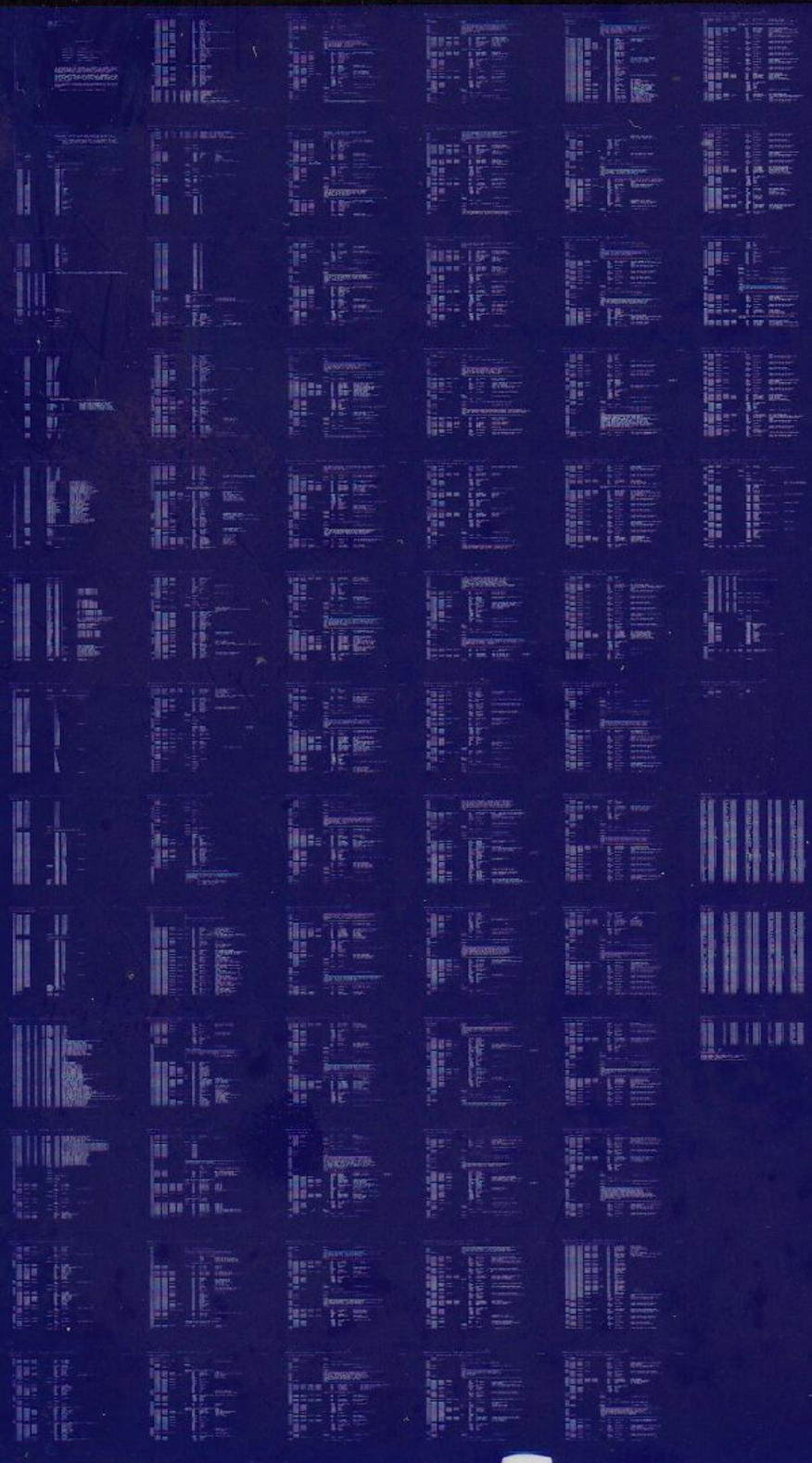
11/Z1+ RLV11 RL11/RLV11 CTRL TST 1
RL01/02 CNRLGA0

AH-T756A-MC
FICHE 1 OF 1

APR 1984
digital
Made In USA



```
                        .TITLE  CNRLGAO RL11/RLV11 CTLR TST 1
                        .ENABLE AMA
000000                  .ENABLE ABS
                        .NLIST  ME,CND,MD,TOC
                        .MCALL SVC

                        .REM @
```

IDENTIFICATION

PRODUCT CODE: AC-T755A-MC

PRODUCT NAME: CNRLGAO RL11/RLV11 CONTROLLER TEST 1

PRODUCT DATE: DECEMBER 19, 1983

MAINTAINER: ISS DIAGNOSTIC SERVICES

AUTHOR: JAMES S. DOUCETTE

REVISION HISTORY

```
                                        .SBTTL  REVISION HISTORY
                                        ;
                                        ;       CHANGES MADE TO CZRLGDO IN PRODUCING CNRLGAO FOR THE SBC-11/21.
                                        ;       (FALCON PLUS), DEC. 19, 1983.  CHANGES ARE IDENTIFIED BY ";JSD REV A'.
                                        ;
                                        ;       1. CHANGED THE GENERAL OPERATING PRIORITY OF THE PROGRAM FROM LEVEL 7 TO
                                        ;               LEVEL 6 TO ALLOW THE "BREAK" KEY TO INVOKE ODT. (THE TRAP
                                        ;               HANDLER AND DEVICE INTERRUPT SERVICE ROUTINE STILL RUN BRIEFLY
                                        ;               AT LEVEL 7).
                                        ;
                                        ;       2. SET VECTOR 140 WITH THE ADDRESS OF ODT IN ROM (170000).
                                        ;

                                        .SBTTL  HEADER

000000                                  SVC
        000000                          SVCINS=0
        000000                          SVCTAG=0

        002000                          .=2000

002000                                          POINTER BGNSFT,BGNSW,BGNDU,BGNAU

002000                                  BGNMOD  MDHEDR

002000                                          HEADER  CNRLG,A,0,7,0,PRI06                     ;JSD REV A - ADDED PRI06
002000      103                                 .ASCII /C/
002001      116                                 .ASCII /N/
002002      122                                 .ASCII /R/
002003      114                                 .ASCII /L/
002004      107                                 .ASCII /G/
002005      000                                 .BYTE   0
002006      000                                 .BYTE   0
002007      000                                 .BYTE   0
002010      101                                 .ASCII  /A/
002011      060                                 .ASCII  /0/
002012  000000                                  .WORD   0
002014  000007                                  .WORD   7
002016  024454                                  .WORD   L$HARD
002020  024660                                  .WORD   L$SOFT
002022  011606                                  .WORD   L$HW
002024  011624                                  .WORD   L$SW
002026  024746                                  .WORD   L$LAST
002030  000000                                  .WORD   0
002032  000000                                  .WORD   0
002034  000000                                  .WORD   0
002036  000000                                  .WORD   0
002040  011634                                  .WORD   L$DISPATCH
002042  000300                                  .WORD   PRI06
002044  000000                                  .WORD   0
002046  000000                                  .WORD   0
002050     003                                  .BYTE   C$REVISION
002051     003                                  .BYTE   C$EDIT
002052  000000                                  .WORD   0
002054  000000                                  .WORD   0
002056  000000                                  .WORD   0
002060  002230                                  .WORD   L$DVTYP
```

```
HEADER

        002062  000000                          .WORD   0
        002064  000000                          .WORD   0
        002066  000000                          .WORD   0
        002070  013056                          .WORD   L$AU
        002072  013052                          .WORD   L$DU
        002074  000000                          .WORD   0
        002076  002122                          .WORD   L$DESC
        002100  104035                          EMT     E$LOAD
        002102  000000                          .WORD   0
        002104  011772                          .WORD   L$INIT
        002106  013004                          .WORD   L$CLEAN
        002110  012562                          .WORD   L$AUTO
        002112  011764                          .WORD   L$PROT
        002114  000000                          .WORD   0
        002116  000000                          .WORD   0
        002120  000000                          .WORD   0
    81
    82 002122                                   ENDMOD
    83
    84 002122                               DESCRIPT <CNRLG TESTS CONTROLLER FUNCTIONS, INTERFACE LOGIC, REGISTER OPERATION>
       002122       103     116     122             .ASCIZ  /CNRLG TESTS CONTROLLER FUNCTIONS, INTERFACE LOGIC, REGISTER OPERATION/
       002125       114     107     040
       002130       124     105     123
       002133       124     123     040
       002136       103     117     116
       002141       124     122     117
       002144       114     114     105
       002147       122     040     106
       002152       125     116     103
       002155       124     111     117
       002160       116     123     054
       002163       040     111     116
       002166       124     105     122
       002171       106     101     103
       002174       105     040     114
       002177       117     107     111
       002202       103     054     040
       002205       122     105     107
       002210       111     123     124
       002213       105     122     040
       002216       117     120     105
       002221       122     101     124
       002224       111     117     116
       002227       000
                                            .EVEN
    85 002230                               DEVTYP  <RL01,RL02>
       002230       122     114     060             .ASCIZ  #RL01,RL02#
       002233       061     054     122
       002236       114     060     062
       002241       000
                                            .EVEN
    86
    87 002242                               BGNMOD  GLBEQAT
    88
    89 002242                                       EQUALS
                                            ;
                                            ; BIT DIFINITIONS
```

HEADER

```
                        ;
100000                  BIT15=: 100000
040000                  BIT14=: 40000
020000                  BIT13=: 20000
010000                  BIT12=: 10000
004000                  BIT11=: 4000
002000                  BIT10=: 2000
001000                  BIT09=: 1000
000400                  BIT08=: 400
000200                  BIT07=: 200
000100                  BIT06=: 100
000040                  BIT05=: 40
000020                  BIT04=: 20
000010                  BIT03=: 10
000004                  BIT02=: 4
000002                  BIT01=: 2
000001                  BIT00=: 1
                        ;
001000                  BIT9=:  BIT09
000400                  BIT8=:  BIT08
000200                  BIT7=:  BIT07
000100                  BIT6=:  BIT06
000040                  BIT5=:  BIT05
000020                  BIT4=:  BIT04
000010                  BIT3=:  BIT03
000004                  BIT2=:  BIT02
000002                  BIT1=:  BIT01
000001                  BIT0=:  BIT00
                        ;
                        ; EVENT FLAG DEFINITIONS
                        ;   EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                        ;
                                                ;  BIT POSITION IN SECOND STATUS WORD
000040                  EF.START=:      32.     ; (100000) START COMMAND WAS ISSUED
000037                  EF.RESTART=:    31.     ; (040000) RESTART COMMAND WAS ISSUED
000036                  EF.CONTINUE=:   30.     ; (020000) CONTINUE COMMAND WAS ISSUED
000035                  EF.NEW=:        29.     ; (010000) A NEW PASS HAS BEEN STARTED
000034                  EF.PWR=:        28.     ; (004000) A POWER-FAIL/POWER-UP OCCURRED
                        ;
                        ;
                        ; PRIORITY LEVEL DEFINITIONS
                        ;
000340                  PRI07=: 340
000300                  PRI06=: 300
000240                  PRI05=: 240
000200                  PRI04=: 200
000140                  PRI03=: 140
000100                  PRI02=: 100
000040                  PRI01=: 40
000000                  PRI00=: 0
                        ;
                        ;OPERATOR FLAG BITS
                        ;
000004                  EVL=:           4
000010                  LOT=:          10
000020                  ADR=:          20
000040                  IDU=:          40
```

HEADER

```
                000100          ISR==      100
                000200          UAM==      200
                000400          BOE==      400
                001000          PNT==     1000
                002000          PRI==     2000
                004000          IXE==     4000
                010000          IBE==    10000
                020000          IER==    20000
                040000          LOE==    40000
                100000          HOE==   100000
     90         000001          DRDY=BIT0               ;DRIVE READY (RLCS)
     91         000100          INTEN=BIT6              ;INTERRUPT ENABLE (RLCS)
     92         100000          ERR=BIT15               ;RL11 ERROR (RLCS)
     93         040000          DERR=BIT14              ;RL01 DRIVE ERROR (RLCS)
     94         002000          OPI=BIT10               ;OPERATION INCOMPLETE (RLCS)
     95         000200          CRDY=BIT7               ;CONTROLLER READY (RLCS)
     96         000040          BA17=BIT5               ;EXTENDED ADDRESS BIT 17 (RLCS)
     97         000020          BA16=BIT4               ;EXTENDED ADDRESS BIT 16 (RLCS)
     98         020000          NXM=BIT13               ;NON-EXISTANT MEMORY (RLCS)
     99         000000          DS0=0                   ;DRIVE SELECT 0 (RLCS)
    100         000400          DS1=BIT8                ;DRIVE SELECT 1 (RLCS)
    101         001000          DS2=BIT9                ;DRIVE SELECT 2 (RLCS)
    102         001400          DS3=BIT8!BIT9           ;DRIVE SELECT 3 (RLCS)
    103         000000          NOOP0=0                 ;FUNCTION-NOOP(0)
    104         000016          NOOP7=BIT1!BIT2!BIT3    ;FUNCTION-NOOP(7)
    105         000002          WRCHK=BIT1              ;WRITE CHECK FUNCTION
    106         000004          GSTAT=BIT2              ;GET STATUS FUNCTION
    107         000006          SEEK=BIT2!BIT1          ;SEEK FUNCTION
    108         000010          RDHDR=BIT3              ;READ HEADER FUNCTION
    109         000012          WRITE=BIT3!BIT1         ;WRITE DATA FUNCTION
    110         000014          READ=BIT3!BIT2          ;READ DATA FUNCTION
    111         000202          GODRVR=BIT1!BIT7        ;CRDY AND DRDY
    112         000010          DRST=BIT3               ;DRIVE RESET (RLDA)
    113         000002          GSBIT=BIT1              ;GET STATUS BIT (RLDA)
    114         000001          MK=BIT0                 ;MARKER BIT (RLDA)
    115         000004          SIGN=BIT2               ;SIGN BIT (RLDA)
    116         000100          RHHS=BIT6               ;HEAD SELECT IN READ HEADER
    117         000100          STHS=BIT6               ;HEAD SELECT IN STATUS BACK
    118         000020          DAHS=BIT4               ;HEAD SELECT IN SEEK
    119
    120                         ;OFFSET FOR HARDWARE P-TABLE
    121
    122         000000          CSR=0
    123         000002          VECT=2
    124         000004          PRIOR=4
    125         000006          TYPDR=6
    126         000010          DRBT=10
    127         000012          CNT=12
    128
    129                         ;OFFSET FOR SOFTWARE P-TABLE
    130
    131         000000          DLT=0
    132         000002          ELT=2
    133         000004          SIZE=4
    134
    135 002242                          ENDMOD
    136
```

```
HEADER

    137 002242                          BGNMOD  GLBDAT
    138
    139                                 .SBTTL  GLOBAL DATA
    140
    141 002242  000000                  PWRFLG: .WORD   0
    142 002244  000000                  UUT:    .WORD   0
    143 002246  000000                  UNITST: .WORD   0
    144 002250  000000                  RLCS:   .WORD   0               ;LOGICAL ADDRESS OF CS
    145 002252  000000                  RLBA:   .WORD   0               ;LOGICAL ADDRESS OF BA
    146 002254  000000                  RLDA:   .WORD   0               ;LOGICAL ADDRESS OF DA
    147 002256  000000                  RLMP:   .WORD   0               ;LOGICAL ADDRESS OF MP
    148 002260  000000                  RLBE:   .WORD   0               ;LOGICAL ADDRESS OF BE
    149 002262  000000                  BCSR:   .WORD   0
    150 002264  000000                  BPRIOR: .WORD   0
    151 002266  000000                  BVEC:   .WORD   0
    152 002270  000000                  DRIVE:  .WORD   0               ;DRIVE UNDER TEST
    153 002272  000000                  B.CS:   .WORD   0               ;CS - BEFORE OPERATION
    154 002274  000000                  B.BA:   .WORD   0               ;BA - BEFORE OPERATION
    155 002276  000000                  B.DA:   .WORD   0               ;DA - BEFORE OPERATION
    156 002300  000000                  B.MP:   .WORD   0               ;MP - BEFORE OPERATION
    157 002302  000000                  B.BE:   .WORD   0               ;BE - BEFORE OPERATION
    158 002304  00000C                  DERFLG: .WORD
    159 002306  000000                  E.CS:   .WORD   0               ;CS - AT OCCURANCE OF ERROR
    160 002310  000000                  E.BA:   .WORD   0               ;BA - AT OCCRUANCE OF ERROR
    161 002312  000000                  E.DA:   .WORD   0               ;DA - AT OCCURANCE OF ERROR
    162 002314  000000                  E.MP:   .WORD   0               ;MP - AT OCCURANCE OF ERROR
    163 002316  000000                  E.MP1:  .WORD   0
    164 002320  000000                  E.MP2:  .WORD   0               ;MP - AT OCCURANCE OF ERROR READ HEADER
    165 002322  000000                  E.BE:   .WORD   0               ;BE - AT OCCURANCE OF ERROR RLV12 ONLY
    166 002324  000000                  PFLG:   .WORD   0               ;PROCESSOR TYPE, 0=UNIBUS, 1=Q-BUS
    167 002326  000000                  TRPFLG: .WORD   0
    168 002330  000000                  INTFLG: .WORD   0               ;INTERRUPT OCCURRENCE FLAG
    169 002332  000000                  LDCSR:  .WORD   0               ;LOCATION TO FORM RLCS
    170 002334  000077                  SECMSK: .WORD   77              ;MASK OUT SECTOR
    171 002336  120001                  XPOLY:  .WORD   120001          ;POLYNOMIAL FOR CRC 16
    172 002340  000004                  ERRVEC: .WORD   4
    173 002342  000000                  BCCFBK: .WORD   0               ;LOCATION USED BY "SIMBCC"
    174 002344  000000                  CALBCC: .WORD   0               ;LOCATION USED BY "SIMBCC"
    175 002346  000000                  TEMP2:  .WORD   0               ;LOCATION USED BY "SIMBCC"
    176 002350  000000                  TEMP3:  .WORD   0               ;LOCATION USED BY "SIMBCC"
    177 002352  000000                  TEMP4:  .WORD   0               ;LOCATION USED BY "SIMBCC"
    178 002354  000000                  TMP0:   .WORD   0
    179 002356  000000                  TMP1:   .WORD   0
    180 002360  000000                  TMP2:   .WORD   0
    181 002362  000000                  GDDAT:  .WORD   0
    182 002364  000000                  BDDAT:  .WORD   0
    183 002366  000000                  FIRST:  .WORD   0               ;FIRST SECTOR READ
    184 002370  177700                  CYLMSK: .WORD   177700          ;MASK CYLINDER AND HEAD SELECT
    185 002372  000050                  MXSEC1: .WORD   40.             ;MAX SECTOR ADDRESS +1
    186 002374  000047                  MAXSEC: .WORD   39.             ;MAX SECTOR ADDRESS
    187 002376  000000                  DWORD:  .WORD   0               ;DIFFERENCE WORD (SEEK)
    188 002400  177600                  MAXCYL: .WORD   177600          ;MAXIMUM CYLINDER ADDRESS
    189 002402  000000                  SVHD:   .WORD   0               ;SAVE CURRENT HEAD SELECT
    190 002404  000000                  WHY:    .WORD   0               ;REASON FOR DROP UNIT
    191
    192 002406  000000                  T.DRIVE:        .WORD   0       ;DRIVE TYPE
    193 002410  000000                  T.CNTLR:        .WORD   0       ;CONTOLLER TYPE
```

H1

GLOBAL DATA

```
    194 002412  000000                  TMPFNC:         .WORD   0
    195 002414  000000                  DLYCNT:         .WORD   0       ;DELAY COUNTER
    196
    197                                 ;
    198                                 ;PATTERNS USED FOR LOADING/READING REGISTERS
    199
    200 002416  000000                  BEGPAT: 0                       ;GROWING 1
    201 002420  000001                          1
    202 002422  000003                          3
    203 002424  000007                          7
    204 002426  000017                          17
    205 002430  000037                          37
    206 002432  000077                          77
    207 002434  000177                          177
    208 002436  000377                          377
    209 002440  000777                          777
    210 002442  001777                          1777
    211 002444  003777                          3777
    212 002446  007777                          7777
    213 002450  017777                          17777
    214 002452  037777                          37777
    215 002454  077777                          77777
    216 002456  177777                          177777
    217 002460  177776                          177776                 ;GROWING 0
    218 002462  177774                          177774
    219 002464  177770                          177770
    220 002466  177760                          177760
    221 002470  177740                          177740
    222 002472  177700                          177700
    223 002474  177600                          177600
    224 002476  177400                          177400
    225 002500  177000                          177000
    226 002502  176000                          176000
    227 002504  174000                          174000
    228 002506  170000                          170000
    229 002510  160000                          160000
    230 002512  140000                          140000
    231 002514  100000                          100000
    232
    233 002516  000000                          000000
    234 002520  000001                          1                      ;WALKING 1
    235 002522  000002                          2
    236 002524  000004                          4
    237 002526  000010                          10
    238 002530  000020                          20
    239 002532  000040                          40
    240 002534  000100                          100
    241 002536  000200                          200
    242 002540  000400                          400
    243 002542  001000                          1000
    244 002544  002000                          2000
    245 002546  004000                          4000
    246 002550  010000                          10000
    247 002552  020000                          20000
    248 002554  040000                          40000
    249 002556  100000                          100000
    250 002560  177777                          177777                 ;WALKING 0
```

GLOBAL DATA

```
                                        177776
                                        177775
                                        177773
                                        177767
                                        177757
                                        177737
                                        177677
                                        177577
                                        177377
                                        176777
                                        175777
                                        173777
                                        167777
                                        157777
                                        137777
                                        077777
                                        177777
                        ENDPAT:         000000

                        .SBTTL  PATTERNS FOR DIFFERENCE WORD

                        SKLST:  .WORD   BIT7
                                .WORD   BIT8            ;SHIFTING 1
                                .WORD   BIT9
                                .WORD   BIT10
                                .WORD   BIT11
                                .WORD   BIT12
                                .WORD   BIT13
                                .WORD   BIT14
                                .WORD   77600           ;SHIFTING 0
                                .WORD   77400
                                .WORD   76600
                                .WORD   75600
                                .WORD   73600
                                .WORD   67600
                                .WORD   57600
                                .WORD   37600
                                .WORD   77600
                                .WORD   200
                                .WORD   600             ;GROWING 1
                                .WORD   1600
                                .WORD   3600
                                .WORD   7600
                        QUAMAX: .WORD   17600
                        HALMAX: .WORD   37600
                                .WORD   77600
                                .WORD   77400           ;GROWING 0
                                .WORD   77000
                                .WORD   76000
                                .WORD   74000
                                .WORD   70000
                                .WORD   60000
                                .WORD   40000
                        SKEND:  .WORD   00000
                        RL2:    .WORD   BIT15
                        QMAX:   .WORD   37600
                        HMAX:   .WORD   77600
```

PATTERNS FOR DIFFERENCE WORD

```
                    
002736  177600              .WORD   177600
002740  177400              .WORD   177400
002742  176600              .WORD   176600
002744  173600              .WORD   173600
002746  167600              .WORD   167600
002750  157600              .WORD   157600
002752  137600              .WORD   137600
002754  177000              .WORD   177000
002756  176000              .WORD   176000
002760  174000              .WORD   174000
002762  170000              .WORD   170000
002764  060000              .WORD   60000
002766  040000              .WORD   40000
002770  000000      SKEEND: .WORD   000000
                    
                    ;PATTERNS FOR TEST OF RLCS
                    
002772  000000      CSPAT:  .WORD   0               ;SHIFTING 1
002774  000002              .WORD   BIT1
002776  000004              .WORD   BIT2
003000  000010              .WORD   BIT3
003002  000020              .WORD   BIT4
003004  000040              .WORD   BIT5
003006  000100              .WORD   BIT6
003010  000400              .WORD   BIT8
003012  001000              .WORD   BIT9
003014  001576              .WORD   1576            ;GROWING 0
003016  001574              .WORD   1574
003020  001570              .WORD   1570
003022  001560              .WORD   1560
003024  001540              .WORD   1540
003026  001500              .WORD   1500
003030  001400              .WORD   1400
003032  001576              .WORD   1576            ;SHIFT 0
003034  001574              .WORD   1574
003036  001566              .WORD   1566
003040  001556              .WORD   1556
003042  001536              .WORD   1536
003044  001436              .WORD   1436
003046  001136              .WORD   1136
003050  000076              .WORD   76
003052  000006              .WORD   6               ;GROWING 1
003054  000016              .WORD   16
003056  000036              .WORD   36
003060  000076              .WORD   76
003062  000176              .WORD   176             ;
003064  000576              .WORD   576
003066  001376              .WORD   1576
003070  000000      CSEND:  .WORD   0
003072  000000      ERPOINT: .WORD  0
003074              ERCOUNT: .BLKW  64.
003274              HDRBUF: .BLKW   160.
003774              ENDMOD
                    
003774              BGNMOD  GLBTXT
                    .SBTTL  GLOBAL TEXT
```

GLOBAL TEXT

```
365
369 003774  040  104  122  DEMES:  .ASCIZ  / DRV/
370 004001  040  116  130  NXMMES: .ASCIZ  / NXM/
371 004006  040  117  120  OPIMES: .ASCIZ  / OPI/
372 004013  040  110  103  HCRCMES:.ASCIZ  / HCRC/
373 004021  040  110  116  HNFMES: .ASCIZ  / HNF/
374 004026  040  104  103  DCKMES: .ASCIZ  / DCK/
375 004033  040  104  114  DLTMES: .ASCIZ  / DLT/
376 004040  015  012  000  MSCRLF: .ASCIZ  <15><12>
377 004043  015  000       LF:     .ASCIZ  <15>
378 004045  040  103  117  COMP:   .ASCIZ  / COMP/
379 004053  106  117  122  OPIERR: .ASCIZ  /FORCED OPI(GET STATUS) CAUSED OTHER ERRORS/
380 004126  116  117  117  NOPMES: .ASCIZ  /NOOP OPERATION-FLAG MODE/
381 004157  116  117  117  NOPINT: .ASCIZ  /NOOP OPERATION-INTR. MODE/
382 004211  127  122  111  WCKMES: .ASCIZ  /WRITE CHECK OPERATION-FLAG MODE/
383 004251  127  122  111  WCKINT: .ASCIZ  /WRITE CHECK OPERATION-INTR. MODE/
384 004312  122  105  101  RHDMES: .ASCIZ  /READ HEADER OPERATION-FLAG MODE/
385 004352  122  105  101  RHDINT: .ASCIZ  /READ HEADER OPERATION-INTR. MODE/
386 004413  123  105  105  SEKMES: .ASCIZ  /SEEK OPERATION-FLAG MODE/
387 004444  123  105  105  SEKINT: .ASCIZ  /SEEK OPERATION-INTR. MODE/
388 004476  107  105  124  GSTMES: .ASCIZ  /GET STATUS OPERATION-FLAG MODE/
389 004535  107  105  124  GSTINT: .ASCIZ  /GET STATUS OPERATION-INTR MODE/
390 004574  103  123  072  ARLCS:  .ASCIZ  /CS: /
391 004601  040  102  101  ARLBA:  .ASCIZ  / BA: /
392 004607  040  104  101  ARLDA:  .ASCIZ  / DA: /
393 004615  040  115  120  ARLMP:  .ASCIZ  / MP: /
394 004623  102  105  106  BEREG:  .ASCIZ  /BEFORE COMMAND: /
395 004644  124  111  115  AFREG:  .ASCIZ  /TIME OF ERROR:  /
396 004665  103  117  116  CRTIM:  .ASCIZ  /CONTROLLER TIMED OUT/
397 004712  104  122  111  DRTIM:  .ASCIZ  /DRIVE READY TIMED OUT/
398 004740  103  101  116  EM1:    .ASCIZ  /CAN NOT ADDRESS RLCS/
399 004765  103  101  116  EM2:    .ASCIZ  /CAN NOT ADDRESS RLBA/
400 005012  103  101  116  EM3:    .ASCIZ  /CAN NOT ADDRESS RLDA/
401 005037  103  101  116  EM4:    .ASCIZ  /CAN NOT ADDRESS RLMP/
402 005064  122  114  103  EM5:    .ASCIZ  %RLCS READ/WRITE ERROR (BIT 0 DON'T CARE)%
403 005135  122  114  102  EM6:    .ASCIZ  %RLBA READ/WRITE ERROR%
404 005163  122  114  104  EM7:    .ASCIZ  %RLDA READ/WRITE ERROR%
405 005211  117  120  111  EM11:   .ASCIZ  /OPI WOULD NOT GENERATE INTERRUPT/
406 005252  116  117  040  EM13:   .ASCIZ  /NO INTERRUPT FROM NOOP(0)/
407 005304  116  117  117  EM14:   .ASCIZ  /NOOP(0) MODIFIED RLMP/
408 005332  116  117  117  EM15:   .ASCIZ  /NOOP(0) MODIFIED RLBA/
409 005360  116  117  117  EM16:   .ASCIZ  /NOOP(0) MODIFIED RLDA/
410 005406  111  116  124  EM17:   .ASCIZ  /INTERRUPT PRIORITY FAILURE/
411 005441  107  105  124  EM30:   .ASCIZ  /GET STATUS WOULD NOT INTERRUPT/
412 005500  107  105  124  EM30A:  .ASCIZ  /GET STATUS SHOULD NOT INTERRUPT/
413 005540  122  114  115  EM32:   .ASCIZ  /RLMP CONTAINED WRONG STATUS/
414 005574  117  120  111  EM33:   .ASCIZ  /OPI DID NOT SET-GSTAT WITHOUT GS BIT/
415 005641  117  120  111  EM34:   .ASCIZ  /OPI DID NOT SET-GSTAT WITHOUT GS AND MK BITS/
416 005716  122  105  101  EM37:   .ASCIZ  /READ HEADER WOULD NOT INTERRUPT/
417 005756  102  101  104  EM41:   .ASCIZ  /BAD CYLINDER OR HEAD SELECT IN REPEATED READ HEADER TEST/
418 006047  102  101  104  EM42:   .ASCIZ  /BAD HEADER CRC ON READ HEADER/
419 006105  123  105  103  EM43:   .ASCIZ  /SECTOR ADDRESS OUT OF SEQUENCE DURING CONSECUTIVE READ HEADERS/
420 006204  127  122  111  EM44:   .ASCIZ  /WRITING RLMP MODIFIED RLCS/
421 006237  127  122  111  EM45:   .ASCIZ  /WRITING RLMP MODIFIED RLBA/
422 006272  127  122  111  EM46:   .ASCIZ  /WRITING RLMP MODIFIED RLDA/
423 006325  123  105  105  EM47:   .ASCIZ  /SEEK WOULD NOT INTERRUPT/
424 006356  104  122  111  EM52:   .ASCIZ  /DRIVE READY CAUSED EXTRANEOUS INTERRUPT/
```

GLOBAL TEXT

```
  425 006426      102     101     104  EM54:   .ASCIZ  /BAD SEEK-TEST OF DIFFENCE WORD/
  426 006465      102     101     104  EM55:   .ASCIZ  /BAD HEAD SELECT VIA RD HDR/
  427 006520      102     101     104  EM56:   .ASCIZ  /BAD HEAD SELECT VIA GET STATUS/
  428 006557      114     117     101  EM57:   .ASCII  /LOADING RLDA BEFORE DRIVE READY ON SEEK/<15><12>
  429 006630      104     122     111          .ASCIZ  /DRIVE READY DID NOT SET/
  430 006660      102     111     124  EM61:   .ASCIZ  /BIT SET INSTRUCTION ON RLCS YIELDED WRONG RESULT/
  431 006741      102     111     124  EM62:   .ASCIZ  /BIT CLEAR INSTRUCTION ON RLCS YIELDED WRONG RESULT/
  432 007024      102     111     124  EM63:   .ASCIZ  /BIT SET INSTRUCTION ON RLBA YIELDED WRONG RESULT/
  433 007105      102     111     124  EM64:   .ASCIZ  /BIT CLEAR INSTRUCTION ON RLBA YIELDED WRONG RESULT/
  434 007170      102     111     124  EM65:   .ASCIZ  /BIT SET INSTRUCTION ON RLDA YIELDED WRONG RESULT/
  435 007251      102     111     124  EM66:   .ASCIZ  /BIT CLEAR INSTRUCTION ON RLDA YIELDED WRONG RESULT/
  436 007334      102     125     123  EM67:   .ASCIZ  /BUS RESET DID NOT CLEAR RLCS/
  437 007371      102     125     123  EM70:   .ASCIZ  /BUS RESET DID NOT CLEAR RLBA/
  438 007426      102     125     123  EM71:   .ASCIZ  /BUS RESET DID NOT CLEAR RLDA/
  439 007463      127     122     111  EM72:   .ASCIZ  /WRITING RLCS MODIFIED RLBA/
  440 007516      127     122     111  EM73:   .ASCIZ  /WRITING RLCS MODIFIED RLDA/
  441 007551      127     122     111  EM74:   .ASCIZ  /WRITING RLBA MODIFED RLCS/
  442 007603      127     122     111  EM75:   .ASCIZ  /WRITING RLBA MODIFED RLDA/
  443 007635      127     122     111  EM76:   .ASCIZ  /WRITING RLDA MODIFIED RLCS/
  444 007670      127     122     111  EM77:   .ASCIZ  /WRITING RLDA MODIFIED RLBA/
  445 007723      122     114     103  EM101:  .ASCIZ  /RLCS CONTAINED FOLLOWING ERROR(S):  /
  446 007770                           EM102:  .BLKB   120.
  447
  448                                  .EVEN
  449
  453 010160                           ENDMOD
  454
  455                                  .SBTTL  GLOBAL ERRORS
  456
  457 010160                           BGNMOD  GLBERR
  458
  459 010160                   BGNMSG  ERR0
  460
  461 010160  004737  010504           JSR     PC,LINE1
  462 010164  004737  010540           JSR     PC,LINE2
  463
  464 010170  004537  013062           JSR     R5,CKERLT       ;CHECK ERROR LIMIT
  465 010174                           ENDMSG
      010174                   L10000:
      010174  104423                  TRAP    C$MSG
  466
  467 010176                   BGNMSG  ERR1
  468
  469 010176  004737  010504           JSR     PC,LINE1
  470
  471 010202  004537  013062           JSR     R5,CKERLT       ;CHECK ERROR LIMIT
  472 010206                           ENDMSG
      010206                   L10001:
      010206  104423                  TRAP    C$MSG
  473
  474 010210                   BGNMSG  ERR2
  475
  476 010210  004737  010504           JSR     PC,LINE1
  477 010214                           PRINTB  #FRMT4,GDDAT,BDDAT
      010214  013746  002364          MOV     BDDAT,-(SP)
      010220  013746  002362          MOV     GDDAT,-(SP)
      010224  012746  011137          MOV     #FRMT4,-(SP)
```

```
GLOBAL ERRORS

                010230  012746  000003                  MOV     #3,-(SP)
                010234  010600                          MOV     SP,R0
                010236  104414                          TRAP    C$PNTB
                010240  062706  000010                  ADD     #10,SP
    478
    479         010244  004537  013062                  JSR     R5,CKERLT       ;CHECK ERROR LIMIT
    480         010250                                  ENDMSG
                010250                          L10002:
                010250  104423                          TRAP    C$MSG
    481
    482         010252                          BGNMSG  ERR3
    483
    484         010252  004737  010504                  JSR     PC,LINE1
    485         010256  004737  010540                  JSR     PC,LINE2
    486         010262                                  PRINTB  #FRMT5,TMP0,BDDAT,GDDAT
                010262  013746  002362                  MOV     GDDAT,-(SP)
                010266  013746  002364                  MOV     BDDAT,-(SP)
                010272  013746  002354                  MOV     TMP0,-(SP)
                010276  012746  011175                  MOV     #FRMT5,-(SP)
                010302  012746  000004                  MOV     #4,-(SP)
                010306  010600                          MOV     SP,R0
                010310  104414                          TRAP    C$PNTB
                010312  062706  000012                  ADD     #12,SP
    487
    488         010316  004537  013062                  JSR     R5,CKERLT       ;CHECK ERROR LIMIT
    489         010322                                  ENDMSG
                010322                          L10003:
                010322  104423                          TRAP    C$MSG
    490
    491         010324                          BGNMSG  ERR4
    492
    493         010324  004737  010504                  JSR     PC,LINE1
    494         010330  004737  010540                  JSR     PC,LINE2
    495         010334                                  PRINTB  #FRMT4,GDDAT,BDDAT
                010334  013746  002364                  MOV     BDDAT,-(SP)
                010340  013746  002362                  MOV     GDDAT,-(SP)
                010344  012746  011137                  MOV     #FRMT4,-(SP)
                010350  012746  000003                  MOV     #3,-(SP)
                010354  010600                          MOV     SP,R0
                010356  104414                          TRAP    C$PNTB
                010360  062706  000010                  ADD     #10,SP
    496
    497         010364  004537  013062                  JSR     R5,CKERLT       ;CHECK ERROR LIMIT
    498         010370                                  ENDMSG
                010370                          L10004:
                010370  104423                          TRAP    C$MSG
    499
    500         010372                          BGNMSG  ERR5
    501
    502         010372  004737  010504                  JSR     PC,LINE1
    503
    504         010376  004537  013062                  JSR     R5,CKERLT       ;CHECK ERROR LIMIT
    505         010402                                  ENDMSG
                010402                          L10005:
                010402  104423                          TRAP    C$MSG
    506
    507         010404                          BGNMSG  ERR6
```

GLOBAL ERRORS

```
508
509 010404  004737  010504                  JSR     PC,LINE1
510 010410  004737  010752                  JSR     PC,LINE3
511 010414  004737  010540                  JSR     PC,LINE2
512
513 010420                          1$:     PRINTB  #FRMT99
    010420  012746  011172                  MOV     #FRMT99,-(SP)
    010424  012746  000001                  MOV     #1,-(SP)
    010430  010600                          MOV     SP,R0
    010432  104414                          TRAP    C$PNTB
    010434  062706  000004                  ADD     #4,SP
514 010440  004537  013062                  JSR     R5,CKERLT       ;CHECK ERROR LIMIT
515 010444                                  ENDMSG
    010444                          L10006:
    010444  104423                          TRAP    C$MSG
516
517 010446                          BGNMSG  ERR7
518
519 010446  004737  010504                  JSR     PC,LINE1
520 010452                                  PRINTB  #FRMT6,BDDAT
    010452  013746  002364                  MOV     BDDAT,-(SP)
    010456  012746  011246                  MOV     #FRMT6,-(SP)
    010462  012746  000002                  MOV     #2,-(SP)
    010466  010600                          MOV     SP,R0
    010470  104414                          TRAP    C$PNTB
    010472  062706  000006                  ADD     #6,SP
521
522 010476  004537  013062                  JSR     R5,CKERLT
523
524 010502                                  ENDMSG
    010502                          L10007:
    010502  104423                          TRAP    C$MSG
525
526 010504                          LINE1:  PRINTB  #FRMT1,RLCS,<B,DRIVE+1>
    010504  005046                          CLR     -(SP)
    010506  153716  002271                  BISB    DRIVE+1,(SP)
    010512  013746  002250                  MOV     RLCS,-(SP)
    010516  012746  011024                  MOV     #FRMT1,-(SP)
    010522  012746  000003                  MOV     #3,-(SP)
    010526  010600                          MOV     SP,R0
    010530  104414                          TRAP    C$PNTB
    010532  062706  000010                  ADD     #10,SP
527 010536  000207                          RTS     PC
528
529 010540                          LINE2:  PRINTB  #FRMT2,#BEREG,#ARLCS,B.CS,#ARLBA,B.BA
    010540  013746  002274                  MOV     B.BA,-(SP)
    010544  012746  004601                  MOV     #ARLBA,-(SP)
    010550  013746  002272                  MOV     B.CS,-(SP)
    010554  012746  004574                  MOV     #ARLCS,-(SP)
    010560  012746  004623                  MOV     #BEREG,-(SP)
    010564  012746  011064                  MOV     #FRMT2,-(SP)
    010570  012746  000006                  MOV     #6,-(SP)
    010574  010600                          MOV     SP,R0
    010576  104414                          TRAP    C$PNTB
    010600  062706  000016                  ADD     #16,SP
530 010604                                  PRINTB  #FRMT2A,#ARLDA,B.DA,#ARLMP,B.MP
    010604  013746  002300                  MOV     B.MP,-(SP)
```

GLOBAL ERRORS

```
        010610  012746  004615                 MOV     @ARLMP, (SP)
        010614  013746  002276                 MOV     B.DA, (SP)
        010620  012746  004607                 MOV     @ARLDA, (SP)
        010624  012746  011103                 MOV     @FRMT2A,-(SP)
        010630  012746  000005                 MOV     #5, (SP)
        010634  010600                         MOV     SP,R0
        010636  104414                         TRAP    C$PNTB
        010640  062706  000014                 ADD     #14,SP
    531 010644                                 PRINTB  @FRMT2,@AFREG,@ARLCS,E.CS,@ARLBA,E.BA
        010644  013746  002310                 MOV     E.BA, (SP)
        010650  012746  004601                 MOV     @ARLBA,-(SP)
        010654  013746  002306                 MOV     E.CS,-(SP)
        010660  012746  004574                 MOV     @ARLCS,-(SP)
        010664  012746  004644                 MOV     @AFREG,-(SP)
        010670  012746  011064                 MOV     @FRMT2,-(SP)
        010674  012746  000006                 MOV     #6, (SP)
        010700  010600                         MOV     SP,R0
        010702  104414                         TRAP    C$PNTB
        010704  062706  000016                 ADD     #16,SP
    532 010710                                 PRINTB  @FRMT2B,@ARLDA,E.DA,@ARLMP,E.MP
        010710  013746  002314                 MOV     E.MP,-(SP)
        010714  012746  004615                 MOV     @ARLMP,-(SP)
        010720  013746  002312                 MOV     E.DA,-(SP)
        010724  012746  004607                 MOV     @ARLDA,-(SP)
        010730  012746  011116                 MOV     @FRMT2B,-(SP)
        010734  012746  000005                 MOV     #5,-(SP)
        010740  010600                         MOV     SP,R0
        010742  104414                         TRAP    C$PNTB
        010744  062706  000014                 ADD     #14,SP
    533 010750  000207                         RTS     PC
    534
    535 010752                         LINE3:  PRINTB  @FRMT3,@EM101
        010752  012746  007723                 MOV     @EM101,-(SP)
        010756  012746  011132                 MOV     @FRMT3,-(SP)
        010762  012746  000002                 MOV     #2,-(SP)
        010766  010600                         MOV     SP,R0
        010770  104414                         TRAP    C$PNTB
        010772  062706  000006                 ADD     #6,SP
    536 010776                                 PRINTB  @FRMT3,@EM102
        010776  012746  007770                 MOV     @EM102,-(SP)
        011002  012746  011132                 MOV     @FRMT3,-(SP)
        011006  012746  000002                 MOV     #2,-(SP)
        011012  010600                         MOV     SP,R0
        011014  104414                         TRAP    C$PNTB
        011016  062706  000006                 ADD     #6,SP
    537 011022  000207                         RTS     PC
    538
    542
    543 011024      045     101     103 FRMT1:  .ASCIZ  /#ACONTROLLER: #06#A  DRIVE: #01/
    544 011064      045     116     045 FRMT2:  .ASCIZ  /#N#T#T#06#T#06/
    545 011103      045     124     045 FRMT2A: .ASCIZ  /#T#06#T#06/
    546 011116      045     124     045 FRMT2B: .ASCIZ  /#T#06#T#06#/
    547 011132      045     116     045 FRMT3:  .ASCIZ  /#N#T/
    548 011137      045     116     045 FRMT4:  .ASCII  /#N#AEXP'D: #06#A REC'D: #06/
    549 011172      045     116     000 FRMT99: .ASCIZ  /#N/
    550 011175      045     116     045 FRMT5:  .ASCIZ  /#N#ALAST: #06#A PRES: #06#A EXP'D: #06#N/
    551 011246      045     116     045 FRMT6:  .ASCIZ  /#N#AAT PROCESSOR LEVEL #06#N/
```

GLOBAL ERRORS

```
552 011303     045     101     105  FRMT11: .ASCIZ  /%AERROR LIMIT EXCEEDED DROPPED%N/
553 011344     045     116     045  FRMT12: .ASCIZ  /%N%ADRIVE DID NOT RECOVER FROM POWER FAILURE%N/
554 011423     045     116     045  FRMT13: .ASCIZ  /%N%T%A   WILL NOT TEST%N/
555 011454     045     116     045  FRMT14: .ASCIZ  /%N%ADRIVE DROPPED - NO CONTROLLER%N/
556 011520     045     116     045  FRMT15: .ASCIZ  /%N%ADRIVE DROPPED   DID NOT RESPOND WITH "READY"%N/
557
558                                 .EVEN
559
563
564 011604                          ENDMOD
565
566 011604                          BGNMOD  HPTCODE
567
568 011604                          BGNHW                           ;DEFAULT HARDWARE TABLE
    011604  000006                          .WORD   L10010-L$HW/2
569 011606  174400                          .WORD   174400          ;CSR
570 011610  000160                          .WORD   160             ;VECTOR
571 011612  000240                          .WORD   240             ;PRIORITY
572 011614  000001                          .WORD   1               ;RL01 = 1
573 011616  000000                          .WORD   0               ;DRIVE (BITS 8,9,10)
574 011620  000001                          .WORD   1               ;RL11 = 1, RLV11 = 2, RLV12 = 3
575
576 011622                          ENDHW
    011622                          L10010:
577
578 011622                          ENDMOD
579
580 011622                          BGNMOD  SPTCODE
581
582 011622                          BGNSW                           ;DEFAULT SOFTWARE TABLE
    011622  000003                          .WORD   L10011-L$SW/2
583
584 011624  000000                  DROP:   .WORD   0
585 011626  000012                  MERLMT: .WORD   10.
586 011630  000000                  T.SIZE: .WORD   0
587
588 011632                          ENDSW
    011632                          L10011:
589
590 011632                          ENDMOD
591
592 011632                          BGNMOD  DSPCODE
593
594 011632                          DISPATCH        44
    011632  000054                          .WORD   44
    011634  014434                          .WORD   T1
    011636  014530                          .WORD   T2
    011640  014624                          .WORD   T3
    011642  014720                          .WORD   T4
    011644  015014                          .WORD   T5
    011646  015134                          .WORD   T6
    011650  015240                          .WORD   T7
    011652  015326                          .WORD   T8
    011654  015452                          .WORD   T9
    011656  015576                          .WORD   T10
    011660  015704                          .WORD   T11
    011662  016004                          .WORD   T12
```

GLOBAL ERRORS

```
011664  016074                          .WORD   T13
011666  016174                          .WORD   T14
011670  016304                          .WORD   T15
011672  016360                          .WORD   T16
011674  016416                          .WORD   T17
011676  016542                          .WORD   T18
011700  016702                          .WORD   T19
011702  017042                          .WORD   T20
011704  017246                          .WORD   T21
011706  017300                          .WORD   T22
011710  017506                          .WORD   T23
011712  017574                          .WORD   T24
011714  017742                          .WORD   T25
011716  017772                          .WORD   T26
011720  020144                          .WORD   T27
011722  020232                          .WORD   T28
011724  020360                          .WORD   T29
011726  020402                          .WORD   T30
011730  020462                          .WORD   T31
011732  020626                          .WORD   T32
011734  020764                          .WORD   T33
011736  021302                          .WORD   T34
011740  021376                          .WORD   T35
011742  021442                          .WORD   T36
011744  021566                          .WORD   T37
011746  022204                          .WORD   T38
011750  022336                          .WORD   T39
011752  022500                          .WORD   T40
011754  022640                          .WORD   T41
011756  023012                          .WORD   T42
011760  023440                          .WORD   T43
    011762  024160                      .WORD   T44
595
596 011764                              ENDMOD
597
598                             .SBTTL  LOAD PROTECTION TABLE
599 011764                      BGNPROT
600 011764  000000                      .WORD    CSR                    ;P-TABLE OFFSET OF CSR
601 011766  177777                      .WORD   -1                      ;NOT A MASS-BUS DRIVE
602 011770  000011                      .WORD   DRBT+1                  ;P-TABLE OFFSET OF DRIVE NUMBER IN BYTES
603 011772                      ENDPROT
604
605                             .SBTTL  INITIALIZATION CODE
606 011772                      BGNMOD  INITCODE
607
608 011772                              BGNINIT
609
610 011772                              BRESET
    011772  104433                      TRAP    C$RESET
611 011774                              READEF  #EF.PWR                 ;POWER UP?????
    011774  012700  000034              MOV     #EF.PWR,R0
    012000  104447                      TRAP    C$REFG
612 012002                              BNCOMPLETE      NOPWR           ;NO,BRANCH
    012002  103004                      BCC     NOPWR
613 012004  013737  002012  002242      MOV     L$UNIT,PWRFLG           ;YES, SET POWER FLAG
614 012012  000510                      BR      CONT                    ;GO TO CONTINUE POINT
615 012014                      NOPWR:  READEF  #EF.RESTART     ;RESTART?
```

INITIALIZATION CODE

```
        012014  012700  000037                  MOV     #EF.RESTART,R0
        012020  104447                          TRAP    C$REFG
    616 012022                                  BCOMPLETE START1
        012022  103404                          BCS     START1
    617 012024                                  READEF  #EF.START               ;START???
        012024  012700  000040                  MOV     #EF.START,R0
        012030  104447                          TRAP    C$REFG
    618 012032                                  BNCOMPLETE      CONTINUE
        012032  103023                          BCC     CONTINUE
    619 012034                          START1: SETVEC  #140,#170000,#340       ;ODT STARTING ADDR      ;JSD REV A
        012034  012746  000340                  MOV     #340,-(SP)
        012040  012746  170000                  MOV     #170000,-(SP)
        012044  012746  000140                  MOV     #140,-(SP)
        012050  012746  000003                  MOV     #3,-(SP)
        012054  104437                          TRAP    C$SVEC
        012056  062706  000010                  ADD     #10,SP
    620 012062  012700  003074                  MOV     #ERCOUNT,R0
    621 012066  012701  000100                  MOV     #64.,R1
    622 012072  005020                  1$:     CLR     (R0)+
    623 012074  005301                          DEC     R1
    624 012076  001375                          BNE     1$
    625 012100  000407                          BR      START
    626
    627 012102                          CONTINUE:       READEF  #EF.CONTINUE    ;CONTINUE????
        012102  012700  000036                  MOV     #EF.CONTINUE,R0
        012106  104447                          TRAP    C$REFG
    628 012110                                  BCOMPLETE       CONT
        012110  103451                          BCS     CONT
    629
    630 012112  005737  002244          NXT:    TST     UUT                     ;DONE ALL UUT'S
    631 012116  001011                          BNE     XXX                     ;NO
    632 012120  012737  177777  002246  START:  MOV     #-1,UNITST
    633 012126  013737  002012  002244          MOV     L$UNIT,UUT
    634 012134  012737  003072  003072          MOV     #ERCOUNT-2,ERPOINT
    635
    636 012142  005237  002246          XXX:    INC     UNITST
    637 012146  062737  000002  003072          ADD     #2,ERPOINT
    638 012154  005337  002244                  DEC     UUT
    639 012160                          REST:   GPHARD  UNITST,R0
        012160  013700  002246                  MOV     UNITST,R0
        012164  104442                          TRAP    C$GPHRD
    640 012166                                  BCOMPLETE       1$
        012166  103406                          BCS     1$
    641 012170  005737  002242                  TST     PWRFLG                  ;POWER FLAG TO 0
    642 012174  001746                          BEQ     NXT                     ;YES, DONT DEC IT
    643 012176  005337  002242                  DEC     PWRFLG
    644 012202  000743                          BR      NXT                     ;GET NEXT ONE
    645
    646 012204  012037  002262          1$:     MOV     (R0)+,BCSR
    647 012210  012037  002266                  MOV     (R0)+,BVEC
    648 012214  012037  002264                  MOV     (R0)+,BPRIOR
    649 012220  012037  002406                  MOV     (R0)+,T.DRIVE
    650 012224  012037  002270                  MOV     (R0)+,DRIVE
    651 012230  012037  002410                  MOV     (R0)+,T.CNTLR   ;GET CONTROLLER TYPE
    652
    653 012234  013700  002262          CONT:   MOV     BCSR,R0         ;BUILD LOGICAL ADDRESSES OF REGISTERS
    654 012240  010037  002250                  MOV     R0,RLCS
```

INITIALIZATION CODE

```
    012244  062700  000002                  ADD     #2,R0
    012250  010037  002252                  MOV     R0,RLBA
    012254  062700  000002                  ADD     #2,R0
    012260  010037  002254                  MOV     R0,RLDA
    012264  062700  000002                  ADD     #2,R0
    012270  010037  002256                  MOV     R0,RLMP
    012274  022737  000002  C02410          CMP     #2,T.CNTLR              ;IF THIS IS AN RLV12, BUILD LOGICAL
    012302  001004                          BNE     1$                      ;ADDRESS FOR BUS ADDRESS EXTENSION.
    012304  062700  000002                  ADD     #2,R0
    012310  010037  002260                  MOV     R0,RLBE
                                    1$:     TST     PWRFLG                  ;RECENT POWER FAILURE?
    012320  001476                          BEQ     END                     ;NO
                                    ;THERE WAS A RECENT POWER FAILURE, THEREFORE WE WILL WAIT
                                    ;FOR THE DRIVE TO COME READY
    012322  012701  000170                  MOV     #120.,R1                ;INITIALIZE WAIT COUNT
    012326  012777  000200  167714          MOV     #200,@RLCS              ;SET CRDY
    012334  053777  002270  167706          BIS     DRIVE,@RLCS             ;SET IN DRIVE SELECT
    012342  032777  000001  167700  DRVRDY: BIT     #DRDY,@RLCS             ;DRIVE READY???
    012350  001042                          BNE     BGNTST                  ;YES, THEN START TEST
    012352  012737  000050  002414          MOV     #40.,DLYCNT             ;INITIALIZE DELAY COUNT
    012360                          WAIT0:  DELAY   1                       ;IMPLEMENT 100-USEC DELAY
    012360  012727  000001                  MOV     #1,(PC)+
    012364  000000                          .WORD   0
    012366  013727  002116                  MOV     L$DLY,(PC)+
    012372  000000                          .WORD   0
    012374  005367  177772                  DEC     -6(PC)
    012400  001375                          BNE     .-4
    012402  005367  177756                  DEC     -22(PC)
    012406  001367                          BNE     .-20
    012410  005337  002414                  DEC     DLYCNT                  ;DECREMENT DELAY COUNT
    012414  001361                          BNE     WAIT0                   ;BRANCH IF TIME DELAY NOT EXPIRED
    012416  005301                          DEC     R1                      ;SIXTY SECONDS GONE BY
    012420  001350                          BNE     DRVRDY                  ;NO, GO BACK
    012422                                  PRINTB  #FRMT12                 ;DROPPING DRIVE - DRIVE DID NOT RECOVER
    012422  012746  011344                  MOV     #FRMT12,-(SP)
    012426  012746  000001                  MOV     #1,-(SP)
    012432  010600                          MOV     SP,R0
    012434  104414                          TRAP    C$PNTB
    012436  062706  000004                  ADD     #4,SP
                                                                            ;/FROM POWER FAILURE
    012442  004737  010504          6$:     JSR     PC,LINE1                ;GIVE DRIVE INFO
    012446                                  DODU    UNITST                  ;TELL SUPERVISOR TO DROP IT
    012446  013700  002246                  MOV     UNITST,R0
    012452  104451                          TRAP    C$DODU
    012454                                  DOCLN                           ;FORCE AN ABORT
    012454  104444                          TRAP    C$DCLN
    012456  012777  000013  167570  BGNTST: MOV     #13,@RLDA               ;SETUP DR RST
    012464  012777  000204  167556          MOV     #204,@RLCS              ;GS FUNC
    012472  053777  002270  167550          BIS     DRIVE,@RLCS             ;SELECT DRIVE
    012500  042777  000200  167542          BIC     #200,@RLCS              ;ISSUE IT
    012506  032777  000200  167534  4$:     BIT     #200,@RLCS              ;WAIT FOR READY
    012514  001774                          BEQ     4$
    012516                          END:    SETVEC  BVEC,#INTSRV,#340
    012516  012746  000340                  MOV     #340,-(SP)
```

INITIALIZATION CODE

```
        012522  012746  014240                 MOV     #INTSRV,-(SP)
        012526  013746  002266                 MOV     BVEC,-(SP)
        012532  012746  000003                 MOV     #3,-(SP)
        012536  104437                         TRAP    C$SVEC
        012540  062706  000010                 ADD     #10,SP
    695 012544  005037  002324                 CLR     PFLG            ;CLR PROCESSOR FLAG
    696 012550                                 READBUS                 ;Q-BUS
        012550  104407                         TRAP    C$RDBU
    697 012552                                 BNCOMPLETE      1$
        012552  103002                         BCC     1$
    698 012554  005237  002324                 INC     PFLG            ;NO, Q BUS THEN
    699 012560                          1$:
    700 012560                                 ENDINIT
        012560                          L10013:
        012560  104411                         TRAP    C$INIT
    701
    702 012562                                 ENDMOD
    703
    704                                 .SBTTL  AUTO DROP SECTION
    705 012562                          BGNAUTO
    706 012562  005037  002326                 CLR     TRPFLG          ;CLEAR TRAP FLAG
    707                                                                ;SET UP VECTOR TO DETECT NON-EXISTENT
    708                                                                ;/CONTROLLER
    709 012566                                 SETVEC  ERRVEC,#TRPHAN,#340
        012566  012746  000340                 MOV     #340,-(SP)
        012572  012746  014232                 MOV     #TRPHAN,-(SP)
        012576  013746  002340                 MOV     ERRVEC,-(SP)
        012602  012746  000003                 MOV     #3,-(SP)
        012606  104437                         TRAP    C$SVEC
        012610  062706  000010                 ADD     #10,SP
    710 012614  012746  000340                 MOV     #340,-(SP)
    711 012620  012746  014232                 MOV     #TRPHAN,-(SP)
    712 012624  013746  002340                 MOV     ERRVEC,-(SP)
    713 012630  012746  000003                 MOV     #3,-(SP)
    714 012634  104037                         EMT     C$SVEC
    715 012636  062706  000010                 ADD     #10,SP
    716
    717 012642  005777  167402                 TST     @RLCS           ;ACCESS CONTROLLER
    718 012646                                 CLRVEC  ERRVEC          ;RELEASE VECTOR
        012646  013700  002340                 MOV     ERRVEC,R0
        012652  104436                         TRAP    C$CVEC
    719 012654  013700  002340                 MOV     ERRVEC,R0
    720 012660  104036                         EMT     C$CVEC
    721 012662  005737  002326                 TST     TRPFLG          ;DID IT TRAP?
    722 012666  001416                         BEQ     1$              ;NO - CHECK ITS DRIVE
    723 012670                                 PRINTB  #FRMT14         ;ELSE, PRINT MSG. "DRIVE DROPPED - NO CONTROLLER"
        012670  012746  011454                 MOV     #FRMT14,-(SP)
        012674  012746  000001                 MOV     #1,-(SP)
        012700  010600                         MOV     SP,R0
        012702  104414                         TRAP    C$PNTB
        012704  062706  000004                 ADD     #4,SP
    724 012710  004737  010504                 JSR     PC,LINE1        ;PROVIDE DRIVE INFORMATION
    725 012714                                 DODU    UNITST          ;DO DROP UNIT ON DRIVE
        012714  013700  002246                 MOV     UNITST,R0
        012720  104451                         TRAP    C$DODU
    726 012722  000427                         BR      2$              ;EXIT
    727
```

AUTO DROP SECTION

```
728 012724  012777  000200  167316  1$:     MOV     #200,@RLCS      ;SET CONTROLLER READY
729 012732  053777  002270  167310          BIS     DRIVE,@RLCS     ;SELECT DRIVE
730 012740  032777  000001  167302          BIT     #1,@RLCS        ;IS DRIVE READY?
731 012746  001015                          BNE     2$              ;YES - EXIT
732                                                                 ;ELSE, PRINT MSG. "DRIVE DROPPED   DID NOT
733                                                                 ;/RESPOND WITH "READY"
734 012750                                  PRINTB  #FRMT15
    012750  012746  011520                  MOV     #FRMT15,-(SP)
    012754  012746  000001                  MOV     #1,-(SP)
    012760  010600                          MOV     SP,R0
    012762  104414                          TRAP    C$PNTB
    012764  062706  000004                  ADD     #4,SP
735 012770  004737  010504                  JSR     PC,LINE1        ;PROVIDE DRIVE INFORMATION
736 012774                                  DODU    UNITST          ;DO DROP UNIT ON DRIVE
    012774  013700  002246                  MOV     UNITST,R0
    013000  104451                          TRAP    C$DODU
737 013002                          2$:
738 013002                          ENDAUTO
    013002                          L10014:
    013002  104461                          TRAP    C$AUTO
739
740 013004                          BGNMOD  CLNCODE
741
742 013004                                  BGNCLN
743
744                                 ;       SETPRI  #PRI07                                  ;JSD REV A
745 013004                                  SETPRI  #PRI06                                  ;JSD REV A
    013004  012700  000300                  MOV     #PRI06,R0
    013010  104441                          TRAP    C$SPRI
746
747 013012  032777  000200  167230  1$:     BIT     #CRDY,@RLCS
748 013020  001774                          BEQ     1$
749
750 013022  042777  000100  167220          BIC     #INTEN,@RLCS
751
752 013030                                  CLRVEC  BVEC
    013030  013700  002266                  MOV     BVEC,R0
    013034  104436                          TRAP    C$CVEC
753
754 013036  005737  002242                  TST     PWRFLG                  ;TREAT POWER FAILURE
755 013042  001402                          BEQ     2$
756
757 013044  005337  002242                  DEC     PWRFLG
758
759 013050                          2$:
760 013050                                  ENDCLN
    013050                          L10015:
    013050  104412                          TRAP    C$CLEAN
761
762 013052                                  ENDMOD
763
764 013052                          BGNMOD  DRPCODE
765
766 013052                                  BGNDU
767
768 013052  000240                          NOP
769
```

AUTO DROP SECTION

```
770 013054                                      ENDDU
    013054                              L10016:
    013054  104453                              TRAP    C$DU
771
772 013056                              ENDMOD
773
774 013056                              BGNMOD  ADDCODE
775
776 013056                                      BGNAU
777
778 013056  000240                              NOP
779
780 013060                                      ENDAU
    013060                              L10017:
    013060  104452                              TRAP    C$AU
781
782 013062                              ENDMOD
783
784                                     .SBTTL  GLOBAL SUBROUTINES
785
786 013062                              BGNMOD  GLBSUB
787
788 013062                              CKERLT: INLOOP
    013062  104420                              TRAP    C$INLP
789 013064                                      BCOMPLETE       99$
    013064  103427                              BCS     99$
790 013066  005737  011624                      TST     DROP
791 013072  001424                              BEQ     99$
792 013074  005277  167772                      INC     @ERPOINT
793 013100  027737  167766  011626              CMP     @ERPOINT,MERLMT
794 013106  002416                              BLT     99$
795
796 013110                                      PRINTF  #FRMT11
    013110  012746  011303                      MOV     #FRMT11,-(SP)
    013114  012746  000001                      MOV     #1,-(SP)
    013120  010600                              MOV     SP,R0
    013122  104417                              TRAP    C$PNTF
    013124  062706  000004                      ADD     #4,SP
797 013130  004737  010504                      JSR     PC,LINE1
798 013134                                      DODU    UNITST          ;DROP THE UNIT
    013134  013700  002246                      MOV     UNITST,R0
    013140  104451                              TRAP    C$DODU
799 013142                                      DOCLN
    013142  104444                              TRAP    C$DCLN
800 013144                              99$:
801 013144  000205                              RTS     R5
802
803                                     .SBTTL  ROUTINE TO CHECK FOR CONTROLLER ERRORS
804
805                                     ;*********************************************************************
806                                     ;*THIS ROUTINE WILL CHECK RLCS FOR ERRORS AND PRINT THEM
807                                     ;*ACCORDINGLY.  IT WILL MERGE THE ERROR PRINTOUT WITH THE TEST
808                                     ;*ERROR MESSAGE.
809                                     ;*
810                                     ;*EXAMPLE:   RLCS CONTAINED FOLLOWING ERROR(S):
811                                     ;*                  DRV   OPI   HCRC   HNF
812                                     ;*           SEEK UNDER INTERRUPT
```

ROUTINE TO CHECK FOR CONTROLLER ERRORS

```
                                        ;*
                                        ;*
                                        ;*
                                        ;*ROUTINE USES R0,R1 AND PICKS HEADER FROM R3
                                        ;*
                                        ;*      CALL    JSR     R5,CHERR
                                        ;*
                                        ;*
                                        ;*

013146  005037  002304          CHERR:  CLR     DERFLG          ;CLEAR OUT DRIVE ERROR FLAG
013152  032737  176000  002306          BIT     #176000,E.CS    ;ANY ERRORS SET
013160  001001                          BNE     199$            ;IF YES, INVESTIGATE
013162  000205                          RTS     R5              ;NO, EXIT
013164  023727  002412  000004  199$:   CMP     TMPFNC,#GSTAT   ;FUNCTION-NOP, RESET, GETSTATUS
013172  002401                          BLT     98$             ;YES, GO CHECK IF ONLY DRIVE ERROR
013174  000414                          BR      1$              ;YES SERVICE ERROR
013176  023727  002412  000002  98$:    CMP     TMPFNC,#WRCHK
013204  001410                          BEQ     1$
013206  013700  002306                  MOV     E.CS,R0         ;GET E.CS
013212  042700  001777                  BIC     #1777,R0        ;
013216  022700  140000                  CMP     #140000,R0      ;DRIVE ERROR ALONE?
013222  001001                          BNE     1$              ;NO, GO SERVICE
013224  000205                  2$:     RTS     R5              ;YES, EXIT

013226  012701  007770          1$:     MOV     #EM102,R1       ;GET START OF STRING
013232  005737  002306                  TST     E.CS            ;IS COMPOSITE ERROR SET?(BETTER BE)
013236  100003                          BPL     99$             ;IT'S NOT SOMETHING IS WRONG
013240  004537  013712                  JSR     R5,FIX          ;YES, PUT "COMP" IN STRING
013244  004045                          COMP                    ;"COMP"
013246  032737  040000  002306  99$:    BIT     #DERR,E.CS      ;DRIVE ERROR SET?
013254  001405                          BEQ     3$              ;NO, CONTINUE
013256  005237  002304                  INC     DERFLG          ;SET DRV ERROR FLAG
013262  004537  013712                  JSR     R5,FIX          ;YES, PUT "DRV" INTO STRING
013266  003774                          DEMES                   ;"DRV"
013270  032737  020000  002306  3$:     BIT     #NXM,E.CS       ;NON-EXISTENT MEMORY ERROR?
013276  001403                          BEQ     4$              ;NO, CONTINUE
013300  004537  013712                  JSR     R5,FIX          ;YES, PUT "NXM" INTO STRING
013304  004001                          NXMMES                  ;"NXM"
013306  032737  002000  002306  4$:     BIT     #OPI,E.CS       ;IS OPI SET?
013314  001422                          BEQ     6$              ;NO, GO CHECK BITS 11 & 12
013316  004537  013712                  JSR     R5,FIX          ;PUT "OPI" INTO STRING
013322  004006                          OPIMES                  ;"OPI"
013324  032737  004000  002306          BIT     #BIT11,E.CS     ;HEADERCRC ERROR?
013332  001403                          BEQ     5$              ;NO, GO CHECK HEADER NOT FOUND
013334  004537  013712                  JSR     R5,FIX          ;GO PUT "HCRC" IN STRING
013340  004013                          HCRCMES                 ;"HCRC"
013342  032737  010000  002306  5$:     BIT     #BIT12,E.CS     ;HEADER NOT FOUND?
013350  001422                          BEQ     8$              ;NO, GO PUT "CRLF" IN STRING
013352  004537  013712                  JSR     R5,FIX          ;PUT "HNF" IN STRING
013356  004021                          HNFMES                  ;"HNF"
013360  000416                          BR      8$              ;PUT "CRLF" IN STRING
013362  032737  004000  002306  6$:     BIT     #BIT11,E.CS     ;DATA CRC ERROR?
013370  001403                          BEQ     7$              ;NO, GO CHECK DATA LATE
013372  004537  013712                  JSR     R5,FIX          ;PUT "DCK" IN STRING
013376  004026                          DCKMES                  ;"DCK"
013400  032737  010000  002306  7$:     BIT     #BIT12,E.CS     ;DATA LATE ERROR?
```

```
ROUTINE TO CHECK FOR CONTROLLER ERRORS

    870 013406  001403                          BEQ     8$              ;NO, GO PUT IN "CRLF"
    871 013410  004537  013712                  JSR     R5,FIX          ;PUT "DLT" IN STRING
    872 013414  004033                          DLTMES                  ;"DLT"
    873 013416  004537  013712          8$:     JSR     R5,FIX
    874 013422  004040                          MSCRLF
    875 013424  004537  013712                  JSR     R5,FIX
    876 013430  000000          RESTMS: .WORD   0               ;HEADER FROM TEST
    877 013432  105011                          CLRB    (R1)            ;PUT TERMINATOR IN
    878
    879 013434                                  ERRDF   300.,LF,ERR6
        013434  104455                          TRAP    C$ERDF
        013436  000454                          .WORD   300
        013440  004043                          .WORD   LF
        013442  010404                          .WORD   ERR6
    880
    881 013444  000205                          RTS     R5              ;EXIT ROUTINE
    882
    883                             .SBTTL  LOAD RLCS
    884                             ;*****************************************************************
    885                             ;* ROUTINE TO LOAD RLCS WITH FUNCTION TO BE PERFORMED
    886                             ;*      CALL:   JSR     R5,LDFUNC
    887                             ;*              .WORD           ;BITS TO BE LOADED, FUNCTION
    888                             ;*                              ;AND INTR ENABLE ONLY
    889                             ;*
    890                             ;
    891
    892 013446  012537  002332  LDFUNC: MOV     (R5)+,LDCSR     ;GET BITS TO LOAD
    893 013452  005737  002304          TST     DERFLG
    894 013456  001424                  BEQ     98$
    895 013460  013746  002272          MOV     B.CS,-(SP)
    896 013464  012777  000013  166562  MOV     #13,@RLDA
    897 013472  012737  000004  002272  MOV     #GSTAT,B.CS
    898 013500  053737  002270  002272  BIS     DRIVE,B.CS
    899 013506  013777  002272  166534  MOV     B.CS,@RLCS
    900 013514  012637  002272          MOV     (SP)+,B.CS
    901 013520  032777  000200  166522  99$:    BIT     #200,@RLCS
    902 013526  001774                  BEQ     99$
    903 013530  010346                  98$:    MOV     R3,-(SP)        ;SAVE R3
    904 013532  042737  177661  002332          BIC     #177661,LDCSR   ;CLEAR ALL BUT FUNC & INTR EN
    905 013540  013737  002332  013664          MOV     LDCSR,FNDFNC    ;SAVE FUNCTION
    906 013546  042737  000100  013664          BIC     #INTEN,FNDFNC   ;ONLY FUNCTION
    907 013554  013737  013664  002412          MOV     FNDFNC,TMPFNC
    908 013562  012703  013666                  MOV     #HDRLST,R3      ;GET HEADER LIST
    909 013566  006237  013664                  ASR     FNDFNC          ;ALIGN TO RIGHT
    910 013572  001404                          BEQ     2$
    911 013574  022323                  1$:     CMP     (R3)+,(R3)+     ;BUMP R3 BY 4
    912 013576  005337  013664                  DEC     FNDFNC          ;FOUND IT
    913 013602  001374                          BNE     1$              ;NO,KEEP LOOKING
    914 013604  032737  000100  002332  2$:     BIT     #INTEN,LDCSR    ;YES,DO WE WANT FLAG OR INTR
    915 013612  001401                          BEQ     3$              ;FLAG BRANCH
    916 013614  005723                          TST     (R3)+           ;INTR POINT TO THAT ONE
    917 013616  011303                  3$:     MOV     (R3),R3         ;SET HEADER
    918 013620  010337  013430                  MOV     R3,RESTMS       ;SET UP HEADER
    919 013624  053737  002270  002332          BIS     DRIVE,LDCSR     ;SELECT DRIVE
    920 013632  052737  000200  002332  4$:     BIS     #200,LDCSR      ;CONTROLLER READY
    921 013640  013777  002332  166402          MOV     LDCSR,@RLCS
    922 013646  004537  013724                  JSR     R5,BEFORE
```

```
013652  042777  000200  166370  5$:     BIC     #200,@RLCS
013660  012603                          MOV     (SP)+,R3        ;RESTORE R3
013662  000205                          RTS     R5              ;EXIT

013664  000000                  FNDFNC: .WORD   0

013666  004126                  WORLST: NOPMES
013670  004157                          NOPINT
013672  004211                          WCKMES
013674  004251                          WCKINT
013676  004476                  OKWOR:  GSTMES
013700  004535                          GSTINT
013702  004413                          SEKMES
013704  004444                          SEKINT
013706  004312                          RHDMES
013710  004352                          RHDINT

                                ;*************************************************************
                                ;*ROUTINE TO MOVE ASCII STRINGS
                                ;*USES REGISTERS R1 - WHERE STRING IS BEING BUILT
                                ;*
                                ;*      CALL    JSR     R5,FIX
                                ;*              .WORD           ;ADDRESS OF STRING TO MOVE

013712  012500                  FIX:    MOV     (R5)+,R0        ;GET ADDRESS AND MOVE RETURN
013714  112021                  1$:     MOVB    (R0)+,(R1)+     ;GET BYTE AND UPDATE
013716  001376                          BNE     1$              ;WATCH 0 BYTE TERMINATOR
013720  105741                          TSTB    -(R1)           ;BACK UP OVER ZERO BYTE
013722  000205                          RTS     R5              ;EXIT

                                ;LOAD REGISTERS BEFORE OPERATION
                                ;CALL:  JSR     R5,BEFORE

013724  017737  166320  002272  BEFORE: MOV     @RLCS,B.CS      ;READ CS
013732  017737  166314  002274          MOV     @RLBA,B.BA      ;READ BA
013740  017737  166310  002276          MOV     @RLDA,B.DA      ;READ DA
013746  017737  166304  002300          MOV     @RLMP,B.MP      ;READ MP
013754  022737  000002  002410          CMP     #2,T.CNTLR      ;IF THE CONTOLLER IS AN RLV12
013762  001003                          BNE     1$              ;READ BE
013764  017737  166270  002302          MOV     @RLBE,B.BE

013772  000205                  1$:     RTS     R5

                                ;LOAD REGISTERS AT ERROR
                                ;CALL:  JSR     R5,AFTER

013774  017737  166250  002306  AFTER:  MOV     @RLCS,E.CS      ;READ CS
014002  017737  166244  002310          MOV     @RLBA,E.BA      ;READ BA
014010  017737  166240  002312          MOV     @RLDA,E.DA      ;READ DA
014016  017737  166234  002314          MOV     @RLMP,E.MP      ;READ MP
014024  017737  166226  002316          MOV     @RLMP,E.MP1     ;READ MP SECOND WORD IN SILO
014032  017737  166220  002320          MOV     @RLMP,E.MP2     ;READ MP THIRD WORD IN SILO
014040  022737  000002  002410          CMP     #2,T.CNTLR      ;IF THE CONTROLLER IS AN RLV12
014046  001003                          BNE     1$              ;READ BE
014050  017737  166204  002322          MOV     @RLBE,E.BE

014056  000205                  1$:     RTS     R5
```

M2


```
                                .SBTTL  ROUTINE TO CALCULATE CRC

                                ;ROUTINE WILL CALCULATE A CRC-16 CRC ON A WORD OF
                                ;1-16 BITS IN LENGTH, RESULT IS RETURNED IN "CALBCC"
                                ;
                                ;       CALL:   JSR     R5,SIMBCC
                                ;               .WORD           ;NUMBER OF BITS (1-16)
                                ;               .WORD           ;DATA FOR CRC CALCULATION
                                ;               .WORD           ;PREVIOUS OR STARTING CRC
                                ;                               (SHOULD BE ZEROED FOR START)
                                ;       ROUTINE USES R0,R1,R2

014060  010046                 SIMBCC: MOV     R0,-(SP)        ;SAVE R0
014062  010146                         MOV     R1,-(SP)        ;SAVE R1
014064  010246                         MOV     R2,-(SP)        ;SAVE R2

014066  012537  002346                 MOV     (R5)+,TEMP2     ;GET NUMBER OF BITS
014072  012537  002350                 MOV     (R5)+,TEMP3     ;GET DATA FOR CRC CALCULATION
014076  012537  002352                 MOV     (R5)+,TEMP4     ;GET STARTING CRC

014102  005037  002342         1$:     CLR     BCCFBK          ;
014106  013700  002352                 MOV     TEMP4,R0        ;GET PREVIOUS CRC
014112  006037  002350                 ROR     TEMP3           ;ROTATE NEW DATA
014116  005500                         ADC     R0              ;MERGE NEW WITH OLD
014120  032700  000001                 BIT     #1,R0           ;BIT 0 SET
014124  001402                         BEQ     2$              ;IF NOT CONTINUE
014126  005137  002342                 COM     BCCFBK          ;
014132  013700  002336         2$:     MOV     XPOLY,R0        ;GET CRC POLYNOMIAL (CRC-16)
014136  005100                         COM     R0              ;COMPLIMENT POLYNOMIAL
014140  040037  002342                 BIC     R0,BCCFBK
014144  000241                         CLC                     ;CLEAR CARRY
014146  006037  002352                 ROR     TEMP4
014152  013700  002342                 MOV     BCCFBK,R0
014156  013701  002352                 MOV     TEMP4,R1
014162  010102                         MOV     R1,R2
014164  040100                         BIC     R1,R0
014166  043702  002342                 BIC     BCCFBK,R2
014172  050200                         BIS     R2,R0
014174  043737  002336  002352         BIC     XPOLY,TEMP4
014202  050037  002352                 BIS     R0,TEMP4
014206  005337  002346                 DEC     TEMP2
014212  001333                         BNE     1$
014214  013737  002352  002344         MOV     TEMP4,CALBCC

014222  012602                         MOV     (SP)+,R2        ;RESTORE REGISTERS FROM STACK
014224  012601                         MOV     (SP)+,R1
014226  012600                         MOV     (SP)+,R0

014230  000205                         RTS     R5              ;RETURN

                                ;ROUTINE TO SET FLAG IF TRAP OCCURRED
                                ;"TRPHAN" IS IN LOCATION 4.

014232  005237  002326         TRPHAN: INC     TRPFLG          ;INDICATE TRAP
014236  000002                         RTI                     ;RETURN
```

ROUTINE TO CALCULATE CRC

```
1037 014240                          BGNSRV
1038
1039 014240  005237  002330          INTSRV: INC     INTFLG          ;INDICATE INTERRUPT
1040
1041 014244                          ENDSRV
     014244                          L10020:
     014244  000002                          RTI
1042
1043                                 ;ROUTINE TO WAIT FOR DRIVE READY
1044 014246  010146                  WTDRDY: MOV     R1,-(SP)        ;SAVE R1
1045 014250  012701  003720                  MOV     #2000.,R1       ;TIME OUT OF 200 MILLISECONDS
1046 014254  032777  000001  165766  1$:     BIT     #DRDY,@RLCS     ;DRIVE READY?
1047 014262  001022                          BNE     2$              ;YES, EXIT
1048 014264                                  DELAY   1               ;WAIT A WHILE
     014264  012727  000001                  MOV     #1,(PC)+
     014270  000000                          .WORD   0
     014272  013727  002116                  MOV     L$DLY,(PC)+
     014276  000000                          .WORD   0
     014300  005367  177772                  DEC     -6(PC)
     014304  001375                          BNE     .-4
     014306  005367  177756                  DEC     -22(PC)
     014312  001367                          BNE     .-20
1049 014314  005301                          DEC     R1              ;CHECK IF TIME UP
1050 014316  001356                          BNE     1$              ;NO, GO CHECK DRIVE READY
1051
1052 014320                                  ERRDF   200.,DRTIM,ERR5 ;DRIVE READY DID NOT SET
     014320  104455                          TRAP    C$ERDF
     014322  000310                          .WORD   200
     014324  004712                          .WORD   DRTIM
     014326  010372                          .WORD   ERR5
1053
1054 014330  012601                  2$:     MOV     (SP)+,R1        ;RESTORE
1055 014332  000205                          RTS     R5              ;EXIT
1056
1057                                 ;ROUTINE TO WAIT FOR CONTROLLER READY
1058 014334  010146                  WTCRDY: MOV     R1,-(SP)        ;SAVE R1
1059 014336  012701  017500                  MOV     #8000.,R1       ;WAIT 800 MILLISECONDS
1060 014342  032777  000200  165700  1$:     BIT     #CRDY,@RLCS     ;CONTROLLER READY
1061 014350  001025                          BNE     2$              ;YES, EXIT
1062 014352                                  DELAY   1               ;WAIT A WHILE
     014352  012727  000001                  MOV     #1,(PC)+
     014356  000000                          .WORD   0
     014360  013727  002116                  MOV     L$DLY,(PC)+
     014364  000000                          .WORD   0
     014366  005367  177772                  DEC     -6(PC)
     014372  001375                          BNE     .-4
     014374  005367  177756                  DEC     -22(PC)
     014400  001367                          BNE     .-20
1063 014402  005301                          DEC     R1              ;CHECK IF TIME UP
1064 014404  001356                          BNE     1$              ;NO GO BACK
1065
1066 014406  004537  013774                  JSR     R5,AFTER        ;GET REGISTERS
1067
1068 014412                                  ERRDF   100.,CRTIM,ERR6 ;CONTROLLER TIMED OUT
     014412  104455                          TRAP    C$ERDF
     014414  000144                          .WORD   100
     014416  004665                          .WORD   CRTIM
```

ROUTINE TO CALCULATE CRC

```
      014420  010404                          .WORD   ERR6
 1069
 1070 014422  000402                          BR      3$              ;EXIT
 1071
 1072 014424  004537  013774          2$:     JSR     R5,AFTER        ;GET REGISTERS
 1073 014430  012601                  3$:     MOV     (SP)+,R1
 1074 014432  000205                          RTS     R5              ;EXIT
 1075
 1076 014434                          ENDMOD
 1077
 1078                                 .SBTTL  **TEST 1** - RLCS ADDRESSABILITY
 1079
 1080 014434                          BGNTST                          ;****START OF TEST****
 1081 014434                          STARS
                                      ;;*******************************************************************
 1082                                 ;TEST TO SEE IF WE CAN ADDRESS T.  CONTROL
 1083                                 ;AND STATUS REGISTER.  IF WE TRAP WE WILL REPORT
 1084                                 ;THE ERROR AND ABORT.  AFTER THIS TEST WE ONLY KNOW
 1085                                 ;THAT WE CAN ADDRESS THE REGISTER.
 1086 014434                          STARS
                                      ;;*******************************************************************
 1087
 1088 014434  005037  002326          1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
 1089 014440                          2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET TO CATCH TRAP
      014440  012746  000340                  MOV     #340,-(SP)
      014444  012746  014232                  MOV     #TRPHAN,-(SP)
      014450  013746  002340                  MOV     ERRVEC,-(SP)
      014454  012746  000003                  MOV     #3,-(SP)
      014460  104437                          TRAP    C$SVEC
      014462  062706  000010                  ADD     #10,SP
 1090
 1091 014466  005777  165556                  TST     @RLCS           ;ADDRESS RLCS
 1092 014472                                  CLRVEC  ERRVEC          ;RELEASE TRAP VECTOR
      014472  013700  002340                  MOV     ERRVEC,R0
      014476  104436                          TRAP    C$CVEC
 1093 014500  005737  002326                  TST     TRPFLG          ;TRAP OCCURRED???
 1094 014504  001407                          BEQ     3$              ;NO. IKAY PROCEED
 1095 014506  013737  002250  002362          MOV     RLCS,GDDAT      ;SET UP ERROR DATA
 1096
 1097 014514                                  ERRSF   0.,EM1,ERR1     ;BUS TIMEOUT IN ADDRESSING RLCS
      014514  104454                          TRAP    C$ERSF
      014516  000000                          .WORD   0
      014520  004740                          .WORD   EM1
      014522  010176                          .WORD   ERR1
 1098 014524                          3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
      014524  104406                          TRAP    C$CLP1
 1099 014526                          ENDTST                          ;****END OF TEST****
      014526                          L10021:
      014 26  104401                          TRAP    C$ETST
 1100
 1101                                 .SBTTL  **TEST 2** - RLBA ADDRESSABILITY
 1102
 1103 014530                          BGNTST                          ;****START OF TEST****
 1104
 1105 014530                          STARS
                                      ;;*******************************************************************
 1106                                 ;TEST TO SEE IF WE CAN ADDRESS THE BUS ADDRESS
```

TEST 2 RLBA ADDRESSABILITY

```
                                        ;REGISTER.  IF WE TRAP WE WILL REPORT THE ERROR
                                        ;AND ABORT.  AFTER THIS TEST WE ONLY KNOW THAT
                                        ;WE CAN ADDRESS THE REGISTER.
014530                                  STARS
                                        ;;*****************************************************************
                                        1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
014534                                  2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET TO CATCH TRAP
014534  012746  000340                          MOV     #340,-(SP)
014540  012746  014232                          MOV     #TRPHAN,-(SP)
014544  013746  002340                          MOV     ERRVEC,-(SP)
014550  012746  000003                          MOV     #3,-(SP)
014554  104437                                  TRAP    C$SVEC
014556  062706  000010                          ADD     #10,SP

014562  005777  165464                          TST     @RLBA           ;ADDRESS RLBA
014566                                          CLRVEC  ERRVEC          ;RELEASE TRAP VECTOR
014566  013700  002340                          MOV     ERRVEC,R0
014572  104436                                  TRAP    C$CVEC
014574  005737  002326                          TST     TRPFLG          ;TRAP OCCURRED???
014600  001407                  M
BEQ     3$              ;NO, CONTINUE
014602  013737  002252  002362                  MOV     RLBA,GDDAT      ;GET UP ERROR DATA

014610                                          ERRSF   1.,EM2,ERR1     ;BUS TIMEOUT IN ADDRESSING RLBA
014610  104454                                  TRAP    C$ERSF
014612  000001                                  .WORD   1
014614  004765                                  .WORD   EM2
014616  010176                                  .WORD   ERR1
014620                                  3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
014620  104406                                  TRAP    C$CLP1
014622                                  ENDTST                          ;****END OF TEST****
014622                                  L10022:
014622  104401                                  TRAP    C$ETST

                                        .SBTTL  **TEST 3** - RLDA ADDRESSABILITY

014624                                  BGNTST                          ;****START OF TEST****
014624                                  STARS
                                        ;;*****************************************************************
                                        ;TEST TO SEE IF WE CAN ADDRESS THE DISK ADDRESS
                                        ;REGISTER IF WE TRAP WE WILL REPORT THE ERROR
                                        ;AND ABORT.  AFTER THIS TEST WE ONLY KNOW THAT
                                        ;WE CAN ADDRESS THE REGISTER.
014624                                  STARS
                                        ;;*****************************************************************

014624  005037  002326                  1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
014630                                  2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET TO CATCH TRAP
014630  012746  000340                          MOV     #340,-(SP)
014634  012746  014232                          MOV     #TRPHAN,-(SP)
014640  013746  002340                          MOV     ERRVEC,-(SP)
014644  012746  000003                          MOV     #3,-(SP)
014650  104437                                  TRAP    C$SVEC
014652  062706  000010                          ADD     #10,SP

014656  005777  165372                          TST     @RLDA           ;ADDRESS RLDA
014662                                          CLRVEC  ERRVEC          ;RELEASE TRAP VECTOR
```

```
**TEST 3**   RLDA ADDRESSABILITY

      014662  013700  002340                  MOV     ERRVEC,R0
      014666  104436                          TRAP    C$CVEC
 1140 014670  005737  002326                  TST     TRPFLG          ;TRAP OCCURRED???
 1141 014674  001407                          BEQ     3$              ;NO, CONTINUE
 1142
 1143 014676  013737  002254  002362          MOV     RLDA,GDDAT      ;SETUP ERROR INFO
 1144 014704                                  ERRSF   2.,EM3,ERR1     ;BUS TIMEOUT IN ADDRESSING RLDA
      014704  104454                          TRAP    C$ERSF
      014706  000002                          .WORD   2
      014710  005012                          .WORD   EM3
      014712  010176                          .WORD   ERR1
 1145 014714                          3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
      014714  104406                          TRAP    C$CLP1
 1146 014716                          ENDTST                          ;****END OF TEST****
      014716                          L10023:
      014716  104401                          TRAP    C$ETST
 1147
 1148                                 .SBTTL  **TEST 4** - RLMP ADDRESSABILITY
 1149
 1150 014720                          BGNTST                          ;****START OF TEST****
 1151 014720                          STARS
                                      ;;**************************************************************
 1152                                 ;TEST TO SEE IF WE CAN ADDRESS THE MULTIPURPOSE
 1153                                 ;REGISTER.  IF WE TRAP WE WILL REPORT THE ERROR AND
 1154                                 ;ABORT.  AFTER THIS TEST WE ONLY KNOW THAT WE CAN
 1155                                 ;ADDRESS THE REGISTER.
 1156 014720                          STARS
                                      ;;**************************************************************
 1157
 1158 014720  005037  002326          1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
 1159 014724                          2$:     SETVEC  ERRVEC,#TRPHAN,#340  ;SET UP TO CATCH TRAP
      014724  012746  000340                  MOV     #340,-(SP)
      014730  012746  014232                  MOV     #TRPHAN,-(SP)
      014734  013746  002340                  MOV     ERRVEC,-(SP)
      014740  012746  000003                  MOV     #3,-(SP)
      014744  104437                          TRAP    C$SVEC
      014746  062706  000010                  ADD     #10,SP
 1160
 1161 014752  005777  165300                  TST     @RLMP           ;ADDRESS RLMP
 1162 014756                                  CLRVEC  ERRVEC          ;RELEASE TRAP VECTOR
      014756  013700  002340                  MOV     ERRVEC,R0
      014762  104436                          TRAP    C$CVEC
 1163 014764  005737  002326                  TST     TRPFLG          ;TRAP OCCURRED???
 1164 014770  001407                          BEQ     3$              ;NO, CONTINUE
 1165 014772  013737  002256  002362          MOV     RLMP,GDDAT      ;SET UP ERROR INFO
 1166
 1167 015000                                  ERRSF   3.,EM4,ERR1     ;BUS TIMEOUT IN ADDRESSING RLMP
      015000  104454                          TRAP    C$ERSF
      015002  000003                          .WORD   3
      015004  005037                          .WORD   EM4
      015006  010176                          .WORD   ERR1
 1168 015010                          3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
      015010  104406                          TRAP    C$CLP1
 1169 015012          ENDTST                  ;****END OF TEST****
      015012                          L10024:
      015012  104401                          TRAP    C$ETST
 1170
```

```
                                .SBTTL  ••TEST 5•• - READ WRITE OF RLCS

015014                          BGNTST                          ;••••START OF TEST••••

015014                          STARS
                                ;;*************************************************************
                                ;TEST THAT WE CAN WRITE/READ BITS 8,9 AND BITS 6-1
                                ;OF THE CONTROL AND STATUS REGISTER.  BITS 15-10 AND 0
                                ;ARE DON'T CARE BITS AT THIS TIME AND BIT 7
                                ;(CONTROLLER READY) IS ALWAYS WRITTEN TO A ONE.
015014                          STARS
                                ;;*************************************************************

015014  012703  002772                  MOV     #CSPAT,R3       ;SET UP TABLE POINTER OF PATTERNS

015020                          BGNSEG                          ;••••START OF SEGMENT••••
015020  104404                          TRAP    C$BSEG

015022                          CSTEST:
015022  011337  002362                  MOV     (R3),GDDAT      ;GET PATTERN INTO GDDAT
015026  052737  000200  002362          BIS     #200,GDDAT      ;INSURE GO IS SET
015034  013777  002362  165206          MOV     GDDAT,@RLCS     ;LOAD RLCS (CONTROL AND STATUS)
015042  032777  040000  165200          BIT     #DERR,@RLCS     ;IF DRIVE ERROR PRESENT
015050  001403                          BEQ     99$             ;THEN EXPECT DRIVE AND
015052  052737  140000  002362          BIS     #ERR!DERR,GDDAT ;COMPOSITE ERROR
015060  017737  165164  002364  99$:    MOV     @RLCS,BDDAT     ;READ RLCS BACK
015066  042737  000001  002364          BIC     #DRDY,BDDAT     ;IGNORE DRIVE READY
015074  023737  002362  002364          CMP     GDDAT,BDDAT     ;DID WE READ WHAT WE LOADED
015102  001404                          BEQ     1$              ;YES, THEN BRANCH

015104                                  ERRDF   4.,EM5,ERR2     ;WRONG DATA IN RLCS
015104  1044••                          TRAP    C$ERDF
015106  000004                          .WORD   4
015110  005064                          .WORD   EM5
015112  010210                          .WORD   ERR2
015114                          1$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
015114  104410                          TRAP    C$ESCAPE
015116  000012                          .WORD   10000$-.

015120  005723                          TST     (R3)+           ;BUMP FOR NEXT PATTERN
015122  020327  003070                  CMP     R3,#CSEND       ;CHECK FOR END
015126  001335                          BNE     CSTEST          ;NOT END, LOAD NEXT PATTERN

015130                          ENDSEG                          ;••••END OF SEGMENT••••
015130                          10000$:
015130  104405                          TRAP    C$ESEG
015132                          ENDTST                          ;••••END OF TEST••••
015132                          L10025:
015132  104401                          TRAP    C$ETST

                                .SBTTL  ••TEST 6•• - READ WRITE OF RLBA

015134                          BGNTST                          ;••••START OF TEST••••

015134                          STARS
                                ;;*************************************************************
                                ;TEST THAT WE CAN WRITE/READ BITS 15-1 OF THE
```

TEST 6 READ WRITE OF RLBA

```
1214                                    ;BUS ADDRESS REGISTER.  FOUR PATTERNS ARE USED: GROWING 1, SHIFTING 1,
1215                                    ;GROWING 0 AND SHIFTING 0.  BIT 0 IS ALSO LOADED BUT
1216                                    ;SHOULD ALWAYS COME BACK AS 0
1217 015134                            STARS
                                        ;;*****************************************************************
1218
1219 015134  012703  002416                    MOV     #BEGPAT,R3      ;GET START OF PATTERN LIST
1220 015140                            BGNSEG                          ;****START OF SEGMENT****
     015140  104404                            TRAP    C$BSEG
1221  15142                            BATEST:
1222 015142  011337  002362                    MOV     (R3),GDDAT      ;GET PATTERN TO SEND
1223 015146  022737  000001  002410            CMP     #1,T.CNTLR              ;RL11??
1224 015154  002403                            BLT     2$              ;NO,
1225 015156  042737  000001  002362            BIC     #BIT0,GDDAT     ;KEEP RLBA EVEN (UNIBUS)
1226 015164  013777  002362  165060  2$:      MOV     GDDAT,@RLBA     ;LOAD PATTERN TO BUS ADDRESS
1227 015172  017737  165054  002364            MOV     @RLBA,BDDAT     ;READ IT BACK
1228 015200  023737  002362  002364            CMP     GDDAT,BDDAT     ;IS IT CORRECT?
1229 015206  001404                            BEQ     1$              ;IF SO, BRANCH
1230
1231 015210                                    ERRDF   5.,EM6,ERR2     ;DATA WRONG IN RLBA
     015210  104455                            TRAP    C$ERDF
     015212  000005                            .WORD   5
     015214  005135                            .WORD   EM6
     015216  010210                            .WORD   ERR2
1232 015220                            1$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
     015220  104410                            TRAP    C$ESCAPE
     015222  000012                            .WORD   10000$-.
1233 015224  005723                            TST     (R3)+           ;BUMP FOR NEXT PATTERN
1234 015226  020327  002624                    CMP     R3,#ENDPAT      ;CHECK FOR END
1235 015232  001343                            BNE     BATEST          ;NOT END, BRANCH FOR NEXT
1236
1237 015234                            ENDSEG                          ;****END OF SEGMENT****
     015234                            10000$:
     015234  104405                            TRAP    C$ESEG
1238 015236                            ENDTST                          ;****END OF TEST****
     015236                            L10026:
     015236  104401                            TRAP    C$ETST
1239
1240                                    .SBTTL  **TEST 7** - READ WRITE OF RLDA
1241
1242 015240                            BGNTST                          ;****START OF TEST****
1243
1244 015240                            STARS
                                        ;;*****************************************************************
1245                                    ;TEST THAT WE CAN WRITE/READ THE DISK ADDRESS REGISTER
1246                                    ;ALL BIT POSITIONS ARE WRITTEN USING FOUR PATTERNS:
1247                                    ;GROWING 1, SHIFTING 1, GROWING 0 AND SHIFTING 0
1248 015240                            STARS
                                        ;;*****************************************************************
1249
1250 015240  012703  002416                    MOV     #BEGPAT,R3      ;SET UP POINTER TO PATTERN LIST
1251 015244                            BGNSEG                          ;****START OF SEGMENT****
     015244  104404                            TRAP    C$BSEG
1252 015246                            DATEST:
1253 015246  011337  002362                    MOV     (R3),GDDAT      ;GET PATTERN
1254 015252  013777  002362  164774            MOV     GDDAT,@RLDA     ;LOAD PATTERN IN DA
1255
```

TEST 7 READ WRITE OF RLDA

```
1256 015260  017737  164770  002364          MOV     @RLDA,BDDAT     ;READ PATTERN BACK
1257 015266  023737  002362  002364          CMP     GDDAT,BDDAT     ;IS IT CORRECT?
1258 015274  001404                          BEQ     1$              ;BRANCH IF CORRECT
1259
1260 015276                                  ERRDF   6.,EM7,ERR2     ;WRONG DATA IN RLDA
     015276  104455                          TRAP    C$ERDF
     015300  000006                          .WORD   6
     015302  005163                          .WORD   EM7
     015304  010210                          .WORD   ERR2
1261 015306                          1$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
     015306  104410                          TRAP    C$ESCAPE
     015310  000012                          .WORD   10000$-.
1262
1263 015312  005723                          TST     (R3)+           ;BUMP POINTER
1264 015314  020327  002624                  CMP     R3,@ENDPAT      ;AT END OF PATTERNS?
1265 015320  001352                          BNE     DATEST          ;NO, BRANCH BACK
1266
1267 015322                          ENDSEG                          ;****END OF SEGMENT****
     015322                          10000$:
     015322  104405                          TRAP    C$ESEG
1268 015324                          ENDTST                          ;****END OF TEST****
     015324                          L10027:
     015324  104401                          TRAP    C$ETST
1269
1270                                 .SBTTL  **TEST 8** - BIS OF RLCS
1271
1272 015326                          BGNTST                          ;****START OF TEST****
1273 015326                          STARS
                                     ;;**********************************************************************
1274                                 ;TEST THAT WE CAN USE THE "BIS" INSTRUCTION ON THE CONTROL
1275                                 ;AND STATUS REGISTER.  BITS 8,9 AND 6-1 ARE TESTED TO
1276                                 ;SET INDIVIDUALLY AS WELL AS COLLECTIVELY WITHOUT DESTROYING
1277                                 ;ANY PREVIOUS DATA PATTERN
1278 015326                          STARS
                                     ;;**********************************************************************
1279
1280 015326  012703  002772                  MOV     @CSPAT,R3       ;GET BEGINNING OF LIST
1281 015332                          BGNSEG                          ;****START OF SEGMENT****
     015332  104404                          TRAP    C$BSEG
1282 015334                          1$:
1283 015334  012777  000200  164706          MOV     @CRDY,@RLCS     ;INSURE GO IS THERE
1284 015342  011337  002362                  MOV     (R3),GDDAT      ;SET UP EXPECTED RLCS
1285 015346  052737  000200  002362          BIS     @CRDY,GDDAT     ;IN GDDAT
1286 015354  051377  164670                  BIS     (R3),@RLCS      ;BIT SET PATTERN IN RLCS
1287 015360  032777  040000  164662          BIT     @DERR,@RLCS     ;IF ERROR BIT SET THEN
1288 015366  001403                          BEQ     99$             ;EXPECT IT ON THE READ
1289 015370  052737  140000  002362          BIS     @ERR!DERR,GDDAT ;BACK
1290 015376  017737  164646  002364  99$:    MOV     @RLCS,BDDAT     ;READ RLCS TO CHECK "BIS"
1291 015404  042737  000001  002364          BIC     @DRDY,BDDAT     ;CLEAR OUT DRIVE READY
1292 015412  023737  002364  002362          CMP     BDDAT,GDDAT     ;DID BIS WORK?
1293 015420  001404                          BEQ     2$              ;BRANCH IF OKAY
1294
1295 015422                                  ERRDF   7.,EM61,ERR2    ;WRONG DATA IN RLCS
     015422  104455                          TRAP    C$ERDF
     015424  000007                          .WORD   7
     015426  006660                          .WORD   EM61
     015430  010210                          .WORD   ERR2
```

```
**TEST 8**   BIS OF RLCS

1296 015432                          2$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
     015432  104410                          TRAP    C$ESCAPE
     015434  000012                          .WORD   10000$-.
1297                                                                 ;BIT OR CLEARED OTHER BIT
1298
1299 015436  005723                          TST     (R3)+           ;GET NEXT PATTERN
1300 015440  022703  003070                  CMP     #CSEND,R3       ;AT END OF LIST
1301 015444  001333                          BNE     1$              ;NO GO BACK FOR TEST OF
1302                                                                 ;NEXT PATTERN
1303 015446                          ENDSEG                          ;****END OF SEGMENT****
     015446                          10000$:
     015446  104405                          TRAP    C$ESEG
1304 015450                          ENDTST                          ;****END OF TEST****
     015450                          L10030:
     015450  104401                          TRAP    C.ETST
1305
1306                                 .SBTTL  **TEST 9** - BIC OF RLCS
1307
1308 015452                          BGNTST                          ;****START OF TEST****
1309
1310 015452                          STARS
                                     ;;**********************************************************************
1311                                 ;TEST THAT THE "BIC" INSTRUCTION WILL WORK ON THE
1312                                 ;CONTROL AND STATUS REGISTER.  BITS 8-9 AND 6-1 ARE
1313                                 ;TESTED.
1314 015452                          STARS
                                     ;;**********************************************************************
1315
1316 015452  012703  002772                  MOV     #CSPAT,R3       ;GET BEGINNING OF PATTERNS
1317 015456                          BGNSEG                          ;****START OF SEGMENT****
     015456  104404                          TRAP    C$BSEG
1318 015460                          1$:
1319 015460  012777  001776  164562          MOV     #1776,@RLCS     ;SET ALL SETTABLE BITS
1320 015466  012737  001776  002362          MOV     #1776,GDDAT     ;SET UP EXPECT DATA IN
1321 015474  041337  002362                  BIC     (R3),GDDAT      ;GDDAT
1322 015500  041377  164544                  BIC     (R3),@RLCS      ;CLEAR BITS IN RLCS VIA "BIC"
1323 015504  032777  040000  164536          BIT     #DERR,@RLCS     ;IF DRIVE ERROR BIT SET
1324 015512  001403                          BEQ     99$             ;EXPECT IT SET WHEN WE
1325 015514  052737  140000  002362          BIS     #ERR!DERR,GDDAT ;READ IT BACK
1326 015522  017737  164522  002364  99$:    MOV     @RLCS,BDDAT     ;MOVE RLCS TO BDDAT FOR COMPARE
1327 015530  042737  000001  002364          BIC     #DRDY,BDDAT     ;CLEAR DRIVE READY
1328 015536  023737  002364  002362          CMP     BDDAT,GDDAT     ;DID "BIC" WORK PROPERLY
1329 015544  001404                          BEQ     2$              ;BRANCH IF OKAY
1330
1331 015546                          ERRDF   8.,EM62,ERR2            ;WRONG DATA IN RLCS
     015546  104455                          TRAP    C$ERDF
     015550  000010                          .WORD   8
     015552  006741                          .WORD   EM62
     015554  010210                          .WORD   ERR2
1332 015556                          2$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
     015556  104410                          TRAP    C$ESCAPE
     015560  000012                          .WORD   10000$-.
1333
1334 015562  005723                          TST     (R3)+           ;GET NEXT PATTERN
1335 015564  020327  003070                  CMP     R3,#CSEND       ;AT END OF LIST
1336 015570  001333                          BNE     1$              ;NO, GO BACK WITH NEXT PATTERN
1337 015572                          ENDSEG                          ;****END OF SEGMENT****
```

```
**TEST 9**   BIC OF RLCS

        015572                          10000$:
        015572  104405                          TRAP    C$ESEG
  1338  015574                          ENDTST                          ;****END OF TEST****
        015574                          L10031:
        015574  104401                          TRAP    C$ETST
  1339
  1340                                  .SBTTL  **TEST 10** - BIS OF RLBA
  1341
  1342  015576                          BGNTST                          ;****START OF TEST****
  1343
  1344  015576                          STARS
                                        ;;*****************************************************************
  1345                                  ;TEST THAT THE "BIS" INSTRUCTION WILL WORK ON THE BUS
  1346                                  ;ADDRESS REGISTER.  BITS 15-0 ARE LOADED, ONLY BITS 15-1
  1347                                  ;ARE EXPECTED BACK.  FOUR PATTERNS ARE USED: GROWING 1, SHIFTING 1,
  1348                                  ;GROWING 0, AND SHIFTING 0.
  1349  015576                          STARS
                                        ;;*****************************************************************
  1350
  1351  015576  012703  002416                 MOV     #BEGPAT,R3      ;GET START OF LIST
  1352  015602                          BGNSEG                          ;****START OF SEGMENT****
        015602  104404                          TRAP    C$BSEG
  1353  015604                          1$:
  1354  015604  005077  164442                 CLR     @RLBA           ;CLEAR "BA"
  1355  015610  011337  002362                 MOV     (R3),GDDAT      ;SET EXPECTED
  1356  015614  022737  000001  002410         CMP     #1,T.CNTLR              ;RL11
  1357  015622  002403                         BLT     3$              ;NO
  1358  015624  042737  000001  002362         BIC     #1,GDDAT        ;BIT 0 CAN'T SET IN RLBA (UNIBUS)
  1359  015632  051377  164414          3$:    BIS     (R3),@RLBA      ;BIS RLBA WITH PATTERN
  1360  015636  017737  164410  002364         MOV     @RLBA,BDDAT     ;READ "BA"
  1361  015644  023737  002364  002362         CMP     BDDAT,GDDAT     ;DID RLBA LOAD PROPERLY?
  1362  015652  001404                         BEQ     2$              ;BRANCH IF YES
  1363
  1364  015654                                 ERRDF   9.,EM63,ERR2    ;WRONG DATA IN RLBA
        015654  104455                          TRAP    C$ERDF
        015656  000011                          .WORD   9
        015660  007024                          .WORD   EM63
        015662  010210                          .WORD   ERR2
  1365  015664                          2$:    ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
        015664  104410                          TRAP    C$ESCAPE
        015666  000012                          .WORD   10000$-.
  1366
  1367  015670  005723                         TST     (R3)+           ;GET NEXT PATTERN
  1368  015672  020327  002624                 CMP     R3,#ENDPAT      ;DID WE COMPLETE LIST
  1369  015676  001342                         BNE     1$              ;NO, GO BACK FOR NEXT.
  1370  015700                          ENDSEG                          ;****END OF SEGMENT****
        015700                          10000$:
        015700  104405                          TRAP    C$ESEG
  1371  015702                          ENDTST                          ;****END OF TEST****
        015702                          L10032:
        015702  104401                          TRAP    C$ETST
  1372
  1373                                  .SBTTL  **TEST 11** - BIC OF RLBA
  1374
  1375  015704                          BGNTST                          ;****START OF TEST****
  1376
  1377  015704                          STARS
```

```
                                        ;;*****************************************************************
                                        ;TEST THAT THE "BIC" INSTRUCTION WILL WORK ON THE BUS
                                        ;ADDRESS REGISTER.  BITS 15-1 ARE TESTED WITH 4 PATTERNS
                                        ;GROWING 1, SHIFTING 1, GROWING 0 AND SHIFTING 0.
                                        STARS
                                        ;;*****************************************************************

016704  012703  002416                  MOV     #BEGPAT,R3      ;GET START OF LIST
016710                                  BGNSEG                  ;****START OF SEGMENT****
016710  104404                          TRAP    C$BSEG
016712                                  1$:
016712  012777  177776  164332          MOV     #-2,@RLBA       ;SET RLBA TO ALL 1'S (BIT 0=0)
016720  012737  177776  002362          MOV     #-2,GDDAT       ;SET UP EXPECTED RESULTS
016726  041337  002362                  BIC     (R3),GDDAT      ;IN GDDAT
016732  041377  164314                  BIC     (R3),@RLBA      ;BIC RLBA
016736  017737  164310  002364          MOV     @RLBA,BDDAT     ;READ RLBA
016744  023737  002364  002362          CMP     BDDAT,GDDAT     ;BIC WORK OKAY?
016752  001404                          BEQ     2$              ;IF YES BRANCH

016754                                  ERRDF   10.,EM64,ERR2   ;WRONG DATA IN RLBA
016754  104455                          TRAP    C$ERDF
016756  000012                          .WORD   10
016760  007105                          .WORD   EM64
016762  010210                          .WORD   ERR2
016764                                  2$:     ESCAPE  SEG     ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
016764  104410                          TRAP    C$ESCAPE
016766  000012                          .WORD   10000$-.

016770  005723                          TST     (R3)+           ;GET NEXT PATTERN
016772  020327  002624                  CMP     R3,#ENDPAT      ;HAVE WE COMPLETED LIST
016776  001345                          BNE     1$              ;NO, GO BACK FOR NEXT
016000                                  ENDSEG                  ;****END OF SEGMENT****
016000                                  10000$:
016000  104405                          TRAP    C$ESEG
016002                                  ENDTST                  ;****END OF TEST****
016002                                  L10033:
016002  104401                          TRAP    C$ETST

                                        .SBTTL  **TEST 12** - BIS OF RLDA

016004                                  BGNTST                  ;****START OF TEST****

016004                                  STARS
                                        ;;*****************************************************************
                                        ;TEST THAT THE "BIS" INSTRUCTION WILL WORK ON THE DISK ADDRESS
                                        ;REGISTER.  BITS 15-0 ARE TESTED WITH 4 PATTERNS, GROWING 1,
                                        ;SHIFTING 1, GROWING 0, AND SHIFTING 0.
                                        STARS
                                        ;;*****************************************************************

016004  012703  002416                  MOV     #BEGPAT,R3      ;GET START OF LIST
016010                                  BGNSEG                  ;****START OF SEGMENT****
016010  104404                          TRAP    C$BSEG
016012                                  1$:
016012  005077  164236                  CLR     @RLDA           ;CLEAR "DA"
016016  011337  002362                  MOV     (R3),GDDAT      ;SET EXPECTED
016022  051377  164226                  BIS     (R3),@RLDA      ;BIS RLDA
```

```
**TEST 12** - BIS OF RLDA

1419 016026  017737  164222  002364          MOV     @RLDA,BDDAT     ;READ RLDA
1420 016034  023737  002364  002362          CMP     BDDAT,GDDAT     ;IS RLDA CORRECT
1421 016042  001404                          BEQ     2$              ;IF OKAY BRANCH
1422
1423 016044                                  ERRDF   11.,EM65,ERR2   ;WRONG DATA IN RLDA
     016044  104455                          TRAP    C$ERDF
     016046  000013                          .WORD   11
     016050  007170                          .WORD   EM65
     016052  010210                          .WORD   ERR2
1424 016054                          2$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
     016054  104410                          TRAP    C$ESCAPE
     016056  000012                          .WORD   10000$-.
1425
1426 016060  005723                          TST     (R3)+           ;GET NEXT PATTERN
1427 016062  020327  002624                  CMP     R3,#ENDPAT      ;HAVE WE FINISHED?
1428 016066  001351                          BNE     1$              ;NO GO BACK
1429 016070                          ENDSEG                          ;****END OF SEGMENT****
     016070                          10000$:
     016070  104405                          TRAP    C$ESEG
1430 016072                          ENDTST                          ;****END OF TEST****
     016072                          L10034:
     016072  104401                          TRAP    C$ETST
1431
1432                                 .SBTTL  **TEST 13** - BIC OF RLDA
1433
1434 016074                          BGNTST                          ;****START OF TEST****
1435
1436 016074                          STARS
                                     ;;*****************************************************************
1437                                 ;TEST THAT THE "BIC" INSTRUCTION WORKS ON THE DISK
1438                                 ;ADDRESS REGISTER.  ALL BITS ARE TESTED WITH FOUR
1439                                 ;PATTERNS: GROWING 1, SHIFTING 1, GROWING 0 AND SHIFTING 0
1440 016074                          STARS
                                     ;;*****************************************************************
1441
1442 016074  012703  002416                  MOV     #BEGPAT,R3      ;GET START OF LIST
1443 016100                          BGNSEG                          ;****START OF SEGMENT****
     016100  104404                          TRAP    C$BSEG
1444 016102                          1$:
1445 016102  012777  177777  164144          MOV     #-1,@RLDA       ;SET RLDA TO ALL 1'S
1446 016110  012737  177777  002362          MOV     #-1,GDDAT       ;SET EXPECTED DATA
1447 016116  041337  002362                  BIC     (R3),GDDAT      ;SET EXPECTED DATA
1448 016122  041377  164126                  BIC     (R3),@RLDA      ;"BIC" RLDA
1449 016126  017737  164122  002364          MOV     @RLDA,BDDAT     ;READ RLDA
1450 016134  023737  002362  002364          CMP     GDDAT,BDDAT     ;DID "BIC" WORK?
1451 016142  001404                          BEQ     2$              ;IF IT DID BRANCH
1452
1453 016144                                  ERRDF   12.,EM66,ERR2   ;WRONG DATA IN RLDA
     016144  104455                          TRAP    C$ERDF
     016146  000014                          .WORD   12
     016150  007251                          .WORD   EM66
     016152  010210                          .WORD   ERR2
1454 016154                          2$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
     016154  104410                          TRAP    C$ESCAPE
     016156  000012                          .WORD   10000$-.
1455
1456 016160  005723                          TST     (R3)+           ;GET NEXT PATTERN
```

TEST 13 - BIC OF RLDA

```
1457 016162  020327  002624                 CMP     R3,#ENDPAT      ;DONE?
1458 016166  001345                         BNE     1$              ;NO GO BACK
1459 016170                         ENDSEG                          ;****END OF SEGMENT****
     016170                         10000$:
     016170  104405                         TRAP    C$ESEG
1460 016172                         ENDTST                          ;****END OF TEST****
     016172                         L10035:
     016172  104401                         TRAP    C$ETST
1461
1462                                .SBTTL  **TEST 14** - BUS RESET OF RLCS
1463
1464 016174                         BGNTST                          ;****START OF TEST****
1465
1466 016174                         STARS
                                    ;;**************************************************************
1467                                ;TEST THAT A BUS RESET WILL CLEAR THE PROPER BITS
1468                                ;OF THE CONTROL AND STATUS REGISTER.  THOSE BITS ARE
1469                                ;BITS 6-1,8,9,10,11,12,13,15.  BIT 15 WILL CLEAR ONLY
1470                                ;IF BIT 14 (DRIVE ERROR IS NOT SET).  BIT 0 (DRIVE READY)
1471                                ;IS A DON'T CARE.  IF AT THE START UP THIS TEST BIT
1472                                ;14 (DRIVE ERROR) IS SET WE WILL INSIST IF IS THERE AFTER
1473                                ;THE "RESET" ALONG WITH BIT 15 (COMPOSITE ERROR).  BITS
1474                                ;15-10 ARE NOT WRITEABLE.
1475 016174                         STARS
                                    ;;**************************************************************
1476
1477                                ;       SETPRI  #PRI07          ;PRIORITY TO SEVEN              ;JSD REV A
1478 016174                                 SETPRI  #PRI06          ;PRIORITY TO SIX                ;JSD REV A
     016174  012700  000300                 MOV     #PRI06,R0
     016200  104441                         TRAP    C$SPRI
1479 016202  012777  000377  164040         MOV     #377,@RLCS      ;LOAD ALL RLCS LOADABLE BITS
1480 016210  012737  000200  002362         MOV     #CRDY,GDDAT     ;SETUP EXPECTED
1481 016216  032777  040000  164024         BIT     #DERR,@RLCS     ;DRIVE ERR SET?
1482 016224  001403                         BEQ     1$              ;IF NOT DON'T EXPECT IT
1483 016226  052737  140000  002362         BIS     #DERR!ERR,GDDAT  ;IT'S SET, INIT BETTER NOT CLR
1484 016234  012700  000100         1$:     MOV     #100,R0         ;SET UP A WAIT LOOP
1485 016240                                 BRESET                  ;BUS RESET
     016240  104433                         TRAP    C$RESET
1486 016242  005300                 2$:     DEC     R0              ;WAIT IN CASE OF DRIVE ERROR
1487 016244  001376                         BNE     2$              ;
1488 016246  017737  163776  002364         MOV     @RLCS,BDDAT     ;READ RLCS
1489 016254  042737  000001  002364         BIC     #DRDY,BDDAT     ;CLEAR OUT DRDY - DON'T CARE
1490 016262  023737  002364  002362         CMP     BDDAT,GDDAT     ;DID INIT WORK
1491 016270  001404                         BEQ     3$              ;YES, BRANCH
1492
1493 016272                                 ERRDF   13.,EM67,ERR2   ;WRONG DATA IN RLCS
     016272  104455                         TRAP    C$ERDF
     016274  000015                         .WORD   13
     016276  007334                         .WORD   EM67
     016300  010210                         .WORD   ERR2
1494 016302                         3$:
1495 016302                         ENDTST                          ;****END OF TEST****
     016302                         L10036:
     016302  104401                         TRAP    C$ETST
1496
1497                                .SBTTL  **TEST 15** - BUS RESET OF RLBA
1498
```

TEST 15 BUS RESET OF .LBA

```
1499 016304                            BGNTST                          ;****START OF TEST****
1500
1501 016304                            STARS
                                       ;;*****************************************************************
1502                                   ;TEST THAT A BUS RESET WILL CLEAR THE ENTIRE
1503                                   ;BUS ADDRESS REGISTER.  THE BUS ADDRESS IS LOADED WITH 177776
1504                                   ;AND IS EXPECTED TO BE ZERO AFTER THE RESET
1505 016304                            STARS
                                       ;;*****************************************************************
1506
1507 016304  012777  177776  163740          MOV     #-2,@RLBA       ;SET BA TO ALL 1'S
1508 016312  022737  000001  002410          CMP     #1,T.CNTLR              ;RL11??
1509 016320  002403                          BLT     2$              ;NO
1510 016322  052777  000001  163722          BIS     #1,@RLBA
1511 016330  005037  002362          2$:     CLR     GDDAT           ;CLEAR EXPECTED DATA
1512 016334                                  BRESET                  ;ISSUE BUS INIT
     016334  104433                          TRAP    C$RESET
1513 016336  017737  163710  002364          MOV     @RLBA,BDDAT     ;READ RLBA
1514 016344  001404                          BEQ     1$              ;IF CLEAR BRANCH
1515
1516 016346                                  ERRDF   14.,EM70,ERR2   ;WRONG DATA IN RLBA
     016346  104455                          TRAP    C$ERDF
     016350  000016                          .WORD   14
     016352  007371                          .WORD   EM70
     016354  010210                          .WORD   ERR2
1517 016356                            1$:
1518
1519 016356                            ENDTST                          ;****END OF TEST****
     016356                            L10037:
     016356  104401                          TRAP    C$ETST
1520
1521                                   .SBTTL  **TEST 16** - BUS RESET OF RLDA
1522
1523 016360                            BGNTST                          ;****START OF TEST****
1524
1525 016360                            STARS
                                       ;;*****************************************************************
1526                                   ;TEST THAT A BUS RESET WILL CLEAR THE ENTIRE
1527                                   ;DISK ADDRESS REGISTER.  THE DISK ADDRESS IS LOADED WITH 177777
1528                                   ;AND IS EXPECTED TO BE ZERO AFTER THE RESET.
1529 016360                            STARS
                                       ;;*****************************************************************
1530
1531 016360  012777  177777  163666          MOV     #-1,@RLDA       ;SET DA TO ALL 1'S
1532 016366  005037  002362                  CLR     GDDAT           ;CLEAR EXPECTED
1533 016372                                  BRESET                  ;ISSUE BUS INIT
     016372  104433                          TRAP    C$RESET
1534 016374  017737  163654  002364          MOV     @RLDA,BDDAT     ;READ RLDA
1535 016402  001404                          BEQ     1$              ;IF CLEAR BRANCH
1536
1537 016404                                  ERRDF   15.,EM71,ERR2   ;WRONG DATA IN RLDA
     016404  104455                          TRAP    C$ERDF
     016406  000017                          .WORD   15
     016410  007426                          .WORD   EM71
     016412  010210                          .WORD   ERR2
1538 016414                            1$:
1539
```

```
**TEST 16**   BUS RESET OF RLDA

1540 016414                          ENDTST                          ;****END OF TEST****
     016414                          L10040:
     016414  104401                          TRAP    C$ETST
1541
1542                                 .SBTTL  **TEST 17** - UNIQUENESS OF RLCS
1543
1544 016416                          BGNTST                          ;****START OF TEST****
1545
1546 016416                          STARS
                                     ;;*************************************************************
1547                                 ;TEST THE UNIQUENESS OF THE CONTROL AND STATUS
1548                                 ;REGISTER.  THE RLBA AND RLDA ARE PRELOADED WITH
1549                                 ;177776 AND 177777 RESPECTIVELY.  THE RLCS IS THEN
1550                                 ;LOADED TO INSURE THAT NEITHER THE RLBA OR RLDA
1551                                 ;ARE MODIFIED BY THE WRITING OF THE RLCS.
1552 016416                          STARS
                                     ;;*************************************************************
1553
1554 016416  012737  000201  002332          MOV     #DRDY!CRDY,@LDCSR       ;SET DRIVE AND CONTROLLER READY
1555 016424  012777  177776  163620          MOV     #-2,@RLBA               ;SET RLBA TO ALL 1'S
1556 016432  012777  177777  163614          MOV     #-1,@RLDA               ;SET RLDA TO ALL 1'S
1557 016440  013777  002332  163602          MOV     LDCSR,@RLCS             ;WRITE RLCS
1558
1559                                 ;CHECK THAT RLBA REMAINS UNAFFECTED
1560
1561 016446  022777  177776  163576          CMP     #-2,@RLBA       ;RLBA OKAY?
1562 016454  001412                          BEQ     1$              ;YES, GO CHECK DA
1563
1564 016456  012737  177776  002362          MOV     #-2,GDDAT       ;SET UP EXPECTED
1565 016464  017737  163562  002364          MOV     @RLBA,BDDAT     ;READ RLBA
1566
1567 016472                                  ERRDF   16.,EM72,ERR2   ;CS MODIFIED BA
     016472  104455                          TRAP    C$ERDF
     016474  000020                          .WORD   16
     016476  007463                          .WORD   EM72
     016500  010210                          .WORD   ERR2
1568 016502                          1$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
     016502  104406                          TRAP    C$CLP1
1569
1570 016504  022777  177777  163542          CMP     #-1,@RLDA       ;RLDA OKAY?
1571 016512  001412                          BEQ     2$              ;YES, CONTINUE
1572
1573 016514  012737  177777  002362          MOV     #-1,GDDAT       ;SET UP EXPECTED
1574 016522  017737  163526  002364          MOV     @RLDA,BDDAT     ;READ DA
1575
1576 016530                                  ERRDF   17.,EM73,ERR2   ;CS MODIFIED DA
     016530  104455                          TRAP    C$ERDF
     016532  000021                          .WORD   17
     016534  007516                          .WORD   EM73
     016536  010210                          .WORD   ERR2
1577 016540                          2$:
1578
1579 016540                          ENDTST                          ;****END OF TEST****
     016540                          L10041:
     016540  104401                          TRAP    C$ETST
1580
1581                                 .SBTTL  **TEST 18** - UNIQUENESS OF RLBA
```

••TEST 18•• - UNIQUENESS OF RLBA

```
1582
1583 016542                            BGNTST                          ;****START OF TEST****
1584 016542                            STARS
                                       ;;*************************************************************
1585                                   ;TEST THE UNIQUENESS OF THE BUS ADDRESS REGISTER.  THE
1586                                   ;RLCS AND RLDA ARE LOADED WITH XXX20X AND 177777
1587                                   ;RESPECTIVELY.  THE RLBA IS THEN WRITTEN TO INSURE
1588                                   ;THAT NEITHER THE RLCS OR RLDA ARE MODIFIED
1589                                   ;BY WRITING THE RLBA.
1590 016542                            STARS
                                       ;;*************************************************************
1591
1592 016542  012737  000200  002362            MOV     #CRDY,GDDAT     ;CONTROLLER READY
1593 016550  032777  040000  163472            BIT     #DERR,@RLCS     ;IF DRIVE ERROR IS
1594 016556  001403                            BEQ     99$             ;SET THEN EXPECT IT
1595 016560  052737  140000  002362            BIS     #ERR!DERR,GDDAT ;SET WHEN WE READ IT.
1596 016566  013777  002362  163454  99$:     MOV     GDDAT,@RLCS     ;LOAD RLCS
1597 016574  012777  177777  163452            MOV     #-1,@RLDA       ;LOAD RLDA
1598 016602  005077  163444                    CLR     @RLBA           ;CLEAR RLBA
1599
1600                                   ;CHECK IF RLCS IS OKAY
1601
1602 016606  017737  163436  002364            MOV     @RLCS,BDDAT     ;READ RLCS
1603 016614  042737  000001  002364            BIC     #DRDY,BDDAT     ;IGNORE DRIVE READY
1604 016622  023737  002364  002362            CMP     BDDAT,GDDAT     ;CS OK?
1605 016630  001404                            BEQ     1$              ;YES, GO CHECK DA
1606
1607 016632                                    ERRDF   18.,EM74,ERR2   ;BA MODIFIED CS
     016632  104455                            TRAP    C$ERDF
     016634  000022                            .WORD   18
     016636  007551                            .WORD   EM74
     016640  010210                            .WORD   ERR2
1608 016642                            1$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
     016642  104406                            TRAP    C$CLP1
1609
1610 016644  022777  177777  163402            CMP     #-1,@RLDA       ;IS RLDA OKAY?
1611
1612 016652  001412                            BEQ     2$              ;IF OKAY BRANCH
1613
1614 016654  012737  177777  002362            MOV     #-1,GDDAT       ;SET UP EXPECTED
1615 016662  017737  163366  002364            MOV     @RLDA,BDDAT     ;READ RLDA
1616
1617 016670                                    ERRDF   19.,EM75,ERR2   ;BA MODIFIED DA
     016670  104455                            TRAP    C$ERDF
     016672  000023                            .WORD   19
     016674  007603                            .WORD   EM75
     016676  010210                            .WORD   ERR2
1618 016700                            2$:
1619 016700                            ENDTST                          ;****END OF TEST****
     016700                            L10042:
     016700  104401                            TRAP    C$ETST
1620
1621                                   .SBTTL  ••TEST 19•• - UNIQUENESS OF RLDA
1622
1623 016702                            BGNTST                          ;****START OF TEST****
1624
1625 016702                            STARS
```

```
                                        ;;*****************************************************************
                                        ;TEST THE UNIQUENESS OF THE DISK ADDRESS REGISTER.  THE RLCS
                                        ;AND RLBA ARE LOADED WITH XXX20X AND 177776
                                        ;RESPECTIVELY.  THE RLDA IS THEN WRITTEN TO INSURE
                                        ;THAT NEITHER THE RLCS OR THE RLBA ARE MODIFIED
                                        ;BY WRITING THE RLDA.
1631 016702                             STARS
                                        ;;*****************************************************************
1632
1633 016702  012737  000200  002362          MOV     #CRDY,GDDAT     ;CONTROLLER READY
1634 016710  032777  040000  163332          BIT     #DERR,@RLCS     ;IF DRIVE ERROR SET
1635 016716  001403                          BEQ     99$             ;THEN EXPECT IT LATER
1636 016720  052737  140000  002362          BIS     #ERR!DERR,GDDAT
1637 016726  013777  002362  163314  99$:    MOV     GDDAT,@RLCS     ;LOAD CS
1638 016734  012777  177776  163310          MOV     #-2,@RLBA       ;LOAD BA WITH ALL 1'S
1639 016742  005077  163306                  CLR     @RLDA           ;CLEAR RLDA
1640
1641                                    ;CHECK IF RLCS IS OKAY
1642
1643 016746  017737  163276  002364          MOV     @RLCS,BDDAT     ;READ RLCS
1644 016754  042737  000001  002364          BIC     #DRDY,BDDAT     ;IGNORE DRIVE READY
1645 016762  023737  002362  002364          CMP     GDDAT,BDDAT     ;RLCS OKAY?
1646 016770  001404                          BEQ     1$              ;YES, THEN BRANCH
1647
1648 016772                                  ERRDF   20.,EM76,ERR2   ;DA MODIFIED CS
     016772  104455                          TRAP    C$ERDF
     016774  000024                          .WORD   20
     016776  007635                          .WORD   EM76
     017000  010210                          .WORD   ERR2
1649 017002                             1$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
     017002  104406                          TRAP    C$CLP1
1650
1651 017004  022777  177776  163240          CMP     #-2,@RLBA       ;IS RLBA OKAY?
1652 017012  001412                          BEQ     2$              ;BRANCH IF OKAY
1653
1654 017014  012737  177776  002362          MOV     #-2,GDDAT       ;SET UP EXPECTED
1655 017022  017737  163224  002364          MOV     @RLBA,BDDAT     ;READ RLBA
1656
1657 017030                                  ERRDF   21.,EM77,ERR2   ;DA MODIFIED BA
     017030  104455                          TRAP    C$ERDF
     017032  000025                          .WORD   21
     017034  007670                          .WORD   EM77
     017036  010210                          .WORD   ERR2
1658 017040                             2$:
1659
1660 017040                             ENDTST                          ;****END OF TEST****
     017040                             L10043:
     017040  104401                          TRAP    C$ETST
1661
1662                                    .SBTTL  ••TEST 20•• - UNIQUENESS OF RLMP
1663
1664 017042                             BGNTST                          ;****START OF TEST****
1665
1666 017042                             STARS
                                        ;;*****************************************************************
1667                                    ;TEST THE UNIQUENESS OF THE MULTI-PURPOSE REGISTER
1668                                    ;WE WILL WRITE THE RLCS, RLBA, AND THE RLDA, THEN THE
```

TEST 20 UNIQUENESS OF RLMP

```
1669                                    ;RLMP IS WRITTEN. WE THEN GO BACK AN VERIFY THE CONTENTS
1670                                    ;OF THE RLCS, RLBA, RLDA.
1671 017042                            STARS
                                        ;;**********************************************************************
1672
1673 017042  012737  000200  002362          MOV     #CRDY,GDDAT     ;CONTROLLER READY
1674 017050  032777  040000  163172          BIT     #DERR,@RLCS     ;IF DRIVE ERROR SET
1675 017056  001403                          BEQ     99$             ;THE EXPECT IT LATER
1676 017060  052737  140000  002362          BIS     #ERR!DERR,GD)AT
1677 017066  013777  002362  163154  99$:    MOV     GDDAT,@RLCS     ;LOAD CS
1678 017074  012777  177776  163150          MOV     #-2,@RLBA       ;LOAD BA WITH ALL 1'S
1679 017102  012777  177777  163144          MOV     #-1,@RLDA       ;LOAD RLDA
1680 017110  005077  163142                  CLR     @RLMP           ;WRITE RLMP
1681
1682                                    ;CHECK IF RLCS IS OKAY
1683
1684 017114  017737  163130  002364          MOV     @RLCS,BDDAT     ;READ RLCS
1685 017122  042737  000001  002364          BIC     #DRDY,BDDAT     ;IGNORE DRIVE READY
1686 017130  023737  002362  002364          CMP     GDDAT,BDDAT     ;RLCS OKAY?
1687 017136  001404                          BEQ     1$              ;YES, THEN BRANCH
1688
1689 017140                                  ERRDF   201.,EM44,ERR2  ;MP MODIFIED CS
     017140  104455                          TRAP    C$ERDF
     017142  000311                          .WORD   201
     017144  006204                          .WORD   EM44
     017146  010210                          .WORD   ERR2
1690 017150                            1$:   CKLOOP                  ;CHECK IF /FL:LOE IS SET
     017150  104406                          TRAP    C$CLP1
1691
1692 017152  022777  177776  163072          CMP     #-2,@RLBA       ;IS RLBA OKAY?
1693 017160  001412                          BEQ     2$              ;BRANCH IF OKAY
1694
1695 017162  012737  177776  002362          MOV     #-2,GDDAT       ;SET UP EXPECTED
1696 017170  017737  163056  002364          MOV     @RLBA,BDDAT     ;READ RLBA
1697
1698 017176                                  ERRDF   211.,EM45,ERR2  ;MP MODIFIED BA
     017176  104455                          TRAP    C$ERDF
     017200  000323                          .WORD   211
     017202  006237                          .WORD   EM45
     017204  010210                          .WORD   ERR2
1699 017206                            2$:   CKLOOP                  ;CHECK IF /FL:LOE IS SET
     017206  104406                          TRAP    C$CLP1
1700 017210  022777  177777  163036          CMP     #-1,@RLDA       ;DISK ADDRESS OKAY
1701 017216  001412                          BEQ     3$              ;YES, CONTINUE
1702
1703 017220  017737  163030  002364          MOV     @RLDA,BDDAT     ;SET UP BAD
1704 017226  012737  177777  002362          MOV     #-1,GDDAT       ;SET UP EXPECTED
1705
1706 017234                                  ERRDF   212.,EM46,ERR2  ;MP MODIFIED DA
     017234  104455                          TRAP    C$ERDF
     017236  000324                          .WORD   212
     017240  006272                          .WORD   EM46
     017242  010210                          .WORD   ERR2
1707
1708 017244                            3$:
1709
1710 017244                            ENDTST                        ;****END OF TEST****
```

TEST 20 UNIQUENESS OF RLMP

```
                017244                          L10044:
                017244  104401                          TRAP    C$ETST
1711
1712                                            .SBTTL  **TEST 21** - NOOP FUNCTION(RL11 ONLY)
1713
1714 017246                                     BGNTST                          ;****START OF TEST****
1715
1716 017246                                     STARS
                                                ;;*****************************************************************
1717                                            ;TEST THAT NOOP WILL FUNCTION.  WE WILL ISSUE THE
1718                                            ;NOOP AND WAIT FOR CONTROLLER READY TO SET.  A
1719                                            ;TIMEOUT OF 200 MILLISECS IS ALLOWED.  DRIVE 0 IS ALWAYS
1720                                            ;SELECTED SINCE THE DRIVE IS NOT NECESSARY.
1721 017246                                     STARS
                                                ;;*****************************************************************
1722
1723 017246  022737  000001  002410                    CMP     #1,T.CNTLR      ;RLV11, OR RLV12?
1724 017254  001010                                    BNE     99$             ;YES SKIP TEST
1725
1726 017256  004537  013446                            JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
1727 017262  000000                                    NOOP0                   ;NOOP(0) FUNCTION
1728 017264  004537  014334                            JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
1729 017270                                     2$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
                017270  104406                          TRAP    C$CLP1
1730
1731 017272  004537  013146                            JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
1732
1733 017276                                     99$:
1734 017276                                     ENDTST                          ;****END OF TEST****
                017276                          L10045:
                017276  104401                          TRAP    C$ETST
1735
1736                                            .SBTTL  **TEST 22** - TEST NOOP DOES NOTHING (RL11 ONLY)
1737
1738 017300                                     BGNTST                          ;****START OF TEST****
1739
1740 017300                                     STARS
                                                ;;*****************************************************************
1741                                            ;TEST THAT ISSUING A NOOP FUNCTION DOES NOTHING.  THIS IS DONE BY WRITING
1742                                            ;THE RLBA, AND RLDA, READING THE RLMP AND MAKING SURE NOTHING CHANGES.
1743 017300                                     STARS
                                                ;;*****************************************************************
1744
1745 017300  022737  000001  002410                    CMP     #1,T.CNTLR      ;RLV11, OR RLV12?
1746 017306  001076                                    BNE     3$              ;YES SKIP TEST.
1747
1748 017310  012777  000001  162736                    MOV     #1,@RLDA        ;LOAD DISK ADDRESS
1749 017316  012777  000002  162726                    MOV     #2,@RLBA        ;LOAD BUS ADDRESS
1750 017324  005077  162726                            CLR     @RLMP
1751 017330  017737  162722  002362                    MOV     @RLMP,GDDAT     ;READ RLMP
1752
1753 017336  004537  013446                            JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
1754 017342  000000                                    NOOP0
1755 017344  004537  014334                            JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
1756 017350                                            CKLOOP                  ;CHECK IF /FL:LOE IS SET
                017350  104406                          TRAP    C$CLP1
1757
```

```
**TEST 22** - TEST NOOP DOES NOTHING (RL11 ONLY)

1758 017352  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
1759 017356                                  ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
     017356  104410                          TRAP    C$ESCAPE
     017360  000124                          .WORD   L10046-.
1760
1761 017362  017737  162670  002364          MOV     @RLMP,BDDAT     ;READ RLMP
1762 017370  023737  002362  002364          CMP     GDDAT,BDDAT     ;RLMP OK?
1763 017376  001404                          BEQ     1$
1764
1765 017400                                  ERRDF   202.,EM14,ERR2
     017400  104455                          TRAP    C$ERDF
     017402  000312                          .WORD   202
     017404  005304                          .WORD   EM14
     017406  010210                          .WORD   ERR2
1766
1767 017410                          1$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
     017410  104406                          TRAP    C$CLP1
1768
1769 017412  012737  000002  002362          MOV     #2,GDDAT        ;SET UP EXP'D BA
1770 017420  017737  162626  002364          MOV     @RLBA,BDDAT     ;READ BA
1771 017426  023737  002362  002364          CMP     GDDAT,BDDAT     ;BA OK?
1772 017434  001404                          BEQ     2$              ;YES
1773
1774 017436                                  ERRDF   203.,EM15,ERR2
     017436  104455                          TRAP    C$ERDF
     017440  000313                          .WORD   203
     017442  005332                          .WORD   EM15
     017444  010210                          .WORD   ERR2
1775
1776 017446                          2$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
     017446  104406                          TRAP    C$CLP1
1777
1778 017450  012737  000001  002362          MOV     #1,GDDAT        ;SET UP EXP'D DA
1779 017456  017737  162572  002364          MOV     @RLDA,BDDAT     ;READ DA
1780 017464  023737  002362  002364          CMP     GDDAT,BDDAT     ;DA OKAY
1781 017472  001404                          BEQ     3$
1782
1783 017474                                  ERRDF   204.,EM16,ERR2
     017474  104455                          TRAP    C$ERDF
     017476  000314                          .WORD   204
     017500  005360                          .WORD   EM16
     017502  010210                          .WORD   ERR2
1784
1785 017504                          3$:
1786
1787 017504                          ENDTST                          ;****END OF TEST****
     017504                          L10046:
     017504  104401                          TRAP    C$ETST
1788
1789                                 .SBTTL  **TEST 23** - TEST OF INTERRUPT (RL11 ONLY)
1790
1791 017506                          BGNTST                          ;****START OF TEST****
1792
1793 017506                          STARS
                                     ;;*************************************************************
1794                                  ;CHECK THE INTERRUPT WITH A NOOP.  WE WILL SET UP THE
1795                                  ;INTERRUPT VECTOR, LOWER THE PSW TO ZERO AND ISSUE
```

```
1796                                    ;A NOOP.  THE INTERRUPT SERVICE ROUTINE WILL SET A
1797                                    ;FLAG UPON INTERRUPT AND RETURN IN LINE.  WE WAIT 200 MILLISECONDS
1798                                    ;LOOKING FOR THAT FLAG TO BE SET BEFORE CALLING IT
1799                                    ;AN ERROR.  IF THE INTERRUPT SENDS US TO ANOTHER
1800                                    ;VECTOR ADDRESS THEN THE ERROR HANDLER WILL REPORT
1801                                    ;"TRAP TO XXXX FROM YYYY" AND RETURN  TO DIAG SUP MONITOR.  IF THE
1802                                    ;INTERRUPT GOES TO ABOVE 1000 WHO KNOWS WHAT WILL HAPPEN.
1803 017506                            STARS
                                        ;;*****************************************************************
1804
1805 017506  022737  000001  002410            CMP     #1,T.CNTLR      ;RLV11 OR RLV12?
1806 017514  001026                            BNE     99$             ;YES SKIP TEST.
1807
1808 017516  005037  002330                    CLR     INTFLG          ;CLEAR INTERRUPT OCCURRENCE FLAG
1809 017522                                    SETPRI  #PRI00          ;SET PSW TO 0
     017522  012700  000000                    MOV     #PRI00,R0
     017526  104441                            TRAP    C$SPRI
1810 017530  004537  013446                    JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
1811 017534  000100                            NOOP0!INTEN             ;NOOP AND INTERRUPT ENABLE
1812 017536  004537  014334                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
1813 017542  005737  002330                    TST     INTFLG          ;DID INTERRUPT OCCUR
1814 017546  001004                            BNE     2$              ;IF SO BRANCH
1815 017550                                    ERRDF   22.,EM13,ERR0
     017550  104455                            TRAP    C$ERDF
     017552  000026                            .WORD   22
     017554  005252                            .WORD   EM13
     017556  010160                            .WORD   ERR0
1816 017560  005037  002330            2$:     CLR     INTFLG
1817 017564                                    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     017564  104406                            TRAP    C$CLP1
1818 017566  004537  013146                    JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
1819
1820 017572                            99$:
1821 017572                            ENDTST                          ;****END OF TEST****
     017572                            L10047:
     017572  104401                            TRAP    C$ETST
1822
1823                                    .SBTTL  **TEST 24** - TEST PRIORITY BR LEVEL
1824
1825 017574                            BGNTST                          ;****START OF TEST****
1826
1827 017574                            STARS
                                        ;;*****************************************************************
1828                                    ;TEST THAT PRIORITY GIVEN IS ACTUAL PRIORITY OF CONTROLLER.  WE KNOW
1829                                    ;THE BOARD WILL INTERRUPT.  WE WILL START TRYING TO INTERRUPT AT 6       ;JSD REV A
1830                                    ;AND WORK DOWN TIL IT DOES INTERRUPT.
1831 017574                            STARS
                                        ;;*****************************************************************
1832
1833 017574  022737  000001  002410            CMP     #1,T.CNTLR              ;RLV11 OR RLV12?
1834 017602  001056                            BNE     6$              ;YES, SKIP TEST
1835
1836                                    ;       MOV     #340,BDDAT      ;SET UP INITIAL OF 7            ;JSD REV A
1837 017604  012737  000300  002364            MOV     #300,BDDAT      ;SET UP INITIAL OF 6            ;JSD REV A
1838 017612  013737  002264  002362            MOV     BPRIOR,GDDAT    ;GET GIVEN PRIORITY
1839
1840 017620                            BGNSEG                          ;****START OF SEGMENT****
```

```
**TEST 24** - TEST PRIORITY BR LEVEL

      017620  104404                          TRAP    C$BSEG
1841
1842  017622  005037  002330          5$:     CLR     INTFLG          ;CLEAR INTERRUPT OCCURRENCE
1843  017626                                  SETPRI  BDDAT           ;SET PRIORITY
      017626  013700  002364                  MOV     BDDAT,R0
      017632  104441                          TRAP    C$SPRI
1844
1845  017634  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
1846  017640  000100                          NOOPO!INTEN
1847
1848  017642  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
1849  017646                                  ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
      017646  104410                          TRAP    C$ESCAPE
      017650  000070                          .WORD   L10050-.
1850
1851  017652  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
1852  017656                                  ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
      017656  104410                          TRAP    C$ESCAPE
      017660  000060                          .WORD   L10050-.
1853
1854  017662  023737  002364  002362          CMP     BDDAT,GDDAT     ;SHOULD IT INTERRUPT
1855  017670  002012                          BGE     1$              ;NO, BRANCH
1856
1857  017672  005737  C02330                  TST     INTFLG          ;DID INTERRUPT OCCUR
1858  017676  001004                          BNE     2$              ;YES, OK
1859
1860  017700                          3$:     ERRDF   204.,EM17,ERR7
      017700  104455                          TRAP    C$ERDF
      017702  000314                          .WORD   204
      017704  005406                          .WORD   EM17
      017706  010446                          .WORD   ERR7
1861
1862  017710                          2$:     ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
      017710  104410                          TRAP    C$ESCAPE
      017712  000014                          .WORD   10000$-.
1863  017714  000405                          BR      4$
1864  017716  005737  002330          1$:     TST     INTFLG          ;DID INTERRUPT OCCUR
1865  017722  001772                          BEQ     2$              ;NO, OK
1866  017724  000765                          BR      3$              ;YES, ERROR
1867
1868  017726                          ENDSEG                          ;****END OF SEGMENT****
      017726                          10000$:
      017726  104405                          TRAP    C$ESEG
1869  017730  162737  000040  002364  4$:     SUB     #40,BDDAT       ;NEXT LEVEL
1870  017736  100331                          BPL     5$
1871
1872  017740                          6$:
1873  017740                          ENDTST                          ;****END OF TEST****
      017740                          L10050:
      017740  104401                          TRAP    C$ETST
1874
1875                                  .SBTTL  **TEST 25** - GET STATUS FUNCTION
1876
1877  017742                          BGNTST                          ;****START OF TEST****
1878
1879  017742                          STARS
                                    ;;**********************************************************************
```

TEST 25 GET STATUS FUNCTION

```
                                        ;TEST GET STATUS FUNCTION.  THE GET STATUS FUNCTION WILL
                                        ;WORK IF DRIVE IS LOADED AND READY OR NOT.  THE RLDA
                                        ;IS LOADED WITH THE GET STATUS AND MARKER BITS (BITS 1,0)
                                        ;AND THE FUNCTION IS ISSUED.  WE WAIT 200 MILLISECONDS
                                        ;FOR CONTROLLER READY.  VERIFY THAT NO ERRORS OCCUR.
017742                                  STARS
                                        ;;*****************************************************************
017742  012777  000013  162304          MOV     #GSBIT!MK!DRST,@RLDA    ;SET GET STATUS AND MARKER BIT
017750  004537  013446                  JSR     R5,LDFUNC               ;ISSUE FUNCTION OF FOLLOWING WORD
017754  000004                          GSTAT                           ;GET STATUS
017756  004537  014334                  JSR     R5,WTCRDY               ;WAIT FOR CONTROLLER READY HIGH
017762                          2$:     CKLOOP                          ;CHECK IF /FL:LOE IS SET
017762  104406                          TRAP    C$CLP1
017764  004537  013146                  JSR     R5,CHERR                ;CHECK CONTROLLER FOR ERRORS
017770                          ENDTST                                  ;****END OF TEST****
017770                          L10051:
017770  104401                          TRAP    C$ETST
                                .SBTTL  **TEST 26** - GET STATUS FUNCTION INTERRUPT
017772                          BGNTST                                  ;****START OF TEST****
                                ;CHECK GET STATUS UNDER INTERRUPT
017772  005037  002330                  CLR     INTFLG                  ;CLEAR INTERRUPT OCCURANCE
017776                                  SETPRI  #PRI00                  ;PSW TO LEVEL 0
017776  012700  000000                  MOV     #PRI00,R0
020002  104441                          TRAP    C$SPRI
020004  012777  000003  162242          MOV     #GSBIT!MK,@RLDA ;SET UP DA
020012  004537  013446                  JSR     R5,LDFUNC               ;ISSUE FUNCTION OF FOLLOWING WORD
020016  000104                          GSTAT!INTEN                     ;GET STATUS, INT ENABLE
020020  004537  014334                  JSR     R5,WTCRDY               ;WAIT FOR CONTROLLER READY HIGH
                                ;       SETPRI  #PRI07                                                  ;JSD REV A
020024                                  SETPRI  #PRI06                                                  ;JSD REV A
020024  012700  000300                  MOV     #PRI06,R0
020030  104441                          TRAP    C$SPRI
020032  005737  002330                  TST     INTFLG                  ;DID INTERRUPT OCCUR
020036  001004                          BNE     2$                      ;YES-BRANCH
020040                                  ERRDF   28.,EM30,ERR0
020040  104455                          TRAP    C$ERDF
020042  000034                          .WORD   28
020044  005441                          .WORD   EM30
020046  010160                          .WORD   ERR0
020050                          2$:     CKLOOP                          ;CHECK IF /FL:LOE IS SET
020050  104406                          TRAP    C$CLP1
020052  004537  013146                  JSR     R5,CHERR                ;CHECK CONTROLLER FOR ERRORS
020056  005037  002330                  CLR     INTFLG                  ;CLEAR INTERRUPT OCCURANCE
020062                                  SETPRI  #PRI00                  ;PSW TO LEVEL 0
020062  012700  000000                  MOV     #PRI00,R0
020066  104441                          TRAP    C$SPRI
020070  012777  000003  162156          MOV     #GSBIT!MK,@RLDA ;SET UP DA FOR GET STATUS CMD
020076  004537  013446                  JSR     R5,LDFUNC               ;ISSUE FUNCTION OF FOLLOWING WORD
020102  000004                          GSTAT                           ;GET STATUS - SHOULD NOT CAUSE AN INTERRUPT
020104  004537  014334                  JSR     R5,WTCRDY               ;WAIT FOR CONTROLLER READY HIGH
```

TEST 26 GET STATUS FUNCTION INTERRUPT

```
1922                                    ;       SETPRI  #PRI07                                  ;JSD REV A
1923 020110                             ;       SETPRI  #PRI06                                  ;JSD REV A
     020110  012700  000300                     MOV     #PRI06,R0
     020114  104441                             TRAP    C$SPRI
1924 020116  005737  002330                     TST     INTFLG          ;DID INTERRUPT OCCUR (SHOULD NOT)
1925 020122  001404                             BEQ     3$              ;NO - BRANCH (OK)
1926 020124                                     ERRDF   281.,EM30A,ERR0
     020124  104455                             TRAP    C$ERDF
     020126  000431                             .WORD   281
     020130  005500                             .WORD   EM30A
     020132  010160                             .WORD   ERR0
1927 020134                             3$:     CKLOOP                          ;CHECK IF /FL:LOE IS SET
     020134  104406                             TRAP    C$CLP1
1928 020136  004537  013146                     JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
1929 020142                             ENDTST                          ;****END OF TEST****
     020142                             L10052:
     020142  104401                             TRAP    C$ETST
1930
1931                                    .SBTTL  **TEST 27** - GET STATUS FUNCTION GENERATES OPI W/O GS BIT
1932
1933 020144                             BGNTST                          ;****START OF TEST****
1934
1935 020144                             STARS
                                        ;;**************************************************************
1936                                    ;VERIFY THAT GET STATUS FUNCTION WILL NOT COMPLETE
1937                                    ;WITHOUT SENDING OUT THE GET STATUS BIT IN THE RLDA.
1938                                    ;WE SET MARKER BUT NO GET STATUS BIT IN THE RLDA AND
1939                                    ;ISSUE A GET STATUS WE SHOULD RECIEVE AN OPI ERROR.
1940                                    ;VERIFY THAT CONTROLLER READY SETS AND OPI SETS
1941 020144                             STARS
                                        ;;**************************************************************
1942
1943 020144  012777  000001  162102             MOV     #MK,@RLDA       ;SET ONLY MARKER BIT!!
1944 020152  004537  013446                     JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
1945 020156  000004                             GSTAT                   ;GET STATUS
1946 020160  004537  014334                     JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
1947 020164  032737  074000  002306             BIT #74000,E.CS
1948 020172  001405                             BEQ     1$
1949 020174  012737  004053  013430             MOV     #OPIERR,RESTMS
1950 020202  004537  013146                     JSR     R5,CHERR
1951 020206                             1$:     CKLOOP
     020206  104406                             TRAP    C$CLP1
1952 020210  032737  002000  002306             BIT     #OPI,E.CS       ;IS OPI SET?
1953 020216  001004                             BNE     2$              ;YES-BRANCH NO-CHECK TIMEOUT
1954 020220                                     ERRDF   29.,EM33,ERR0
     020220  104455                             TRAP    C$ERDF
     020222  000035                             .WORD   29
     020224  005574                             .WORD   EM33
     020226  010160                             .WORD   ERR0
1955 020230                             2$:
1956
1957 020230                             ENDTST                          ;****END OF TEST****
     020230                             L10053:
     020230  104401                             TRAP    C$ETST
1958
1959                                    .SBTTL  **TEST 28** - OPI UNDER INTERRUPT
1960
```

```
 1961 020232                            BGNTST                          ;****START OF TEST****
 1962 020232                            STARS
                                        ;;*************************************************************
 1963                                   ;FORCE AN OPI ERROR UNDER INTERRUPT TO VERIFY THAT
 1964                                   ;AN INTERRUPT WILL OCCUR FROM OPI.  THE OPI IS FORCED
 1965                                   ;USING A GET STATUS WITHOUT THE GET STATUS BIT SET
 1966                                   ;IN RLDA.
 1967 020232                            STARS
                                        ;;*************************************************************
 1968
 1969 020232                                    SETPRI  #PRI00
      020232  012700  000000                    MOV     #PRI00,R0
      020236  104441                            TRAP    C$SPRI
 1970 020240  005037  002330                    CLR     INTFLG
 1971 020244  012777  000001  162002            MOV     #MK,@RLDA       ;SET ONLY MARKER BIT!!
 1972 020252  004537  013446                    JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
 1973 020256  000104                            GSTAT!INTEN             ;GET STATUS
 1974 020260  004537  014334                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
 1975                                   ;       SETPRI  #PRI07                                  ;JSD REV A
 1976 020264                                    SETPRI  #PRI06                                  ;JSD REV A
      020264  012700  000300                    MOV     #PRI06,R0
      020270  104441                            TRAP    C$SPRI
 1977 020272  005737  002330                    TST     INTFLG          ;INTERRUPT OCCUR
 1978 020276  001004                            BNE     2$
 1979 020300                                    ERRDF   30.,EM11,ERR0
      020300  104455                            TRAP    C$ERDF
      020302  000036                            .WORD   30
      020304  005211                            .WORD   EM11
      020306  010160                            .WORD   ERR0
 1980 020310                            2$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
      020310  104406                            TRAP    C$CLP1
 1981 020312  032737  074000  002306            BIT     #74000,E.CS
 1982 020320  001405                            BEQ     1$
 1983 020322  012737  004053  013430            MOV     #OPIERR,RESTMS
 1984 020330  004537  013146                    JSR     R5,CHERR
 1985 020334                            1$:     CKLOOP
      020334  104406                            TRAP    C$CLP1
 1986 020336  032737  002000  002306            BIT     #OPI,E.CS       ;IS OPI SET?
 1987 020344  001004                            BNE     3$              ;YES-BRANCH NO-CHECK TIMEOUT
 1988 020346                                    ERRDF   31.,EM33,ERR0
      020346  104455                            TRAP    C$ERDF
      020350  000037                            .WORD   31
      020352  005574                            .WORD   EM33
      020354  010160                            .WORD   ERR0
 1989 020356                            3$:
 1990
 1991 020356                            ENDTST                          ;****END OF TEST****
      020356                            L10054:
      020356  104401                            TRAP    C$ETST
 1992
 1993                                   .SBTTL  **TEST 29** - READ HEADER FUNCTION
 1994
 1995 020360                            BGNTST                          ;****START OF TEST****
 1996 020360                            STARS
                                        ;;*************************************************************
 1997                                   ;CHECK THAT READ HEADER WORKS, THAT WE CAN ISSUE
 1998                                   ;IT, GET READY BACK WITHOUT ANY ERRORS SETTING.
```

```
020360                              STARS
                                    ;;*****************************************************************
020360  004537  013446                      JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
020364  000010                              RDHDR                   ;READ HEADER
020366  004537  014334                      JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH READY
020372                              2$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
020372  104406                              TRAP    C$CLP1
020374  004537  013146                      JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS

020400                              ENDTST                          ;****END OF TEST****
020400                              L10055:
020400  104401                              TRAP    C$ETST

                                    .SBTTL  **TEST 30** - READ HEADER FUNCTION INTERRUPT

020402                              BGNTST                          ;****START OF TEST****

020402                              STARS
                                    ;;*****************************************************************
                                    ;CHECK THAT READ HEADER WILL GENERATE AN INTERRRUPT
                                    ;UPON COMPLETION WITHOUT ANY ERRORS SETTING
020402                              STARS
                                    ;;*****************************************************************

020402                                      SETPRI  #PRI00          ;PSW TO 0
020402  012700  000000                      MOV     #PRI00,R0
020406  104441                              TRAP    C$SPRI
020410  005037  002330                      CLR     INTFLG          ;CLEAR INTERRUPT OCCURENCE
020414  004537  013446                      JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
020420  000110                              RDHDR!INTEN             ;READ HEADER, INTR. ENA
020422  004537  014334                      JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
                                    ;       SETPRI  #PRI07                                  ;JSD REV A
020426                                      SETPRI  #PRI06                                  ;JSD REV A
020426  012700  000300                      MOV     #PRI06,R0
020432  104441                              TRAP    C$SPRI
020434  005737  002330                      TST     INTFLG          ;INTERRUPT HAPPEN
020440  001004                              BNE     2$              ;YES-CONTINUE
020442                                      ERRDF   35.,EM37,ERR0
020442  104455                              TRAP    C$ERDF
020444  000043                              .WORD   35
020446  005716                              .WORD   EM37
020450  010160                              .WORD   ERR0
020452                              2$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
020452  104406                              TRAP    C$CLP1

020454  004537  013146                      JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS

020460                              ENDTST                          ;****END OF TEST****
020460                              L10056:
020460  104401                              TRAP    C$ETST

                                    .SBTTL  **TEST 31** - REPEATED RD HDRS YIELD SAME CYL AND HD

020462                              BGNTST                          ;****START OF TEST****

020462                              STARS
```

```
                                        ;;*****************************************************************
                                        ;CHECK THAT READ HEADERS WILL RELIABLY READ THE SAME
                                        ;CYLINDER AND HEAD SELECT.  WE WILL READ HEADERS VERIFYING
                                        ;THAT WE ALWAYS READ THE SAME CYLINDER AND HEAD SELECT.
020462                                  STARS
                                        ;;*****************************************************************

020462  012701  000144                  MOV     #100.,R1        ;SET UP TO DO 100 RD HDR'S
020466  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
020472  000010                          RDHDR                   ;READ HEADER
020474  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
020500                          99$:    ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
020500  104410                          TRAP    C$ESCAPE
020502  000122                          .WORD   L10057-.

020504  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
020510                                  ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
020510  104410                          TRAP    C$ESCAPE
020512  000112                          .WORD   L10057-.

020514  013737  002314  002362          MOV     E.MP,GDDAT      ;READ FIRST HEADER (ASSUME GOOD)
020522  043737  002334  002362          BIC     SECMSK,GDDAT    ;MASK AWAY SECTOR BITS
020530                          BGNSEG                          ;****START OF SEGMENT****
020530  104404                          TRAP    C$BSEG
020532                          2$:
020532  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
020536  000010                          RDHDR
020540  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
020544                          97$:    ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
020544  104410                          TRAP    C$ESCAPE
020546  000054                          .WORD   10000$-.

020550  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
020554                                  ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
020554  104410                          TRAP    C$ESCAPE
020556  000044                          .WORD   10000$-.

020560  013737  002314  002364          MOV     E.MP,BDDAT      ;READ HEADER
020566  043737  002334  002364          BIC     SECMSK,BDDAT    ;MASK AWAY SECTOR BITS
020574  023737  002362  002364          CMP     GDDAT,BDDAT     ;IS HEADER CORRECT
020602  001404                          BEQ     4$

020604                                  ERRDF   36.,EM41,ERR4
020604  104455                          TRAP    C$ERDF
020606  000044                          .WORD   36
020610  005756                          .WORD   EM41
020612  010324                          .WORD   ERR4

                                                                ;CONSTANT CYL & HS
020614                          4$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
020614  104406                          TRAP    C$CLP1

020616  005301                          DEC     R1              ;PERFORM ALL READ HDR'S
020620  001344                          BNE     2$              ;IF NOT GO BACK AND DO ANOTHER
020622                          ENDSEG                          ;****END OF SEGMENT****
020622                          10000$:
020622  104405                          TRAP    C$ESEG
020624                          ENDTST                          ;****END OF TEST****
```

```
**TEST 31** - REPEATED RD HDRS YIELD SAME CYL AND HD

                020624                          L10057:
                020624  104401                          TRAP    C$ETST
2078
2079                                            .SBTTL  **TEST 32** - CHECK OF HEADER CRC
2080
2081 020626                                     BGNTST                          ;****START OF TEST****
2082
2083 020626                                     STARS
                                                ;;**************************************************************
2084                                            ;CHECK THAT WE CAN READ THE HDCRC AFTER A
2085                                            ;READ HEADER AND THAT IT IS THE CORRECT CRC
2086                                            ;FOR THE HEADER.
2087 020626                                     STARS
                                                ;;**************************************************************
2088
2089 020626  005037  020676                             CLR     3$
2090 020632  004537  013446                             JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2091 020636  000010                                     RDHDR                   ;READ HEADER
2092 020640  004537  014334                             JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2093 020644                                             ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
                020644  104410                          TRAP    C$ESCAPE
                020646  000114                          .WORD   L10060-.
2094
2095 020650  004537  013146                             JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2096 020654                                             ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
                020654  104410                          TRAP    C$ESCAPE
                020656  000104                          .WORD   L10060-.
2097
2098 020660  013737  002314  020674                     MOV     E.MP,2$         ;READ HEADER WORD CONTAINS SEC, HD, CYL
2099
2100 020666  004537  014060                             JSR     R5,SIMBCC       ;GO CALCULATE CRC
2101 020672  000020                                     16.                     ;16 BITS
2102 020674  000000                             2$:     .WORD   0               ;HEADER GOES HERE
2103 020676  000000                             3$:     .WORD   0               ;START WITH 0 CRC
2104 020700  013737  002344  020724                     MOV     CALBCC,5$
2105 020706  013737  002316  020722                     MOV     E.MP1,4$        ;GET SECOND WORD IN SILO, CONTAINS 0'S
2106 020714  004537  014060                             JSR     R5,SIMBCC
2107 020720  000020                                     16.
2108 020722  000000                             4$:     .WORD   0
2109 020724  000000                             5$:     .WORD   0
2110 020726  013737  002344  002362                     MOV     CALBCC,GDDAT    ;STORE CALCULATED CRC AS GOOD
2111 020734  013737  002320  002364                     MOV     E.MP2,BDDAT     ;THIRD READ OF MP SILO GETS CRC
2112 020742  023737  002362  002364                     CMP     GDDAT,BDDAT     ;IS CRC CORRECT?
2113 020750  001404                                     BEQ     6$              ;IF SO CONTINUE
2114
2115 020752                                             ERRDF   37.,EM42,ERR4
                020752  104455                          TRAP    C$ERDF
                020754  000045                          .WORD   37
                020756  006047                          .WORD   EM42
                020760  010324                          .WORD   ERR4
2116 020762                                     6$:
2117
2118 020762                                     ENDTST                          ;****END OF TEST****
                020762                          L10060:
                020762  104401                          TRAP    C$ETST
2119
2120                                            .SBTTL  **TEST 33** - CHECK CONSECUTIVE HEADERS
```

••TEST 33•• - CHECK CONSECUTIVE HEADERS

```
2121
2122 020764                          BGNTST                          ;••••START OF TEST••••
2123
2124 020764                          STARS
                                     ;;*****************************************************************
2125                                 ;CHECK THAT THE HEADERS ARE CONSECUTIVE.  WE WILL DO
2126                                 ;40 (FORTY) READ HEADERS AND STORE EACH.  AFTER WE HAVE
2127                                 ;READ THE FORTIETH HEADER WE WILL VERIFY THAT
2128                                 ;THEY CAME IN SEQUENTIAL, THAT 0 FOLLOWS 39,
2129                                 ;THAT THERE WERE NO ERRORS.
2130 020764                          STARS
                                     ;;*****************************************************************
2131
2132 020764  005037  002366                CLR     FIRST           ;CLEAR FIRST READ DONE FLAG
2133 020770  012703  003274                MOV     #HDRBUF,R3      ;STORE HEADERS
2134 020774  012701  000050                MOV     #40.,R1         ;FORTY HEADERS
2135 021000  012737  000210  002272        MOV     #RDHDR!CRDY,B.CS
2136 021006  053737  002270  002272        BIS     DRIVE,B.CS
2137 021014  013777  002272  161226        MOV     B.CS,@RLCS
2138 021022  042777  000200  161220  2$:   BIC     #200,@RLCS
2139 021030  032777  000200  161212  1$:   BIT     #200,@RLCS      ;DONE?
2140 021036  001774                       BEQ     1$
2141 021040  017723  161204                MOV     @RLCS,(R3)+
2142 021044  017723  161206                MOV     @RLMP,(R3)+
2143 021050  017723  161202                MOV     @RLMP,(R3)+
2144 021054  017723  161176                MOV     @RLMP,(R3)+
2145 021060  005301                       DEC     R1              ;HAVE WE READ FORTY HEADERS
2146 021062  001357                       BNE     2$              ;GO BACK UNTIL FOURTY DONE
2147 021064  012703  003274                MOV     #HDRBUF,R3      ;GET LIST OF HEADERS
2148 021070  012701  000050                MOV     #40.,R1         ;CHECK FORTY OF THEM
2149 021074  011337  002306                MOV     (R3),E.CS
2150 021100  005737  002306                TST     E.CS
2151 021104  100016                       BPL     99$
2152 021106  012737  004312  013430        MOV     #RHDMES,RESTMS
2153 021114  005723                       TST     (R3)+
2154 021116  012337  002314                MOV     (R3)+,E.MP
2155 021122  012337  002316                MOV     (R3)+,E.MP1
2156 021126  012337  002320                MOV     (R3)+,E.MP2
2157 021132  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2158 021136  000137  021300                JMP     7$
2159 021142  005723              99$:      TST     (R3)+
2160 021144  011337  002364                MOV     (R3),BDDAT      ;GET HEADER
2161 021150  005737  002366                TST     FIRST           ;IS THIS FIRST READ?
2162 021154  001007                       BNE     4$              ;NO, BRANCH
2163 021156  012737  000001  002366        MOV     #1,FIRST        ;SET FIRST READ DONE FLAG
2164 021164  013737  002364  002362  3$:   MOV     BDDAT,GDDAT     ;SET UP NEXT READ EXPECTED
2165 021172  000435                       BR      6$              ;GO SEE IF TEST IS DONE
2166 021174  005237  002362        4$:    INC     GDDAT           ;INCREMENT EXP'D HEADER
2167 021200  023737  002364  002362        CMP     BDDAT,GDDAT     ;IS NEW HEADER SEQUENTIAL?
2168 021206  001766                       BEQ     3$              ;YES THEN BRANCH
2169 021210  033737  002334  002364        BIT     SECMSK,BDDAT    ;IS NEW HEADER ZERO?
2170 021216  001015                       BNE     5$              ;NO, THEN ERROR GO REPORT IT
2171 021220  013737  002362  002346        MOV     GDDAT,TEMP2     ;YES, CHECK IF LAST HEADER WAS
2172 021226  043737  002370  002346        BIC     CYLMSK,TEMP2    ;MAX ADDRESS, IF SO BRANCH
2173 021234  023737  002372  002346        CMP     MXSEC1,TEMP2    ;STORE NEW DATA AS OLD
2174 021242  001750                       BEQ     3$              ;AND PERFORM NEW RD HDR
2175 021244  043737  002334  002362        BIC     SECMSK,GDDAT    ;EXPECTING ZERO SECTOR
```

```
**TEST 33**   CHECK CONSECUTIVE HEADERS

2176
2177 021252                          5$:
2178
2179 021252  005037  002366                  CLR     FIRST           ;ERROR WILL MAKE US MISS
2180                                                                  ;NEXT SECTOR SEQUENTIALLY
2181                                                                  ;START OVER; CLEAR FIRST FLAG
2182 021256                                  ERRDF   38.,EM43,ERR2
     021256  104455                         TRAP    C$ERDF
     021260  000046                         .WORD   38
     021262  006105                         .WORD   EM43
     021264  010210                         .WORD   ERR2
2183 021266                          6$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021266  104406                         TRAP    C$CLP1
2184
2185 021270  062703  000006                 ADD     #6,R3
2186 021274  005301                         DEC     R1              ;HAVE WE DONE THIS ENOUGH
2187 021276  001321                         BNE     99$             ;NO, GO BACK DO IT AGAIN
2188 021300                          7$:
2189 021300                          ENDTST                          ;****END OF TEST****
     021300                          L10061:
     021300  104401                         TRAP    C$ETST
2190
2191                                 .SBTTL  **TEST 34** - SEEK FUNCTION
2192
2193 021302                          BGNTST                          ;****START OF TEST****
2194 021302                          STARS
                                     ;;*****************************************************************
2195                                 ;CHECK THE SEEK FUNCTION RETURNS CONTROLLER READY
2196                                 ;WITH NO ERRORS.  WE ISSUE A ONE TRACK IN WORD SEEK.
2197                                 ;WE DO NOT CHECK THE RESULT FOR POSITION
2198 021302                          STARS
                                     ;;*****************************************************************
2199
2200 021302  012777  000205  160744          MOV     #BIT7!MK!SIGN,@RLDA  ;SET UP DA-DIFF=1,MARKER,TOWARDS
2201 021310  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2202 021314  000006                          SEEK                    ;SEEK
2203 021316  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2204 021322  012737  000010  002414          MOV     #8.,DLYCNT      ;INITIALIZE DELAY COUNT
2205 021330                          WAIT1:  DELAY   250.            ;IMPLEMENT TIME DELAY
     021330  012727  000372                  MOV     #250.,(PC)+
     021334  000000                          .WORD   0
     021336  013727  002116                  MOV     L$DLY,(PC)+
     021342  000000                          .WORD   0
     021344  005367  177772                  DEC     -6(PC)
     021350  001375                          BNE     .-4
     021352  005367  177756                  DEC     -22(PC)
     021356  001367                          BNE     .-20
2206 021360  005337  002414                  DEC     DLYCNT          ;DECREMENT DELAY COUNT
2207 021364  001361                         BNE     WAIT1           ;BRANCH IF DELAY NOT EXPIRED
2208 021366                          2$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021366  104406                         TRAP    C$CLP1
2209 021370  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2210
2211 021374                          ENDTST                          ;****END OF TEST****
     021374                          L10062:
     021374  104401                         TRAP    C$ETST
2212
```

```
**TEST 35**   CHECK DRIVE READY ON SEEK

                                        .SBTTL  **TEST 35**   CHECK DRIVE READY ON SEEK

021376                                  BGNTST                          ;****START OF TEST****

021376                                  STARS
                                        ;;*************************************************************
                                        ;CHECK THE SEEK FUNCTION RETURNS DRIVE READY WITH
                                        ;NO ERRORS.  WE ISSUE A ONE TRACK INWARD SEEK.  WE DO
                                        ;NOT CHECK THE RESULT FOR POSITION
021376                                  STARS
                                        ;;*************************************************************

021376  012777  000201  160650          MOV     #BIT7!MK,@RLDA  ;SET DA, MARKER, DIFF=1.
021404  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
021410  000006                          SEEK                    ;SEEK
021412  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
021416                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
021416  104406                          TRAP    C$CLP1
021420  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
021424                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
021424  104406                          TRAP    C$CLP1
021426  004537  014246                  JSR     R5,WTDRDY       ;WAIT FOR DRIVE READY
021432                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
021432  104406                          TRAP    C$CLP1
021434  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS

021440                                  ENDTST                          ;****END OF TEST****
021440                                  L10063:
021440  104401                          TRAP    C$ETST

                                        .SBTTL  **TEST 36** - SEEK FUNCTION INTERRUPT

021442                                  BGNTST                          ;****START OF TEST****

021442                                  STARS
                                        ;;*************************************************************
                                        ;CHECK THAT CONTROLLER READY RESETTING WHEN THE SEEK IS
                                        ;INITIATED CAUSES AN INTERRUPT BUT DRIVE READY WILL
                                        ;NOT.  WE ALSO MONITOR FOR ANY ERROR BITS SETTING.
021442                                  STARS
                                        ;;*************************************************************

021442  005037  002330                  CLR     INTFLG
021446                                  SETPRI  #PRI00          ;SET PSW TO 0
021446  012700  000000                  MOV     #PRI00,R0
021452  104441                          TRAP    C$SPRI
021454  012777  000205  160572          MOV     #BIT7!MK!SIGN,@RLDA  ;SET UP RLDA
021462  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
021466  000106                          SEEK!INTEN              ;SEEK AND INTR. ENA.
021470  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
021474  000240                          NOP                     ;
021476  005737  002330          1$:     TST     INTFLG          ;DID INTERRUPT OCCUR
021502  001004                          BNE     2$              ;YES, GO CHECK DRDY
021504                                  ERRDF   40.,EM47,ERR0
```

TEST 36 SEEK FUNCTION INTERRUPT

```
        021504  104455                          TRAP    C$ERDF
        021506  000050                          .WORD   40
        021510  006325                          .WORD   EM47
        021512  010160                          .WORD   ERRO
 2259   021514                          2$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
        021514  104406                          TRAP    C$CLP1
 2260
 2261   021516  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
 2262   021522                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
        021522  104406                          TRAP    C$CLP1
 2263
 2264   021524  005037  002330                  CLR     INTFLG          ;CLEAR INTERRUPT OCCURANCE
 2265
 2266   021530  004537  014246                  JSR     R5,WTDRDY       ;WAIT FOR DRIVE READY
 2267   021534                          5$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
        021534  104406                          TRAP    C$CLP1
 2268
 2269                                  ;       SETPRI  #PRI07                                          ;JSD REV A
 2270   021536                                  SETPRI  #PRI06                                          ;JSD REV A
        021536  012700  000300                  MOV     #PRI06,R0
        021542  104441                          TRAP    C$SPRI
 2271   021544  005737  002330                  TST     INTFLG          ;DID DRIVE READY CAUSE INTERRUPT
 2272   021550  001404                          BEQ     6$              ;NO, CONTINUE
 2273
 2274   021552                                  ERRDF   42.,EM52,ERRO
        021552  104455                          TRAP    C$ERDF
        021554  000052                          .WORD   42
        021556  006356                          .WORD   EM52
        021560  010160                          .WORD   ERRO
 2275   021562                          6$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
        021562  104406                          TRAP    C$CLP1
 2276
 2277   021564                                  ENDTST                          ;****END OF TEST****
        021564                                  L10064:
        021564  104401                                  TRAP    C$ETST
 2278
 2279                                  .SBTTL  **TEST 37** - TEST DIFFERENCE WORD TRANSMISSION
 2280
 2281   021566                                  BGNTST                          ;****START OF TEST****
 2282
 2283   021566                                  STARS
                                                ;;**************************************************************
 2284                                           ;VERIFY THAT THE DIFFERENCE WORD LOADS AND IS
 2285                                           ;TRANSMITTED CORRECTLY.  WE WILL ISSUE SEEKS WITH THE
 2286                                           ;DIFFERENCE WORD CONTAINING ALL OF THE BIT PATTERNS FLOATING 1,
 2287                                           ;GROWING 1, GROWING 0 AND SHIFTING 0.  THE SEEK WILL
 2288                                           ;START FROM TRACK 0 EACH TIME AND WILL RETURN THERE
 2289                                           ;EACH. THUS BOTH DIRECTIONS FOR PATTERNS WILL BE CHECKED.
 2290                                           ;READ HEADERS ARE USED TO VERIFY THE SEEK CORRECTNESS.
 2291                                           ;ERRORS ARE MONITORED AND REPORTED.
 2292   021566                                  STARS
                                                ;;**************************************************************
 2293
 2294   021566  012703  002626                          MOV     #SKLST,R3       ;GET LIST OF DIFFERENCE WORDS
 2295   021572                                  BGNSEG                          ;****START OF SEGMENT****
        021572  104404                                  TRAP    C$BSEG
 2296   021574                                  1$:
```

TEST 37 - TEST DIFFERENCE WORD TRANSMISSION

```
2297 021574  004537  013446                 JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2298 021600  000010                         RDHDR                   ;READ HEADER
2299 021602  004537  014334                 JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2300 021606                         98$:    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021606  104406                         TRAP    C$CLP1
2301
2302 021610  004537  013146                 JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2303 021614                                 CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021614  104406                         TRAP    C$CLP1
2304
2305 021616  013737  002314  002364         MOV     E.MP,BDDAT      ;READ HEADER
2306 021624  043737  002334  002364         BIC     SECMSK,BDDAT    ;CLEAR OUT SECTOR
2307 021632  001462                         BEQ     99$             ;IF ON TRACK ZERO, H.S. ZERO, OK
2308
2309                                 ;NOT ON TRACK ZERO CALCULATE DIFFERENCE WORD AND PUT IT BACK
2310                                 ;ON ZERO.
2311
2312 021634  042737  000100  002364         BIC     #RHHS,BDDAT     ;CLEAR OUT HEAD SELECT
2313 021642  013777  002364  160404         MOV     BDDAT,@RLDA     ;PUT CYLINDER AS DIFFERENCE WORD
2314 021650  052777  000001  160376         BIS     #MK,@RLDA       ;SET MARKER BIT
2315 021656  004537  013446                 JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2316 021662  000006                         SEEK                    ;SEEK
2317 021664  004537  014334                 JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2318 021670                                 CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021670  104406                         TRAP    C$CLP1
2319
2320 021672  004537  013146                 JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2321 021676                                 CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021676  104406                         TRAP    C$CLP1
2322
2323 021700  004537  014246                 JSR     R5,WTDRDY       ;WAIT FOR DRIVE READY
2324 021704                         89$:    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021704  104406                         TRAP    C$CLP1
2325
2326 021706  004537  013146                 JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2327 021712                                 CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021712  104406                         TRAP    C$CLP1
2328
2329 021714  004537  013446                 JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2330 021720  000010                         RDHDR                   ;READ HEADER
2331 021722  004537  014334                 JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2332 021726                         96$:    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021726  104406                         TRAP    C$CLP1
2333
2334 021730  004537  013146                 JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2335 021734                                 CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021734  104406                         TRAP    C$CLP1
2336
2337 021736  005037  002362                 CLR     GDDAT           ;CLEAR EXPECTED
2338 021742  013737  002364  002376         MOV     BDDAT,DWORD     ;SAVE DIFFERENCE WORD
2339 021750  013737  002314  002364         MOV     E.MP,BDDAT      ;READ HEADER
2340 021756  043737  002334  002364         BIC     SECMSK,BDDAT    ;MASK OUT SECTOR BITS
2341 021764  001404                         BEQ     5$              ;BRANCH IF ON ZERO TRACK
2342
2343 021766                                 ERRDF   43.,EM54,ERR3
     021766  104455                         TRAP    C$ERDF
     021770  000053                         .WORD   43
```

TEST 37 - TEST DIFFERENCE WORD TRANSMISSION

```
        021772  006426                          .WORD   EM54
        021774  010252                          .WORD   ERR3
 2344   021776                          5$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
        021776  104406                          TRAP    C$CLP1
 2345
 2346   022000  011377  160250          99$:    MOV     (R3),@RLDA      ;GET DIFFERENCE WORD
 2347   022004  052777  000005  160242          BIS     #SIGN!MK,@RLDA  ;SET SIGN (TOWARDS SPINDLE) AND MARKER
 2348   022012  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
 2349   022016  000006                          SEEK                    ;SEEK
 2350   022020  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
 2351   022024                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
        022024  104406                          TRAP    C$CLP1
 2352
 2353   022026  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
 2354   022032                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
        022032  104406                          TRAP    C$CLP1
 2355
 2356   022034  004537  014246                  JSR     R5,WTDRDY       ;WAIT FOR DRIVE READY
 2357   022040                          87$:    CKLOOP                  ;CHECK IF /FL:LOE IS SET
        022040  104406                          TRAP    C$CLP1
 2358
 2359   022042  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
 2360   022046                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
        022046  104406                          TRAP    C$CLP1
 2361
 2362   022050  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
 2363   022054  000010                          RDHDR                   ;READ HEADER
 2364
 2365   022056  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
 2366   022062                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
        022062  104406                          TRAP    C$CLP1
 2367
 2368   022064  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
 2369   022070                                  ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
        022070  104410                          TRAP    C$ESCAPE
        022072  000106                          .WORD   10000$-.
 2370
 2371   022074  011337  002362                  MOV     (R3),GDDAT      ;GET EXPECTED CYLINDER
 2372   022100  011337  002376          8$:     MOV     (R3),DWORD      ;SET UP DIFFERENCE FOR SEEK
 2373   022104  013737  002314  002364          MOV     E.MP,BDDAT      ;READ HEADER FROM RLMP
 2374   022112  043737  002334  002364          BIC     SECMSK,BDDAT    ;CLEAR OUT SECTOR BITS
 2375   022120  023737  002362  002364          CMP     GDDAT,BDDAT     ;DID SEEK GO TO THE RIGHT
 2376   022126  001404                          BEQ     9$              ;TRACK, IF SO, GO GET NEXT
 2377
 2378   022130                                  ERRDF   44.,EM54,ERR3
        022130  104455                          TRAP    C$ERDF
        022132  000054                          .WORD   44
        022134  006426                          .WORD   EM54
        022136  010252                          .WORD   ERR3
 2379   022140                          9$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
        022140  104406                          TRAP    C$CLP1
 2380
 2381   022142  005723                          TST     (R3)+           ;BUMP PATTERN
 2382   022144  023727  002406  000001          CMP     T.DRIVE,#1
 2383   022152  001005                          BNE     2$
 2384   022154  020327  002726                  CMP     R3,#SKEND
 2385   022160  001407                          BEQ     10$
```

TEST 37 TEST DIFFERENCE WORD TRANSMISSION

```
2386 022162  000137  021574                    JMP     1$
2387
2388 022166  020327  002770          2$:       CMP     R3,#SKEEND
2389 022172  001402                            BEQ     10$
2390 022174  000137  021574                    JMP     1$
2391
2392 022200                          10$:
2393
2394 022200                          ENDSEG                          ;****END OF SEGMENT****
     022200                          10000$:
     022200  104405                            TRAP    C$ESEG
2395 022202                          ENDTST                          ;****END OF TEST****
     022202                          L10065:
     022202  104401                            TRAP    C$ETST
2396
2397                                 .SBTTL  **TEST 38** - VERIFY HEAD SELECT 0 VIA RD HDR
2398
2399 022204                          BGNTST                          ;****START OF TEST****
2400
2401                                 ;
2402
2403 022204                          STARS
                                     ;;**************************************************************
2404                                 ;CHECK THAT WE CAN SELECT HEAD SELECT ZERO.  ISSUE
2405                                 ;SEEK TO HEAD SELECT 0 AND VERIFY WITH READ HEADER.
2406 022204                          STARS
                                     ;;**************************************************************
2407
2408 022204  012777  000001  160042  99$:     MOV     #1K,@RLDA       ;SET MARKER IN RLDA
2409 022212  005037  002362                    CLR     GOODAT          ;SET EXPECTED
2410                                                                  ;LOAD HS=0 INTO RLDA
2411 022216                          2$:
2412 022216  004537  013446                    JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2413 022222  000006                            SEEK                    ;SEEK
2414 022224  004537  014334                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2415 022230                                    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022230  104406                            TRAP    C$CLP1
2416
2417 022232  004537  013146                    JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2418 022236                                    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022236  104406                            TRAP    C$CLP1
2419
2420 022240  004537  014246                    JSR     R5,WTDRDY       ,WAIT FOR DRIVE READY
2421 022244                          89$:      CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022244  104406                            TRAP    C$CLP1
2422
2423 022246  004537  013146                    JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2424 022252                                    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022252  104406                            TRAP    C$CLP1
2425
2426 022254  004537  013446                    JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2427 022260  000010                            RDHDR                   ;READ HEADER
2428 022262  004537  014334                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2429 022266                          96$:      CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022266  104406                            TRAP    C$CLP1
2430
2431 022270  004537  013146                    JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
```

TEST 38 VERIFY HEAD SELECT 0 VIA RD HDR

```
2432 022274                                ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
     022274  104410                        TRAP    C$ESCAPE
     022276  000036                        .WORD   L10066-.
2433
2434 022300  013737  002314  002364        MOV     E.MP,BDDAT      ;READ HEADER FOR HEAD SELECT
2435 022306  042737  177677  002364        BIC     #177677,BDDAT   ;MASK ONLY HEAD SELECT
2436 022314  023737  002362  002364        CMP     GDDAT,BDDAT     ;COMPARE HEAD SELECTS
2437 022322  001404                        BEQ     5$              ;IF EQUAL CONTINUE
2438
2439 022324                                ERRDF   45.,EM55,ERR4
     022324  104455                        TRAP    C$ERDF
     022326  000055                        .WORD   45
     022330  006465                        .WORD   EM55
     022332  010324                        .WORD   ERR4
2440 022334                        5$:
2441
2442 022334                        ENDTST                          ;****END OF TEST****
     022334                        L10066:
     022334  104401                        TRAP    C$ETST
2443
2444                               .SBTTL  **TEST 39** - VERIFY HEAD SELECT 1 VIA RD HDR
2445
2446 022336                        BGNTST                          ;****START OF TEST****
2447
2448 022336                        STARS
                                   ;;**************************************************************
2449                               ;CHECK THAT WE CAN SELECT HEAD SELECT ONE.  ISSUE
2450                               ;SEEK TO HEAD SELECT 1 AND VERIFY WITH READ HEADER.
2451 022336                        STARS
                                   ;;**************************************************************
2452
2453 022336  012777  000001  157710  99$:   MOV     #MK,@RLDA       ;SET MARKER IN RLDA
2454 022344  052777  000020  157702        BIS     #DAHS,@RLDA     ;LOAD HS=1 INTO RLDA
2455 022352  004537  013446        2$:     JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2456 022356  000006                        SEEK                    ;SEEK
2457 022360  004537  014334                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2458 022364                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022364  104406                        TRAP    C$CLP1
2459
2460 022366  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2461 022372                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022372  104406                        TRAP    C$CLP1
2462
2463 022374  004537  014246                JSR     R5,WTDRDY       ;WAIT FOR DRIVE CLEAR
2464 022400                        89$:    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022400  104406                        TRAP    C$CLP1
2465
2466 022402  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2467 022406                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022406  104406                        TRAP    C$CLP1
2468
2469 022410  004537  013446                JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2470 022414  000010                        RDHDR                   ;READ HEADER
2471 022416  004537  014334                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2472 022422                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022422  104406                        TRAP    C$CLP1
2473
```

TEST 39 - VERIFY HEAD SELECT 1 VIA RD HDR

```
2474 022424  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2475 022430                                ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
     022430  104410                        TRAP    C$ESCAPE
     022432  000044                        .WORD   L10067-.
2476
2477 022434  013737  002314  002364        MOV     E.MP,BDDAT      ;READ HEADER
2478 022442  042737  177677  002364        BIC     #177677,BDDAT   ;MASK FOR H.S.
2479 022450  012737  000100  002362        MOV     #RHHS,GDDAT     ;SET EXPECTED
2480 022456  023737  002362  002364        CMP     GDDAT,BDDAT     ;CORRECT HEAD
2481 022464  001404                        BEQ     5$              ;YES, CONTINUE
2482
2483 022466                                ERRDF   46.,EM55,ERR4
     022466  104455                        TRAP    C$ERDF
     022470  000056                        .WORD   46
     022472  006465                        .WORD   EM55
     022474  010324                        .WORD   ERR4
2484 022476                        5$:
2485
2486 022476                        ENDTST                          ;****END OF TEST****
     022476                        L10067:
     022476  104401                        TRAP    C$ETST
2487
2488                               .SBTTL  **TEST 40** - VERIFY HEAD SELECT 0 VIA GET STATUS
2489
2490 022500                        BGNTST                          ;****START OF TEST****
2491
2492 022500                        STARS
                                   ;;**************************************************************
2493                                ;CHECK THAT WE CAN READ BACK HEAD SELECT 0 WITH
2494                                ;A GET STATUS FUNCTION.  SELECT H.S. 0 WITH A SEEK
2495                                ;VERIFY WITH GET STATUS
2496 022500                        STARS
                                   ;;**************************************************************
2497
2498 022500  012777  000001  157546        MOV     #MK,@RLDA       ;SET MARKER IN RLDA
2499                                                                ;LOAD HS=0 INTO RLDA
2500 022506  005037  002362        2$:     CLR     GDDAT           ;SET UP EXP'D
2501 022512  004537  013446        3$:     JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2502 022516  000006                        SEEK                    ;SEEK
2503 022520  004537  014334                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2504 022524                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022524  104406                        TRAP    C$CLP1
2505
2506 022526  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2507 022532                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022532  104406                        TRAP    C$CLP1
2508
2509 022534  004537  014246                JSR     R5,WTDRDY       ;WAIT FOR DRIVE READY
2510 022540                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022540  104406                        TRAP    C$CLP1
2511
2512 022542  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2513 022546                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     022546  104406                        TRAP    C$CLP1
2514
2515 022550  012777  000003  157476        MOV     #GSBIT!MK,@RLDA ;SET UP FOR GET STATUS IN DA
2516 022556  004537  013446                JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
```

TEST 40 VERIFY HEAD SELECT 0 VIA GET STATUS

```
2517 022562  000004                        GSTAT                       ;GET STATUS
2518 022564  004537  014334                JSR     R5,WTCRDY           ;WAIT FOR CONTROLLER READY HIGH
2519 022570                                CKLOOP                      ;CHECK IF /FL:LOE IS SET
     022570  104406                        TRAP    C$CLP1
2520
2521 022572  004537  013146                JSR     R5,CHERR            ;CHECK CONTROLLER FOR ERRORS
2522 022576                                ESCAPE  TST                 ;IF /FL:LOE SET LOOP, ELSE EXIT TST
     022576  104410                        TRAP    C$ESCAPE
     022600  000036                        .WORD   L10070-.
2523
2524 022602  013737  002314  002364        MOV     E.MP,BDDAT          ;READ STATUS FOR HEAD SELECT BIT
2525 022610  042737  177677  002364        BIC     #177677,BDDAT       ;LEAVE ONLY H.S. BIT
2526 022616  023737  002362  002364        CMP     GDDAT,BDDAT         ;IS HEAD SELECT CORRECT?
2527 022624  001404                        BEQ     6$                  ;YES, CONTINUE
2528
2529 022626                                ERRDF   47.,EM56,ERR4
     022626  104455                        TRAP    C$ERDF
     022630  000057                        .WORD   47
     022632  006520                        .WORD   EM56
     022634  010324                        .WORD   ERR4
2530 022636                        6$:
2531
2532 022636                        ENDTST                              ;****END OF TEST****
     022636                        L10070:
     022636  104401                        TRAP    C$ETST
2533
2534                               .SBTTL  **TEST 41** - VERIFY HEAD SELECT 1 VIA GET STATUS
2535
2536 022640                        BGNTST                              ;****START OF TEST****
2537
2538 022640                        STARS
                                   ;;*****************************************************************
2539
2540                               ;CHECK THAT WE CAN READ BACK HEAD SELECT 1 WITH A GET
2541                               ;STATUS FUNCTION.  SELECT H.S. 1 WITH A SEEK AND VERIFIY WITH
2542 022640                        ;GET STATUS
                                   STARS
                                   ;;*****************************************************************
2543
2544 022640  012777  000001  157406        MOV     #MK,@RLDA           ;SET MARKER IN RLDA
2545 022646  052777  000020  157400        BIS     #DAHS,@RLDA         ;LOAD HS=1 INTO RLDA
2546 022654  012737  000100  002362  2$:   MOV     #STHS,GDDAT         ;SET UP EXP'D
2547 022662  004537  013446        3$:     JSR     R5,LDFUNC           ;ISSUE FUNCTION OF FOLLOWING WORD
2548 022666  000006                        SEEK                        ;SEEK
2549 022670  004537  014334                JSR     R5,WTCRDY           ;WAIT FOR CONTROLLER READY HIGH
2550 022674                                CKLOOP                      ;CHECK IF /FL:LOE IS SET
     022674  104406                        TRAP    C$CLP1
2551
2552 022676  004537  013146                JSR     R5,CHERR            ;CHECK CONTROLLER FOR ERRORS
2553 022702                                CKLOOP                      ;CHECK IF /FL:LOE IS SET
     022702  104406                        TRAP    C$CLP1
2554
2555 022704  004537  014246                JSR     R5,WTDRDY           ;WAIT FOR DRIVE READY
2556 022710                                CKLOOP                      ;CHECK IF /FL:LOE IS SET
     022710  104406                        TRAP    C$CLP1
2557
2558 022712  004537  013146                JSR     R5,CHERR            ;CHECK CONTROLLER FOR ERRORS
2559 022716                                CKLOOP                       CHECK IF /FL:LOE IS SET
```

```
**TEST 41** - VERIFY HEAD SELECT 1 VIA GET STATUS

      022716  104406                          TRAP    C$CLP1
2560
2561 022720  012777  000003  157326          MOV     #GSBIT!MK,@RLDA ;SET UP FOR GET STATUS IN DA
2562 022726  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2563 022732  000004                          GSTAT                   ;GET STATUS
2564 022734  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2565 022740                                   ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
     022740  104410                          TRAP    C$ESCAPE
     022742  000046                          .WORD   L10071-.
2566
2567 022744  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2568 022750                                   ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
     022750  104410                          TRAP    C$ESCAPE
     022752  000036                          .WORD   L10071-.
2569
2570 022754  013737  002314  002364          MOV     E.MP,BDDAT      ;READ STATUS FOR HEAD SELECT BIT
2571 022762  042737  177677  002364          BIC     #177677,BDDAT   ;LEAVE ONLY H.S. BIT
2572 022770  023737  002362  002364          CMP     GDDAT,BDDAT     ;IS HEAD SELECT CORRECT?
2573 022776  001404                          BEQ     6$              ;YES, CONTINUE
2574
2575 023000                                   ERRDF   48.,EM56,ERR4
     023000  104455                          TRAP    C$ERDF
     023002  000060                          .WORD   48
     023004  006520                          .WORD   EM56
     023006  010324                          .WORD   ERR4
2576 023010                           6$:
2577
2578 023010                           ENDTST                          ;****END OF TEST****
     023010                           L10071:
     023010  104401                          TRAP    C$ETST
2579
2580                                  .SBTTL  **TEST 42** - TEST TIME AT WHICH DIF WD GETS TRANSMITTED
2581
2582 023012                           BGNTST                          ;****START OF TEST****
2583
2584 023012                           STARS
                                      ;;**************************************************************
2585                                  ;VERIFY THAT THE DIFFERENCE WORD ON A SEEK IS
2586                                  ;TRANSMITTED PRIOR TO CONTROLLER READY SETTING.  THIS
2587                                  ;IS DONE BY SETTING A KNOWN DIFFERENCE WORD IN
2588                                  ;THE RLDA ISSUING A A SEEK, WAITING FOR CONTROLLER READY
2589                                  ;(BUT NOT DRIVE READY), WRITING A DIFFERENT RLDA AND WAITING
2590                                  ;FOR DRIVE READY.  THE RESULTANT POSITION SHOULD BE THAT
2591                                  ;OF THE FIRST RLDA ONLY.
2592 023012                           STARS
                                      ;;**************************************************************
2593
2594 023012  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2595 023016  000010                          RDHDR                   ;READ HEADER
2596 023020  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2597 023024                           99$:    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023024  104406                          TRAP    C$CLP1
2598
2599 023026  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2600 023032                                   CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023032  104406                          TRAP    C$CLP1
2601
```

TEST 42 - TEST TIME AT WHICH DIF WD GETS TRANSMITTED

```
2602 023034  013737  002314  002362          MOV     E.MP,GDDAT      ;READ HEADER
2603 023042  043737  002334  002362          BIC     SECMSK,GDDAT    ;CLEAR SECTOR BITS
2604 023050  012777  000001  157176          MOV     #MK,@RLDA       ;SET MARKER IN RLDA
2605 023056  032737  000100  002362          BIT     #RHHS,GDDAT     ;TEST H.S.
2606 023064  001403                          BEQ     2$              ;IF ZERO, CONTINUE
2607 023066  052777  000020  157160          BIS     #DAHS,@RLDA     ;ONE, SET SO WE WILL REMAIN THERE
2608 023074  013737  002362  002354  2$:     MOV     GDDAT,TMPO      ;STORE HEADER
2609 023102  042737  000100  002354          BIC     #RHHS,TMPO      ;CLEAR H.S. FROM STORED WORD
2610 023110  023727  002406  000001          CMP     T.DRIVE,#1
2611 023116  001034                          BNE     12$
2612 023120  023737  002354  002704          CMP     TMPO,HALMAX
2613 023126  101007                          BHI     3$
2614 023130  052777  000004  157116          BIS     #SIGN,@RLDA
2615 023136  063737  002702  002362          ADD     QUAMAX,GDDAT
2616 023144  000403                          BR      4$
2617 023146  163737  002702  002362  3$:     SUB     QUAMAX,GDDAT
2618 023154  053777  002702  157072  4$:     BIS     QUAMAX,@RLDA
2619 023162  012737  000001  002356          MOV     #MK,TMP1
2620 023170  032777  000020  157056          BIT     #DAHS,@RLDA
2621 023176  001037                          BNE     5$
2622 023200  052737  000020  002356          BIS     #DAHS,TMP1
2623 023206  000433                          BR      5$
2624 023210  023737  002354  002734  12$:    CMP     TMPO,HMAX
2625 023216  101007                          BHI     13$
2626 023220  052777  000004  157026          BIS     #SIGN,@RLDA
2627 023226  063737  002732  002362          ADD     QMAX,GDDAT
2628 023234  000403                          BR      14$
2629 023236  163737  002732  002362  13$:    SUB     QMAX,GDDAT
2630 023244  053777  002732  157002  14$:    BIS     QMAX,@RLDA
2631 023252  012737  000001  002356          MOV     #MK,TMP1
2632 023260  032777  000020  156766          BIT     #DAHS,@RLDA
2633 023266  001003                          BNE     5$
2634 023270  052737  000020  002356          BIS     #DAHS,TMP1
2635 023276  004537  013446          5$:     JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2636 023302  000006                          SEEK                    ;SEEK
2637 023304  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2638 023310                                   CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023310  104406                          TRAP    C$CLP1
2639
2640 023312  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2641 023316                                   CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023316  104406                          TRAP    C$CLP1
2642
2643 023320  013777  002356  156726          MOV     TMP1,@RLDA      ;SEND IN NEW DIFFERENCE WORD
2644 023326  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2645 023332                                   CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023332  104406                          TRAP    C$CLP1
2646
2647 023334  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2648 023340                                   CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023340  104406                          TRAP    C$CLP1
2649
2650 023342  004537  014246                  JSR     R5,WTDRDY       ;WAIT FOR DRIVE READY
2651 023346                           8$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023346  104406                          TRAP    C$CLP1
2652
2653 023350  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
```

TEST 42 - TEST TIME AT WHICH DIF WD GETS TRANSMITTED

```
2654 023354                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023354  104406                        TRAP    C$CLP1
2655
2656 023356  004537  013446                JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2657 023362  000010                        RDHDR                   ;READ HEADER
2658 023364  004537  014334                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2659 023370                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023370  104406                        TRAP    C$CLP1
2660
2661 023372  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2662 023376                                ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
     023376  104410                        TRAP    C$ESCAPE
     023400  000036                        .WORD   L10072-.
2663
2664 023402  013737  002314  002364        MOV     E.MP,BDDAT      ;READ HEADER
2665 023410  043737  002334  002364        BIC     SECMSK,BDDAT    ;CLEAR SECTOR ADDRESS
2666 023416  023737  002362  002364        CMP     GDDAT,BDDAT     ;IS HEADER CORRECT?
2667 023424  001404                        BEQ     10$             ;IF SO BRANCH
2668
2669 023426                                ERRDF   50.,EM57,ERR4
     023426  104455                        TRAP    C$ERDF
     023430  000062                        .WORD   50
     023432  006557                        .WORD   EM57
     023434  010324                        .WORD   ERR4
2670 023436                        10$:
2671
2672 023436                        ENDTST                          ;****END OF TEST****
     023436                        L10072:
     023436  104401                        TRAP    C$ETST
2673
2674                               .SBTTL  **TEST 43** - EXTENSIVE CHECK OF HEADER CRC
2675
2676 023440                        BGNTST                          ;****START OF TEST****
2677 023440                        STARS
                                   ;;*************************************************************
2678                                ;MORE EXTENSIVE CHECK OF HEADER CRC.  WE WILL SEEK
2679                                ;AND READ HEADERS VERIFYING HDR CRC ACROSS THE
2680                                ;PLATTER USING THE GROWING 0, GROWING 1, SHIFTING 0 AND
2681                                ;GROWING 0 PATTERNS FOR TRACK ADDRESSES.
2682 023440                        STARS
                                   ;;*************************************************************
2683
2684 023440  012703  002626                MOV     #SKLST,R3       ;GET LIST OF DIFFERENCE WORDS
2685 023444                        BGNSEG                          ;****START OF SEGMENT****
     023444  104404                        TRAP    C$BSEG
2686 023446                        1$:
2687 023446  004537  013446                JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2688 023452  000010                        RDHDR                   ;READ HEADER
2689 023454  004537  014334                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2690 023460                        98$:    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023460  104406                        TRAP    C$CLP1
2691
2692 023462  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2693 023466                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023466  104406                        TRAP    C$CLP1
2694
2695 023470  013737  002314  002364        MOV     E.MP,BDDAT      ;READ HEADER
```

TEST 43 - EXTENSIVE CHECK OF HEADER CRC

```
2696 023476  043737  002334  002364          BIC     SECMSK,BDDAT    ;CLEAR OUT SECTOR
2697 023504  001461                          BEQ     5$              ;IF ON TRACK ZERO, H.S. ZERO, OK
2698
2699                                 ;NOT ON TRACK ZERO CALCULATE DIFFERENCE WORD AND PUT IT BACK
2700                                 ;ON ZERO.
2701
2702 023506  042737  000100  002364          BIC     #RHHS,BDDAT     ;CLEAR OUT HEAD SELECT
2703 023514  013777  002364  156532          MOV     BDDAT,@RLDA     ;PUT CYLINDER AS DIFFERENCE WORD
2704 023522  052777  000001  155524          BIS     #MK,@RLDA       ;SET MARKER BIT
2705 023530  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2706 023534  000006                          SEEK                    ;SEEK
2707 023536  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2708 023542                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023542  104406                          TRAP    C$CLP1
2709
2710 023544  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2711 023550                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023550  104406                          TRAP    C$CLP1
2712
2713 023552  004537  014246                  JSR     R5,WTDRDY       ;WAIT FOR DRIVE READY
2714 023556                          89$:    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023556  104406                          TRAP    C$CLP1
2715
2716 023560  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2717 023564                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023564  104406                          TRAP    C$CLP1
2718
2719 023566  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2720 023572  000010                          RDHDR                   ;READ HEADER
2721 023574  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2722 023600                          96$:    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023600  104406                          TRAP    C$CLP1
2723
2724 023602  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2725 023606                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023606  104406                          TRAP    C$CLP1
2726
2727 023610  005037  002362                  CLR     GDDAT           ;CLEAR EXPECTED
2728 023614  013737  002364  002376          MOV     BDDAT,DWORD     ;SAVE DIFFERENCE WORD
2729 023622  013737  002314  002364          MOV     E.MP,BDDAT      ;READ HEADER
2730 023630  043737  002334  002364          BIC     SECMSK,BDDAT    ;MASK OUT SECTOR BITS
2731 023636  001404                          BEQ     5$              ;BRANCH IF ON ZERO TRACK
2732
2733 023640                                  ERRDF   51.,EM54,ERR3
     023640  104455                          TRAP    C$ERDF
     023642  000063                          .WORD   51
     023644  006426                          .WORD   EM54
     023646  010252                          .WORD   ERR3
2734 023650                          5$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
     023650  104406                          TRAP    C$CLP1
2735
2736 023652  011377  156376                  MOV     (R3),@RLDA      ;GET DIFFERENCE WORD
2737 023656  052777  000005  156370          BIS     #SIGN!MK,@RLDA  ;SET SIGN (TOWARDS 'INDLE) AND MARKER
2738 023664  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2739 023670  000006                          SEEK                    ;SEEK
2740 023672  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2741 023676                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
```

TEST 43 EXTENSIVE CHECK OF HEADER CRC

```
                023676  104406                          TRAP    C$CLP1
2742
2743            023700  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2744            023704                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
                023704  104406                          TRAP    C$CLP1
2745
2746            023706  004537  014246                  JSR     R5,WTDRDY       ;WAIT FOR DRIVE READY
2747            023712                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
                023712  104406                          TRAP    C$CLP1
2748
2749            023714  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2750            023720                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
                023720  104406                          TRAP    C$CLP1
2751
2752            023722  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2753            023726  000010                          RDHDR                   ;READ HEADER
2754            023730  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2755            023734                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
                023734  104406                          TRAP    C$CLP1
2756
2757            023736  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2758            023742                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
                023742  104406                          TRAP    C$CLP1
2759
2760            023744  011337  002362          8$:     MOV     (R3),GDDAT      ;GET EXPECTED CYLINDER
2761            023750  011337  002376                  MOV     (R3),DWORD      ;SET UP DIFFERENCE FOR SEEK
2762            023754  013737  002314  002364          MOV     E.MP,BDDAT      ;READ HEADER FROM RLMP
2763            023762  043737  002334  002364          BIC     SECMSK,BDDAT    ;CLEAR OUT SECTOR BITS
2764            023770  023737  002362  002364          CMP     GDDAT,BDDAT     ;DID SEEK GO TO THE RIGHT
2765            023776  001404                          BEQ     9$              ;TRACK, IF SO, GO GET NEXT
2766
2767            024000                                  ERRDF   52.,EM54,ERR3
                024000  104455                          TRAP    C$ERDF
                024002  000064                          .WORD   52
                024004  006426                          .WORD   EM54
                024006  010252                          .WORD   ERR3
2768            024010                          9$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
                024010  104406                          TRAP    C$CLP1
2769
2770            024012  013737  002314  024026          MOV     E.MP,10$        ;GET HEADER WORD
2771            024020  004537  014060                  JSR     R5,SIMBCC       ;GO CALCULATE HEADER CRC
2772            024024  000020                          16.                     ;16 BITS
2773            024026  000000                  10$:    .WORD   0               ;HEADER GOES HERE
2774            024030  000000                          .WORD   0               ;START WITH ZERO CRC
2775            024032  013737  002344  024056          MOV     CALBCC,20$
2776            024040  013737  002316  024054          MOV     E.MP1,21$
2777            024046  004537  014060                  JSR     R5,SIMBCC
2778            024052  000020                          16.
2779            024054  000000                  21$:    .WORD   0
2780            024056  000000                  20$:    .WORD   0
2781            024060  013737  002344  002362          MOV     CALBCC,GDDAT    ;MOVE CALCULATED CRC TO GDDAT
2782            024066  013737  002320  002364          MOV     E.MP2,BDDAT     ;GET HEADER CRC FROM RLMP
2783            024074  023737  002362  002364          CMP     GDDAT,BDDAT     ;IS CRC CORRECT?
2784            024102  001404                          BEQ     11$             ;IF SO CONTINUE
2785
2786            024104                                  ERRDF   53.,EM42,ERR4
                024104  104455                          TRAP    C$ERDF
```

TEST 43 EXTENSIVE CHECK OF HEADER CRC

```
                024106  000065                          .WORD   53
                024110  006047                          .WORD   EM42
                024112  010324                          .WORD   ERR4
   2787         024114                          11$:    CKLOOP                  ;CHECK IF /FL:LOE IS SET
                024114  104406                          TRAP    C$CLP1
   2788
   2789         024116  005723                          TST     (R3)+           ;BUMP PATTERN
   2790         024120  023727  002406  000001          CMP     T.DRIVE,#1
   2791         024126  001005                          BNE     2$
   2792         024130  020327  002726                  CMP     R3,#SKEND
   2793         024134  001407                          BEQ     12$
   2794         024136  000137  023446                  JMP     1$
   2795         024142  020327  002770          2$:     CMP     R3,#SKEEND
   2796         024146  001402                          BEQ     12$
   2797         024150  000137  023446                  JMP     1$
   2798         024154                          12$:
   2799
   2800         024154                          ENDSEG                          ;****END OF SEGMENT****
                024154                          10000$:
                024154  104405                          TRAP    C$ESEG
   2801         024156                          ENDTST                          ;****END OF TEST****
                024156                          L10073:
                024156  104401                          TRAP    C$ETST
   2802
   2803                                         .SBTTL  **TEST 44** - VERIFY GET STATUS WHILE DRDY IS LOW
   2804
   2805         024160                          BGNTST                          ;****START OF TEST****
   2806
   2807         024160                          STARS
                                                ;;**************************************************************
   2808                                         ;VERIFY THAT WE CAN ISSUE GET STATUS AND RECIEVE
   2809                                         ;THE STATUS WORD WHILE THE DRIVE IS IN MOTION SEEKING
   2810         024160                          STARS
                                                ;;**************************************************************
   2811
   2812         024160                          1$:
   2813         024160  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
   2814         024164  000010                          RDHDR                   ;READ HEADER
   2815         024166  004537  014334                  JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
   2816         024172                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
                024172  104406                          TRAP    C$CLP1
   2817
   2818         024174  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
   2819         024200                                  CKLOOP                  ;CHECK IF /FL:LOE IS SET
                024200  104406                          TRAP    C$CLP1
   2820
   2821         024202  013737  002314  002364          MOV     E.MP,BDDAT      ;READ HEADER
   2822         024210  043737  002334  002364          BIC     SECMSK,BDDAT    ;CLEAR OUT SECTOR
   2823         024216  001461                          BEQ     5$              ;IF ON TRACK ZERO, H.S. ZERO, OK
   2824
   2825                                         ;NOT ON TRACK ZERO CALCULATE DIFFERENCE WORD AND PUT IT BACK
   2826                                         ;ON ZERO.
   2827
   2828         024220  042737  000100  002364          BIC     #RMHS,BDDAT     ;CLEAR OUT HEAD SELECT
   2829         024226  013777  002364  156020          MOV     BDDAT,@RLDA     ;PUT CYLINDER AS DIFFERENCE WORD
   2830         024234  052777  000001  156012          BIS     #MK,@RLDA       ;SET MARKER BIT
   2831         024242  004537  013446                  JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
```

**TEST 4444 VERIFY GET STATUS WHILE DRDY IS LOW

```
2832 024246  000006                        SEEK                    ;SEEK
2833 024250  004537  014334                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2834 024254                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     024254  104406                        TRAP    C$CLP1
2835
2836 024256  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2837 024262                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     024262  104406                        TRAP    C$CLP1
2838
2839 024264  004537  014246                JSR     R5,WTDRDY       ;WAIT FOR DRIVE READY
2840 024270                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     024270  104406                        TRAP    C$CLP1
2841
2842 024272  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2843 024276                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     024276  104406                        TRAP    C$CLP1
2844
2845 024300  004537  013446                JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2846 024304  000010                        RDHDR                   ;READ HEADER
2847 024306  004537  014334                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2848 024312                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     024312  104406                        TRAP    C$CLP1
2849
2850 024314  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2851 024320                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     024320  104406                        TRAP    C$CLP1
2852
2853 024322  005037  002362                CLR     GDDAT           ;CLEAR EXPECTED
2854 024326  013737  002364  002376        MOV     BDDAT,DWORD     ;SAVE DIFFERENCE WORD
2855 024334  013737  002314  002364        MOV     E.MP,BDDAT      ;READ HEADER
2856 024342  043737  002334  002364        BIC     SECMSK,BDDAT    ;MASK OUT SECTOR BITS
2857 024350  001404                        BEQ     5$              ;BRANCH IF ON ZERO TRACK
2858
2859 024352                                ERRDF   54.,EM54,ERR3
     024352  104455                        TRAP    C$ERDF
     024354  000066                        .WORD   54
     024356  006426                        .WORD   EM54
     024360  010252                        .WORD   ERR3
2860 024362                          5$:   CKLOOP                  ;CHECK IF /FL:LOE IS SET
     024362  104406                        TRAP    C$CLP1
2861
2862 024364  012777  077601  155662        MOV     #77601,@RLDA    ;GET DIFFERENCE WORD
2863 024372  052777  000005  155654        BIS     #SIGN!MK,@RLDA  ;SET SIGN (TOWARDS SPINDLE) AND MARKER
2864 024400  004537  013446                JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2865 024404  000006                        SEEK                    ;SEEK
2866 024406  004537  014334                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2867 024412                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     024412  104406                        TRAP    C$CLP1
2868
2869 024414  004537  013146                JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2870 024420                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
     024420  104406                        TRAP    C$CLP1
2871 024422  012777  000003  155624        MOV     #MK!GSBIT,@RLDA
2872 024430  004537  013446                JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2873 024434  000004                        GSTAT
2874 024436  004537  014334                JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2875 024442                                CKLOOP                  ;CHECK IF /FL:LOE IS SET
```

```
**TEST 44**   VERIFY GET STATUS WHILE DRDY IS LOW

        024442  104406                          TRAP    C$CLP1
2876    024444  004537  013146                  JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2877
2878    024450                          ENDTST                          ;****END OF TEST****
        024450                          L10074:
        024450  104401                          TRAP    C$ETST
2879
2880    024452                          BGNMOD  HRDPRM
2881
2882    024452                                  BGNHRD
        024452  000032                          .WORD L10075-L$HARD/2
2883                                                                    ;WHAT TYPE OF CONTROLLER
2884                                                                    ;RL11=1, RLV11=2, RLV12=3
2885    024454                                  GPRMD   CNTMSG,CNT,0,3,1,3,YES
        024454  005032                          .WORD   T$CODE
        024456  024554                          .WORD   CNTMSG
        024460  000003                          .WORD   3
        024462  000001                          .WORD   T$LOLIM
        024464  000003                          .WORD   T$HILIM
2886                                                                    ;CONTOLLER BUS ADDRESS
2887    024466                                  GPRMA   CSRMSG,CSR,0,160000,177776,YES
        024466  000031                          .WORD   T$CODE
        024470  024540                          .WORD   CSRMSG
        024472  160000                          .WORD   T$LOLIM
        024474  177776                          .WORD   T$HILIM
2888                                                                    ;INTERRUPT VECTOR
2889    024476                                  GPRMA   VECMSG,VECT,0,0,776,YES
        024476  001031                          .WORD   T$CODE
        024500  024616                          .WORD   VECMSG
        024502  000000                          .WORD   T$LOLIM
        024504  000776                          .WORD   T$HILIM
2890                                                                    ;DRIVE NUMBER
2891    024506                                  GPRMD   DRMSG,DRBT,0,03400,0,7,YES
        024506  004032                          .WORD   T$CODE
        024510  024647                          .WORD   DRMSG
        024512  003400                          .WORD   03400
        024514  000000                          .WORD   T$LOLIM
        024516  000007                          .WORD   T$HILIM
2892                                                                    ;DRIVE TYPE
2893    024520                                  GPRML   DRTYPE,TYPDR,1,YES
        024520  003130                          .WORD   T$CODE
        024522  024625                          .WORD   DRTYPE
        024524  000001                          .WORD   1
2894                                                                    ;BREAK LEVEL
2895    024526                                  GPRMD   BRMSG,PRIOR,0,340,0,7,YES
        024526  002032                          .WORD   T$CODE
        024530  024605                          .WORD   BRMSG
        024532  000340                          .WORD   340
        024534  000000                          .WORD   T$LOLIM
        024536  000007                          .WORD   T$HILIM
2896
2897    024540                                  ENDHRD
                                                .EVEN
        024540                          L10075:
2898
2899    024540    102   125   123     CSRMSG: .ASCIZ  /BUS ADDRESS/
        024543    040   101   104
```

```
**TEST 44**   VERIFY GET STATUS WHILE DRDY IS LOW

        024546  104     122     105
        024551  123     123     000
 2900   024554  122     114     061  CNTMSG: .ASCIZ  /RL11-1, RLV11-2, RLV12-3/
        024557  061     075     061
        024562  054     040     122
        024565  114     126     061
        024570  061     075     062
        024573  054     040     122
        024576  114     126     061
        024601  062     075     063
        024604  000
 2901   024605  102     122     040  BRMSG:  .ASCIZ  /BR LEVEL/
        024610  114     105     126
        024613  105     114     000
 2902   024616  126     105     103  VECMSG: .ASCIZ  /VECTOR/
        024621  124     117     122
        024624  000
 2903   024625  104     122     111  DRTYPE: .ASCIZ  /DRIVE TYPE = RL01/
        024630  126     105     040
        024633  124     131     120
        024636  105     040     075
        024641  040     122     114
        024644  060     061     000
 2904   024647  104     122     111  DRMSG:  .ASCIZ  /DRIVE/
        024652  126     105     000
 2905                            .EVEN
 2906
 2907   024656                       ENDMOD
 2908
 2909   024656                  BGNMOD  SFTPRM
 2910
 2911   024656                          BGNSFT
        024656  000011                  .WORD L10076-L$SOFT/2
 2912   024660                          GPRML   DMSG,DLT,1,YES
        024660  000130                  .WORD   T$CODE
        024662  024702                  .WORD   DMSG
        024664  000001                  .WORD   1
 2913   024666                          XFERF   1$
        024666  006044                  .WORD   T$CODE
 2914   024670                          GPRMD   EMSG,ELT,0,177777,0,177777,YES
        024670  001032                  .WORD   T$CODE
        024672  024726                  .WORD   EMSG
        024674  177777                  .WORD   177777
        024676  000000                  .WORD   T$LOLIM
        024700  177777                  .WORD   T$HILIM
 2915   024702                  1$:     ENDSFT
                                        .EVEN
        024702                  L10076:
 2916
 2920
 2921   024702      104     122     117  DMSG:   .ASCIZ  /DROP ON ERROR LIMIT/
 2922   024726      105     122     122  EMSG:   .ASCIZ  /ERROR LIMIT/
 2923
 2927
 2928                            .EVEN
 2929
 2930   024742                           ENDMOD
```

```
••TEST 44••   VERIFY GET STATUS WHILE DRDY IS LOW

 2931 024742                            LASTAD
                                                .EVEN
      024742  000000                              .WORD   0
      024744  000000                              .WORD   0
      024746                            L$LAST::
 2932
 2933          000001                   .END
```

SYMBOL TABLE

```
ADDCOD  013056 G        CLNCOD  013004 G        C$RDBU= 000007          EM32    005540          E.MP1   002316
ADR   = 000020 G        CNT   = 000012          C$REFG= 000047          EM33    005574          E.MP2   002320
AFREG   004644          CNTMSG  024554          C$RESE= 000033          EM34    005641          FIRST   002366
AFTER   013774          COMP    004045          C$REVI= 000003          EM37    005716          FIX     013712
ARLBA   004601          CONT    012234          C$RFLA= 000021          EM4     005037          FNDFNC  013664
ARLCS   004574          CONTIN  012102          C$RPT = 000025          EM41    005756          FRMT1   011024
ARLDA   004607          CRDY  = 000200          C$SEFG= 000046          EM42    006047          FRMT11  011303
ARLMP   004615          CRTIM   004665          C$SPRI= 000041          EM43    006105          FRMT12  011344
ASSEMB= 000010          CSEND   003070          C$SVEC= 000037          EM44    006204          FRMT13  011423
BATEST  015142          CSPAT   002772          C$TPRI= 000013          EM45    006237          FRMT14  011454
BA16  = 000020          CSR   = 000000          DAHS  = 000020          EM46    006272          FRMT15  011520
BA17  = 000040          CSRMSG  024540          DATEST  015246          EM47    006325          FRMT2   011064
BCCFBK  002342          CSTEST  015022          DCKMES  004026          EM5     005064          FRMT2A  011103
BCSR    002262          CYLMSK  002370          DEMES   003774          EM52    006356          FRMT2B  011116
BDDAT   002364          C$AU  = 000052          DERFLG  002304          EM54    006426          FRMT3   011132
BEFORE  013724          C$AUTO= 000061          DERR  = 040000          EM55    006465          FRMT4   011137
BEGPAT  002416          C$BRK = 000022          DIAGMC= 000000          EM56    006520          FRMT5   011175
BEREG   004623          C$BSEG= 000004          DLT   = 000000          EM57    006557          FRMT6   011246
BGNTST  012456          C$BSUB= 000002          DLTMES  004033          EM6     005135          FRMT99  011172
BIT0  = 000001 G        C$CEFG= 000045          DLYCNT  002414          EM61    006660          F$AU  = 000015
BIT00 = 000001 G        C$CLCK= 000062          DMSG    024702          EM62    006741          F$AUTO= 000020
BIT01 = 000002 G        C$CLEA= 000012          DRBT  = 000010          EM63    007024          F$BGN = 000040
BIT02 = 000004 G        C$CLOS= 000035          DRDY  = 000001          EM64    007105          F$CLEA= 000007
BIT03 = 000010 G        C$CLP1= 000006          DRIVE   002270          EM65    007170          F$DU  = 000016
BIT04 = 000020 G        C$CVEC= 000036          DRMSG   024647          EM66    007251          F$END = 000041
BIT05 = 000040 G        C$DCLN= 000044          DROP    011624          EM67    007334          F$HARD= 000004
BIT06 = 000100 G        C$DODU= 000051          DRPCOD  013052 G        EM7     005163          F$HW  = 000013
BIT07 = 000200 G        C$DRPT= 000024          DRST  = 000010          EM70    007371          F$INIT= 000006
BIT08 = 000400 G        C$DU  = 000053          DRTIM   004712          EM71    007426          F$JMP = 000050
BIT09 = 001000 G        C$EDIT= 000003          DRTYPE  024625          EM72    007463          F$MOD = 000000
BIT1  = 000002 G        C$ERDF= 000055          DRVRDY  012342          EM73    007516          F$MSG = 000011
BIT10 = 002000 G        C$ERHR= 000056          DSPCOD  011632 G        EM74    007551          F$PROT= 000021
BIT11 = 004000 G        C$ERRO= 000060          DS0   = 000000          EM75    007603          F$PWR = 000017
BIT12 = 010000 G        C$ERSF= 000054          DS1   = 000400          EM76    007635          F$RPT = 000012
BIT13 = 020000 G        C$ERSO= 000057          DS2   = 001000          EM77    007670          F$SEG = 000003
BIT14 = 040000 G        C$ESCA= 000010          DS3   = 001400          END     012516          F$SOFT= 000005
BIT15 = 100000 G        C$ESEG= 000005          DWORD   002376          ENDPAT  002624          F$SRV = 000010
BIT2  = 000004 G        C$ESUB= 000003          EF.CON= 000036 G        ERCOUN  003074          F$SUB = 000002
BIT3  = 000010 G        C$ETST= 000001          EF.NEW= 000035 G        ERPOIN  003072          F$SW  = 000014
BIT4  = 000020 G        C$EXIT= 000032          EF.PWR= 000034 G        ERR   = 100000          F$TEST= 000001
BIT5  = 000040 G        C$GETB= 000026          EF.RES= 000037 G        ERRVEC  002340          GDDAT   002362
BIT6  = 000100 G        C$GETW= 000027          EF.STA= 000040 G        ERR0    010160 G        GLBDAT  002242 G
BIT7  = 000200 G        C$GMAN= 000043          ELT   = 000002          ERR1    010176 G        GLBEQA  002242 G
BIT8  = 000400 G        C$GPHR= 000042          EMSG    024726          ERR2    010210 G        GLBERR  010160 G
BIT9  = 001000 G        C$GPLO= 000030          EM1     004740          ERR3    010252 G        GLBSUB  013062 G
BOE   = 000400 G        C$GPRI= 000040          EM101   007723          ERR4    010324 G        GLBTXT  003774 G
BPRIOR  002264          C$INIT= 000011          EM102   007770          ERR5    010372 G        GODRVR= 000202
BRMSG   024605          C$INLP= 000020          EM11    005211          ERR6    010404 G        GSBIT = 000002
BVEC    002266          C$MANI= 000050          EM13    005252          ERR7    010446 G        GSTAT = 000004
B.BA    002274          C$MEM = 000031          EM14    005304          EVL   = 000004 G        GSTINT  004535
B.BE    002302          C$MSG = 000023          EM15    005332          E$END = 002100          GSTMES  004476
B.CS    002272          C$OPEN= 000034          EM16    005360          E$LOAD= 000035          G$CNTO= 000200
B.DA    002276          C$PNTB= 000014          EM17    005406          E.BA    002310          G$DELM= 000372
B.MP    002300          C$PNTF= 000017          EM2     004765          E.BE    002322          G$DISP= 000003
CALBCC  002344          C$PNTS= 000016          EM3     005012          E.CS    002306          G$EXCP= 000400
CHERR   013146          C$PNTX= 000015          EM30    005441          E.DA    002312          G$HILI= 000002
CKERLT  013062          C$QIO = 000377          EM30A   005500          E.MP    002314          G$LOLI= 000001
```

SYMBOL TABLE

```
G$NO  = 000000          LOT   = 000010 G        L10004  010370          L10076  024702          SECMSK  002334
G$OFFS= 000400          L$ACP   002110 G        L10005  010402          MAXCYL  002400          SEEK  = 000006
G$OFSI= 000376          L$APT   002036 G        L10006  010444          MAXSEC  002374          SEKINT  004444
G$PRMA= 000001          L$AU    013056 G        L10007  010502          MDHEDR  002000 G        SEKMES  004413
G$PRMD= 000002          L$AUT   002070 G        L10010  011622          MERLMT  011626          SFTPRM  024656 G
G$PRML= 000000          L$AUTO  012562 G        L10011  011632          MK    = 000001          SIGN  = 000004
G$RADA= 000140          L$CCP   002106 G        L10013  012560          MSCRLF  004040          SIMBCC  014060
G$RADB= 000000          L$CLEA  013004 G        L10014  013002          MXSEC1  002372          SIZE  = 000004
G$RADD= 000040          L$CO    002032 G        L10015  013050          NOOP0 = 000000          SKEEND  002770
G$RADL= 000120          L$DEPO  002011 G        L10016  013054          NOOP7 = 000016          SKEND   002726
G$RADO= 000020          L$DESC  002122 G        L10017  013060          NOPINT  004157          SKLST   002626
G$XFER= 000004          L$DESP  002076 G        L10020  014244          NOPMES  004126          SPTCOD  011622 G
G$YES = 000010          L$DEVP  002060 G        L10021  014526          NOPWR   012014          START   012120
HALMAX  002704          L$DISP  011634 G        L10022  014622          NXM   = 020000          START1  012034
HCRCME  004013          L$DLY   002116 G        L10023  014716          NXMMES  004001          STHS  = 000100
HDRBUF  003274          L$DTP   002040 G        L10024  015012          NXT     012112          SVCGBL= 000000
HDRLST  013666          L$DTYP  002034 G        L10025  015132          OKHDR   013676          SVCINS= 000000
HMAX    002734          L$DU    013052 G        L10026  015236          OPI   = 002000          SVCSUB= 177777
HNFMES  004021          L$DUT   002072 G        L10027  015324          OPIERR  004053          SVCTAG= 000000
HOE   = 100000 G        L$DVTY  002230 G        L10030  015450          OPIMES  004006          SVCTST= 177777
HPTCOD  011604 G        L$EF    002052 G        L10031  015574          O$APTS= 000000          SVHD    002402
HRDPRM  024452 G        L$ENVI  002044 G        L10C32  015702          O$AU  = 000001          S$LSYM= 010000
IBE   = 010000 G        L$ETP   002102 G        L10033  016002          O$BGNR= 000000          TEMP2   002346
IDU   = 000040 G        L$EXP1  002046 G        L10034  016072          O$BGNS= 000001          TEMP3   002350
IER   = 020000 G        L$EXP4  002064 G        L10035  016172          O$DU  = 000001          TEMP4   002352
INITCO  011772 G        L$EXP5  002066 G        L10036  016302          O$ERRT= 000000          TMPFNC  002412
INTEN = 000100          L$HARD  024454 G        L10037  016356          O$GNSW= 000001          TMP0    002354
INTFLG  002330          L$HIME  002120 G        L10040  016414          O$POIN= 000001          TMP1    002356
INTSRV  014240          L$HPCP  002016 G        L10041  016540          O$SETU= 000000          TMP2    002360
ISR   = 000100 G        L$HPTP  002022 G        L10042  016700          PFLG    002324          TRPFLG  002326
IXE   = 004000 G        L$HW    011606 G        L10043  017040          PNT   = 001000 G        TRPHAN  014232
I$AU  = 000041          L$ICP   002104 G        L10044  017244          PRI   = 002000 G        TYPDR = 000006
I$AUTO= 000041          L$INIT  011772 G        L10045  017276          PRIOR = 000004          T$ARGC= 000001
I$CLN = 000041          L$LADP  002026 G        L10046  017504          PRI00 = 000000 G        T$CODE= 001032
I$DU  = 000041          L$LAST  024746 G        L10047  017572          PRI01 = 000040 G        T$ERRN= 000066
I$HRD = 000041          L$LOAD  002100 G        L10050  017740          PRI02 = 000100 G        T$EXCP= 000000
I$INIT= 000041          L$LUN   002074 G        L10051  017770          PRI03 = 000140 G        T$FLAG= 000040
I$MOD = 000041          L$MREV  002050 G        L10052  020142          PRI04 = 000200 G        T$GMAN= 000000
I$MSG = 000041          L$NAME  002000 G        L10053  020230          PRI05 = 000240 G        T$HILI= 177777
I$PROT= 000040          L$PRIO  002042 G        L10054  020356          PRI06 = 000300 G        T$LAST= 000001
I$PTAB= 000041          L$PROT  011764 G        L10055  020400          PRI07 = 000340 G        T$LOLI= 000000
I$PWR = 000041          L$PRT   002112 G        L10056  020460          PWRFLG  002242          T$LSYM= 010000
I$RPT = 000041          L$REPP  002062 G        L10057  020624          QMAX    002732          T$LTNO= 000054
I$SEG = 000041          L$REV   002010 G        L10060  020762          QUAMAX  002702          T$NEST= 177777
I$SETU= 000041          L$SOFT  024660 G        L10061  021300          RDHDR = 000010          T$NSO = 000000
I$SFT = 000041          L$SPC   002056 G        L10062  021374          READ  = 000014          T$NS1 = 000005
I$SRV = 000041          L$SPCP  002020 G        L10063  021440          REST    012160          T$PTNU= 000000
I$SUB = 000041          L$SPTP  002024 G        L10064  021564          RESTMS  013430          T$SAVL= 177777
I$TST = 000041          L$STA   002030 G        L10065  022202          RHDINT  004352          T$SEGL= 177777
J$JMP = 000167          L$SW    011624 G        L10066  022334          RHDMES  004312          T$SEKO= 010000
LDCSR   002332          L$TEST  002114 G        L10067  022476          RHHS  = 000100          T$SUBN= 000000
LDFUNC  013446          L$TIML  002014 G        L10070  022636          RLBA    002252          T$TAGL= 177777
LF      004043          L$UNIT  002012 G        L10071  023010          RLBE    002260          T$TAGN= 010077
LINE1   010504          L10000  010174          L10072  023436          RLCS    002250          T$TEMP= 000000
LINE2   010540          L10001  010206          L10073  024156          RLDA    002254          T$TEST= 000054
LINE3   010752          L10002  010250          L10074  024450          RLMP    002256          T$TSTM= 177777
LOE   = 040000 G        L10003  010322          L10075  024540          RL2     002730          T$TSTS= 000001
```

SEQ 0(

SYMBOL TABLE

```
T$$AU  - 010017          T1      014434 G        T24     017574 G        T39     022336 G        VECT  - 000002
T$$AUT - 010014          T10     015576 G        T25     017742 G        T4      014720 G        WAITO   012360
T$$CLE - 010015          T11     015704 G        T26     017772 G        T40     022500 G        WAIT1   021330
T$$DU  - 010016          T12     016004 G        T27     020144 G        T41     022640 G        WCKINT  004251
T$$HAR - 010075          T13     016074 G        T28     020232 G        T42     023012 G        WCKMES  004211
T$$HW  - 010010          T14     016174 G        T29     020360 G        T43     023440 G        WHY     002404
T$$INI - 010013          T15     016304 G        T3      014624 G        T44     024160 G        WRCHK - 000002
T$$MSG - 010007          T16     016360 G        T30     020402 G        T5      015014 G        WRITE - 000012
T$$PRO - 010012          T17     016416 G        T31     020462 G        T6      015134 G        WTCRDY  014334
T$$SEG - 010000          T18     016542 G        T32     020626 G        T7      015240 G        WTDRDY  014246
T$$SOF - 010076          T19     016702 G        T33     020764 G        T8      015326 G        XPOLY   002336
T$$SRV - 010020          T2      014530 G        T34     021302 G        T9      015452 G        XXX     012142
T$$SW  - 010011          T20     017042 G        T35     021376 G        UAM   - 000200 G        X$ALWA - 000000
T$$TES - 010074          T21     017246 G        T36     021442 G        UNITST  002246          X$FALS - 000040
T.CNTL   002410          T22     017300 G        T37     021566 G        UUT     002244          X$OFFS - 000400
T.DRIV   002406          T23     017506 G        T38     022204 G        VECMSG  024616          X$TRUE - 000020
T.SIZE   011630

. ABS.   024746     000
         000000     001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  28581 WORDS  ( 112 PAGES)
DYNAMIC MEMORY:  20060 WORDS  ( 77 PAGES)
ELAPSED TIME:  00:22:31
CNRLGA.BIC,CNRLGA.LST/-SP=SVC34.MLB/ML,CNRLGA.MAC
```