGN *                                                    PAGE  25

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                     SOURCE
            946 004D2   1234  2 3A82            STA    4,5
            947 004D3   1235  2      3A83       STA    6,5
            948 004D4   1236  2 3A8A            STA    20,5
            949 004D5   1237  2      3A8B       STA    22,5
            950 004D6   1238  2 3A8E            STA    28,5
            951 004D7   1239  2      3A8F       STA    30,5
            952 004D8   1240  2 5400001E        LDB    FONE
            953 004DA   1242  2 3A88            STA    16,5
            954 004DB   1243  2      7A89       STB    18,5      TM1(2,2)=1.0
            955 004DC   1244  2 14000034        LDA    TEM2+2
            956 004DE   1246  2 54000032        LDB    TEM2
            957 004E0   1248  2 3A81            STA    2,5       TM1(1,1)=TM1(3,3)=TEM2
            958 004E1   1249  2      7A80       STB    0,5
            959 004E2   1250  2 3A91            STA    34,5
            960 004E3   1251  2      7A90       STB    32,5
            961 004E4   1252  2 14000048        LDA    SY+2
            962 004E6   1254  2 54000046        LDB    SY
            963 004E8   1256  2 3A85            STA    10,5      TM1(3,1)=SY
            964 004E9   1257  2      7A84       STB    8,5
            965 004EA   1258  2 1400001C        LDA    ZERO
            966 004EC   1260  2 5400001C        LDB    ZERO
            967 004EE   1262  2 DC000046        SFD    SY        SY=-SY
            968 004F0   1264  2 3A8D            STA    26,5      TM1(1,3)=-SY
            969 004F1   1265  2      7A8C       STB    24,5
            970 004F2   1266  2 64040000        JS     MUL33     D1(I,J)=TM(I,J)*TM1(I,J)
            971 004F4   1268  2 6008            JRU    *+8
GENERATED                            0700
            972 004F6   1270  2 0000012C        PTR    TM
            973 004F8   1272  2 00000150        PTR    TM1
            974 004FA   1274  2 00000054        PTR    D1
            975 004FC   1276  2 5C2A012C        LDX    5,TM,M
            976 004FE   1278  2 1400001C        LDA    ZERO
            977 00500   1280  2 3A86            STA    12,5      TM(1,2)=TM(1,3)=TM(2,1)=TM(3,1)=0
            978 00501   1281  2      3A87       STA    14,5
            979 00502   1282  2 3A8C            STA    24,5
            980 00503   1283  2      3A8D       STA    26,5
            981 00504   1284  2 3A82            STA    4,5
            982 00505   1285  2      3A83       STA    6,5
            983 00506   1286  2 3A84            STA    8,5
            984 00507   1287  2      3A85       STA    10,5
            985 00508   1288  2 5400001E        LDB    FONE
            986 0050A   1290  2 3A80            STA    0,5
            987 0050B   1291  2      7A81       STB    2,5       TM(1,1)=1.0
            988 0050C   1292  2 14000030        LDA    TEM0+2
            989 0050E   1294  2 5400002E        LDB    TEM0
            990 00510   1296  2 3A89            STA    18,5      TM(2,2)=TM(3,3)=TEM0
            991 00511   1297  2      7A88       STB    16,5
            992 00512   1298  2 3A91            STA    34,5
            993 00513   1299  2      7A90       STB    32,5
            994 00514   1300  2 14000044        LDA    SX+2
            995 00516   1302  2 54000042        LDB    SX
            996 00518   1304  2 3A8F            STA    30,5
            997 00519   1305  2      7A8E       STB    28,5      TM(2,3)=SX
            998 0051A   1306  2 1400001C        LDA    ZERO
            999 0051C   1308  2 5400001C        LDB    ZERO
```

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VERSION K20A0503      DECK NAME=*ALIGN *                                                                PAGE  26

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
            1000 0051E   1310  2 DC000042           SFD    SX           SX=-SX
            1001 00520   1312  2 3A8B               STA    22,5
            1002 00521   1313  2     7A8A           STB    20,5         TM(3,2)=-SX
            1003 00522   1314  2 64040000           JS     MUL33        A(I,J)=D1(I,J)*TM(I,J)
            1004 00524   1316  2 6008               JRU    *+8
GENERATED                                0700
            1005 00526   1318  2 00000054           PTR    D1
            1006 00528   1320  2 0000012C           PTR    TM
            1007 0052A   1322  2 0000000C           PTR    A
            1008 0052C   1324  2 640405AC IIP3      JS     IIRS         SETS UP D(I,J)
            1009 0052E   1326  2 64040000           JS     MUL33        TM(I,J)=D(I,J)*A(I,J)
            1010 00530   1328  2 6008               JRU    *+8
GENERATED                                0700
            1011 00532   1330  2 000000E4           PTR    D
            1012 00534   1332  2 0000000C           PTR    A
            1013 00536   1334  2 0000012C           PTR    TM
            1014 00538   1336  2 64040000           JS     MUL33        D1(I,J)=TM(I,J)*AJ(I,J)
            1015 0053A   1338  2 6008               JRU    *+8
GENERATED                                0700
            1016 0053C   1340  2 0000012C           PTR    TM
            1017 0053E   1342  2 000000F2           PTR    AJ
            1018 00540   1344  2 00000054           PTR    D1
            1019 00542   1346  2 5C2A0022           LDX    5,34,M
            1020 00544   1348  2 16800054 IIP3B     LDA    D1,5         AJ(I,J)=D1(I,J)
            1021 00546   1350  2 3E8000F2           STA    AJ,5
            1022 00548   1352  2 6C2B0002           IMN    5,2,M
            1023 0054A   1354  2 64300544           JGU    IIP3B
            1024 0054C   1356  2 640405D6           JS     ALNO         CALL ALIGN OUTPUT ROUTINE
            1025 0054E   1358  2 7400000E           RTA    IIPM
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
                                      *
                                      *          SUBROUTINE GTND (GO TO NAV DECISION)
                                      *
                                      *     THIS ROUTINE IS EXECUTED ONCE EVERY 1/8 SECOND DURING ALIGN.
                                      *     THE DECISION TO ENABLE NAV IS BASED ON TWO CRITERIA.
                                      *       1. NAV MUST BE THE SELECTED SYSTEM MODE.
                                      *       2. AN ADEQUATE AJ MATRIX MUST BE AVAILABLE,WHICH IS ONLY
                                      *          WHEN FINE ALIGN HAS BEEN COMPLETED (NMO.GE.8)
                                      *
                                      *
          1027                                ENTRY    IIR
          1028                                EVEN
          1029 00550   1360  2 0000001U IIR   PTR    IIRM
          1030 00552   1362  2 1400000B IIR1  LDA    NONE
          1031 00554   1364  2 3C000036       STA    ASCH          ASCH=-1
                                      **********************
                                      *
                                      *    DPU PROCESSING - NOT IMPLEMENTED
                                      *
                                      **********************
          1032 00556   1366  2 1400006C       LDA    MODE
          1033 00558   1368  2 E4000010       SBU    FOUR
          1034 0055A   1370  2 6104           JRN    IIR1A
GENERATED                          0700
          1035 0055C   1372  2 74000010       RTA    IIRM          MODE=4 RETURN TO BACKGROUND
                                      *                            IN AIR ALIGN...NOT IMPLEMENTED
          1036 0055E   1374  2 6304     IIR1A JRL    IIR1B
GENERATED                            0700
          1037 00560   1376  2 74000010       RTA    IIRM          MODE>4 RETURN TO BACKGROUND
                                      *                            GROUND ALIGN
          1038 00562   1378  2 14000030 IIR1B  LDA    FLGN          MODE<4
          1039 00564   1380  2 6110           JRN    IIR2
GENERATED                            0700
          1040 00566   1382  2 5C28002C       LDX    5,NMO
          1041 00568   1384  2 242B0008       ICL    5,8,M         CHECK FOR NMO > 7
          1042 0056A   1386  2 6430056E       JGU    IIR1C
          1043 0056C   1388  2 74000010       RTA    IIRM          NMO .LE. 7. RETURN TO BACKGROUND
          1044 0056E   1390  2 1400000A IIR1C  LDA    ONE
          1045 00570   1392  2 3C000070       STA    TMPR          TMPR=1
          1046 00572   1394  2 600C           JU     IIR3
GENERATED                            0700
          1047 00574   1396  2 5C2A0022 IIR2  LDX    5,34,M
          1048 00576   1398  2 16B0010B IIR2A LDA    SA,5          AJ(I,J)=SA(I,J)
          1049 00578   1400  2 3E8000F2       STA    AJ,5
          1050 0057A   1402  2 6C2B0002       IMN    5,2,M
          1051 0057C   1404  2 64300576       JGU    IIR2A
          1052 0057E   1406  2 1400005A IIR3  LDA    TIME+2
          1053 00580   1408  2 54000058       LDB    TIME
          1054 00582   1410  2 DC000032       SFD    SAVT          TIME-SAVT
          1055 00584   1412  2 5C220028       LDX    4,OMEG,M
          1056 00586   1414  2 64040000       JS     MULFD         OMEG*(TIME-SAVT)
          1057 00588   1416  2 64040000       JS     SINCOS
          1058 0058A   1418  2 6004           JRU    *+4
GENERATED                            0700
```

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            1059 0058C   1420  2 00000000          PTR    SWT            SWT=SIN(OMEG*(TIME-SAVT))
            1060 0058E   1422  2 3C000006          STA    CWT+2
            1061 00590   1424  2 7C000004          STB    CWT            CWT=COS(OMEG*(TIME-SAVT))
            1062 00592   1426  2 640405AC          JS     IIR5
            1063 00594   1428  2 64040000 IIR6     JS     MUL33          D1(I,J)=D(I,J)*AJ(I,J)
            1064 00596   1430  2 6008              JRU    *+8
GENERATED                              0700
            1065 00598   1432  2 000000E4          PTR    D
            1066 0059A   1434  2 000000F2          PTR    AJ
            1067 0059C   1436  2 00000054          PTR    D1
            1068 0059E   1438  2 5C2A0022          LDX    5,34,M
            1069 005A0   1440  2 16A00054 IIR6A    LDA    D1,5           AJ(I,J)=D1(I,J)
            1070 005A2   1442  2 3EA000F2          STA    AJ,5
            1071 005A4   1444  2 6C2A0002          IMN    5,2,M
            1072 005A6   1446  2 643005A0          JGU    IIR6A
                                                  **********************
                                                  *
                                                  *    DOPPLER PROCESSING - NOT IMPLEMENTED
                                                  *
                                                  **********************
            1073 005A8   1448  2 64040000          JS     NAVI           INITIALIZE FOR NAVIGATION
            1074 005AA   1450  2 74000010          RTA    IIRM
```

VERSION K20A0503 DECK NAME=*ALIGN *

```
DIAGNOSTICS LINE ADRES OADRES LC  PROGRAM                              SOURCE
                                      *
                                      *    SUBROUTINE IIR5 SETS UP MATRIX D TO PRE MULTIPLY MATRIX AJ
                                      *
 1076                                        ENTRY    IIR5
 1077                                        EVEN
 1078 005AC   1452  2 00000012 IIR5    PTR    IIR5M
 1079 005AE   1454  2 5C2A00E4          LDX    5,0,M
 1080 005B0   1456  2 1400001C          LDA    ZERO
 1081 005B2   1458  2 3A8C              STA    24,5          D(1,3)=D(2,3)=D(3,1)=D(3,2)=0
 1082 005B3   1459  2      3A8D          STA    26,5
 1083 005B4   1460  2 3A8E              STA    28,5
 1084 005B5   1461  2      3A8F          STA    30,5
 1085 005B6   1462  2 3A84              STA    8,5
 1086 005B7   1463  2      3A85          STA    10,5
 1087 005B8   1464  2 3A8A              STA    20,5
 1088 005B9   1465  2      3A8B          STA    22,5
 1089 005BA   1466  2 5400001E          LDB    FONE
 1090 005BC   1468  2 3A90              STA    32,5
 1091 005BD   1469  2      7A91          STB    34,5          D(3,3)=1.0
 1092 005BE   1470  2 14000006          LDA    CWT+2
 1093 005C0   1472  2 54000004          LDB    CWT
 1094 005C2   1474  2 3A81              STA    2,5           D(1,1)=D(2,2)=CWT
 1095 005C3   1475  2      7A80          STB    0,5
 1096 005C4   1476  2 3A89              STA    18,5
 1097 005C5   1477  2      7A88          STB    16,5
 1098 005C6   1478  2 14000002          LDA    SWT+2
 1099 005C8   1480  2 54000000          LDB    SWT
 1100 005CA   1482  2 3A87              STA    14,5
 1101 005CB   1483  2      7A86          STB    12,5          D(1,2)=SWT
 1102 005CC   1484  2 1400001C          LDA    ZERO
 1103 005CE   1486  2 5400001C          LDB    ZERO
 1104 005D0   1488  2 DC000000          SFD    SWT           SWT=-SWT
 1105 005D2   1490  2 3A83              STA    6,5           D(2,1)=-SWT
 1106 005D3   1491  2      7A82          STB    4,5
 1107 005D4   1492  2 74000012          RTA    IIR5M
```

```
VERSION K20A0503      DECK NAME=*ALIGN *                                                          PAGE  30

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
                                          *
                                          *    ALIGNMENT OUTPUT ROUTINE , ALNO
                                          *
            1109                                       ENTRY  ALNO
            1110                                       EVEN
            1111 005D6   1494  2 00000014 ALNO         PTR    ALNOR
            1112 005D8   1496  2 14005100              LDA    DECFLG      INCREMENT PDP-11 FLAG
            1113 005DA   1498  2 A400000A              ADD    ONE
            1114 005DC   1500  2 3C005100              STA    DECFLG
            1115 005DE   1502  2 1400005A              LDA    TIME+2
            1116 005E0   1504  2 54000058              LDB    TIME
            1117 005E2   1506  2 3C005104              STA    BTIME+2     PUT TIME IN BUFFER
            1118 005E4   1508  2 7C005102              STB    BTIME
            1119 005E6   1510  2 5C2A000A              LDX    5,10,M
            1120 005E8   1512  2 16800042 ALNO1        LDA    SX,5
            1121 005EA   1514  2 3E805106              STA    BSX,5       PUT SX,SY, AND SZ IN BUFFER
            1122 005EC   1516  2 6C2B0002              IMN    5,2,M
            1123 005EE   1518  2 643005E8              JGU    ALNO1
            1124 005F0   1520  2 5C2A0022              LDX    5,34,M
            1125 005F2   1522  2 168000F2 ALNO2        LDA    AJ,5
            1126 005F4   1524  2 3E805112              STA    BAJ,5       PUT MATRIX AJ IN BUFFER
            1127 005F6   1526  2 6C2B0002              IMN    5,2,M
            1128 005F8   1528  2 643005F2              JGU    ALNO2
            1129 005FA   1530  2 0700                  NOP                FILL WORD FOR POSSIBLE OTHER DATA
            1130 005FB   1531  2      0700             NOP
            1131 005FC   1532  2 0700                  NOP
            1132 005FD   1533  2      0700             NOP
            1133 005FE   1534  2 1400002C              LDA    NMO
            1134 00600   1536  2 3C005136              STA    BNMO        PUT NMO IN BUFFER
            1135 00602   1538  2 74000014              RTA    ALNOR
            1136                                       END
```

STATISTICS

TOTAL SHORTS 120
TOTAL LONGS 612
TOTAL INSTRUCTIONS 732
PERCENT SHORT 16.4
GENERATED NOPS 24
THEORETICAL PERCENT NOP LOADING 7.8
ACTUAL PERCENT NOP LOADING 2.0

```
DECK NAME=*ALIGN *          *****ERROR MESSAGES*****

 LINE NUMBER                DIAGNOSTIC
 1   197.....ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
 2   371.....ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
```

XREF 1 DECK NAME=*ALIGN * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 1

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES					
0000C	12		5	A	114	115	1007	1012			
0003E	62		1	ACM	318	698	699	757	758	852	853
000F2	242		4	AJ	109	1017	1021	1049	1066	1070	1125
0000C	12		8	AK1T	166	519	659	821			
00010	16		8	AK2T	167	530	531				
00014	20		1	ALNOR	307	1111	1135				
005E8	1512		2	ALNO1	1120	1123					
005F2	1522		2	ALNO2	1125	1128					
00506	1494		2	ALNO	1111	1024	1109				
00010	16		7	ALT	126						
00150	336		7	AP	155						
00036	54		5	ASCH	118	119	374	376	1031		
0015C	348		7	AT	156						
05112	20754		13	BAJ	294	1126					
05136	20790		13	BNMO	295	1134					
05106	20742		13	BSX	293	1121					
00030	48		4	BTE1	17						
00032	50		4	BTE3	18						
05102	20738		13	BTIME	292	1117	1118				
05100	20736			BUFORG	1	290					
0003C	60		9	CD01	222						
00040	64		9	CD02	223						
00044	68		9	CD03	224						
00038	56		5	CD04D	120						
00048	72		9	CD04	225						
0004C	76		9	CD05	226						
00050	80		9	CD06	227						
00054	84		9	CD07	228						
00058	88		9	CD08	229						
0005C	92		9	CD09	230						
00060	96		9	CD10	231						
00064	100		9	CD11	232						
00068	104		9	CD12	233						
0006C	108		9	CD13	234						
00070	112		9	CD14	235						
00074	116		9	CD15	237						
00078	120		9	CD16	238						
0007C	124		9	CD17	239						
00080	128		9	CD18	240						
00084	132		9	CD19	241						
00088	136		9	CD20	242						
0008C	140		9	CD21	243						
00090	144		9	CD22	244						
00094	148		9	CD23	245						
00098	152		9	CD24	246						
0009C	156		9	CD25	247						
000A0	160		9	CD26	248						
000A4	164		9	CD27	249						
000A8	168		9	CD28	250						
000AC	172		9	CD29	251						
000B0	176		9	CD30	252						
000B4	180		9	CD31	253						
000B8	184		9	CD32	254						

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES							
000BC	188		9	CD33	255								
000C0	192		9	CD34	256								
000C4	196		9	CD35	257								
000C8	200		9	CD36	258								
000CC	204		9	CD37	259								
000D0	208		9	CD38	260								
000D4	212		9	CD39	261								
000D8	216		9	CD40	263								
000DC	220		9	CD41	264								
000E0	224		9	CD42	265								
000E4	228		9	CD43	266								
000E8	232		9	CD44	267								
000EC	236		9	CD45	268								
000F0	240		9	CD46	269								
000F4	244		9	CD47	270								
000F8	248		9	CD48	271								
000FC	252		9	CD49	272								
00100	256		9	CD50	273								
00104	260		9	CD51	274								
00108	264		9	CD52	275								
0010C	268		9	CD53	276								
00110	272		9	CD54	277								
00114	276		9	CD55	278								
00118	280		9	CD56	279								
0011C	284		9	CD57	280	281							
00120	288		9	CD58	282								
00124	292		9	CD59	283								
00128	296		9	CD60	284								
0012C	300		9	CD61	285								
00130	304		9	CD62	286								
00134	308		9	CD63	287								
00138	312		9	CD64	288								
0000C	12		7	CGUL	125	163	717	718	854	882			
00038	56		4	CIPM	21								
0000C	12		7	CL	163								
00000	0		9	CONCO4	194								
00016	22		1	CTHR	308	517	518	520	521	608			
00052	82		4	CTR1	31								
00054	84		4	CTR2	32								
00056	86		4	CTR3	33								
00004	4		7	CWT	123	691	692	772	773	1060	1061	1092	1093
0004A	74		4	CYLE	27								
0002E	46		7	C1	133								
00032	50		7	C2	134								
00036	54		7	C3	135								
0003A	58		7	C4	136								
000E4	228		7	D	150	157	1011	1065	1079				
00066	102		4	DATA	39								
0000C	12		5	DCAM	115								
00002	2		4	DCSK	197								
05100	20736		13	DECFLG	291	1112	1114						
*****UNDEFINED*****				DECSO		565	679	743	909				
00030	48		9	DELT	218	534	620						

XREF 1 DECK NAME=*ALIGN * SRC 2000 CROSS REFERENCE DICTIONARY PAGE 3

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES										
0001C	28	9		DFONE	212	387										
00014	20	2		DF6	331	840										
00078	120	7		DG	145											
00024	36	4		DPDV	14											
00028	40	4		DPHV	15											
0003A	58	1		DPTO	317	572	573	574	586							
00020	32	4		DPVV	13											
0004E	78	4		DRFV	29											
*****UNDEFINED*****				DVFD		571	662	667	685	690	711	824	830	836	851	863
0003E	62	4		DVX	24	555	556	557	576	577	641	646	647			
00014	20	4		DVXG	10											
00000	0	5		DVXI	111	426	427	454	455	483	484	495	496	636		
00042	66	4		DVY	25											
00018	24	4		DVYG	11											
00004	4	5		DVYJ	112											
00046	70	4		DVZ	26											
0001C	28	4		DVZG	12											
00008	8	5		DVZK	113											
00054	84	7		D1	144	159	974	1005	1018	1020	1067	1069				
00034	52	9		D1032	219											
00038	56	9		D3032	220											
00016	22	9		EIGHT	207											
0009C	156	7		E1	146											
000A8	168	7		E2	147											
000B4	180	7		E3	148											
0000C	12	2		FKC	328	452										
00008	8	2		FKF	327	424										
00030	48	5		FLGN	116	1038										
0001E	30	9		FONE	211	584	906	924	952	985	1089					
00010	16	9		FOUR	204	478	1033									
0002C	44	4		GMT	16											
00050	80	4		HDGV	30											
00000	0	8		IACOM	164											
000A8	168	2		IIA	371	370										
00000	0	1		IIAM	297	371	396	398	417	419						
000BA	186	2		IIA1A	381	380										
000AA	170	2		IIA1	372											
000C2	194	2		IIA2	385	381										
000DA	218	2		IIA3	397	382										
000EC	236	2		IIA4A	407	406										
000F2	242	2		IIA4H	410	407										
000F6	246	2		IIA4C	412	408										
000FA	250	2		IIA4D	414	409										
000FC	252	2		IIA4E	415	411	413									
000DE	222	2		IIA4	399	383										
00104	260	2		IIA5A	419	377	402									
00102	258	2		IIA5	418	384										
*****UNDEFINED*****				IIC		393										
00106	262	2		IID	423	394	421									
00002	2	1		IIDM	298	423	503									
0010C	268	2		IID1A	426	434										
00108	264	2		IID1	424											
00122	290	2		IID2A	437	448										

XREF 1 DECK NAME=*ALIGN * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 4

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES			
0011E	286		2	IID2	435				
0013A	314		2	IID3	449	447			
00144	324		2	IID4A	454	462			
00140	320		2	IID4	452				
0015A	346		2	IID5A	465	476			
00156	342		2	IID5	463				
0017A	378		2	IID6A	481	486			
00172	370		2	IID6	477	475			
00192	402		2	IID7A	493	498			
00190	400		2	IID7	492	451			
001A6	422		2	IID8	503	479	491		
*****UNDEFINED*****				IIE		395			
*****UNDEFINED*****				IIF		397			
*****UNDEFINED*****				IIG		399			
001A8	424		2	IIH	507	400	505		
00004	4		1	IIHM	299	507	631	643	654
001AA	426		2	IIH1	508				
001E2	482		2	IIH2A	536	542			
001C0	448		2	IIH2	519				
001F6	502		2	IIH3A	547	546			
001F0	496		2	IIH3	543				
0029E	670		2	IIJ	632	547			
0029E	670		2	IIJ1	633				
002C8	712		2	IIK	658	410	656		
00006	6		1	IIKM	300	658	702		
002CA	714		2	IIK2	659				
002E0	736		2	IIK3	670				
00312	786		2	IIK4A	695	697			
0030E	782		2	IIK4	693				
00284	692		2	IIL	644	548			
00286	694		2	IIL1	646	653			
00322	802		2	IIM	706	412	704		
00324	804		2	IIMI	707				
00008	8		1	IIMM	301	706	760		
00328	808		2	IIM1A	709	715			
0037E	894		2	IIM2A	752	747			
00382	898		2	IIM2B	754	751			
00336	822		2	IIM2	716				
0000A	10		1	IIM3M	302	764	774		
00390	912		2	IIM3	764	759	762	893	
001FC	508		2	IIN	550	549			
00206	518		2	IIN1A	556	564			
0022E	558		2	IIN1B	576	583			
001FC	508		2	IIN1	551				
003A6	934		2	IIO	778	414	777		
0000C	12		1	IIOM	303	778	894		
0038C	956		2	IIO1A	790	820			
003A8	936		2	IIO1	779				
00418	1050		2	IIO2A	841	847			
003F2	1010		2	IIO2	821				
00486	1158		2	IIP	898	415	896		
0000E	14		1	IIPM	304	898	1025		
00488	1162		2	IIP1A	900	913			

XREF 1 DECK NAME=*ALIGN * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 5

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
00488	1160		2	IIP1	899												
004A6	1190		2	IIP2	914												
00544	1348		2	IIP3B	1020	1023											
0052C	1324		2	IIP3	1008												
00550	1360		2	IIR	1029	418	1027										
00010	16		1	IIRM	305	1029	1035	1037	1043	1074							
0055E	1374		2	IIR1A	1036	1034											
00562	1378		2	IIR1B	1038	1036											
0056E	1390		2	IIR1C	1044	1042											
00552	1362		2	IIR1	1030												
00576	1398		2	IIR2A	1048	1051											
00574	1396		2	IIR2	1047	1039											
0057E	1406		2	IIR3	1052	1046											
00012	18		1	IIR5M	306	1078	1107										
005AC	1452		2	IIR5	1078	1008	1062	1076									
005A0	1440		2	IIR6A	1069	1072											
00594	1428		2	IIR6	1063												
00060	96		4	ITER	36												
000E4	228		7	J3X3	157												
0002C	44		9	KGDL	217												
0004E	78		7	KSN1	141												
00050	80		7	KSN2	142												
00052	82		7	KSN3	143												
00150	336		7	K3X3	158												
00024	36		7	LCA1	160												
00028	40		7	LCA4	161												
0006E	110		4	LITE	43												
00018	24		2	LSSC	332	779											
00054	84		7	L3X3	159												
00000	0		7	MATCOM	121												
00028	40		8	MCSI	174	781											
0006C	108		4	MODE	42	1032											
*****UNDEFINED*****				MULFD		429	440	457	468	512	522	527	538	558	578	598	604
						611	623	625	627	671	677	719	724	735	741	768	793
						799	806	812	843	857	869	878	885	903	1056		
*****UNDEFINED*****				MUL33		970	1003	1009	1014	1063							
00064	100		4	NAVF	38	373											
*****UNDEFINED*****				NAVI		1073											
00024	36		8	NCCD	172	390	392	401									
0002A	42		8	NCCU	175	385	386	388	389	509	510	621	622	766	767	848	
00004	4		9	NFOUR	198												
00000	0		5	NIACOM	110												
00018	24		9	NINE	208												
0002C	44		7	NMO	132	449	477	1040	1133								
00008	8		9	NONE	200	1030											
00036	54		5	NSCH	119												
00006	6		9	NT#0	199												
00000	0		9	N64	195												
000C0	192		7	OC	149												
00028	40		9	OMEG	216	1055											
00024	36		9	OMGA	215	626											
0000A	10		9	ONE	201	375	391	1044	1113								
00020	32		9	ONMLF	214	511											

XREF 1 DECK NAME=*ALIGN * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 6

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES
000AC	172	4	014		74
00094	148	4	018		62
000A4	164	4	021		70
000A6	166	4	022		71
000A2	162	4	023		69
000A8	168	4	024		72
000CA	202	4	025		89
00096	150	4	030		63
00098	152	4	031		64
0009A	154	4	032		65
0009C	156	4	033		66
0009E	158	4	034		67
000A0	160	4	035		68
00086	134	4	04A		55
00088	136	4	04B		56
0008A	138	4	04C		57
000B2	178	4	04D		77
000B4	180	4	04E		78
00072	114	4	04F		45
00074	116	4	040		46
00076	118	4	041		47
00078	120	4	042		48
0007A	122	4	043		49
0007C	124	4	044		50
0007E	126	4	045		51
0008C	140	4	046		58
00080	128	4	047		52
00082	130	4	048		53
00084	132	4	049		54
000D2	210	4	05A		93
000C4	196	4	05B		86
000C6	198	4	05D		87
000C8	200	4	05E		88
000B6	182	4	050		79
000B8	184	4	051		80
000BA	186	4	052		81
000BC	188	4	053		82
000BE	190	4	054		83
000C0	192	4	055		84
000C2	194	4	056		85
000D6	214	4	057		95
000D8	216	4	058		96
000DA	218	4	059		97
000EA	234	4	06A		105
000EC	236	4	06B		106
0008E	142	4	06C		59
00090	144	4	06D		60
00092	146	4	06E		61
000CC	204	4	060		90
000D4	212	4	062		94
000DC	220	4	063		98
000DE	222	4	064		99
000E0	224	4	065		100

XREF 1 DECK NAME=*ALIGN * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 7

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES												
000E2	226	4	066		101												
000E4	228	4	067		102												
000E6	230	4	068		103												
000E8	232	4	069		104												
000B0	176	4	071		76												
000AE	174	4	072		75												
00014	20	8	PHA		168	489	490	501	502	513	700	701					
00062	98	4	PHAS		37												
00000	0	2	PHC		323	487	488										
00004	4	2	PHF		325	499	500										
00068	104	4	PUSH		40												
0003A	58	4	RAT		22												
0003C	60	4	RATL		23												
00008	8	4	RATM		6												
0000C	12	4	RATP		7												
0001E	30	1	ROVX		310	523	524	536	537	539	540	579	648				
00022	34	1	ROVY		311	528	529										
00026	38	1	ROVZ		312	532	533										
00014	20	7	RES1		127												
00018	24	7	RES2		128												
0001C	28	7	RES3		129												
00020	32	7	RES4		130												
00010	16	4	ROT1		8												
00012	18	4	ROT2		9												
*****UNDEFINED*****				RSET		416											
00034	52	4	R1CT		19												
00036	54	4	R2CT		20												
00108	264	7	SA		151	1048											
00026	38	8	SAMI		173	403	543										
00032	50	5	SAVT		117	1054											
00014	20	9	SEVEN		206	450											
00008	8	7	SGOL		124	162	722	723	866								
*****UNDEFINED*****				SINCOS		514	769	1057									
00012	18	9	SIX		205												
00008	8	7	SL		162												
00024	36	7	SRA		131	160	161	587	588	589	849	850					
00000	0	4	SRT1		4												
00004	4	4	SRT2		5												
0001A	26	1	STHR		309	516	525	526	595								
00000	0	7	SWT		122	686	687	771	1059	1098	1099	1104					
00042	66	1	SX		319	695	725	726	729	730	731	825	826	841	842	844	845
						867	868	879	880	881	900	901	902	994	995	1000	1120
00046	70	1	SY		320	754	755	837	838	961	962	967					
0004A	74	1	SZ		321	720	721	831	832	855	856	888	889	891	892	933	934
						939											
0003E	62	7	S1		137												
00042	66	7	S2		138												
00046	70	7	S3		139												
0004A	74	7	S4		140												
0002A	42	1	TEM		313	552	553	559	560	561	566	567	568	672	673	678	680
						681	682	736	737	742	744	745	750	752	753	780	785
0002E	46	1	TEMO		314	580	581	590	591	596	597	668	669	670	683	684	712
						713	732	733	734	858	859	872	873	876	877	883	884

XREF 1 DECK NAME=*ALIGN * SKC 2000 CROSS REFERENCE DICTIONARY PAGE 8

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES
					886 887 890 904 905 908 910 911 988 989
00032	50		1	TEM2	315 615 616 624 663 664 674 675 676 688 689 716 864
					865 874 955 956
00036	54		1	TEM4	316 602 603 609 610 738 739 740 746 870 871 875 927
					928
0001A	25		9	TEN	209
0006A	106		4	TEST	41
0000E	14		9	THREE	203
0005B	88		4	TIME	34 1052 1053 1115 1116
0012C	300		7	TM	152 914 972 975 1006 1013 1016
00070	112		4	TMPR	44 1045
00150	336		7	TM1	153 155 156 158 942 973
0000C	12		9	TWO	202
0005C	92		4	TO	35
00018	24		8	VAX	169 170 171 640 642 649 650 651 660 661 709 710
00000	0		8	VAXI	165 635 637
0001C	28		8	VAY	170 665 666
00020	32		8	VAZ	171
00066	102		8	VC1X	188 189 190 456 458 459 460 465 466 467 469 470 471
00072	114		8	VC2X	189
0007E	126		8	VC3X	190 481 482
					633 638
*****UNDEFINED*****				VECADD	
00174	372		7	VECT	154
0008A	138		8	VF1X	191 192 193 428 430 431 432 437 438 439 441 442 443
00096	150		8	VF2X	192
000A2	162		8	VF3X	193 493 494
0004C	76		4	VRTV	28
0011C	284		9	VT	281
0005E	94		8	VTB	186 707
00062	98		8	VTC	187 569 570 860
00010	16		2	WDT	330 508
00000	0		4	WLDCOM	3
00010	16		2	WOPP	329 330 765
0002E	46		8	XA	176 788 829
00036	54		8	XB	177 861 862
0003E	62		8	XC	178 822 823 835
00046	70		8	YA	185 789
00046	70		8	YA1	179 185 592 593 594
0004A	74		8	YA2	180 599 600 601
0004E	78		8	YB1	181 617 618 619
00052	82		8	YB2	182 628 629 630
00056	86		8	YC1	183 612 613 614
0005A	90		8	YC2	184 605 606 607
0001C	28		9	ZERO	210 212 372 551 585 693 727 728 748 749 756 827 828
					833 834 907 915 937 938 943 965 966 976 998 999
					1080 1102 1103

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VERSION K20A0503     DECK NAME=*RTEXEC*                                                                    PAGE   1

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
                                          $FAP RTEXEC
                                          *
                                          *     EXECUTIVE DATA AREA
                                          *
             1 07FE0  32736 -2            RTNORG    SETX    7FE0         BEGINNING OF RETURN ADDRESS LOCATIONS
             2 07FC0  32704 -2            APOIC     SETX    7FC0         DMA CONTROL WORD AREA
             3 07FC8  32712 -2            PICOUT    SETX    7FC8         INPUT CONTROL WORD LOCATION
             4 07FE8  32744 -2            RET04     SETX    7FE8         INTERRUPT 04 RETURN LOCATION
             5 07FEA  32746 -2            RET05     SETX    7FEA         INTERRUPT 05 RETURN LOCATION
             6 07FF4  32756 -2            RET10     SETX    7FF4         INTERRUPT 10 RETURN LOCATION
             7 03FFE  16382 -2            TEMCOR    SETX    3FFE         SUBLIB STACK ADDRESS
             8 0FF7F  65407 -2            MSK       SETX    FF7F
             9 07800  30720 -2            EXORG     SETX    7800         ORIGIN OF EXECUTIVE ROUTINE
            10 07FA0  32672 -2            INTORG    SETX    7FA0         INTERRUPT TRAP AREA ORIGIN
            11 00218    536 -2            IMSK      SETX    0218         INTERRUPT MASK REGISTER
            12 0B600  46592 -2            DEC       SETX    B600         PDP-11 INTERFACE ROUTINE ADDRESS
            13 06FE0  28640 -2            SDLORG    SETX    6FE0         SIDL DATA AREA ORIGIN
                                          *
                                          *
            14                0                     USE     0
                                          *
            15                0                     ORG     INTORG
            16 07FA0  32672   0                     BSS     8
R           17 07FA8  32680   0 6430022C  TRP04     JGU     INT04        INTERRUPT 04 VECTOR LOCATION
            18 07FAA  32682   0 643001EA  TRP05     JGU     INT05        INTERRUPT 05 VECTOR LOCATION
            19 07FAC  32684   0                     BSS     8
            20 07FB4  32692   0 64300158  TRP10     JGU     INT10        INTERRUPT 10 VECTOR LOCATION
                                          *
                                          *    GEANS WORLD COMMON VARIABLES DATA AREA
                                          *
            21                4           WLDCOM    COMMON  4
            22 00000      0   4           SRT1      BSS     4            GYRO ROTOR 1 SPEED ACCUMULATION
            23 00004      4   4           SRT2      BSS     4            GYRO ROTOR 2 SPEED ACCUMULATION
            24 00008      8   4           RATM      BSS     4            NEGATIVE R.A.T. PULSE ACCUMULATION
            25 0000C     12   4           RATP      BSS     4            POSITIVE R.A.T. PULSE ACCUMULATION
            26 00010     16   4           ROT1      BSS     2            GYRO 1 ROTOR SPEED ( REV/SECOND )
            27 00012     18   4           ROT2      BSS     2            GYRO 2 ROTOR SPEED ( REV/SECOND )
            28 00014     20   4           DVXG      BSS     4            ACCUMULATED DELT VX
            29 00018     24   4           DVYG      BSS     4            ACCUMULATED DELT VY
            30 0001C     28   4           DVZG      BSS     4            ACCUMULATED DELT VZ
            31 00020     32   4           DPVV      BSS     4            DOPPLER VERTICAL VELOCITY ACCUMULATION
            32 00024     36   4           DPDV      BSS     4            DOPPLER DRIFT    VELOCITY ACCUMULATION
            33 00028     40   4           DPHV      BSS     4            DOPPLER HEADING  VELOCITY ACCUMULATION
            34 0002C     44   4           GMT       BSS     4            GREENWICH MEAN TIME
            35 00030     48   4           BTE1      BSS     2            BITE ACTUAL STATE MASK WORD 1
            36 00032     50   4           BTE3      BSS     2            BITE ACTUAL STATE MASK WORD 3
            37 00034     52   4           R1CT      BSS     2            COUNTER FOR ROTOR 1 SPEED FAULT
            38 00036     54   4           R2CT      BSS     2            COUNTER FOR ROTOR 2 SPEED FAULT
            39 00038     56   4           CIPM      BSS     2            INPUT POWER MONITOR COUNTER
            40 0003A     58   4           RAT       BSS     2            REDUNDANT AXIS TORQUING (PULSES)
            41 0003C     60   4           RATL      BSS     2            COUNTER FOR RAT
            42 0003E     62   4           DVX       BSS     4            INPUT DELTA VX
            43 00042     66   4           DVY       BSS     4            INPUT DELTA VY
            44 00046     70   4           DVZ       BSS     4            INPUT DELTA VZ
            45 0004A     74   4           CYLE      BSS     2            OUT-OF-TIME FLAG
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VERSION K20A0503      DECK NAME=*RTEXEC*                                                                PAGE   2

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                     SOURCE
            46 0004C     76  4            VRTV     BSS    2           DOPPLER VERTICAL VELOCITY
            47 0004E     78  4            DRFV     BSS    2           DOPPLER DRIFT     VELOCITY
            48 00050     80  4            HDGV     BSS    2           DOPPLER HEADING   VELOCITY
            49 00052     82  4            CTR1     BSS    2           PHASE TIMER
            50 00054     84  4            CTR2     BSS    2           INTERNAL SEQUENCING COUNTER
            51 00056     86  4            CTR3     BSS    2           INTERNAL SEQUENCING COUNTER
            52 00058     88  4            TIME     BSS    4           TIME FROM SYSTEM TURN ON (SECONDS)
            53 0005C     92  4            TO       BSS    4           TIME AT ENTRY TO NAV
            54 00060     96  4            ITER     BSS    2           ITERATION COUNTER
            55 00062     98  4            PHAS     BSS    2           AUTOMATIC SEQUENCING PHASE
            56 00064    100  4            NAVF     BSS    2           IN-NAVIGATION MODE FLAG (2/3 - MAN/AUTO)
            57 00066    102  4            DATA     BSS    2           SYSTEM DATA SWITCH (0-7)
            58 00068    104  4            PUSH     BSS    2           PUSHBUTTON SWITCH (0-31)
            59 0006A    106  4            TEST     BSS    2           PRESS TO TEST SWITCH (0/-1)
            60 0006C    108  4            MODE     BSS    2           SYSTEM MODE SWITCH
            61 0006E    110  4            LITE     BSS    2           CDU LIGHTS (SOFTWARE)
            62 00070    112  4            TMPR     BSS    2           TEMP STORAGE LOCATION
                                          *
                                          *    SODL DATA AREA
                                          *
            63 00072    114  4            SODL     EQU    *
            64 00072    114  4            04F      BSS    2     01    FRAME MARKER
            65 00074    116  4            040      BSS    2     02    MSH OF GMT
            66 00076    118  4            041      BSS    2     03    LSH OF GMT
            67 00078    120  4            042      BSS    2     04    MSH OF LATITUDE
            68 0007A    122  4            043      BSS    2     05    LSH OF LATITUDE
            69 0007C    124  4            044      BSS    2     06    MSH OF LONGITUDE
            70 0007E    126  4            045      BSS    2     07    LSH OF LONGITUDE
            71 00080    128  4            047      BSS    2     08    MSH OF VERTICAL VELOCITY
            72 00082    130  4            048      BSS    2     09    LSH OF VERTICAL VELOCITY
            73 00084    132  4            049      BSS    2     10    MSH OF EAST VELOCITY
            74 00086    134  4            04A      BSS    2     11    LSH OF EAST VELOCITY
            75 00088    136  4            04B      BSS    2     12    MSH OF NORTH VELOCITY
            76 0008A    138  4            04C      BSS    2     13    LSH OF NORTH VELOCITY
            77 0008C    140  4            046      BSS    2     14    I.N.S. ALTITUDE
            78 0008E    142  4            06C      BSS    2     15    AHRS HEADING
            79 00090    144  4            06D      BSS    2     16    AHRS PITCH
            80 00092    146  4            06E      BSS    2     17    AHRS ROLL
            81 00094    148  4            018      BSS    2     18    RESET,IMU,DPU,EAU,CDU,DCU,BATT BITE BITS
            82 00096    150  4            030      BSS    2     19    3RD,4TH,5TH,6TH, RIGHT NUMERIC
            83 00098    152  4            031      BSS    2     20    4 DISCRETES; R.ALPHA; 1ST,2ND R. NUMERIC
            84 0009A    154  4            032      BSS    2     21    2ND,3RD,4TH,5TH LEFT NUMERIC
            85 0009C    156  4            033      BSS    2     22    1ST,2ND WAYPOINT; L. ALPHA; 1ST L.NUMERIC
            86 0009E    158  4            034      BSS    2     23    1ST,2ND FROM< 1ST,2ND TO
            87 000A0    160  4            035      BSS    2     24    CDU/ACDU DISPLAY LIGHTS
            88 000A2    162  4            023      BSS    2     25    HEADING
            89 000A4    164  4            021      BSS    2     26    PITCH
            90 000A6    166  4            022      BSS    2     27    ROLL
            91 000A8    168  4            024      BSS    2     28    STEERING SIGNAL
            92 000AA    170  4                     BSS    2     29    BLANK
            93 000AC    172  4            014      BSS    2     30    SEQ CNT,G1,2 MED,G1,2 TERM SHUTDOWN BITS
            94 000AE    174  4            072      BSS    2     31    TORQUE FOR GIMBALS 1 AND 2
            95 000B0    176  4            071      BSS    2     32    TORQUE FOR GIMBALS 3 AND 4
            96 000B2    178  4            04D      BSS    2     33    ROTOR 1,2, ROTOR SPEED
            97 000B4    180  4            04E      BSS    2     34    RAT AND VERTICAL VELOCITY
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VERSION K20A0503     DECK NAME=*RTEXEC*                                                              PAGE   3

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                SOURCE
             98 000B6   182  4          050       BSS      2         35   -,* DELTA VX
             99 000B8   184  4          051       BSS      2         36   -,* DELTA VY
            100 000BA   186  4          052       BSS      2         37   -,* DELTA VZ
            101 000BC   188  4          053       BSS      2         38   GIMBAL 1 RESOLVER
            102 000BE   190  4          054       BSS      2         39   GIMBAL 2 RESOLVER
            103 000C0   192  4          055       BSS      2         40   GIMBAL 3 RESOLVER
            104 000C2   194  4          056       BSS      2         41   GIMBAL 4 RESOLVER
            105 000C4   196  4          058       BSS      2         42   DATA,MODE,TST AND PUSHBUTTON SWITCHES
            106 000C6   198  4          05D       BSS      2         43   BITE BITS
            107 000C8   200  4          05E       BSS      2         44   BITE BITS
            108 000CA   202  4          025       BSS      2         45   BAROMETRIC ALTITUDE AND BITE BITS
            109 000CC   204  4          060       BSS      2         46   DRIFT AND HEADING VELOCITY
            110 000CE   206  4                    BSS      2         47   SPARE
            111 000D0   208  4                    BSS      2         48   SPARE
            112 000D2   210  4          05A       BSS      2         49   DELTA LATITUDE (FIX)
            113 000D4   212  4          062       BSS      2         50   DELTA LONGITUDE (FIX)
            114 000D6   214  4          057       BSS      2         51   VERTICAL DIFFERENCE VELOCITY
            115 000D8   216  4          058       BSS      2         52   CROSS TRACK DIFFERENCE VELOCITY
            116 000DA   218  4          059       BSS      2         53   ALONG TRACK DIFFERENCE VELOCITY
            117 000DC   220  4          063       BSS      2         54   A11 ALIGNMENT MATRIX
            118 000DE   222  4          064       BSS      2         55   A21 ALIGNMENT MATRIX
            119 000E0   224  4          065       BSS      2         56   A31 ALIGNMENT MATRIX
            120 000E2   226  4          066       BSS      2         57   A12 ALIGNMENT MATRIX
            121 000E4   228  4          067       BSS      2         58   A22 ALIGNMENT MATRIX
            122 000E6   230  4          068       BSS      2         59   A32 ALIGNMENT MATRIX
            123 000E8   232  4          069       BSS      2         60   A13 ALIGNMENT MATRIX
            124 000EA   234  4          06A       BSS      2         61   A23 ALIGNMENT MATRIX
            125 000EC   236  4          06B       BSS      2         62   A33 ALIGNMENT MATRIX
            126 000EE   238  4                    BSS      2         63   SPARE
            127 000F0   240  4                    BSS      2         64   SPARE
            128 000F2   242  4          AJ        BSS      36             ALIGNMENT MATRIX
                                        *
                                        *
            129                  7      MATCOM    COMMON 7                MATRIX,VECTOR,AND MISCELLANEOUS DATA
                                        *
            130 00000     0  7          SWT       BSS      4              SIN(OMEGA T)
            131 00004     4  7          CWT       BSS      4              COS(OMEGA T)
            132 00008     8  7          SGDL      BSS      4              SIN(GEODETIC LATITUDE)
            133 0000C    12  7          CGDL      BSS      4              COS(GEODETIC LATITUDE)
            134 00010    16  7          ALT       BSS      4              ALTITUDE
                                        *
                                        *    GIMBAL RESOLVER POSITION (BIAS EXCLUDED)
                                        *
            135 00014    20  7          RES1      BSS      4
            136 00018    24  7          RES2      BSS      4
            137 0001C    28  7          RES3      BSS      4
            138 00020    32  7          RES4      BSS      4
            139 00024    36  7          SRA       BSS      8              SUM OF 1-(G KNOWN)/(G ACCELERATION)
            140 0002C    44  7          NMO       BSS      2
                                        *
                                        *    COSINES OF CORRECTED GIMBAL ANGLES
                                        *
            141 0002E    46  7          C1        BSS      4
            142 00032    50  7          C2        BSS      4
            143 00036    54  7          C3        BSS      4
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VERSION K20A0503      DECK NAME=*RTEXEC*                                                    PAGE   4

DIAGNOSTICS LINE ADRES UADRES LC  PROGRAM                                SOURCE
            144 0003A      58  7         C4        BSS     4
                                         *
                                         *    SINES OF CORRECTED GIMBAL ANGLES
                                         *
            145 0003E      62  7         S1        BSS     4
            146 00042      66  7         S2        BSS     4
            147 00046      70  7         S3        BSS     4
            148 0004A      74  7         S4        BSS     4
                                         *
            149 0004E      78  7         KSN1      BSS     2          GAIN COLUMN INDEX
            150 00050      80  7         KSN2      BSS     2          GAIN COLUMN INDEX
            151 00052      82  7         KSN3      BSS     2          GAIN COLUMN INDEX
            152 00054      84  7         D1        BSS     36         TEMP 3X3 MATRIX
            153 00078     120  7         DG        BSS     36         TOTAL GIMBAL AND THEN TSP2
                                         *
                                         *    STATE MATRIX ( STORED ROW MAJOR ORDER )
                                         *****        E11 = PSI = HEADING
                                         *****        E12 = THETA = PITCH
                                         *****        E13 = PHI = ROLL
                                         *
                                         *
            154 0009C     156  7         E1        BSS     12
            155 000A8     168  7         E2        BSS     12
            156 000B4     180  7         E3        BSS     12
            157 000C0     192  7         OC        BSS     36         VEHICLE TO CASE TRANSFORMATION MATRIX
            158 000E4     228  7         D         BSS     36         TEMP 3X3 MATRIX
            159 00108     264  7         SA        BSS     36         SAVE AJ MATRIX
            160 0012C     300  7         TM        BSS     36         TEMP 3X3 MATRIX
            161 00150     336  7         TM1       BSS     36         TEMP 3X3 MATRIX
            162 00174     372  7         VECT      BSS     34         TABLE OF SUBROUTINE CALLS
            163 00150     336  7         AP        EQU     TM1        TEMP 3X1 VECTOR
            164 0015C     348  7         AT        EQU     TM1+12     TEMP 3X1 VECTOR
            165 000E4     228  7         J3X3      EQU     D
            166 00150     336  7         K3X3      EQU     TM1
            167 00054      84  7         L3X3      EQU     D1
            168 00024      36  7         LCA1      EQU     SRA        LAST GIMBAL 1 COMMAND
            169 00028      40  7         LCA4      EQU     SRA+4      LAST GIMBAL 4 COMMAND
            170 00008       8  7         SL        EQU     SGDL       SIN(LAT) GEODETIC
            171 0000C      12  7         CL        EQU     CGDL       COS(LAT) GEODETIC
                                         *
                                         *
            172                11        SPEXMC    COMMON 11          EXEC,SPIN,AND MISC COMMON DATA
                                         *
            173 00000       0 11         BDS1      BSS     2          BITE DESIRED STATE MASK - WORD 1
            174 00002       2 11         BDS2      BSS     2          BITE DESIRED STATE MASK - WORD 2
            175 00004       4 11         BDS3      BSS     2          BITE DESIRED STATE MASK - WORD 3
            176 00006       6 11         BDS4      BSS     2          BITE DESIRED STATE MASK - WORD 4
            177 00008       8 11         BMK1      BSS     2          BITE CHECK ENABLE MASK - WORD 1
            178 0000A      10 11         BMK2      BSS     2          BITE CHECK ENABLE MASK - WORD 2
            179 0000C      12 11         BMK3      BSS     2          BITE CHECK ENABLE MASK - WORD 3
            180 0000E      14 11         BMK4      BSS     2          BITE CHECK ENABLE MASK - WORD 4
            181 00010      16 11         HOLD      BSS     2          SEQUENCING HOLD FLAG
            182 00012      18 11         LPTK      BSS     2          LAST PASS TORQUE DISCRETE
            183 00014      20 11         TEMP      BSS     2
            184 00016      22 11         TEMP2     BSS     2
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VERSION K20A0503      DECK NAME=*RTEXEC*                                                      PAGE    5

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                             SOURCE
            185 00018     24 11           TEMP4     BSS    2
            186 0001A     26 11           MASK      BSS    2          SPIN TERMINATE FLAG STORE
            187 0001C     28 11           ANGL      BSS    4          GYRO INVERT ANGLE STORE
            188 00020     32 11           DATI      BSS    2          LAST PASS DATA SWITCH INPUT VALUE
            189 00022     34 11           LHED      BSS    2          AHRS HEADING
            190 00024     36 11           LPCH      BSS    2          AHRS PITCH
            191 00026     38 11           LROL      BSS    2          AHRS ROLL
            192 00028     40 11           CMD1      BSS    4          GIM 1 RESOLVER COMMAND ( BIAS INCLUDED )
            193 0002C     44 11           CMD2      BSS    4          GIM 2 RESOLVER COMMAND ( BIAS INCLUDED )
            194 00030     48 11           CMD3      BSS    4          GIM 3 RESOLVER COMMAND ( BIAS INCLUDED )
            195 00034     52 11           CMD4      BSS    4          GIM 4 RESOLVER COMMAND ( BIAS INCLUDED )
            196 00014     20 11           OMAX      EQU    TEMP
                                          *
                                          *
                                          *
                                          *    GEANS WORLD COMMON CONSTANTS DATA AREA
                                          *
            197                 9         CONCOM    COMMON 9
                                          *
            198 00000      0  9 FFFFFFC0 N64        DEC    -64
            199                                     EVEN
R           200 00002      2  9           DCSK      BSS    2
            201 00004      4  9           NFOUR     BSS    2
            202 00006      6  9           NTWO      BSS    2
            203 00008      8  9           NONE      BSS    2
            204 0000A     10  9           ONE       BSS    2
            205 0000C     12  9           TWO       BSS    2
            206 0000E     14  9           THREE     BSS    2
            207 00010     16  9           FOUR      BSS    2
            208 00012     18  9           SIX       BSS    2
            209 00014     20  9           SEVEN     BSS    2
            210 00016     22  9           EIGHT     BSS    2
            211 00018     24  9           NINE      BSS    2
            212 0001A     26  9           TEN       BSS    2
            213 0001C     28  9           ZERO      BSS    2
            214 0001E     30  9           FONE      BSS    2
            215 0001C     28  9           DFONE     EQU    ZERO
            216                                     EVEN
            217 00020     32  9           ONHLF     BSS    4
            218 00024     36  9           OMGA      BSS    4          EARTH ROTATION RATE  RAD/SEC
            219 00028     40  9           OMEG      BSS    4           EARTH RATE   PI RAD/SEC
            220 0002C     44  9           KGDL      BSS    4          GEODETIC LATITUDE CONSTANT
            221 00030     48  9           DELT      BSS    4          DELTA TIME = 1/8 SECOND
            222 00034     52  9           D1032     BSS    4          DOUBLE PRECISION 1/32
            223 00038     56  9           D3032     BSS    4          =3/32
                                          *
                                          *    CALIBRATION DATA.    CD01-CD64
                                          *
            224                                     EVEN
            225 0003C     60  9           CD01      BSS    4          X ACCEL SCALE FACTOR  M/SEC/PULSE
            226 00040     64  9           CD02      BSS    4          Y ACCEL SCALE FACTOR  M/SEC/PULSE
            227 00044     68  9           CD03      BSS    4          Z ACCEL SCALE FACTOR  M/SEC/PULSE
            228 00048     72  9           CD04      BSS    4          X ACCEL BIAS   PULSE/SEC
            229 0004C     76  9           CD05      BSS    4          Y ACCEL BIAS   PULSE/SEC
            230 00050     80  9           CD06      BSS    4          Z ACCEL BIAS   PULSE/SEC
```

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VERSION K20A0503      DECK NAME=*RTEXEC*                                                                      PAGE   6

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
            231 00054    84  9          CD07      BSS     4          B11 ACCEL MISALIGNMENT
            232 00058    88  9          CD08      BSS     4          B12 ACCEL MISALIGNMENT
            233 0005C    92  9          CD09      BSS     4          B13 ACCEL MISALIGNMENT
            234 00060    96  9          CD10      BSS     4          B21 ACCEL MISALIGNMENT
            235 00064   100  9          CD11      BSS     4          B22 ACCEL MISALIGNMENT
            236 00068   104  9          CD12      BSS     4          B23 ACCEL MISALIGNMENT
            237 0006C   108  9          CD13      BSS     4          B31 ACCEL MISALIGNMENT
            238 00070   112  9          CD14      BSS     4          B32 ACCEL MISALIGNMENT
            239                                   EVEN
            240 00074   116  9          CD15      BSS     4          B33 ACCEL MISALIGNMENT
            241 00078   120  9          CD16      BSS     4          GYRO TORQUE,G INDEPEN,DYNE-CM
            242 0007C   124  9          CD17      BSS     4          GYRO TORQUE,G INDEPEN,DYNE-CM
            243 00080   128  9          CD18      BSS     4          GYRO TORQUE,G INDEPEN,DYNE-CM
            244 00084   132  9          CD19      BSS     4          G11 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            245 00088   136  9          CD20      BSS     4          G12 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            246 0008C   140  9          CD21      BSS     4          G13 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            247 00090   144  9          CD22      BSS     4          G21 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            248 00094   148  9          CD23      BSS     4          G22 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            249 00098   152  9          CD24      BSS     4          G23 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            250 0009C   156  9          CD25      BSS     4          G31 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            251 000A0   160  9          CD26      BSS     4          G32 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            252 000A4   164  9          CD27      BSS     4          G33 GYRO TORQUE,G DEPEN,DYNE-CM/SEC**2
            253 000A8   168  9          CD28      BSS     4          RAT GYRO TORQUE  DYNE-CM
            254 000AC   172  9          CD29      BSS     4          RAT GYRO TORQUE  DYNE-CM
            255 000B0   176  9          CD30      BSS     4          SPEED COMP,G INDEPENDENT  DYNE-CM
            256 000B4   180  9          CD31      BSS     4          SPEED COMP,G INDEPENDENT  DYNE-CM
            257 000B8   184  9          CD32      BSS     4          SPEED COMP,G INDEPENDENT  DYNE-CM
            258 000BC   188  9          CD33      BSS     4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            259 000C0   192  9          CD34      BSS     4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            260 000C4   196  9          CD35      BSS     4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            261 000C8   200  9          CD36      BSS     4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            262 000CC   204  9          CD37      BSS     4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            263 000D0   208  9          CD38      BSS     4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            264 000D4   212  9          CD39      BSS     4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            265                                   EVEN
            266 000D8   216  9          CD40      BSS     4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            267 000DC   220  9          CD41      BSS     4          SPEED COMP,G INDEPEN  DYNE-CM/M/SEC**2
            268 000E0   224  9          CD42      BSS     4          A18P RAT SPEED COMP  DYNE-CM
            269 000E4   228  9          CD43      BSS     4          A19P RAT SPEED COMP  DYNE-CM
            270 000E8   232  9          CD44      BSS     4          STARTING LOCUS          PI RADIANS
            271 000EC   236  9          CD45      BSS     4          BETA(12) MISALIGNMENT   PI RADIANS
            272 000F0   240  9          CD46      BSS     4          GIMBAL 1 RESOLVER BIAS  PI RADIANS
            273 000F4   244  9          CD47      BSS     4          GIMBAL 2 RESOLVER BIAS  PI RADIANS
            274 000F8   248  9          CD48      BSS     4          GIMBAL 3 RESOLVER BIAS  PI RADIANS
            275 000FC   252  9          CD49      BSS     4          GIMBAL 4 RESOLVER BIAS  PI RADIANS
            276 00100   256  9          CD50      BSS     4          PLATFORM AZIMUTH ALIGN IN PI RADIANS
            277 00104   260  9          CD51      BSS     4          PLATFORM ELEVATION ALIGN IN PI RADIANS
            278 00108   264  9          CD52      BSS     4          VERTICAL DAMPING CONSTANT,
                                        *                            0.59594852 IN M/SEC/M*2**31
            279 0010C   268  9          CD53      BSS     4          VERTICAL VELOCITY GAIN     UNITLESS
            280 00110   272  9          HEDL      BSS     4          LOADED HEADING IN PI RADIANS = CD54
            281 00110   272  9          CD54      EQU     HEDL
            282 00114   276  9          CD55      BSS     4          LOADED LATITUDE         PI RADIANS
            283 00118   280  9          CD56      BSS     4          LOADED LONGITUDE        PI RADIANS
            284 0011C   284  9          CD57      BSS     4          LOCAL GRAVITY           METERS/SEC**2
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VERSION K20A0503     DECK NAME=*RTEXEC*                                                                          PAGE   7

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                         SOURCE
            285 00120   288  9            CD58     BSS    4              1/SCALE FACTOR             PULSES/M/SEC
            286 00124   292  9            CD59     BSS    4              ROTOR 1 SPEED        REVOLUTIONS/SEC
            287 00128   296  9            CD60     BSS    4              ROTOR 2 SPEED        REVOLUTIONS/SEC
            288 0012C   300  9            CD61     BSS    4              BARO ALT SCALE FACTOR   METERS/BIT
            289 00130   304  9            CD62     BSS    4              BARO ALTITUDE BIAS      BITS
            290 00134   308  9            CD63     BSS    4              ALTIMETER / AHRS FLAGS  NONE
            291 00138   312  9            CD64     BSS    4              ALTITUDE                METERS
                                          *
            292                12         BITCOM   COMMON 12
            293 00000     0 12 80000000 B1       HEX    80000000
            294 00002     2 12 40000000 B2       HEX    40000000
            295 00004     4 12 20000000 B3       HEX    20000000
            296 00006     6 12 10000000 B4       HEX    10000000
            297 00008     8 12 08000000 B5       HEX    08000000
            298 0000A    10 12 04000000 B6       HEX    04000000
            299 0000C    12 12 02000000 B7       HEX    02000000
            300 0000E    14 12 01000000 B8       HEX    01000000
            301 00010    16 12 00800000 B9       HEX    00800000
            302 00012    18 12 00400000 B10      HEX    00400000
            303 00014    20 12 00200000 B11      HEX    00200000
            304 00016    22 12 00100000 B12      HEX    00100000
            305 00018    24 12 00080000 B13      HEX    00080000
            306 0001A    26 12 00040000 B14      HEX    00040000
            307 0001C    28 12 00020000 B15      HEX    00020000
            308 0001E    30 12 00010000 B16      HEX    00010000
                                          *
                                          *
                                          *
            309                 1                  USE    1
                                          *
                                          *
            310                                    EVEN
            311 00000     0  1            BDSIR    BSS    2              RETURN ADDRESS LOCATION
            312 00002     2  1            CDUIR    BSS    2              CDUI AND CDU RETURN LOCATION
            313 00004     4  1            DECDR    BSS    2              DECODE RETURN ADDRESS LOCATION
            314 00006     6  1            CDUS1    BSS    2              CDU SOFTWARE SWITCH 1
            315 00008     8  1            CDUS2    BSS    2              CDU SOFTWARE SWITCH 2
            316 0000A    10  1            DMASAV   BSS    2              SAVE INT 10 STATUS REGISTER
            317 0000C    12  1                     BSS    2              SAVE A REGISTER
            318 0000E    14  1                     BSS    2              SAVE B REGISTER
            319 00010    16  1                     BSS    2              SAVE INT 05 STATUS REGISTER
            320 00012    18  1                     BSS    2              SAVE INT 04 STATUS REGISTER
                                          *
                                          *    DMA ERROR WORD BITS ARE SET AS FOLLOWS:
                                          *********** BIT 31 ON = SODL OPE OR OFT ERROR
                                          *********** BIT 30 ON = FIRST 05 SIDL WORD TRANSFER ERROR
                                          *********** BIT 29 ON =  LAST 10 SIDL WORD TRANSFER ERROR
                                          *********** BIT 28 ON = INT 10 OCCURRED WITH DMA NOT READY FOR START
                                          *********** BIT 27 ON = CYLE .GT. 2 ON EXECUTION OF DECODE
                                          *********** BITS 26 - 0 UNUSED
                                          *
            321 00014    20  1            DMAERR   BSS    2              DMA ERROR WORD
            322 00016    22  1            ERRCNT   BSS    2              DMA ERROR COUNT WORD
            323 00018    24  1            BLP1     BSS    2              ACCUMULATED ERROR WORD 1 BITS
            324 0001A    26  1            BLP2     BSS    2              ACCUMULATED ERROR WORD 2 BITS
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VERSION K20A0503      DECK NAME=*RTEXEC*                                                                              PAGE   8

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                         SOURCE
            325 0001C    28  1            BLP3      BSS    2            ACCUMULATED ERROR WORD 3 BITS
            326 0001E    30  1            BLP4      BSS    2            ACCUMULATED ERROR WORD 4 BITS
            327 00020    32  1            BNBR      BSS    2            BITE ERROR COUNTER
            328 00022    34  1            BCTR      BSS    2            BITE ERROR TIMER
            329 00024    36  1            HCTR      BSS    2            DELAY WHEN RESTARTING FROM TEMPORARY HOLD
            330 00026    38  1            MALF      BSS    2            INSTANTANEOUS MALFUNCTION NUMBER
            331 00028    40  1            MLFN'     BSS    2            LAST BITE MALFUNCTION NUMBER
            332 0002A    42  1            BER1      BSS    2            BITE ERROR WORD 1
            333 0002C    44  1            BER2      BSS    2            BITE ERROR WORD 2
            334 0002E    46  1            BER3      BSS    2            BITE ERROR WORD 3
            335 00030    48  1            BER4      BSS    2            BITE ERROR WORD 4
            336 00032    50  1            EXNO      BSS    2            REAL TIME IN PROGRESS FLAG
            337 00034    52  1            GSCT      BSS    2            GIMBAL STUCK COUNTER
            338 00036    54  1            BARO      BSS    2            BAROMETRIC ALTITUDE
            339 00038    56  1            ROTR      BSS    2
            340 0003A    58  1            TDVX      BSS    12           TEMP STORAGE FOR RAW DELTA V'S
                                          *
                                          *
                                          *    SIDL DATA AREA - ORIGIN AT ADDRESS 6FE0 - HIGH END OF
                                          *    UNPROTECTED CORE
                                          * .
            341             10                      USE    10
            342             10                      ORG    SDLORG
                                          *
            343 06FE0 28640 10            I4F       BSS    2            TURN AROUND WORD
            344 06FE2 28642 -1            SIDL      EQU    *
            345 06FE2 28642 10            I71       BSS    2            IMU/RESOLVER 1
            346 06FE4 28644 10            I72       BSS    2            IMU/RESOLVER 2
            347 06FE6 28646 10            I73       BSS    2            IMU/RESOLVER 3
            348 06FE8 28648 10            I74       BSS    2            IMU/RESOLVER 4
            349 06FEA 28650 10            I75       BSS    2            IMU / + DELTA V
            350 06FEC 28652 10            I76       BSS    2            IMU / - DELTA V
            351 06FEE 28654 10            I77       BSS    2            IMU / RAT - ROTOR SPEED
            352 06FF0 28656 10            I21       BSS    2            DPU / BARO ALTIMETER
            353 06FF2 28658 10            I22       BSS    2            DPU / DOP VELOCITY
            354 06FF4 28660 10            I13       BSS    2            EAU / BITE BITS
            355 06FF6 28662 10            I3F       BSS    2            CDU / SWITCHES
            356 06FF8 28664 10            I24       BSS    2            DPU / AHRS HEADING
            357 06FFA 28666 10            I28       BSS    2            DPU / AHRS PITCH
            358 06FFC 28668 10            I2C       BSS    2            DPU / AHRS ROLL
                                          *
                                          *
                                          *
            359              2                      USE    2
                                          *
                                          *
            360 00000     0  2 00000300 RMAX      DEC    768          MAXIMUM ALLOWED ROTOR SPEED
            361 00002     2  2 00000190 RMIN      DEC    400          MINIMUM ALLOWED ROTOR SPEED
            362 00004     4  2 0000C020 LITCOM    HEX    C020
            363 00006     6  2 00008000 BIT16     HEX    8000
   R        364 00008     8  2 64307846 VECJMP    JGU    EX30A
            365 0000A    10  2 64040104 CDUJMP    JS     CDU
            366 0000C    12  2 64040000 JDUMY     JS     DUMY
            367 0000E    14  2 64040000 BITEJM    JS     BITE
            368 00010    16  2 64040300 DECDJM    JS     DECD
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VERSION K20A0503     DECK NAME=*RTEXEC*                                                          PAGE   9

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
            369 00012     18  2 64040000 GASCJM    JS       GASC
            370 00014     20  2 64040000 SPINJM    JS       SPIN
            371 00016     22  2 00000800 BTIN      HEX      0800            INITIAL VALUES FOR BDS(I)  I=1,4
            372 00018     24  2 0000700F           HEX      700F
            373 0001A     26  2 00000000           HEX      0
            374 0001C     28  2 00000000           HEX      0
            375 0001E     30  2 00001D00           HEX      1D00            INITIAL VALUES FOR BMK(I)  I=1,4
            376 00020     32  2 0000FE8F           HEX      FE8F
            377 00022     34  2 0000E409           HEX      E409
            378 00024     36  2 0000FFFF           HEX      FFFF
            379 00026     38  2 0000E120 KLIT      HEX      E120
                                         *
                                         *  TABLE SODLIN IS INITIALIZATION FOR THE SODL
                                         *
            380 00028     40  2 F417F3DA SODLIN    HEX      F417F3DA
            381 0002A     42  2 04270000           HEX      04270000
            382 0002C     44  2 14370000           HEX      14370000
            383 0002E     46  2 24470000           HEX      24470000
            384 00030     48  2 34570000           HEX      34570000
            385 00032     50  2 44670000           HEX      44670000
            386 00034     52  2 54770000           HEX      54770000
            387 00036     54  2 74120000           HEX      74120000
            388 00038     56  2 84220000           HEX      84220000
            389 0003A     58  2 94310000           HEX      94310000
            390 0003C     60  2 A4F30000           HEX      A4F30000
            391 0003E     62  2 B4420000           HEX      B4420000
            392 00040     64  2 C4820000           HEX      C4820000
            393 00042     66  2 64C20000           HEX      64C20000
            394 00044     68  2 C6000000           HEX      C6000000
            395 00046     70  2 D6000000           HEX      D6000000
            396 00048     72  2 E6000000           HEX      E6000000
            397 0004A     74  2 81000000           HEX      81000000
            398 0004C     76  2 0300FFFF           HEX      0300FFFF
            399 0004E     78  2 13007FFF           HEX      13007FFF
            400 00050     80  2 2300FFFF           HEX      2300FFFF
            401 00052     82  2 3300FFFF           HEX      3300FFFF
            402 00054     84  2 4300FFFF           HEX      4300FFFF
            403 00056     86  2 53000000           HEX      53000000
            404 00058     88  2 32000000           HEX      32000000
            405 0005A     90  2 12000000           HEX      12000000
            406 0005C     92  2 22000000           HEX      22000000
            407 0005E     94  2 42000000           HEX      42000000
            408 00060     96  2 00000000           HEX      00000000
            409 00062     98  2 41000000           HEX      41000000
            410 00064    100  2 27007C7C           HEX      27007C7C
            411 00066    102  2 17007C7C           HEX      17007C7C
            412 00068    104  2 04000000             HEX      04000000
            413 0006A    106  2 E4000000           HEX      E4000000
            414 0006C    108  2 05000000           HEX      05000000
            415 0006E    110  2 15000000           HEX      15000000
            416 00070    112  2 25000000           HEX      25000000
            417 00072    114  2 35000000           HEX      35000000
            418 00074    116  2 45000000           HEX      45000000
            419 00076    118  2 55000000           HEX      55000000
            420 00078    120  2 65000000           HEX      65000000
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VERSION K20A0503 DECK NAME=*RTEXEC*

DIAGNOSTICS	LINE	ADRES	DADRES	LC	PROGRAM			SOURCE	
	421	0007A	122	2	85000000		HEX	85000000	
	422	0007C	124	2	D5000000		HEX	D5000000	
	423	0007E	126	2	E5000000		HEX	E5000000	
	424	00080	128	2	52000000		HEX	52000000	
	425	00082	130	2	06000000		HEX	06000000	
	426	00084	132	2	00000000		HEX	00000000	
	427	00086	134	2	00000000		HEX	00000000	
	428	00088	136	2	A5000000		HEX	A5000000	
	429	0008A	138	2	26000000		HEX	26000000	
	430	0008C	140	2	75000000		HEX	75000000	
	431	0008E	142	2	85000000		HEX	85000000	
	432	00090	144	2	95000000		HEX	95000000	
	433	00092	146	2	36000000		HEX	36000000	
	434	00094	148	2	46000000		HEX	46000000	
	435	00096	150	2	56000000		HEX	56000000	
	436	00098	152	2	66000000		HEX	66000000	
	437	0009A	154	2	76000000		HEX	76000000	
	438	0009C	156	2	86000000		HEX	86000000	
	439	0009E	158	2	96000000		HEX	96000000	
	440	000A0	160	2	A6000000		HEX	A6000000	
	441	000A2	162	2	B6000000		HEX	B6000000	
	442	000A4	164	2	00000000		HEX	0	
	443	000A6	166	2	00000000		HEX	0	
						*			
	444	000A8	168	2	0F000000	C30S23	SCLB	30,8	
	445	000AA	170	2	05000000	C10S23	SCLB	10,8	
	446	000AC	172	2	00000021	S1A32	SCLB	1.03125,26	=1.03125
	447	000AE	174	2	40600000	F304	DEC	0.75	
	448	000B0	176	2	80808080	MSBMSK	HEX	80808080	
	449	000B2	178	2	003F0000	SWMSK	HEX	003F0000	
	450	000B4	180	2	FFE00000	ITRMSK	HEX	FFE00000	
	451	000B6	182	2	007F0000	RATMS1	HEX	007F0000	
	452	000B8	184	2	01FF0000	RATMS2	HEX	01FF0000	
	453	000BA	186	2	7E000000	RATMS3	HEX	7E000000	
	454	000BC	188	2	00FF0000	TEMSK	HEX	00FF0000	
	455	000BE	190	2	000F0000	IMUMSK	HEX	000F0000	
	456	000C0	192	2	0E000000	BTEMSK	HEX	0E000000	
	457	000C2	194	2	00300000	THTY	HEX	00300000	
	458	000C4	196	2	000000FF	MEDMSK	HEX	000000FF	
	459	000C6	198	2	00060000	0006	HEX	00060000	
	460	000C8	200	2	F0000000	F	HEX	F0000000	
	461	000CA	202	2	FF000000	FF	HEX	FF000000	
	462	000CC	204	2	FFFF0000	FFFF	HEX	FFFF0000	
	463	000CE	206	2	F00F0000	F00F	HEX	F00F0000	
	464	000D0	208	2	FF0F0000	FF0F	HEX	FF0F0000	
	465	000D2	210	2	FFFD0000	FFFD	HEX	FFFD0000	
	466	000D4	212	2	FFFE0000	FFFE	HEX	FFFE0000	
	467	000D6	214	2	0FF00000	OFF0	HEX	0FF00000	
	468	000D8	216	2	00FF0000	OOFF	HEX	00FF0000	
	469	000DA	218	2	0FFF0000	OFFF	HEX	0FFF0000	
	470	000DC	220	2	FFFFFF3F	FF3F	HEX	FFFFFF3F	
	471	000D6	214	2		FAILMS	EQU	OFF0	
	472	000DE	222	2	4F0CC003	POCC1	HEX	4F0CC003	
	473	000E0	224	2	0F04400B	POCC2	HEX	0F04400B	
	474	000E2	226	2	4F066009	PICC1	HEX	4F066009	

VERSION K20A0503 DECK NAME=*RTEXEC*

DIAGNOSTICS LINE	ADRES	DADRES	LC	PROGRAM			SOURCE
475	000E4	228	2	0F020000	PICC2	HEX	0F020000
476	000E6	230	2	0F00000F	PCCKST	HEX	0F00000F
477	000E8	232	2	400F0000	MSK1	HEX	400F0000
478	000EA	234	2	0F000000	MSK2	HEX	0F000000
479	000EC	236	2	FF7FFFFF	FG1ZER	HEX	FF7FFFFF
480			2		POC1	VFD	4/0,10/127,18/SODL
481			2		POC2	VFD	4/8,10/1,18/SODL
482			2		PIC2	VFD	4/0,10/9,18/SIDL-2
483			2		PIC3	VFD	4/0,10/19,18/I74+2

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                   SOURCE
                                          *
                                          *     INITIALIZATION FOR GEANS SKC-2000 EXECUTIVE ROUTINE
                                          *
            485                3                    USE    3
            486                                     EVEN
            487                3                    ORG    EXORG
            488 07800  30720   3 9C01001C EXEC      LDS    ZERO          CLEAR STATUS REGISTER
                                          *
                                          *     CLEAR PROCESSOR INTERRUPT STATE
                                          *
            489 07802  30722   3 5C2A001E           LDX    5,30,*M       INITIALIZE LOOP
            490 07804  30724   3 3400780A EX00      LAE    RTNCLR        LOAD ADDRESS OF COUNT DOWN
            491 07806  30726   3 3E807FE0           STA    RTNORG,5      STORE IN RETURN ADDRESS
            492 07808  30728   3 76807FE0           RTA    RTNORG,5      RTA THRU RETURN ADDRESS
            493 0780A  30730   3 6C2B0002 RTNCLR    IMN    5,2,*M        DECREMENT COUNTER
            494 0780C  30732   3 64307804           JGU    EX00          GO BACK FOR ANOTHER
            495 0780E  30734   3 5C323FFE           LDX    6,TEMCOR,*M   SET (XR6) TO ADDRESS OF STACK
            496 07810  30736   3 5C2A001E           LDX    5,30,*M
            497 07812  30738   3 1400000C           LDA    JDUMY
            498 07814  30740   3 3E800174 EX01      STA    VECT,5        SET ALL ENTRIES IN VECT TO 'CALL DUMY'
            499 07816  30742   3 6C2B0002           IMN    5,2,*M
            500 07818  30744   3 64307814           JGU    EX01
            501 0781A  30746   3 14000008           LDA    VECJMP
            502 0781C  30748   3 3C000194           STA    VECT+32       SET RETURN JUMP FROM VECT
                                          *
            503 0781E  30750   3 640402AA           JS     BDSI          INITIALIZE SYSTEM VARIABLES
            504 07820  30752   3 640400F6           JS     CDUI          INITIALIZE SKC-2000 CDU FLAGS
                                          *
                                          *     SEA INITIALIZATION
                                          *
            505 07822  30754   3 140000E6           LDA    PCCRST
            506 07824  30756   3 4820               DOA    4             RESET DMA INPUT AND OUTPUT CHANNELS
            507 07825  30757   3     4828           DOA    5
            508 07826  30758   3 0301               SET    1             SET DMA NOT READY FLAG
GENERATED                                 0700
            509 07828  30760   3 FC030218           LDI    IMSK,*M       SET INTERRUPT 4,5,AND 10 MASKS
            510 0782A  30762   3 1400001C           LDA    ZERO
            511 0782C  30764   3 3C000032           STA    EXNO          EXNO=0
            512 0782E  30766   3 14000008           LDA    NONE
            513 07830  30768   3 3C000016           STA    ERRCNT        ERRCNT=-1
            514 07832  30770   3 0080               EMI                  ENABLE MEMORY INTERRUPTS
            515 07833  30771   3     0200           EPI                  ENABLE PROGRAM INTERRUPTS
            516 07834  30772   3 6000               JU     *             WAIT FOR FIRST 32 HZ INTERRUPT
                                          *
                                          *     SKC-2000 EXECUTIVE BEGINS HERE
                                          *
GENERATED                                 0700
            517 07836  30774   3 1400000A EX30      LDA    ONE
            518 07838  30776   3 3C000032           STA    EXNO          EXNO SET TO NON - ZERO
            519 0783A  30778   3 14000060           LDA    ITER
            520 0783C  30780   3 84000014           AND    SEVEN         CHECK ITER FOR 1/4 SECOND
            521 0783E  30782   3 6106               JN     NORSET
GENERATED                                 0700
            522 07840  30784   3 1400000C           LDA    TWO
```

```
VERSION K20A0503     DECK NAME=*RTEXEC*                                                                          PAGE  13

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                         SOURCE
            523 07842  30786  3 48A8                DOA    21          RESET WATCHDOG TIMER AT 1/4 SECOND
GENERATED                             0700
            524 07844  30788  3 64300174 NORSET     JU     VECT        EXECUTE VECTOR TABLE
                                         *
                                         *
            525 07846  30790  3 0100     EX30A      DPI                DISABLE PROGRAM INTERRUPTS
GENERATED                             0700
            526 07848  30792  3 1400004A            LDA    CYLE
            527 0784A  30794  3 3C000032            STA    EXNO        EXNO=CYLE
            528 0784C  30796  3 0200                EPI                ENABLE PROGRAM INTERRUPTS
            529 0784D  30797  3     6197            JN     EX30        IF EXNO.NE.0 EXECUTE VECTOR TABLE
            530 0784E  30798  3 6404B600 EX70       JS     DEC         CALL PDP-11 INTERFACE ROUTINE
            531 07850  30800  3 6082                JU     EX70        WAIT FOR NEXT 32 HZ INTERRUPT
R           532 07851  30801  3                     BSS    2
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                              SOURCE
                                            *
                                            *    INITIALIZE SUBROUTINE CDU
                                            *
             534              2                       USE    2
             535                                      ENTRY  CDUI
             536                                      EVEN
             537 000F6    246  2 00000002 CDUI        PTR    CDUIR
             538 000F8    248  2 1400001C             LDA    ZERO
             539 000FA    250  2 3C000006             STA    CDUS1          CDUS1=CDUS2=0
             540 000FC    252  2 3C000008             STA    CDUS2
             541 000FE    254  2 1400000A             LDA    CDUJMP
             542 00100    256  2 3C000178             STA    VECT+4         3RD ENTRY OF VECT = 'CALL CDU'
             543 00102    258  2 74000002             RTA    CDUIR
```

```
VERSION K20A0503     DECK NAME=*RTEXEC*                                                                    PAGE  15

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                 SOURCE
                                           *
                                           *   SKC-2000 CDU ROUTINE. SYNCRONIZES SKC-2000 ALIGNMENT WITH
                                           *   HONEYWELL ALIGNMENT
                                           *
            545               2                   USE    2
            546                                   ENTRY  CDU
            547                                   EVEN
            548 00104    260  2 00000002 CDU      PTR    CDUIR
            549 00106    262  2 14000006          LDA    CDUS1        IF CDUS1 .NE. 0 BYPASS SW3 TEST
            550 00108    264  2 612C              JN     CDU40
GENERATED                          0700
            551 0010A    266  2 6598012C          JGW    CDU30,3      IF SW3 IS ON CALL FENT IMMEDIATELY
            552 0010C    268  2 14000008          LDA    CDUS2        IF CDUS2 .NE. 0 TEST FOR 601
                                           *                          ALIGNMENT RE-ENTRY
            553 0010E    270  2 610E              JN     CDU20
GENERATED                          0700
            554 00110    272  2 1400006C          LDA    MODE         IS MODE SET FOR ALIGNMENT
            555 00112    274  2 E4000010          SBU    FOUR         IF MODE .LT. 4 SYSTEM IS IN NAV
            556 00114    276  2 6206              JG     CDU10        SYSTEM STILL IN ALIGN - RETURN
GENERATED                          0700
            557 00116    278  2 1400000A          LDA    ONE          SYSTEM IN NAV - SET CDUS2 NON ZERO
            558 00118    280  2 3C000008          STA    CDUS2        CDUS2=1
            559 0011A    282  2 74000002 CDU10    RTA    CDUIR
                                           *
            560 0011C    284  2 1400006C CDU20    LDA    MODE
            561 0011E    286  2 E4000010          SBU    FOUR         HAS 601 RE-ENTERED ALIGN
            562 00120    288  2 6204              JG     CDU21        YES - GO CHECK MODE START SWITCH
GENERATED                          0700
            563 00122    290  2 74000002          RTA    CDUIR        NO - RETURN
            564 00124    292  2 140000C4 CDU21    LDA    05B
            565 00126    294  2 8402001F          AND    31,M         GET PUSHBUTTON SWITCHES
            566 00128    296  2 E4020019          SBU    25,M         HAS ALIGN STARTED
            567 0012A    298  2 6108              JN     CDU31        NO - RETURN
GENERATED                          0700
            568 0012C    300  2 1400000A CDU30    LDA    ONE          YES - PREPARE TO CALL FENT
            569 0012E    302  2 3C000006          STA    CDUS1        CDUS1=1
            570 00130    304  2 64040000          JS     FENT         INITIALIZE FOR ALIGN - PUT
                                           *                          'CALL ALIGN' IN VECT
            571 00132    306  2 74000002 CDU31    RTA    CDUIR        RETURN
                                           *
            572 00134    308  2 64180140 CDU40    JGW    CDU41,0
            573 00136    310  2 54006FF6          LDB    I3F          GET SWITCHES FROM SIDL
            574 00138    312  2 0810              SLLD   16           SHIFT MODE SWITCH TO 'A' REGISTER
GENERATED                          0700
            575 0013A    314  2 84000014          AND    SEVEN        MASK OUT GARBAGE
            576 0013C    316  2 3C00006C          STA    MODE         MODE=MODE FIELD FROM SIDL
            577 0013E    318  2 74000002          RTA    CDUIR        RETURN
                                           *
            578 00140    320  2 6498014A CDU41    JGW    CDU42,1
            579 00142    322  2 0700              NOP
            580 00143    323  2        0700       NOP
            581 00144    324  2 0700              NOP
            582 00145    325  2        0700       NOP
            583 00146    326  2 0700              NOP
```

VERSION M2040503 DECK NAME=*RTEXEC*

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                          *
                                          *     PDP-11 SUPPLIED MODE PICKED UP HERE
                                          *
GENERATED                                0700
            584 00148     328  2 74000002          RTA     CDUIR          RETURN
                                          *
            585 0014A     330  2 65180152 CDU42     JSW     CDU43,2
            586 0014C     332  2 14000010          LDA     FOUR
            587 0014E     334  2 3C00006C          STA     MODE           MODE=4; ENTER ALIGN
            588 00150     336  2 74000002          RTA     CDUIR          RETURN
                                          *
            589 00152     338  2 1400000E CDU43    LDA     THREE
            590 00154     340  2 3C00006C          STA     MODE           MODE=3; ENTER NAV
            591 00156     342  2 74000002          RTA     CDUIR
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                                    PAGE  17

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
            593                                    EVEN
                                          *
                                          *    INTERRUPT 10 ROUTINE. PROCESSES 32 HZ INTERRUPT.
                                          *
            594 00158      344  2 DC01000A INT10    STS       DMASAV       *SAVE S
            595 0015A      346  2 3C00000C          STA       DMASAV+2     *SAVE A
            596 0015C      348  2 7C00000E          STB       DMASAV+4      *SAVE B
            597 0015E      350  2 6448017E          JGF       NOTRED+1     *TEST FOR DMA NOT READY
            598 00160      352  2 140000DE          LDA       POCC1
            599 00162      354  2 4820              DOA       4            *START DMA OUTPUT
GENERATED                            0700
            600 00164      356  2 140000E2          LDA       PICC1
            601 00166      358  2 4828              DOA       5            *START DMA INPUT
GENERATED                            0700
            602 00168      360  2 1400000A          LDA       DMASAV
            603 0016A      362  2 C4000010          LOR    B9              SET NOT READY FLAG
            604 0016C      364  2 3C00000A          STA       DMASAV
            605 0016E      366  2 14000014          LDA    DMAERR
            606 00170      368  2 84020010          AND    16,M
            607 00172      370  2 3C000014          STA       DMAERR       *RESET DMA STATUS WORD
            608 00174      372  2 0700              NOP
            609 00175      373  2       0700        NOP
            610 00176      374  2 1400000C I10END   LDA       DMASAV+2     *RESTORE A,B,S
            611 00178      376  2 5400000E          LDB       DMASAV+4     *
            612 0017A      378  2 9C01000A          LDS       DMASAV       *
            613 0017C      380  2 74007FF4          RTA       RET10
                                          *
                                          *    INTERRUPT 10 INITIALIZATION OR FIXUP
                                          *
            614 0017E      382  2 A400000A NOTRED   ADU    ONE             CLEAR CARRY BIT
            615 00180      384  2 14000016          LDA    ERRCNT
            616 00182      386  2 A4020001          ADU       1,M          *INCREMENT ERROR COUNT
            617 00184      388  2 3C000016          STA       ERRCNT
            618 00186      390  2 5402000F          LDB       15,M         *BEGIN SETTING OF DMA STATUS
            619 00188      392  2 4822              DIA       4
GENERATED                            0700
            620 0018A      394  2 8C000000          SAM       B1           * TEST FOR OEOT1
            621 0018C      396  2 64300193          JGU       NRD1
            622 0018E      398  2 0500              EAB
GENERATED                            0700
            623 00190      400  2 8402001E          AND    30,M            RESET SODL ERROR BIT
            624 00192      402  2 0500              EAB
            625 00193      403  2       482A NRD1   DIA       5
            626 00194      404  2 8C000002          SAM       B2           *TEST FOR IEOT2
            627 00196      406  2 6430019E          JGU       NRD2
            628 00198      408  2 0500              EAB
GENERATED                            0700
            629 0019A      410  2 8402001D          AND    29,M            RESET SIDL TORQUE ERROR BIT
            630 0019C      412  2 0500              EAB
GENERATED                            0700
            631 0019E      414  2 8C000004 NRD2     SAM       B3           *TEST FOR IEOT3
            632 001A0      416  2 643001A8          JGU       NRD3
            633 001A2      418  2 0500              EAB
GENERATED                            0700
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                              PAGE  18

DIAGNOSTICS LINE ADRES OADRES LC  PROGRAM                                        SOURCE
            634 001A4    420  2 8402001B              AND     27.M          RESET LAST SIDL ERROR BIT
            635 001A6    422  2 0500                  EAB
GENERATED                          0700
            636 001A8    424  2 7C000014 NRD3         STB        DMAERR
            637 001AA    426  2 140000E6              LDA        PCCRST       *START DMA INITIALIZATION
            638 001AC    428  2 4820                  DOA        4
            639 001AD    429  2     4828              DOA        5
            640 001AE    430  2 140000F0              LDA        POC2
            641 001B0    432  2 3C007FC2              STA        APOIC+2
            642 001B2    434  2 140000E0              LDA        POCC2
            643 001B4    436  2 4820                  DOA        4            *START SCB PROG. CONT. RESET
GENERATED                          0700
            644 001B6    438  2 140000EE              LDA        POC1
            645 001B8    440  2 3C007FC0              STA        APOIC
            646 001BA    442  2 140000F2              LDA        PIC2
            647 001BC    444  2 3C007FCA              STA        APOIC+10
            648 001BE    446  2 140000F4              LDA        PIC3
            649 001C0    448  2 3C007FCC              STA        APOIC+12
            650 001C2    450  2 4822       NRD4       DIA        4
GENERATED                          0700
            651 001C4    452  2 8C000002              SAM        B2           *CHECK FOR OEOT2
            652 001C6    454  2 643001C2              JGU        NRD4
            653 001C8    456  2 140000E6              LDA        PCCRST
            654 001CA    458  2 4820                  DOA        4
GENERATED                          0700
            655 001CC    460  2 140000F0              LDA        POC2
            656 001CE    462  2 3C007FC2              STA        APOIC+2
            657 001D0    464  2 1400000A              LDA        DMASAV
            658 001D2    466  2 840000EC              AND        FG1ZER       *RESET NOT READY FLAG
            659 001D4    468  2 3C00000A              STA        DMASAV
            660 001D6    470  2 14000016              LDA     ERRCNT
            661 001D8    472  2 6102                  JN      NRD5          IS ERRCNT .GT. 0
            662 001D9    473  2     60E3*             JU      I10END
            663 001DA    474  2 1400004A NRD5         LDA     CYLE
            664 001DC    476  2 A400000C              ADU     TWO
            665 001DE    478  2 3C00004A              STA     CYLE          CYLE=CYLE+2
            666 001E0    480  2 14000032              LDA     EXNO
            667 001E2    482  2 61EC                  JN      I10END        IS EXNO NON - ZERO
GENERATED                          0700
            668 001E4    484  2 34007836              LAE     EX30
            669 001E6    486  2 3C007FF4              STA     RET10         SET RETURN TO CALL EXECUTIVE
            670 001E8    488  2 60F2                  JU      I10END
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                           PAGE  19

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                               SOURCE
GENERATED                          0700
            672                                    EVEN
                                         *
                                         *   INTERRUPT 5 ROUTINE. PROCESSES DMA INPUT COMPLETE INTERRUPT.
                                         *
            673 001EA    490  2 DC010010 INT05     STS      DMASAV+6     *SAVES S
            674 001EC    492  2 0100               DPI
GENERATED                          0700
            675 001EE    494  2 3C00000A           STA      DMASAV       *SAVE A
            676 001F0    496  2 7C00000C           STB      DMASAV+2     *SAVE B
            677 001F2    498  2 482A               DIA      5
GENERATED                          0700
            678 001F4    500  2 3C00000E           STA      DMASAV+4     *SAVE DMA INPUT STATUS
            679 001F6    502  2 8C000006           SAM      FAILMS       *TEST FOR NON-EOT
            680 001F8    504  2 64300212           JGU      ISEOT
            681 001FA    506  2 A400000A           ADD    ONE           CLEAR CARRY BIT
            682 001FC    508  2 14000016           LDA      ERRCNT
            683 001FE    510  2 A4020001           ADD      1,M          *INCREMENT ERROR COUNT
            684 00200    512  2 3C000016           STA      ERRCNT
            685 00202    514  2 14000014           LDA      DMAERR
            686 00204    516  2 C4020002           LOR      2,M          *SET SIDL TORK ERROR BIT
            687 00206    518  2 3C000014           STA      DMAERR
            688 00208    520  2 1400000E           LDA      DMASAV+4
            689 0020A    522  2 CC000002           EXO      B2
            690 0020C    524  2 840000EB           AND      MSK1
            691 0020E    526  2 C40000EA           LOR      MSK2
            692 00210    528  2 4828               DOA      5            *RESET NON-EOT INTERRUPT
GENERATED                          0700
            693 00212    530  2 1400000E ISEOT     LDA      DMASAV+4
            694 00214    532  2 8C000002           SAM      B2           *TEST FOR IEOT2
            695 00216    534  2 64300224           JGU      ISEND
            696 00218    536  2 140000E4           LDA      PICC2
            697 0021A    538  2 4828               DOA      5            *MODIFY INPUT CONTROL WORD
GENERATED                          0700
            698 0021C    540  2 14000014           LDA      DMAERR
            699 0021E    542  2 8402001D           AND    29,M          RESET SIDL TORK ERROR BIT
            700 00220    544  2 3C000014           STA      DMAERR
            701 00222    546  2 64040000           JS       TORK
            702 00224    548  2 1400000A ISEND     LDA      DMASAV       *RESTORE  A,B,S
            703 00226    550  2 5400000C           LDB      DMASAV+2     *
            704 00228    552  2 9C010010           LDS      DMASAV+6     *
            705 0022A    554  2 74007FEA           RTA      RET05
            706                                    EVEN
                                         *
```

```
VERSION K20A0503      DECK NAME=*HTEXEC*

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                       SOURCE
                                           *     INTERRUPT 4 ROUTINE. PROCESSES DMA OUTPUT COMPLETE INTERRUPT.
                                           *
            708 0022C    556  2 DC010012 INT04    STS       DMASAV+8     *SAVE S
            709 0022E    558  2 0100              DPI
GENERATED                         0700
            710 00230    560  2 3C00000A          STA       DMASAV       *SAVE A
            711 00232    562  2 7C00000C          STB       DMASAV+2     *SAVE B
            712 00234    564  2 4822              DIA       4
GENERATED                         0700
            713 00236    566  2 3C00000E          STA       DMASAV+4     *SAVE DMA OUTPUT STATUS
            714 00238    568  2 8C000006          SAM       FAILMS       *TEST FOR NON-EOT INTERRUPT
            715 0023A    570  2 64300252          JGU       I4EOT
            716 0023C    572  2 840000E8          AND       MSK1
            717 0023E    574  2 CC000002          EXO       B2
            718 00240    576  2 C40000EA          LOR       MSK2
            719 00242    578  2 4820              DOA       4            *ERROR INTERRUPT RESET
GENERATED                         0700
            720 00244    580  2 A400000A          ADD    ONE            CLEAR CARRY BIT
            721 00246    582  2 14000016          LDA       ERRCNT
            722 00248    584  2 A4020001          ADD       1,M         *INCREMENT ERROR COUNT
            723 0024A    586  2 3C000016          STA       ERRCNT
            724 0024C    588  2 14000014          LDA       DMAERR
            725 0024E    590  2 C4020001          LOR       1,M          *SET SODL ERROR BIT
            726 00250    592  2 3C000014          STA       DMAERR
            727 00252    594  2 1400000E I4EOT    LDA       DMASAV+4
            728 00254    596  2 8C000000          SAM       B1           *TEST FOR OEOT1
            729 00256    598  2 643002A2          JGU       I4END
            730 00258    600  2 14000014          LDA       DMAERR
            731 0025A    602  2 8402001E          AND     30,M          RESET SODL ERROR BIT
            732 0025C    604  2 3C000014          STA       DMAERR
            733 0025E    606  2 482A              DIA       5
GENERATED                         0700
            734 00260    608  2 8C000004          SAM       B3           *TEST FOR IEOT3
            735 00262    610  2 6430026C          JGU       I4EOT1
            736 00264    612  2 14000014          LDA       DMAERR
            737 00266    614  2 84020013          AND     19,M          RESET DMA ERROR BITS
            738 00268    616  2 3C000014          STA       DMAERR
            739 0026A    618  2 600E              JU        I4EOT2
GENERATED                         0700
            740 0026C    620  2 14000014 I4EOT1   LDA       DMAERR
            741 0026E    622  2 C4020004          LOR       4,M          *SET LAST SIDL ERROR BIT
            742 00270    624  2 3C000014          STA       DMAERR
            743 00272    626  2 14000016          LDA       ERRCNT
            744 00274    628  2 A4020001          ADD       1,M          *INCREMENT ERROR COUNT
            745 00276    630  2 3C000016          STA       ERRCNT
            746 00278    632  2 140000E6 I4EOT2   LDA       PCCRST       *RE-INITIALIZE DMA
            747 0027A    634  2 4820              DOA       4
            748 0027B    635  2     4828          DOA       5
            749 0027C    636  2 140000EE          LDA       POC1
            750 0027E    638  2 3C007FC0          STA       APOIC
            751 00280    640  2 140000F0          LDA       POC2
            752 00282    642  2 3C007FC2          STA       APOIC+2
            753 00284    644  2 140000F2          LDA       PIC2
            754 00286    646  2 3C007FCA          STA       APOIC+10
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                          PAGE  21

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                        SOURCE
             755 00288   648  2 140000F4           LDA       PIC3
             756 0028A   650  2 3C007FCC           STA       APOIC+12
             757 0028C   652  2 14000012           LDA       DMASAV+8
             758 0028E   654  2 840000EC           AND       FGIZER         *RESET DMA NOT READY FLAG
             759 00290   656  2 3C000012           STA       DMASAV+8
             760 00292   658  2 14000032           LDA       EXNO           *BEGIN EXNO TEST
             761 00294   660  2 6108               JN        I4EXNO
GENERATED                         0700
             762 00296   662  2 34007836           LAE    EX30           SET RETURN TO CALL EXECUTIVE
             763 00298   664  2 3C007FE8           STA       RET04          *MODIFY RTA PTR FOR EXEC
             764 0029A   666  2 6008               JU        I4END
GENERATED                         0700
             765 0029C   668  2 1400004A I4EXNO    LDA    CYLE
             766 0029E   670  2 A400000A           ADD    ONE
             767 002A0   672  2 3C00004A           STA    CYLE           CYLE = CYLE+1
             768 002A2   674  2 1400000A I4END     LDA       DMASAV         *RESTORE A,B,S
             769 002A4   676  2 5400000C           LDB       DMASAV+2
             770 002A6   678  2 9C010012           LDS       DMASAV+8
             771 002A8   680  2 74007FE8           RTA       RET04
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                                    PAGE  22

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
                                               *
                                               *   SUBROUTINE BDSI. INITIALIZE BUILT-IN TEST,DATA DECODE,AND
                                               *   AUTO SEQUENCING.
                                               *
            773                2                  '    USE    2
            774                                        ENTRY  BDSI
            775                                        EVEN
            776 002AA     682  2 00000000 BDSI         PTR    BDSIR
            777 002AC     684  2 1400001C              LDA    ZERO
                                               *
                                               *   BLP1=BLP2=BLP3=BLP4=0; BCTR=BNBR=HCTR=0; HOLD=MALF=MLFN=0;
                                               *   CMD1=CMD2=CMD3=CMD4=0; BER1=BER2=BER3=BER4=0
                                               *
            778 002AE     686  2 5C2A0022              LDX    5,34,M
            779 002B0     688  2 3E800018 BDSI1        STA    BLP1,5
            780 002B2     690  2 6C2B0002              IMN    5,2,M
            781 002B4     692  2 643002B0              JGU    BDSI1
                                               *
                                               *   SET INITIAL VALUES OF BDS(I) AND BMK(I) I=1,4, FROM TABLE BTIN
                                               *
            782 002B6     694  2 5C2A000E              LDX    5,14,M
            783 002B8     696  2 16800016 BDSI2        LDA    BTIN,5
            784 002BA     698  2 3E800000              STA    BDS1,5        BDS(I)=BTIN(I)  I=1,4
            785 002BC     700  2 6C2B0002              IMN    5,2,M         BMK(I)=BTIN(I+4)  I=1,4
            786 002BE     702  2 643002B8              JGU    BDSI2
                                               *
                                               *   SRT1=SRT2=RATP=RATM=0; ROT1=ROT2=0; DVXG=DVYG=DVZG=0;
                                               *   DPVV=DPDV=DPHV=0; GMT=0; BTE1=BTE2=BTE3=BTE4=0;
                                               *   R1CT=R2CT=CIPM=RAT=RATL=0; DVX=DVY=DVZ=0; CYLE=VRTV=DRFV=HDGV=0
                                               *
            787 002C0     704  2 1400001C              LDA    ZERO
            788 002C2     706  2 5C2A0050              LDX    5,80,M
            789 002C4     708  2 3E800000 BDSI4        STA    SRT1,5
            790 002C6     710  2 6C2B0002              IMN    5,2,M
            791 002C8     712  2 643002C4              JGU    BDSI4
                                               *
                                               *   CTR1=CTR2=CTR3=0; TIME=ITER=PHAS=0; NAVF=DATA=PUSH=TEST=0
                                               *
            792 002CA     714  2 5C2A0014              LDX    5,20,M
            793 002CC     716  2 3E800052 BDSI5        STA    CTR1,5
            794 002CE     718  2 6C2B0002              IMN    5,2,M
            795 002D0     720  2 643002CC              JGU    BDSI5
            796 002D2     722  2 14000026              LDA    KLIT
            797 002D4     724  2 3C00006E              STA    LITE          LITE=KLIT
            798 002D6     726  2 1400001C              LDA    ZERO
            799 002D8     728  2 3C0100AD              STAH   014+1         014 DATA = 0
            800 002DA     730  2 3C0100CB              STAH   025+1         025 DATA = 0
            801 002DC     732  2 54006FF6              LDB    I3F           PICK UP SWITCHES FROM SIDL
            802 002DE     734  2 0810                  SLLD   16            SHIFT MODE SWITCH TO 'A' REGISTER
GENERATED                          0700
            803 002E0     736  2 84000014              AND    SEVEN         MASK OUT GARBAGE
            804 002E2     738  2 3C00006C              STA    MODE          MODE = MODE SWITCH FROM SIDL
            805 002E4     740  2 14000010              LDA    DECDJM
            806 002E6     742  2 3C000176              STA    VECT+2        2ND ENTRY OF VECT = 'CALL DECD'
```

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VERSION K20A0503     DECK NAME=*RTEXEC*                                                          PAGE  23

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
             807 002E8    744  2 14000014            LDA    SPINJM
             808 002EA    746  2 3C00017C            STA    VECT+8       5TH ENTRY OF VECT=SPIN
             809 002EC    748  2 1400000E            LDA    BITEJM
             810 002EE    750  2 3C000180            STA    VECT+12      7TH ENTRY OF VECT=BITE
             811 002F0    752  2 14000012            LDA    GASCJM
             812 002F2    754  2 3C00018E            STA    VECT+26      14TH ENTRY OF VECT=GASC
                                            *
                                            *    INITIALIZE SODL DATA AREA
                                            *
             813 002F4    756  2 5C2A007E            LDX    5,126,M      INITIALIZE COUNTER
             814 002F6    758  2 16800028 BDSI6      LDA    SODLIN,5
             815 002F8    760  2 3E800072            STA    SODL,5       SODL(N)=SODLIN(N)
             816 002FA    762  2 6C280002            IMN    5,2,M        DECREMENT COUNTER
             817 002FC    764  2 643002F6            JGU    BDSI6        GO BACK FOR ANOTHER
             818 002FE    766  2 74000000            RTA    BDSIR
                                            *
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                                   PAGE  24

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                  SOURCE
                                          *
                                          *         SUBROUTINE DECD (DECODE)
                                          *
                                          *    THIS ROUTINE UNPACKS THE SERIAL DATA BUS (SIDL) INPUTS AND
                                          *    STORES THESE VALUES FOR USE BY OTHER PROGRAMS. THE BITE BITS
                                          *    ARE REPACKED FOR USE BY THE BITE ROUTINE. DIAGNOSTIC CHECKS ARE
                                          *    USED FOR VERIFICATION OF ROTOR SPEED AND DELTA V'S.
                                          *
                                          *
            820                 2                  USE    2
            821                                    ENTRY  DECD
            822                                    EVEN
            823 00300    768  2 00000004 DECD      PTR    DECDR
            824 00302    770  2 1400001C           LDA    ZERO
            825 00304    772  2 3C000032           STA    BTE3          BTE3=BTE4=0
            826 00306    774  2 3C000016           STA    TEMP2         PREPARE TO RESET TORQUING TIMER
            827 00308    776  2 14000012           LDA    LPTK
            828 0030A    778  2 0841               SLL    1             LPTK*2
GENERATED                           0700
            829 0030C    780  2 3C000012           STA    LPTK          LPTK=LPTK*2
            830 0030E    782  2 540100B1           LDBH   071+1         PREPARE TORQUING COMMANDS TO CHECK
                                          *                             FOR MAX TORQUING
            831 00310    784  2 140000AE           LDA    072
            832 00312    786  2 0810               SLLD    16           PUT BOTH WORDS IN A REG.
GENERATED                           0700
            833 00314    788  2 3C000014           STA    TEMP          (A) = TORQUING COMMANDS
            834 00316    790  2 CC000008           EXO    NONE          COMPLEMENT TORQUE TIMER
            835 00318    792  2 0841               SLL    1
GENERATED                           0700
            836 0031A    794  2 CC000014           EXO    TEMP          CHECK TO SEE IF BIT1 = BIT2
            837 0031C    796  2 840000B0           AND    MSBMSK
            838 0031E    798  2 6102               JN     D003
            839 0031F    799  2      6013          JU     D005
            840 00320    800  2 14000012 D003      LDA    LPTK
            841 00322    802  2 A400000A           ADU    ONE
            842 00324    804  2 3C000012           STA    LPTK          SET TORQUING BIT
            843 00326    806  2 14000034           LDA    GSCT
            844 00328    808  2 E40000AC           SBU    S1A32         GSCT-1.03125
            845 0032A    810  2 620E               JG     D007          CHECK FOR GSCT .GT. 1 MINUTE
GENERATED                           0700
            846 0032C    812  2 14000034           LDA    GSCT
            847 0032E    814  2 A400000A           ADU    ONE           GSCT=GSCT+1/32  (ONE=SCLB  0.03125)
            848 00330    816  2 3C000016           STA    TEMP2
            849 00332    818  2 14000016 D005      LDA    TEMP2         ADVANCE/RESET TORQUING TIMER
            850 00334    820  2 3C000034           STA    GSCT          GSCT=TEMP2
            851 00336    822  2 6008               JU     D009
GENERATED                           0700
            852 00338    824  2 14000032 D007      LDA    BTE3
            853 0033A    826  2 C4000004           LOR    B3            SET GIMBAL STUCK BIT
            854 0033C    828  2 3C000032           STA    BTE3
            855 0033E    830  2 14006FE0 D009      LDA    I4F           CHECK TURN AROUND WORD
            856 00340    832  2 E4000072           SBU    04F
            857 00342    834  2 6102               JN     D010
            858 00343    835  2      6007          JU     D011
```

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VERSION K20A0503      DECK NAME=*RTEXEC*                                                                      PAGE  25

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                      SOURCE
            859 00344    836  2 14000032 D010      LDA    BTE3
            860 00346    838  2 C400000A           LOR    ONE          BTE4=1
            861 00348    840  2 3C000032           STA    BTE3
            862 0034A    842  2 5C2A0000 D011      LDX    5,0,M
            863 0034C    844  2 14010033 D015      LDAH   BTE3+1
            864 0034E    846  2 0841               SLL    1            BTE4*2
GENERATED                         0700
            865 00350    848  2 3C010033           STAH   BTE3+1
            866 00352    850  2 16816FE2           LDAH   SIDL,5       LOAD UPPER HALF OF SIDL WORD
            867 00354    852  2 840000CA           AND    FF           MASK OFF UFC FIELD
            868 00356    854  2 3C000014           STA    TEMP
            869 00358    856  2 16810072           LDAH   SODL,5       LOAD UPPER HALF OF SODL WORD
            870 0035A    858  2 0848               SLL    8            ALIGN UFC FIELD WITH SIDL
GENERATED                         0700
            871 0035C    860  2 E4000014           SBU    TEMP
            872 0035E    862  2 6102               JN     D016         ARE UFC FIELDS EQUAL
            873 0035F    863  2       6007         JU     D017
            874 00360    864  2 14000032 D016      LDA    BTE3
            875 00362    866  2 A400000A           ADU    ONE          BTE4=BTE4+1
            876 00364    868  2 3C000032           STA    BTE3
            877 00366    870  2 6C2A0002 D017      IMP    5,2,M
            878 00368    872  2 2428001C           ICL    5,28,M
            879 0036A    874  2 6430036E           JGU    D020
            880 0036C    876  2 6430034C           JGU    D015
            881 0036E    878  2 1400001C D020      LDA    ZERO
            882 00370    880  2 3C0100C7           STAH   050+1        CLEAR BITE BITS
            883 00372    882  2 0100               DPI                 DISABLE PROGRAM INTERRUPTS
GENERATED                         0700
            884 00374    884  2 1400004A           LDA    CYLE
            885 00376    886  2 6102               JN     D021         CYLE.NE.0
            886 00377    887  2       6015         JU     D023         CYLE=0
            887 00378    888  2 E400000C D021      SBU    TWO          IS CYLE .GT. 1
            888 0037A    890  2 6308               JL     D022         NO - GO SET OUT OF TIME FLAG
GENERATED                         0700
            889 0037C    892  2 14020010           LDA    16,M
            890 0037E    894  2 C4000014           LOR    DMAERR       SET CYLE .GT. 2 FLAG
            891 00380    896  2 3C000014           STA    DMAERR
            892 00382    898  2 14010033 D022      LDAH   BTE3+1
            893 00384    900  2 C4000000           LOR    B1
            894 00386    902  2 3C010033           STAH   BTE3+1       SET OUT OF TIME FLAG
            895 00388    904  2 1400001C           LDA    ZERO
            896 0038A    906  2 3C00004A           STA    CYLE         CYLE=0
            897 0038C    908  2 0200      D023     EPI                 ENABLE PROGRAM INTERRUPTS
GENERATED                         0700
            898 0038E    910  2 1400002E           LDA    GMT+2
            899 00390    912  2 5400002C           LDB    GMT
            900 00392    914  2 9C000034           AFD    D1032        GMT=GMT+0.03125 SEC/ND
            901 00394    916  2 3C00002E           STA    GMT+2
            902 00396    918  2 7C00002C           STB    GMT
            903 00398    920  2 0400               CFX                 FIX GMT
GENERATED                         0700
            904 0039A    922  2 7C010077           STBH   041+1        041 DATA = LEAST SIGNIFICANT PART OF GMT
            905 0039C    924  2 0870               SRLD   16
GENERATED                         0700
            906 0039E    926  2 7C010075           STBH   040+1        040 DATA = MOST SIGNIFICANT PART OF GMT
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            907 003A0   928  2 14000058          LDA    TIME+2
            908 003A2   930  2 54000058          LDB    TIME
            909 003A4   932  2 9C000034          AFD    D1032      TIME = TIME + 0.03125 SECOND
            910 003A6   934  2 3C00005A          STA    TIME+2
            911 003A8   936  2 7C000058          STB    TIME
            912 003AA   938  2 0400               CFX               FIX TIME
GENERATED                          0700
            913 003AC   940  2 7C010061          STBH   ITER+1     (B)=MODULO 1 SECOND
            914 003AE   942  2 14000072          LDA    04F        PICK UP TURN AROUND WORD
            915 003B0   944  2 0C65              SRC    5          GET RID OF OLD ITER
            916 003B1   945  2      0805         SLLD   5          PICK UP NEW ITER
            917 003B2   946  2 3C000072          STA    04F
            918 003B4   948  2 14000060          LDA    ITER
            919 003B6   950  2 0C68              SRC    11         RIGHT JUSTIFY ITER
GENERATED                          0700
            920 003B8   952  2 3C000060          STA    ITER
            921 003BA   954  2 54016FF7          LDBH   13F+1      GET LOW ORDER HALF WORD
            922 003BC   956  2 0801              SLLD   1          PACK IT
GENERATED                          0700
            923 003BE   958  2 14016FF6          LDAH   13F        GET HIGH ORDER HALF WORD
            924 003C0   960  2 84000082          AND    SWMSK      GET RID OF UNWANTED BITS
            925 003C2   962  2 0C70              SRC    16         PACK HIGH ORDER HALF WORD
            926 003C3   963  2      086A         SRLD   10
            927 003C4   964  2 7C0100C5          STBH   058+1      058 DATA = CDU SWITCHES
            928 003C6   966  2 14010033          LDAH   BTE3+1
            929 003C8   968  2 84000018          AND    B13        CHECK ALT UNREASONABLE BIT
            930 003CA   970  2 6160              JN     D050
GENERATED                          0700
            931 003CC   972  2 540100C5          LDBH   058+1      LOAD 058 DATA INTO B REGISTER
            932 003CE   974  2 0804              SLLD   4          LEFT JUSTIFY DATA BITS
GENERATED                          0700
            933 003D0   976  2 14000020          LDA    DATI
            934 003D2   978  2 3C000014          STA    TEMP
            935 003D4   980  2 0803              SLLD   3          DATI=DATI*8+058 BITS 20-22
GENERATED                          0700
            936 003D6   982  2 84027FFF          AND    32767,M    DATI.AND.7FFF HEX
            937 003D8   984  2 3C000020          STA    DATI
            938 003DA   986  2 E4000014          SBU    TEMP
            939 003DC   988  2 6108              JN     D030       DOES TEMP=DATI
GENERATED                          0700
            940 003DE   990  2 14000020          LDA    DATI
            941 003E0   992  2 84020007          AND    7,M        YES: DATA=DATI.AND.7
            942 003E2   994  2 3C000066          STA    DATA
            943 003E4   996  2 140000C4 0030     LDA    058
            944 003E6   998  2 84020020          AND    32,M
            945 003E8  1000  2 3C00006A          STA    TEST       TEST = PRESS-TO-TEST-BIT
            946 003EA  1002  2 140000C4          LDA    058
            947 003EC  1004  2 8402001F          AND    31,M       (A) = PUSHBUTTON SWITCH
            948 003EE  1006  2 6102              JN     D031       IS (A)=0
            949 003EF  1007  2      6003         JU     D032
            950 003F0  1008  2 3C000068 0031     STA    PUSH       YES: PUSH=(A)
            951 003F2  1010  2 E4020019 0032     SBU    25,M       CHECK MODE START SWITCH
            952 003F4  1012  2 3C000070          STA    TMPR       SAVE FOR FUTURE REFERENCE
            953 003F6  1014  2 A4020006          ADU    6,M        HAS DATA SWITCH BEEN PRESSED (19)
            954 003F8  1016  2 6102              JN     D033
```

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VERSION K2040503      DECK NAME=*RTEXEC*                                                              PAGE  27

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
             955 003F9   1017  2      6003           JU     D034
             956 003FA   1018  2 14020100 D033       LDA    256.M          (A).NE.0 SO (A)=256=(B8)
             957 003FC   1020  2 CC020180 D034       EXO    384.M          (A)=(A).XOR. 384
             958 003FE   1022  2 C400006E            LOR    LITE
             959 00400   1024  2 CC020180            EXO    384.M
             960 00402   1026  2 3C00006E            STA    LITE           TURN OFF LITE BITS 12 AND 13
             961 00404   1028  2 0803                SLLD   3              GET MODE SWITCH FROM B REGISTER
GENERATED                             0700
             962 00406   1030  2 84000014            AND    SEVEN          CLEAR OUT GARBAGE
             963 00408   1032  2 06C0                LXA    8              (XR8)=NEW MODE
GENERATED                             0700
             964 0040A   1034  2 2440006C            ICN    8.MODE         IS NEW MODE = MODE
             965 0040C   1036  2 6430042A            JGU    D050           YES - DO NOT CHANGE MODE SWITCH
             966 0040E   1038  2 24430006            ICL    8.6.M          IS NEW MODE .GE.6
             967 00410   1040  2 64300424            JGU    D040           YES - TURN ON MODE START LITE
             968 00412   1042  2 24420001            ICN    8.1.M          IS NEW MODE = 1
             969 00414   1044  2 64300424            JGU    D040           YES - TURN ON MODE START LITE
             970 00416   1046  2 24430001            ICL    8.1.M          IS NEW MODE .LT. 1
             971 00418   1048  2 6430041C            JGU    D035           NO - GO CHECK MODE START SWITCH
             972 0041A   1050  2 6430042A            JGU    D050           YES - DO NOT CHANGE MODE SWITCH
             973 0041C   1052  2 14000070 D035       LDA    TMPR           HAS MODE STARTED
             974 0041E   1054  2 6106                JN     D040           NO - TURN ON MODE START LITE
GENERATED                             0700
             975 00420   1056  2 1C40006C            STX    8.MODE         STORE NEW MODE SWITCH
             976 00422   1058  2 6008                JU     D050
GENERATED                             0700
             977 00424   1060  2 14020080 D040       LDA    128.M
             978 00426   1062  2 C400006E            LOR    LITE
             979 00428   1064  2 3C00006E            STA    LITE           TURN ON MODE START LIGHT
             980 0042A   1066  2 14016FEE D050       LDAH   I77
             981 0042C   1068  2 84000086            AND    RATMS1         MASK OFF R.A.T. FIELD
             982 0042E   1070  2 0849                SLL    9             SHIFT TO PROPER LOCATION
GENERATED                             0700
             983 00430   1072  2 3C000014            STA    TEMP
             984 00432   1074  2 14006FF2            LDA    I22
             985 00434   1076  2 840000D8            AND    00FF           MASK OFF VERTICAL VELOCITY
             986 00436   1078  2 0841                SLL    1              SHIFT TO PROPER LOCATION
GENERATED                             0700
             987 00438   1080  2 C4000014            LOR    TEMP           INSERT IN WORD
             988 0043A   1082  2 3C010085            STAH   04E+1          STORE IN 04E DATA
             989 0043C   1084  2 14016FEF            LDAH   I77+1
             990 0043E   1086  2 3C010083            STAH   04D+1          04D DATA = ROTOR SPEED
             991 00440   1088  2 14016FEE            LDAH   I77
             992 00442   1090  2 84000010            AND    B9             MASK OFF RAT-BITE BIT
             993 00444   1092  2 0C66                SRC    6              SHIFT TO PROPER LOCATION
GENERATED                             0700
             994 00446   1094  2 3C000014            STA    TEMP           SAVE IT
             995 00448   1096  2 14016FE8            LDAH   I74            PICK UP I74
             996 0044A   1098  2 8400008C            AND    TEMSK          MASK OF  TEMPERATURE BITE
             997 0044C   1100  2 0844                SLL    4              SHIFT TO PROPER LOCATION
GENERATED                             0700
             998 0044E   1102  2 C4000014            LOR    TEMP
             999 00450   1104  2 3C000014            STA    TEMP
            1000 00452   1106  2 14016FE6            LDAH   I73
            1001 00454   1108  2 8400008E            AND    IMUMSK         MASK OFF IMU BITE
```

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VERSION K20A0503      DECK NAME=*HTEXEC*                                                    PAGE  28

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                       SOURCE
            1002 00456  1110  2 084C             SLL    12          SHIFT TO RIGHT POSITION
GENERATED                           0700
            1003 00458  1112  2 C4000014         LOR    TEMP        INSERT IN TEMP
            1004 0045A  1114  2 3C000014         STA    TEMP
            1005 0045C  1116  2 14016FF1         LDAH   I21+1
            1006 0045E  1118  2 8400000C         AND    B7          MASK OFF DOPPLER RELIABLE BIT
            1007 00460  1120  2 0C69             SRC    9          SHIFT TO RIGHT POSITION
GENERATED                           0700
            1008 00462  1122  2 C4000014         LOR    TEMP
            1009 00464  1124  2 3C0100C7         STAH   050+1       PUT WORD IN 050 DATA
            1010 00466  1126  2 14015FF1         LDAH   I21+1
            1011 00468  1128  2 840000C0         AND    BTEMSK      MASK OFF BITE BITS
            1012 0046A  1130  2 0C66             SRC    6           SHIFT TO RIGHT POSITION
GENERATED                           0700
            1013 0046C  1132  2 3C000014         STA    TEMP
            1014 0046E  1134  2 14016FF0         LDAH   I21
            1015 00470  1136  2 84000008         AND    00FF        MASK OFF BAROMETRIC ALTITUDE
            1016 00472  1138  2 0848             SLL    8           SHIFT TO RIGHT POSITION
GENERATED                           0700
            1017 00474  1140  2 C4000014         LOR    TEMP
            1018 00476  1142  2 3C0100C6         STAH   025+1       STORE IN 025 DATA
            1019 00478  1144  2 14016FF3         LDAH   I22+1
            1020 0047A  1146  2 3C0100CD         STAH   060+1       060 DATA = DRIFT AND HEADING
            1021 0047C  1148  2 14016FEC 0090    LDAH   I76
            1022 0047E  1150  2 84000008         AND    00FF        MASK OFF -DVX
            1023 00480  1152  2 0848             SLL    8
GENERATED                           0700
            1024 00482  1154  2 3C010014         STAH   TEMP        SAVE IT
            1025 00484  1156  2 14015FEA         LDAH   I75
            1026 00486  1158  2 84000008         AND    00FF        MASK OFF +DVX
            1027 00488  1160  2 C4000014         LOR    TEMP        INSERT IT
            1028 0048A  1162  2 3C0100B7         STAH   050+1       STORE IN 050 DATA
            1029 0048C  1164  2 14016FED         LDAH   I76+1
            1030 0048E  1166  2 840000CA         AND    FF          MASK OFF -DVY
            1031 00490  1168  2 3C010014         STAH   TEMP
            1032 00492  1170  2 14016FEB         LDAH   I75+1
            1033 00494  1172  2 840000CA         AND    FF          MASK OFF +DVY
            1034 00496  1174  2 0C68             SRC    8
GENERATED                           0700
            1035 00498  1176  2 C4000014         LOR    TEMP        INSERT IT
            1036 0049A  1178  2 3C0100B9         STAH   051+1       STORE IT IN 051 DATA
            1037 0049C  1180  2 14016FED         LDAH   I76+1
            1038 0049E  1182  2 84000008         AND    00FF        MASK OFF -DVZ
            1039 004A0  1184  2 0848             SLL    8
GENERATED                           0700
            1040 004A2  1186  2 3C010014         STAH   TEMP
            1041 004A4  1188  2 14016FEB         LDAH   I75+1
            1042 004A6  1190  2 84000008         AND    00FF        MASK OFF +DVZ
            1043 004A8  1192  2 C4000014         LOR    TEMP        INSERT IT
            1044 004AA  1194  2 3C0100B8         STAH   052+1
            1045 004AC  1196  2 14016FF5         LDAH   I13+1
            1046 004AE  1198  2 3C0100C9         STAH   05E+1       05E DATA = I13 DATA
            1047 004B0  1200  2 14000032         LDA    BTE3
            1048 004B2  1202  2 84020800         AND    2048+M      IS BTE4 BIT FOR SIDL-03=0
            1049 004B4  1204  2 6110             JN     0091
```

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VERSION K20A0503      DECK NAME=*RTEXEC*                                                              PAGE  29

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                          SOURCE
GENERATED                              0700
            1050 00486   1206  2 14010030          LDAH   BTE1           YES
            1051 00488   1208  2 8400000A          AND    0FFF           ISOLATE BITS F000 OF BTE1
            1052 0048A   1210  2 3C010030          STAH   BTE1
            1053 0048C   1212  2 140100C7          LDAH   05D+1
            1054 0048E   1214  2 840000C8          AND    F              ISOLATE FIELD F000
            1055 004C0   1216  2 C4000030          LOR    BTE1           INSERT IN BTE1 FIELD F000
            1056 004C2   1218  2 3C010030          STAH   BTE1
            1057 004C4   1220  2 14000032 D091     LDA    BTE3
            1058 004C6   1222  2 84020400          AND    1024*M         IS BTE4 BIT FOR SIDL-04=0
            1059 004C8   1224  2 6110              JN     D092
GENERATED                              0700
            1060 004CA   1226  2 14010030          LDAH   BTE1           YES
            1061 004CC   1228  2 840000CE          AND    F00F           ISOLATE BITS F00F OF BTE1
            1062 004CE   1230  2 3C010030          STAH   BTE1
            1063 004D0   1232  2 140100C7          LDAH   05D+1
            1064 004D2   1234  2 84000006          AND    0FF0           ISOLATE FIELD 0FF0
            1065 004D4   1236  2 C4000030          LOR    BTE1           INSERT IN BTE1 FIELD 0FF0
            1066 004D6   1238  2 3C010030          STAH   BTE1
            1067 004D8   1240  2 14000032 D092     LDA    BTE3
            1068 004DA   1242  2 84020080          AND    128*M          IS BTE4 BIT FOR SIDL-07=0
            1069 004DC   1244  2 6110              JN     D093
GENERATED                              0700
            1070 004DE   1246  2 14010030          LDAH   BTE1           YES
            1071 004E0   1248  2 84000002          AND    FFFD           ISOLATE BITS FFFD OF BTE1
            1072 004E2   1250  2 3C010030          STAH   BTE1
            1073 004E4   1252  2 140100C7          LDAH   05D+1
            1074 004E6   1254  2 8400001C          AND    B15            ISOLATE FIELD 0002
            1075 004E8   1256  2 C4000030          LOR    BTE1           INSERT IN BTE1 FIELD 0002
            1076 004EA   1258  2 3C010030          STAH   BTE1
            1077 004EC   1260  2 14000032 D093     LDA    BTE3
            1078 004EE   1262  2 84020040          AND    64*M           IS BTE4 BIT FOR SIDL-08=0
            1079 004F0   1264  2 6110              JN    D094
GENERATED                              0700
            1080 004F2   1266  2 14010030          LDAH   BTE1           YES
            1081 004F4   1268  2 84000004          AND    FFFE           ISOLATE BTE1 FIELD FFFE
            1082 004F6   1270  2 3C010030          STAH   BTE1
            1083 004F8   1272  2 140100C7          LDAH   05D+1
            1084 004FA   1274  2 8400001E          AND    B16            ISOLATE FIELD 0001
            1085 004FC   1276  2 C4000030          LOR    BTE1
            1086 004FE   1278  2 3C010030          STAH   BTE1
            1087 00500   1280  2 14010030 D094     LDAH   BTE1
            1088 00502   1282  2 CC0000CC          EXO    FFFF           BTE1 = .NOT. BTE1
            1089 00504   1284  2 840000C2          AND    THTY           ((.NOT. BTE1).AND. 30 HEX)
            1090 00506   1286  2 3C010014          STAH   TEMP
            1091 00508   1288  2 140100AD          LDAH   014+1
            1092 0050A   1290  2 84000000          AND    FF0F           (014 DATA.AND.FF0F)
            1093 0050C   1292  2 C4000014          LOR    TEMP           (014 DATA.AND.FF0F).OR.TEMP
            1094 0050E   1294  2 3C0100AD          STAH   014+1
            1095 00510   1296  2 14000032          LDA    BTE3
            1096 00512   1298  2 84020010          AND    16*M           IS BTE4 BIT FOR SIDL-10=0
            1097 00514   1300  2 6106              JN     D095
GENERATED                              0700
            1098 00516   1302  2 140100C9          LDAH   05E+1
            1099 00518   1304  2 3C010031          STAH   BTE1+1         BTE2 = 05E DATA
```
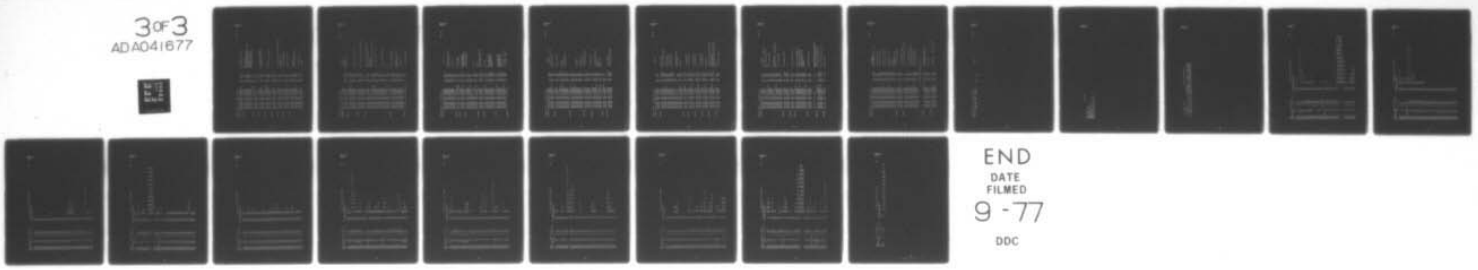

AD-A041 677 AIR FORCE AVIONICS LAB WRIGHT-PATTERSON AFB OHIO F/G 17/7
CONVERSION OF COMPUTER SOFTWARE FOR THE GIMBALLED ELECTROSTATIC--ETC(U)
FEB 77 W MIKULSKI, W E SHEPHARD

UNCLASSIFIED AFAL-TR-77-8-VOL-2 NL

3 OF 3
AD A041677



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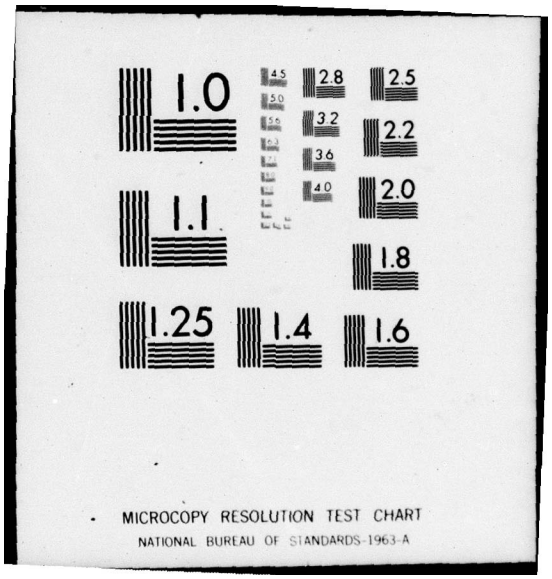
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1.4
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1.8
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2.8
3.2
3.6
4.0
4.5
5.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                                    PAGE  30

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                            SOURCE
            1100 0051A    1306  2 14000032 D095      LDA    BTE3
            1101 0051C    1308  2 84020080           AND    128*M      IS BTE4 BIT FOR SIDL-07=1
            1102 0051E    1310  2 611E               JN     D100       YES
GENERATED                           0700
            1103 00520    1312  2 14010085           LDAH   04E+1      LOAD 04E DATA
            1104 00522    1314  2 8C000000           SAM    B1,L       CHECK SIGN OF R.A.T. FIELD
            1105 00524    1316  2 6430052C           JGU    D096       R.A.T. FIELD POSITIVE - GO TO D096
            1106 00526    1318  2 8400008A           AND    RATMS3     MASK OFF MAGNITUDE BITS
            1107 00528    1320  2 CC000008           EXO    NONE       COMPLEMENT
            1108 0052A    1322  2 A400000A           ADD    ONE        ADD 1 FOR 2'S COMPLEMENT
            1109 0052C    1324  2 0C59     D096      SRA    25         SHIFT POSITIVE R.A.T. FIELD
GENERATED                           0700
            1110 0052E    1326  2 5400001C D097      LDB    ZERO
            1111 00530    1328  2 0480               CXF
            1112 00531    1329  2     6102           JN     *+2
            1113 00532    1330  2 6004               JU     D098
GENERATED                           0700
            1114 00534    1332  2 E40000AA           SBU    C10S23     SCALE R.A.T. FOR SUMMATION
            1115 00536    1334  2 3C00003A D098      STA    RAT        STORE 04E RAT FIELD IN RAT
            1116 00538    1336  2 14010083           LDAH   04D+1      (A)= 04D DATA
            1117 0053A    1338  2 6004               JU     D150
GENERATED                           0700
            1118 0053C    1340  2 1400001C D100      LDA    ZERO
            1119 0053E    1342  2 3C010039 D150      STAH   ROTR+1     ROTR=(A)
            1120 00540    1344  2 14000032           LDA    BTE3
            1121 00542    1346  2 84020100           AND    256*M      IS BTE4 BIT FOR SIDL-08=0
            1122 00544    1348  2 6122               JN     D155
GENERATED                           0700
            1123 00546    1350  2 14000036           LDA    BARO
            1124 00548    1352  2 3C000014           STA    TEMP
            1125 0054A    1354  2 140100CB           LDAH   025+1
            1126 0054C    1356  2 0876               SRLD   22
GENERATED                           0700
            1127 0054E    1358  2 3C000036           STA    BARO       BARO = BAROMETRIC ALTITUDE FIELD OF 025
            1128 00550    1360  2 14000014           LDA    TEMP
            1129 00552    1362  2 E4000036           SBU    BARO       TEMP-BARO
            1130 00554    1364  2 6208               JG     D151       IS (TEMP-BARO).GT.0
GENERATED                           0700
            1131 00556    1366  2 3C000014           STA    TEMP       NO; TAKE ABS(TEMP-BARO)
            1132 00558    1368  2 1400001C           LDA    ZERO
            1133 0055A    1370  2 E4000014           SBU    TEMP
            1134 0055C    1372  2 E4020008 D151      SBU    8*M        IS ABS(TEMP-BARO).GT.8
            1135 0055E    1374  2 6308               JL     D155       NO
GENERATED                           0700
            1136 00560    1376  2 14010032           LDAH   BTE3
            1137 00562    1378  2 C4000018           LOR    B13
            1138 00564    1380  2 3C010032           STAH   BTE3       BTE3=BTE3.OR.B13
            1139 00566    1382  2 64040000 D155      JS     CDPU       PROCESS DOPPLER DISCRETES
            1140 00568    1384  2 14000136           LDA    CD63+2
            1141 0056A    1386  2 54000134           LDB    CD63
            1142 0056C    1388  2 0400               CFX
            1143 0056D    1389  2     610D           JN     D157       IS ALTITUDE FLAG = 0
            1144 0056E    1390  2 14000036           LDA    BARO
            1145 00570    1392  2 5400001C           LDB    ZERO
            1146 00572    1394  2 0480               CXF                FLOAT BARO
```

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VERSION K20A0503      DECK NAME=*RTEXEC*                                                                        PAGE  31

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                    SOURCE
GENERATED                          0700
            1147 00574   1396  2 9C000130           AFD    CD62         BARO+CD62
            1148 00576   1398  2 9400012E           MLF    CD61+2       CD61*(BARO+CD62)
            1149 00578   1400  2 6006               JU     D158
GENERATED                          0700
            1150 0057A   1402  2 1400013A D157      LDA    CD64+2
            1151 0057C   1404  2 54000138           LDB    CD64
            1152 0057E   1406  2 3C000012 D158      STA    ALT+2
            1153 00580   1408  2 7C000010           STB    ALT
            1154 00582   1410  2 14000032           LDA    BTE3
            1155 00584   1412  2 84020080           AND    128,M        IS BTE4 BIT FOR SIDL-09=1
            1156 00586   1414  2 6118               JN     D160         YES
GENERATED                          0700
            1157 00588   1416  2 140000CC           LDA     060
            1158 0058A   1418  2 840000C4           AND    HEDMSK
            1159 0058C   1420  2 3C000050           STA    HDGV         HDGV = HEADING VELOCITY FIELD FROM 060
            1160 0058E   1422  2 140100C0           LDAH   060+1
            1161 00590   1424  2 840000CA           AND    FF
            1162 00592   1426  2 0C58               SRA    24
GENERATED                          0700
            1163 00594   1428  2 3C00004E           STA    DRFV         DRFV = DRIFT VELOCITY FIELD FROM 060
            1164 00596   1430  2 14010085           LDAH   04E+1
            1165 00598   1432  2 84000088           AND    RATMS2       MASK OFF VERTICAL VELOCITY
            1166 0059A   1434  2 0847               SLL    7            PICK UP SIGN
            1167 0059B   1435  2     0C57           SRA    23           RIGHT JUSTIFY
            1168 0059C   1436  2 3C00004C           STA    VRTV         VRTV = VERTICAL VELOCITY FIELD OF 04E
            1169 0059E   1438  2 5C2A0004 D160      LDX    5,4,M
            1170 005A0   1440  2 16800020 D161      LDA    DPVV,5
            1171 005A2   1442  2 A680004C           ADU    VRTV,5       DPVV(I)=DPVV(I)+VRTV(I)  I=1,3
            1172 005A4   1444  2 3E800020           STA    DPVV,5
            1173 005A6   1446  2 6C2B0002           IMN    5,2,M
            1174 005A8   1448  2 643005A0           JGU    D161
            1175 005AA   1450  2 5400001C           LDB    ZERO
            1176 005AC   1452  2 14000030           LDA    BTE1
            1177 005AE   1454  2 8C00001C           SAM    B15          IS BTE1 BIT FOR RAT BITE = 1
            1178 005B0   1456  2 643005B4           JGU    D163
            1179 005B2   1458  2 7C00003A           STB    RAT          RAT=0
            1180 005B4   1460  2 1400003A D163      LDA    RAT
            1181 005B6   1462  2 6102               JN     D164
            1182 005B7   1463  2     602F           JU     D165         YES
            1183 005B8   1464  2 6318     D164      JL     D164A
GENERATED                          0700
            1184 005BA   1466  2 9C00000C           AFD    RATP         RAT.GT.0; RATP=RATP+RAT
            1185 005BC   1468  2 3C00000E           STA    RATP+2
            1186 005BE   1470  2 7C00000C           STB    RATP
            1187 005C0   1472  2 140000AC           LDA    014
            1188 005C2   1474  2 840000DC           AND    FF3F         CLEAR RAT+ AND RAT- BITS
            1189 005C4   1476  2 C4020040           LOR    64,M         SET RAT+ BIT TO 1
            1190 005C6   1478  2 3C0000AC           STA    014
            1191 005C8   1480  2 1400003C           LDA    RATL
            1192 005CA   1482  2 A400000A           ADU    ONE          RATL=RATL+1
            1193 005CC   1484  2 3C00003C           STA    RATL
            1194 005CE   1486  2 601A               JU     D166
GENERATED                          0700
            1195 005D0   1488  2 9C000008 D164A     AFD    RATM         RAT.LT.0; RATM=RATM+RAT
```

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            1196 0050Z   1490  2 3C00000A          STA    RATM+2
            1197 00504   1492  2 7C000008          STB    RATM
            1198 0050Ø   1494  2 140000AC          LDA    Ø14
            1199 00508   1496  2 840000DC          AND    FF3F        CLEAR RAT+ AND RAT- BITS
            1200 0050A   1498  2 C40200Ø0          LOR    128,M       SET RAT- BIT TO 1
            1201 0050C   1500  2 3C0000AC          STA    Ø14
            1202 0050E   1502  2 1400003C          LDA    RATL
            1203 005EØ   1504  2 E400000A          SBU    ONE         RATL=RATL-1
            1204 005E2   1506  2 3C00003C          STA    RATL
            1205 005E4   1508  2 6004              JU     D166
GENERATED                      0700
            1206 005E6   1510  2 3C00003C D165     STA    RATL        RAT=Ø SO RATL=Ø
            1207 005E8   1512  2 6206      D166    JG     D167        IS RATL .GE.Ø
GENERATED                      0700
            1208 005EA   1514  2 1400001C          LDA    ZERO
            1209 005EC   1516  2 E400003C          SBU    RATL        NO; TAKE ABS(RATL)
            1210 005EE   1518  2 E4020800 D167     SBU    2048,M      (ABS(RATL)-32*64)
            1211 005FØ   1520  2 6308              JL     D170        IS ABS(RATL).GE.32*64)
GENERATED                      0700
            1212 005F2   1522  2 14000032          LDA    BTE3        YES; BTE3=BTE3.OR.B5
            1213 005F4   1524  2 C4000008          LOR    B5
            1214 005F6   1526  2 3C000032          STA    BTE3
            1215 005F8   1528  2 14000038 D170     LDA    ROTR
            1216 005FA   1530  2 086E              SRLD   14
            1217 005FC   1531  2      06A8         LXA    5
            1218 005FC   1532  2 6102              JN     D171        IS I=Ø
            1219 005FD   1533  2      6057         JU     D240
            1220 005FE   1534  2 E400000E D171     SBU    THREE
            1221 00600   1536  2 610A              JN     D180        IS I=3
GENERATED                      0700
            1222 00602   1538  2 14010032          LDAH   BTE3        NO; SET BITS IN BITE WORD
            1223 00604   1540  2 C40000C6          LOR    0006        BTE3 BITS 0006 = 3
            1224 00606   1542  2 3C010032          STAH   BTE3
            1225 0060Ø   1544  2 604C              JU     D240
GENERATED                      0700
            1226 0060A   1546  2 24280002 D180     ICL    5,2,M       IS IT ROT1
            1227 0060C   1548  2 6430061C          JGU    D181        NO
            1228 0060E   1550  2 14000010          LDA    ROT1
            1229 00610   1552  2 3C000014          STA    TEMP        SAVE PREVIOUS ROT1
            1230 00612   1554  2 14000038          LDA    ROTR        LOAD ROTOR SPEED
            1231 00614   1556  2 84023FFF          AND    16383,M     MASK OFF BITS 3FFF
            1232 00616   1558  2 3C000010          STA    ROT1        UPDATE ROT1
            1233 00618   1560  2 3C000016          STA    TEMP2
            1234 0061A   1562  2 600E              JU     D182
GENERATED                      0700
            1235 0061C   1564  2 14000012 D181     LDA    ROT2
            1236 0061E   1566  2 3C000014          STA    TEMP        SAVE PREVIOUS ROT2
            1237 00620   1568  2 14000038          LDA    ROTR        LOAD ROTOR SPEED
            1238 00622   1570  2 84023FFF          AND    16383,M     MASK OFF BITS 3FFF
            1239 00624   1572  2 3C000012          STA    ROT2        UPDATE ROT2
            1240 00626   1574  2 3C000016          STA    TEMP2
            1241 00628   1576  2 E4000014 D182     SBU    TEMP        (TEMP-ROT(I))  I=1 OR 2
            1242 0062A   1578  2 E4020020          SBU    32,M
            1243 0062C   1580  2 6206              JG     D183        IS (TEMP-ROT(I))<32)
GENERATED                      0700
```

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            1244 0062E   1582  2 14000016          LDA   TEMP2
            1245 00630   1584  2 3C000014          STA   TEMP      YES; TEMP=ROT(I)  I=1 OR 2
            1246 00632   1586  2 14000002 D183     LDA   RMIN
            1247 00634   1588  2 E4000014          SBU   TEMP      IS RMIN .GE. TEMP
            1248 00636   1590  2 6208              JG    D184      YES
GENERATED                          0700
            1249 00638   1592  2 14000014          LDA   TEMP
            1250 0063A   1594  2 E4000000          SBU   RMAX      IS TEMP .GE. RMAX
            1251 0063C   1596  2 6202              JG    D184
            1252 0063D   1597  2     6005          JU    D185
            1253 0063E   1598  2 14024000 D184     LDA   16384.M
            1254 00640   1600  2 3C000014          STA   TEMP      TEMP=B2
            1255 00642   1602  2 24280002 D185     ICL   5,2,M     IS IT ROT1
            1256 00644   1604  2 6430064E          JGU   D186
            1257 00646   1606  2 14000014          LDA   TEMP      YES; R1CT=TEMP-ROT1
            1258 00648   1608  2 E4000010          SBU   ROT1
            1259 0064A   1610  2 3C000034          STA   R1CT
            1260 0064C   1612  2 6008              JU    D240
GENERATED                          0700
            1261 0064E   1614  2 14000014 D186     LDA   TEMP
            1262 00650   1616  2 E4000012          SBU   ROT2
            1263 00652   1618  2 3C000036          STA   R2CT
            1264 00654   1620  2 14000034 D240     LDA   R1CT
            1265 00656   1622  2 A400000A          ADU   ONE
            1266 00658   1624  2 3C000034          STA   R1CT      R1CT=R1CT+1
            1267 0065A   1626  2 14000036          LDA   R2CT
            1268 0065C   1628  2 A400000A          ADU   ONE
            1269 0065E   1630  2 3C000036          STA   R2CT      R2CT=R2CT+1
            1270 00660   1632  2 E4020018          SBU   24.M
            1271 00662   1634  2 6314              JL    D245      IS (R2CT .GE. 24)
GENERATED                          0700
            1272 00664   1636  2 14000032          LDA   BTE3      YES; BTE3=BTE3 .OR. B15
            1273 00666   1638  2 C400001C          LOR   B15
            1274 00668   1640  2 3C000032          STA   BTE3
            1275 0066A   1642  2 14000034          LDA   R1CT
            1276 0066C   1644  2 E4020018          SBU   24.M
            1277 0066E   1646  2 6308              JL    D245      IS (R1CT .GE. 24)
GENERATED                          0700
            1278 00670   1648  2 14000032          LDA   BTE3
            1279 00672   1650  2 C400001A          LOR   B14
            1280 00674   1652  2 3C000032          STA   BTE3      YES; BTE3=BTE3 .OR. B14
            1281 00676   1654  2 14000060 D245     LDA   ITER
            1282 00678   1656  2 6102              JN    D246      IS ITER = 0
            1283 00679   1657  2     6005          JU    D247      YES
            1284 0067A   1658  2 E4020010 D246     SBU   16.M      IS ITER = 16
            1285 0067C   1660  2 611E              JN    D250      YES
GENERATED                          0700
            1286 0067E   1662  2 14000010 D247     LDA   ROT1
            1287 00680   1664  2 5400001C          LDB   ZERO
            1288 00682   1666  2 0480              CXF
GENERATED                          0700
            1289 00684   1668  2 94000022          MLF   ONHLF+2   ROT1*0.5 SECOND
            1290 00686   1670  2 9C000000          AFD   SRT1
            1291 00688   1672  2 3C000002          STA   SRT1+2    SRT1=SRT1+ROT1*0.5 SECOND
            1292 0068A   1674  2 7C000000          STB   SRT1
```

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DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            1293 0068C   1676  2 14000012          LDA    ROT2
            1294 0068E   1678  2 5400001C          LDB    ZERO
            1295 00690   1680  2 0480              CXF
GENERATED                          0700
            1296 00692   1682  2 94000022          MLF    ONMLF+2      ROT2*0.5 SECOND
            1297 00694   1684  2 9C000004          AFD    SRT2
            1298 00696   1686  2 3C000006          STA    SRT2+2       SRT2=SRT2+ROT2*0.5 SECOND
            1299 00698   1688  2 7C000004          STB    SRT2
            1300 0069A   1690  2 14016FF9 D250     LDAH   I24+1
            1301 0069C   1692  2 3C01008F          STAH   06C+1        06C DATA=I24 DATA
            1302 0069E   1694  2 14016FF8          LDAH   I28+1
            1303 006A0   1696  2 3C010091          STAH   06D+1        06D DATA=I28 DATA
            1304 006A2   1698  2 14016FFD          LDAH   I2C+1
            1305 006A4   1700  2 3C010093          STAH   06E+1        06E DATA=I2C DATA
            1306 006A6   1702  2 14000136          LDA    CD63+2
            1307 006A8   1704  2 54000134          LDB    CD63
            1308 006AA   1706  2 0400              CFX
            1309 006AB   1707  2      0500        EAB                 PUT AHRS FLAG IN A REG
            1310 006AC   1708  2 6102              JN     D251         IS AHRS FLAG=0
            1311 006AD   1709  2      6007        JU     D252
            1312 006AE   1710  2 14000110 D251    LDA    HEDL
            1313 006B0   1712  2 3C000022          STA    LHED         LHED=HEDL
            1314 006B2   1714  2 6020              JU     D254
GENERATED                          0700
            1315 006B4   1716  2 14010033 D252    LDAH   BTE3+1
            1316 006B6   1718  2 8400001A          AND    B14
            1317 006B8   1720  2 6106              JN     D252A        IS BTE4.AND.B14=0
GENERATED                          0700
            1318 006BA   1722  2 1401008F          LDAH   06C+1        YES; LHED=06C DATA
            1319 006BC   1724  2 3C010023          STAH   LHED+1
            1320 006BE   1726  2 14010033 D252A    LDAH   BTE3+1
            1321 006C0   1728  2 8400001C          AND    B15
            1322 006C2   1730  2 6106              JN     D252B        IS BTE4.AND.B15=0
GENERATED                          0700
            1323 006C4   1732  2 14010091          LDAH   06D+1        YES; LPCH=06D DATA
            1324 006C6   1734  2 3C010025          STAH   LPCH+1
            1325 006C8   1736  2 14010033 D252B    LDAH   BTE3+1
            1326 006CA   1738  2 8400001E          AND    B16
            1327 006CC   1740  2 6106              JN     D254         IS BTE4.AND.B16=0
GENERATED                          0700
            1328 006CE   1742  2 14010093          LDAH   06E+1        YES; LROL=06E DATA
            1329 006D0   1744  2 3C010027          STAH   LROL+1
            1330 006D2   1746  2 14000032 D254    LDA    BTE3
            1331 006D4   1748  2 84020300          AND    768,M        BTE4.AND.768
            1332 006D6   1750  2 6152              JN     D280
GENERATED                          0700
            1333 006D8   1752  2 5C220000          LDX    4,0,M        INITIALIZE XR4 AND XR5 FOR DO LOOP
            1334 006DA   1754  2 5C2A0000          LDX    5,0,M
            1335 006DC   1756  2 1400001C D254A    LDA    ZERO         CLEAR A REGISTER
            1336 006DE   1758  2 56810087          LDBH   050+1,S      LOAD B REG WITH 05(I) DATA  I=0,2
            1337 006E0   1760  2 0808              SLLD   8            PUT MDV(I) IN A REG.  I= X OR Y OR Z
GENERATED                          0700
            1338 006E2   1762  2 3C000014          STA    TEMP         SAVE IT
            1339 006E4   1764  2 16800086          LDA    050,S
            1340 006E6   1766  2 840200FF          AND    255,M        MASK OFF POSITIVE SUM
```

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                          SOURCE
            1341 006E8   1768  2 3C000016          STA   TEMP2
            1342 006EA   1770  2 A4000014          ADD   TEMP      PDV(I)+MDV(I)   I=X OR Y OR Z
            1343 006EC   1772  2 E4020100          SBD   256,M
            1344 006EE   1774  2 6102              JN    D255      DOES (PDV(I)+MDV(I))=256
            1345 006EF   1775  2     600D          JU    D260      NO
            1346 006F0   1776  2 14000032 D255     LDA   BTE3
            1347 006F2   1778  2 C680000C          LOR   B7,5      DELTA V SUM BAD BIT=1
            1348 006F4   1780  2 3C000032          STA   BTE3
            1349 006F6   1782  2 14000014          LDA   TEMP
            1350 006F8   1784  2 A4000016          ADD   TEMP2
            1351 006FA   1786  2 6124              JN    D271      DOES MDV+PDV=0
            1352 006FB   1787  2     601D          JU    D270      NO; GO SET DELTA V UNREASONABLE BIT
            1353 006FC   1788  2 14020100 D260     LDA   256,M     YES
            1354 006FE   1790  2 E4000014          SBD   TEMP
            1355 00700   1792  2 E4000014          SBD   TEMP      DVX(I)= 256-MDV-MDV
            1356 00702   1794  2 3C000018          STA   TEMP4
            1357 00704   1796  2 5400001C          LDB   ZERO
            1358 00706   1798  2 0480              CXF
GENERATED                          0700
            1359 00708   1800  2 3E00003C          STA   TDVX+2,4  STORE FLOATED DELTA V'S
            1360 0070A   1802  2 7E00003A          STB   TDVX,4
            1361 0070C   1804  2 14000018          LDA   TEMP4
            1362 0070E   1806  2 8402FF7F          AND   MSK,M
            1363 00710   1808  2 6204              JG    *+4
GENERATED                          0700
            1364 00712   1810  2 CC02FF7F          EXD   MSK,M
            1365 00714   1812  2 E4020040          SBD   64,M      IS DVX .GT.64 OR .LT.-63
            1366 00716   1814  2 6308              JL    D271
GENERATED                          0700
            1367 00718   1816  2 14000032 D270     LDA   BTE3
            1368 0071A   1818  2 C6800012          LOR   B10,5     SET DELTA V UNREASONABLE BIT
            1369 0071C   1820  2 3C000032          STA   BTE3
            1370 0071E   1822  2 6C220004 D271     IMP   4,4,M     INCREMENT INDEX REGISTERS
            1371 00720   1824  2 6C2A0002          IMP   5,2,M
            1372 00722   1826  2 242B0006          ICL   5,6,M     TEST XRS FOR END OF LOOP
            1373 00724   1828  2 64300728          JGU   D280      JUMP OUT OF LOOP
            1374 00726   1830  2 643006DC          JGU   D254A     LOOP BACK
            1375 00728   1832  2 64040000 D280     JS    VECADD
            1376 0072A   1834  2 6008              JU    *+8
GENERATED                          0700
            1377 0072C   1836  2 00000014          PTR   DVXG      DVXG(I)=DVXG(I)+DVX(I)
            1378 0072E   1838  2 0000003A          PTR   TDVX
            1379 00730   1840  2 00000014          PTR   DVXG
                                 *
                                 *
            1380 00732   1842  2 605A              JU    D300      BYPASS RESOLVER CHECK. THIS CODE IS
                                 *                                UNUSED AT THIS TIME(11 JUL 75)
GENERATED                          0700
            1381 00734   1844  2 5C2A0000 D290     LDX   5,0,M     INITIALIZE INDICIES FOR LOOP
            1382 00736   1846  2 5C220000          LDX   4,0,M
            1383 00738   1848  2 16816FE3 D290A    LDAH  I71+1,5
            1384 0073A   1850  2 3E8100BD          STAH  053+1,5   053(I) DATA=I71(I) DATA  I=1,4
            1385 0073C   1852  2 0480              CXF
GENERATED                          0700
            1386 0073E   1854  2 E40000A8          SBD   C30S23    SCALE TO 2**-14
```

```
VERSION K20A0503      DECK NAME=*RTEXEC*                                                                         PAGE  36

DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                                         SOURCE
            1387 00740  1856  2 9E0000F0          AFD    CD46,4      RESIN(I)+RBIAS(I)
            1388 00742  1858  2 BC0000AE          ADF    F304        RESIN(I)+RBIAS(I)+0.75  I=1,4
            1389 00744  1860  2 3C000014          STA    TEMP
            1390 00746  1862  2 14000030          LDA    BTE1
            1391 00748  1864  2 8C000006          SAM    B4          IS R/D BIT OF BTE1+1
            1392 0074A  1866  2 64300750          JGU    D291
            1393 0074C  1868  2 16800014          LDA    RES1,5      YES; TEMP=RES(I)  I=1,4
            1394 0074E  1870  2 3C000014          STA    TEMP
            1395 00750  1872  2 14010033 D291     LDAH   BTE3+1
            1396 00752  1874  2 8E800004          SAM    B3,5        IS SIDL(I) BIT OF BTE4=1
            1397 00754  1876  2 6430075A          JGU     D292
            1398 00756  1878  2 16800014          LDA    RES1,5      YES; TEMP=RES(I)  I=1,4
            1399 00758  1880  2 3C000014          STA    TEMP
            1400 0075A  1882  2 16800014 D292     LDA    RES1,5
            1401 0075C  1884  2 3C000016          STA    TEMP2       TEMP2=RES(I)   I=1,4
            1402 0075E  1886  2 14000014          LDA    TEMP
            1403 00760  1888  2 3E800014          STA    RES1,5      RES(I)=TEMP
            1404 00762  1890  2 14000016          LDA    TEMP2
            1405 00764  1892  2 FE800014          SBF    RES1,5      TEMP2-RES(I)
            1406 00766  1894  2 6208              JG     D293        IS (TEMP2-RES(I)).GE.0
GENERATED                             0700
            1407 00768  1896  2 3C000018          STA    TEMP4       NO; TAKE ABS(TEMP2-RES(I))
            1408 0076A  1898  2 1400001C          LDA    ZERO
            1409 0076C  1900  2 FC000018          SBF    TEMP4
            1410 0076E  1902  2 FC00001E D293     SBF    FONE
            1411 00770  1904  2 6308              JL     D294        IS ABS(TEMP2-RES(I)).GE.1.0
GENERATED                             0700
            1412 00772  1906  2 14000032          LDA    BTE3        YES; ANY GIMBAL RATE BIT OF BTE3=1
            1413 00774  1908  2 C4000000          LOR    B1
            1414 00776  1910  2 3C000032          STA    BTE3
            1415 00778  1912  2 14000032 D294     LDA    BTE3
            1416 0077A  1914  2 8C000000          SAM    B1          IS ANY GIMBAL RATE BIT=1
            1417 0077C  1916  2 64300782          JGU    D295
            1418 0077E  1918  2 C400001E          LOR    B16         YES; GIMBAL SPIN BIT OF BTE3=1
            1419 00780  1920  2 3C000032          STA    BTE3
            1420 00782  1922  2 6C2A0002 D295     IMP    5,2,M       INCREMENT FOR NEXT PASS
            1421 00784  1924  2 6C220004          IMP    4,4,M
            1422 00786  1926  2 242A0008          ICN    5,8,M       CHECK FOR END OF LOOP
            1423 00788  1928  2 6430078C          JGU    D300
            1424 0078A  1930  2 60D2              JU     D290A
                                              *
                                              *   END OF BYPASSED RESOLVER CHECK CODE
                                              *
GENERATED                             0700
            1425 0078C  1932  2 14010031 D300     LDAH   BTE1+1      LOAD A REG. WITH BTE2
            1426 0078E  1934  2 8C000008          SAM    B5          IS INPUT POWER BIT OF BTE2=1
            1427 00790  1936  2 64300798          JGU    D301
            1428 00792  1938  2 1400001C          LDA    ZERO
            1429 00794  1940  2 3C000038          STA    CIPM        YES; CIPM=0
            1430 00796  1942  2 6008              JU     D310
GENERATED                             0700
            1431 00798  1944  2 14000038 D301     LDA    CIPM
            1432 0079A  1946  2 A400000A          ADU    ONE         CIPM=CIPM+1/32    (ONE=SCLB  0.03125)
            1433 0079C  1948  2 3C000038          STA    CIPM
            1434 0079E  1950  2 64040000 D310     JS     TKTH
```

VERSION K20A0503 DECK NAME=*RTEXEC* PAGE 37

```
DIAGNOSTICS LINE ADRES DADRES LC  PROGRAM                    SOURCE
          1435 007A0   1952  2 74000004        RTA    DECOR
          1436                                  END
```

STATISTICS

TOTAL SHORTS 181
TOTAL LONGS 754
TOTAL INSTRUCTIONS 935
PERCENT SHORT 19.4
GENERATED NOPS 120
THEORETICAL PERCENT NOP LOADING 9.0
ACTUAL PERCENT NOP LOADING 6.6

```
DECK NAME=*RTEXEC*                              *****ERROR MESSAGES*****

LINE NUMBER                        DIAGNOSTIC
1      17..........................ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
2     200..........................ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
3     364..........................ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
4     532..........................ILLEGAL ATTEMPT TO REDEFINE LOCATION COUNTER
```

XREF 1 DECK NAME=*RTEXEC* SKC 2000 CROSS REFERENCE DICTIONARY PAGE 1

RELATIVE ADDRESS (OR SET VALUE) VARIABLE NAME LINE NUMBERS OF OCCURRENCES

HEX	DEC	BIT	LC		DEFINED	REFERENCES
000F2	242		4	AJ	128	
00010	16		7	ALT	134	1152 1153
0001C	28		11	ANGL	187	
00150	336		7	AP	163	
07FC0	32704			APOIC	2	641 645 647 649 656 750 752 754 756
0015C	348		7	AT	164	
00036	54		1	BARO	338	1123 1127 1129 1144
00022	34		1	BCTR	328	
00000	0		1	BDSIM	311	776 818
002B0	688		2	BDSI1	779	781
002B8	696		2	BDSI2	783	786
002C4	708		2	BDSI4	789	791
002CC	716		2	BDSI5	793	795
002F6	758		2	BDSI6	814	817
002AA	682		2	BDSI	776	503 774
00000	0		11	BDS1	173	764
00002	2		11	BDS2	174	
00004	4		11	BDS3	175	
00006	6		11	BDS4	176	
0002A	42		1	BER1	332	
0002C	44		1	BER2	333	
0002E	46		1	BER3	334	
00030	48		1	BER4	335	
00000	0		12	BITCOM	292	
0000E	14		2	BITEJM	367	809
*****UNDEFINED*****				BITE		367
00006	6		2	BIT16	363	
00018	24		1	BLP1	323	779
0001A	26		1	BLP2	324	
0001C	28		1	BLP3	325	
0001E	30		1	BLP4	326	
00008	8		11	BMK1	177	
0000A	10		11	BMK2	178	
0000C	12		11	BMK3	179	
0000E	14		11	BMK4	180	
00020	32		1	BNBR	327	
000C0	192		2	BTEMSK	456	1011
00030	48		4	BTE1	35	1050 1052 1055 1056 1060 1062 1065 1066 1070 1072 1075 1076
						1080 1082 1085 1086 1087 1099 1176 1390 1425
00032	50		4	BTE3	36	825 852 854 859 861 863 865 874 876 892 894 928
						1047 1057 1067 1077 1095 1100 1120 1136 1138 1154 1212 1214
						1222 1224 1272 1274 1278 1280 1315 1320 1325 1330 1346 1348
						1367 1369 1395 1412 1414 1415 1419
00016	22		2	BTIN	371	783
00000	0		12	B1	293	620 728 893 1104 1413 1416
00012	18		12	B10	302	1368
00014	20		12	B11	303	
00016	22		12	B12	304	
00018	24		12	B13	305	929 1137
0001A	26		12	B14	306	1279 1316
0001C	28		12	B15	307	1074 1177 1273 1321
0001E	30		12	B16	308	1084 1326 1418
00002	2		12	B2	294	626 651 689 694 717

XREF 1 DECK NAME=*RTEXEC* SKC 2000 CROSS REFERENCE DICTIONARY PAGE 2

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES
00004	4	12	B3		295	631 734 853 1396
00006	6	12	B4		296	1391
00008	8	12	B5		297	1213 1426
0000A	10	12	B6		298	
0000C	12	12	B7		299	1006 1347
0000E	14	12	B8		300	
00010	16	12	B9		301	603 992
*****UNDEFINED*****				CDPU		1139
00104	260	2		CDU	548	365 546
00002	2	1		CDUIR	312	537 543 548 559 563 571 577 584 588 591
000F6	246	2		CDUI	537	504 535
0000A	10	2		CDUJMP	365	541
00006	6	1		CDUS1	314	539 549 569
00008	8	1		CDUS2	315	540 552 558
0011A	282	2		CDU10	559	556
0011C	284	2		CDU20	560	553
00124	292	2		CDU21	564	562
0012C	300	2		CDU30	568	551
00132	306	2		CDU31	571	567
00134	308	2		CDU40	572	550
00140	320	2		CDU41	578	572
0014A	330	2		CDU42	585	578
00152	338	2		CDU43	589	585
0003C	60	9		CD01	225	
00040	64	9		CD02	226	
00044	68	9		CD03	227	
00048	72	9		CD04	228	
0004C	76	9		CD05	229	
00050	80	9		CD06	230	
00054	84	9		CD07	231	
00058	88	9		CD08	232	
0005C	92	9		CD09	233	
00060	96	9		CD10	234	
00064	100	9		CD11	235	
00068	104	9		CD12	236	
0006C	108	9		CD13	237	
00070	112	9		CD14	238	
00074	116	9		CD15	240	
00078	120	9		CD16	241	
0007C	124	9		CD17	242	
00080	128	9		CD18	243	
00084	132	9		CD19	244	
00088	136	9		CD20	245	
0008C	140	9		CD21	246	
00090	144	9		CD22	247	
00094	148	9		CD23	248	
00098	152	9		CD24	249	
0009C	156	9		CD25	250	
000A0	160	9		CD26	251	
000A4	164	9		CD27	252	
000A8	168	9		CD28	253	
000AC	172	9		CD29	254	
000B0	176	9		CD30	255	

XREF 1 DECK NAME=$RTEXEC$ SRC 2000 CROSS REFERENCE DICTIONARY PAGE 3

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES						
000B4	180	9		CD31	256							
000B8	184	9		CD32	257							
000BC	188	9		CD33	258							
000C0	192	9		CD34	259							
000C4	196	9		CD35	260							
000C8	200	9		CD36	261							
000CC	204	9		CD37	262							
000D0	208	9		CD38	263							
000D4	212	9		CD39	264							
000D8	216	9		CD40	266							
000DC	220	9		CD41	267							
000E0	224	9		CD42	268							
000E4	228	9		CD43	269							
000E8	232	9		CD44	270							
000EC	236	9		CD45	271							
000F0	240	9		CD46	272	1387						
000F4	244	9		CD47	273							
000F8	248	9		CD48	274							
000FC	252	9		CD49	275							
00100	256	9		CD50	276							
00104	260	9		CD51	277							
00108	264	9		CD52	278							
0010C	268	9		CD53	279							
00110	272	9		CD54	281							
00114	276	9		CD55	282							
00118	280	9		CD56	283							
0011C	284	9		CD57	284							
00120	288	9		CD58	285							
00124	292	9		CD59	286							
00128	296	9		CD60	287							
0012C	300	9		CD61	288	1145						
00130	304	9		CD62	289	1147						
00134	308	9		CD63	290	1140	1141	1306	1307			
00138	312	9		CD64	291	1150	1151					
0000C	12	7		CGOL	133	171						
00038	56	4		CIPM	39	1429	1431	1433				
0000C	12	7		CL	171							
00028	40	11		CMD1	192							
0002C	44	11		CMD2	193							
00030	48	11		CMD3	194							
00034	52	11		CMD4	195							
00000	0	9		CONCOM	197							
00052	82	4		CTR1	49	793						
00054	84	4		CTR2	50							
00056	86	4		CTR3	51							
00004	4	7		CWT	131							
0004A	74	4		CYLE	45	526	663	665	765	767	884	896
0002E	46	7		C1	141							
000AA	170	2		C10S23	445	1114						
00032	50	7		C2	142							
00036	54	7		C3	143							
000A8	168	2		C30S23	444	1386						
0003A	58	7		C4	144							

XREF 1 DECK NAME=*RTEXEC* SRC 2000 CROSS REFERENCE DICTIONARY PAGE 4

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
000E4	228	7		D	158	165											
00066	102	4		DATA	57	942											
00020	32	11		DATI	188	933	937	940									
00002	2	9		DCSR	200												
08600	46592			DEC	12	530											
00010	16	2		DECDUM	368	805											
00004	4	1		DECDX	313	823	1435										
00300	768	2		DECD	823	368	821										
00030	48	9		DELT	221												
0001C	28	9		DFONE	215												
00078	120	7		DG	153												
00014	20	1		DMAERR	321	605	607	636	685	687	698	700	724	726	730	732	736
						738	740	742	890	891							
0000A	10	1		DMASAV	316	594	595	596	602	604	610	611	612	657	659	673	675
						676	678	688	693	702	703	704	708	710	711	713	727
						757	759	768	769	770							
00024	36	4		DPDV	32												
00028	40	4		DPHV	33												
00020	32	4		DPVV	31	1170	1172										
0004E	78	4		DRFV	47	1163											
*****UNDEFINED*****				DUMY		366											
0003E	62	4		DVX	42												
00014	20	4		DVXG	28	1377	1379										
00042	66	4		DVY	43												
00018	24	4		DVYG	29												
00046	70	4		DVZ	44												
0001C	28	4		DVZG	30												
00320	800	2		D003	840	838											
00332	818	2		D005	849	839											
00338	824	2		D007	852	845											
0033E	830	2		D009	855	851											
00344	835	2		D010	859	857											
0034A	842	2		D011	862	858											
0034C	844	2		D015	863	880											
00360	864	2		D016	874	872											
00366	870	2		D017	877	873											
0036E	878	2		D020	881	879											
00378	888	2		D021	887	885											
00382	898	2		D022	892	888											
0038C	908	2		D023	897	886											
003E4	996	2		D030	943	939											
003F0	1008	2		D031	950	948											
003F2	1010	2		D032	951	949											
003FA	1018	2		D033	956	954											
003FC	1020	2		D034	957	955											
0041C	1052	2		D035	973	971											
00424	1060	2		D040	977	967	969	974									
0042A	1066	2		D050	980	930	965	972	976								
0047C	1148	2		D090	1021												
004C4	1220	2		D091	1057	1049											
004D8	1240	2		D092	1067	1059											
004EC	1260	2		D093	1077	1069											
00500	1280	2		D094	1087	1079											

XREF 1 DECK NAME=**TEXEC* SRC 2000 CROSS REFERENCE DICTIONARY PAGE 5

RELATIVE ADDRESS
(OR SET VALUE)

HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES		
0051A	1306		2	D095	1100	1097		
0052C	1324		2	D096	1109	1105		
0052E	1326		2	D097	1110			
00536	1334		2	D098	1115	1113		
00054	84		1	D1	152	167		
00034	52		4	D1032	222	900	909	
0053C	1340		2	D100	1118	1102		
0053E	1342		2	D150	1119	1117		
0055C	1372		2	D151	1134	1130		
00566	1382		2	D155	1139	1122	1135	
0057A	1402		2	D157	1150	1143		
0057E	1406		2	D158	1152	1149		
0059E	1438		2	D160	1169	1156		
005A0	1440		2	D161	1170	1174		
005B4	1460		2	D163	1180	1178		
005D0	1488		2	D164A	1195	1183		
005B8	1464		2	D164	1183	1181		
005E6	1510		2	D165	1206	1182		
005E8	1512		2	D166	1207	1194	1205	
005EE	1518		2	D167	1210	1207		
005F8	1528		2	D170	1215	1211		
005FE	1534		2	D171	1220	1218		
0060A	1546		2	D180	1226	1221		
0061C	1564		2	D181	1235	1227		
00628	1576		2	D182	1241	1234		
00632	1586		2	D183	1246	1243		
0063E	1598		2	D184	1253	1248	1251	
00642	1602		2	D185	1255	1252		
0064E	1614		2	D186	1261	1256		
00654	1620		2	D240	1264	1219	1225	1260
00676	1654		2	D245	1281	1271	1277	
0067A	1658		2	D246	1284	1282		
0067E	1662		2	D247	1286	1283		
0069A	1690		2	D250	1300	1285		
006AE	1710		2	D251	1312	1310		
006BE	1726		2	D252A	1320	1317		
006C8	1736		2	D252B	1325	1322		
006D4	1716		2	D252	1315	1311		
006DC	1756		2	D254A	1335	1374		
006D2	1746		2	D254	1330	1314	1327	
006F0	1776		2	D255	1346	1344		
006FC	1788		2	D260	1353	1345		
00718	1816		2	D270	1367	1352		
0071E	1822		2	D271	1370	1351	1366	
00728	1832		2	D280	1375	1332	1373	
00734	1844		2	D290A	1383	1424		
00734	1844		2	D290	1381			
00750	1872		2	D291	1395	1392		
0075A	1882		2	D292	1400	1397		
0076E	1902		2	D293	1410	1406		
00778	1912		2	D294	1415	1411		
00782	1922		2	D295	1420	1417		
00038	56		4	D3032	223			

XREF 1 DECK NAME=*RTEXEC* SKC 2000 CROSS REFERENCE DICTIONARY PAGE 6

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES									
0079C	1932		2	D300	1425	1380	1423								
00798	1944		2	D301	1431	1427									
0079E	1950		2	D310	1434	1430									
00015	22		9	EIGHT	210										
00016	22		1	ERRCNT	322	513	615	617	660	682	684	721	723	743	745
07800	30720		3	EXEC	488										
00032	50		1	EXND	336	511	518	527	666	760					
07800	30720			EXORG	9	487									
07804	30724		3	EX00	490	494									
07814	30740		3	EX01	498	500									
07846	30790		3	EX30A	525	364									
07836	30774		3	EX30	517	529	668	762							
0784E	30795		3	EX70	530	531									
0009C	156		7	E1	154										
000A8	168		7	E2	155										
000B4	180		7	E3	156										
000C8	200		2	F	460	1054									
00005	214		2	FAILMS	471	679	714								
*****UNDEFINED*****				FENT		570									
000CA	202		2	FF	461	867	1030	1033	1161						
000D2	210		2	FFFD	465	1071									
000D4	212		2	FFFE	466	1081									
000CC	204		2	FFFF	462	1088									
000D0	208		2	FF0F	464	1092									
000DC	220		2	FF3F	470	1188	1199								
000EC	236		2	FGIZER	479	658	758								
0001E	30		9	FONE	214	1410									
00010	16		9	FOUR	207	555	561	586							
000CE	206		2	F00F	463	1061									
000AE	174		2	F304	447	1388									
00012	18		2	GASCJM	369	811									
*****UNDEFINED*****				GASC		369									
0002C	44		4	GMT	34	898	899	901	902						
00034	52		1	GSCT	337	843	846	850							
00024	36		1	HCTM	329										
00050	80		4	HDGV	48	1159									
00110	272		9	HEDL	280	281	1312								
000C4	196		2	HEDMSK	458	1156									
00010	16		11	HOLD	181										
00218	536			IMSK	11	509									
000BE	190		2	IMUMSK	455	1001									
07FA0	32672			INTORG	10	15									
0022C	556		2	INT04	708	17									
001EA	490		2	INT05	673	18									
00158	344		2	INT10	594	20									
00060	96		4	ITER	54	519	913	918	920	1281					
000B4	180		2	ITRMSK	450										
00176	374		2	I10END	610	662	667	670							
06FF4	28660		10	I13	354	1045									
06FFC	28668		10	I2C	358	1304									
06FF0	28656		10	I21	352	1005	1010	1014							
06FF2	28658		10	I22	353	984	1019								
06FF8	28664		10	I24	356	1300									

XREF 1 DECK NAME='TEXEC' SRC 2000 CROSS REFERENCE DICTIONARY PAGE 7

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES							
06FFA	28666		10	I2B	357	1302						
06FF6	28662		10	I3F	355	573	801	921	923			
00242	674		2	I4END	768	729	764					
00252	594		2	I4EOT	727	715						
0026C	620		2	I4EOT1	740	735						
00278	632		2	I4EOT2	746	739						
0029C	664		2	I4EXNO	765	761						
06FE0	28640		10	I4F	343	855						
00224	548		2	I5END	702	695						
00212	530		2	I5EOT	693	680						
06FE2	28642		10	I71	345	1383						
06FE4	28644		10	I72	346							
06FE6	28646		10	I73	347	1000						
06FE8	28648		10	I74	348	995						
06FEA	28650		10	I75	349	1025	1032	1041				
06FEC	28652		10	I76	350	1021	1029	1037				
06FEE	28654		10	I77	351	980	989	991				
0000C	12		2	JDUMY	366	497						
000E4	228		7	J3X3	165							
0002C	44		9	KGUL	220							
00026	38		2	KLIT	379	796						
0004E	78		4	KSN1	149							
00050	80		7	KSN2	150							
00052	82		7	KSN3	151							
00150	336		7	K3X3	166							
00024	36		7	LCA1	158							
00028	40		7	LCA4	159							
00022	34		11	LHED	189	1313	1319					
00004	4		2	LITCO4	362							
0006E	110		4	LITE	61	797	958	960	978	979		
00024	36		11	LPCH	190	1324						
00012	18		11	LPTK	182	827	829	840	842			
00026	38		11	LROL	191	1329						
00054	84		7	L3X3	167							
00026	38		1	MALF	330							
0001A	26		11	MASK	186							
00000	0		7	MATCO4	129							
00028	40		1	MLFN	331							
0006C	108		4	MODE	60	554	560	576	587	590	804	964	975
000B0	176		2	MSHMSK	448	837						
0FF7F	65407			MSK	8	1362	1364					
000E8	232		2	MSK1	477	690	716					
000EA	234		2	MSK2	478	691	718					
00064	100		4	NAVF	56							
00004	4		9	NFOUR	201							
00018	24		9	NINE	211							
0002C	44		7	NMO	140							
00008	8		9	NONE	203	512	834	1107				
07844	30788		3	NORSET	524	521						
0017E	382		2	NOTRED	614	597						
00193	403		2	NR01	625	621						
0019E	414		2	NR02	631	627						
001A8	424		2	NR03	636	632						

XREF 1 DECK NAME=*RTEXEC* SKC 2000 CROSS REFERENCE DICTIONARY PAGE 8

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES
001C2	450	2		NRD4	650	652
001DA	474	2		NRD5	663	661
00006	6	9		NTWO	202	
00000	0	9		N64	198	
000C0	192	7		OC	157	
000DA	218	2		OFFF	469	1051
000D6	214	2		OFFO	467	471 1064
00014	20	11		OMAX	196	
00028	40	9		OMEG	219	
00024	36	9		OMGA	218	
0000A	10	9		ONE	204	517 557 568 614 681 720 766 841 847 860 875 1108 1192 1203 1265 1268 1432
00020	32	9		ONMLF	217	1289 1296
000D8	216	2		OOFF	468	985 1015 1022 1026 1038 1042
000C6	198	2		OOO6	459	1223
000AC	172	4		O14	93	799 1091 1094 1187 1190 1198 1201
00094	148	4		O18	81	
000A4	164	4		O21	89	
000A6	166	4		O22	90	
000A2	162	4		O23	88	
000A8	168	4		O24	91	
000CA	202	4		O25	108	600 1018 1125
00096	150	4		O30	82	
00098	152	4		O31	83	
0009A	154	4		O32	84	
0009C	156	4		O33	85	
0009E	158	4		O34	86	
000A0	160	4		O35	87	
00086	134	4		O4A	74	
00088	136	4		O4B	75	
0008A	138	4		O4C	76	
000B2	178	4		O4D	96	990 1110
000B4	180	4		O4E	97	988 1103 1164
00072	114	4		O4F	64	856 914 917
00074	116	4		O40	65	906
00076	118	4		O41	66	904
00078	120	4		O42	67	
0007A	122	4		O43	68	
0007C	124	4		O44	69	
0007E	126	4		O45	70	
000BC	140	4		O46	77	
00080	128	4		O47	71	
000B2	130	4		O48	72	
00084	132	4		O49	73	
000D2	210	4		O5A	112	
000C4	196	4		O5B	105	564 927 931 943 946
000C6	198	4		O5C	106	882 1009 1053 1063 1073 1083
000C8	200	4		O5E	107	1046 1098
000B6	182	4		O5O	98	1028 1336 1339
000B8	184	4		O51	99	1036
000BA	186	4		O52	100	1044
000BC	188	4		O53	101	1384
000BE	190	4		O54	102	

XREF 1 DECK NAME=*RTEXEC* SRC 2000 CROSS REFERENCE DICTIONARY PAGE 9

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES					
000C0	192		4	055	103						
000C2	194		4	056	104						
000C6	214		4	057	114						
000C8	215		4	058	115						
000CA	214		4	059	115						
000EA	234		4	060	124						
000EC	235		4	065	125						
000BE	142		4	06C	78	1301	1318				
00090	144		4	06D	79	1303	1323				
00092	146		4	06E	80	1305	1328				
000CC	204		4	050	109	1020	1157	1160			
000D4	212		4	062	113						
000DC	220		4	063	117						
000DE	222		4	064	118						
000E0	224		4	065	119						
000E2	225		4	066	120						
000E4	226		4	067	121						
000E5	230		4	068	122						
000E8	232		4	069	123						
000B0	176		4	071	95	830					
000AE	174		4	072	94	831					
000E6	230		2	#CCRST	476	505	637	653	746		
00062	98		4	#MAS	55						
000E2	225		2	#ICC1	474	600					
000E4	226		2	#ICC2	475	696					
07FCB	32712			#ICOUT	3						
000F2	242		2	#IC2	482	646	753				
000F4	244		2	#IC3	483	648	755				
000DE	222		2	#OCC1	472	598					
000E0	224		2	#OCC2	473	642					
000EE	238		2	#OC1	480	644	749				
000F0	240		2	#OC2	481	640	655	751			
00058	104		4	#USM	58	950					
0003A	58		4	#AT	40	1115	1179	1180			
0003C	60		4	#ATL	41	1191	1193	1202	1204	1206	1209
00086	182		2	#ATMS1	451	981					
00088	184		2	#ATMS2	452	1165					
0008A	186		2	#ATMS3	453	1106					
00008	8		4	#ATM	24	1195	1196	1197			
0000C	12		4	#ATP	25	1184	1185	1186			
00014	20		7	#ES1	135	1393	1398	1400	1403	1405	
00018	24		7	#ES2	136						
0001C	28		7	#ES3	137						
00020	32		7	#ES4	138						
07FE8	32744			#ET04	4	763	771				
07FEA	32746			#ET05	5	705					
07FF4	32756			#ET10	6	613	664				
00000	0		2	#MAX	360	1250					
00002	2		2	#MIN	361	1246					
00038	56		1	#OTH	339	1119	1215	1230	1237		
00010	16		4	#OT1	26	1228	1232	1256	1286		
00012	18		4	#OT2	27	1235	1239	1262	1293		
07A0A	30730		3	#TNCLR	493	490					

XREF 1 DECK NAME=*RTEXEC* SKC 2000 CROSS REFERENCE DICTIONARY PAGE 10

RELATIVE ADDRESS (OR SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED	REFERENCES											
07FE0	32736			RTNORG	1	491	492										
00034	52		4	R1CT	37	1259	1264	1266	1275								
00036	54		4	R2CT	38	1263	1267	1269									
00108	264		7	SA	159												
06FE0	28640			SDLORG	13	342											
00014	20		9	SEVEN	209	520	575	803	962								
00008	8		7	SGDL	132	170											
06FE2	28642		10	SIDL	344	866											
00012	18		9	SIX	208												
00008	8		7	SL	170												
00028	40		2	SDDLIN	380	814											
00072	114		4	SDDL	63	815	869										
00000	0		11	SPEXMC	172												
00014	20		2	SPINJM	370	807											
*****UNDEFINED*****				SPIN		370											
00024	36		7	SRA	139	168	169										
00000	0		4	SRT1	22	789	1290	1291	1292								
00004	4		4	SRT2	23	1297	1298	1299									
00082	178		2	SWMSK	449	924											
00000	0		7	SWT	130												
0003E	62		7	S1	145												
000AC	172		2	S1A32	446	844											
00042	66		7	S2	146												
00046	70		7	S3	147												
0004A	74		7	S4	148												
0003A	58		1	TDVX	340	1359	1360	1378									
03FFE	16382			TEMCOR	7	495											
00016	22		11	TEMP2	184	826	848	849	1233	1240	1244	1341	1350	1401	1404		
00018	24		11	TEMP4	185	1356	1361	1407	1409								
00014	20		11	TEMP	183	196	833	836	868	871	934	938	983	987	994	998	999
						1003	1004	1008	1013	1017	1024	1027	1031	1035	1040	1043	1090
						1093	1124	1128	1131	1133	1229	1236	1241	1245	1247	1249	1254
						1257	1261	1338	1342	1349	1354	1355	1389	1394	1399	1402	
000BC	188		2	TEMSK	454	996											
0001A	26		9	TEN	212												
0006A	106		4	TEST	59	945											
0000E	14		9	THREE	206	589	1220										
000C2	194		2	THTY	457	1089											
00058	88		4	TIME	52	907	908	910	911								
*****UNDEFINED*****				TKTH		1434											
0012C	300		7	TM	166												
00070	112		4	TMPR	62	952	973										
00150	336		7	TM1	161	163	164	166									
*****UNDEFINED*****				TORK		701											
07FA8	32680		0	TRP04	17												
07FAA	32682		0	TRP05	18												
07FB4	32692		0	TRP10	20												
0000C	12		9	TWO	205	522	664	887									
0005C	92		4	TO	53												
*****UNDEFINED*****				VECADD		1375											
00004	4		2	VECJMP	364	501											
00174	372		7	VECT	182	498	502	524	542	806	808	810	812				
0004C	76		4	VRTV	46	1168	1171										

XREF .1 DECK NAME=*RTEXEC* SRC 2000 CROSS REFERENCE DICTIONARY PAGE 11

RELATIVE ADDRESS (OW SET VALUE) HEX	DEC	BIT	LC	VARIABLE NAME	LINE NUMBERS OF OCCURRENCES DEFINED REFERENCES
00000	0	4		*LDCOM	21
0001C	28	9		ZERO	213 215 488 510 538 777 787 798 824 881 895 1110 1118 1132 1145 1175 1208 1287 1294 1335 1357 1408 1428