```
                        .TITLE  CNRLGAO RL11/RLV11 CTLR  ST 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
```

```
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

002122                                  ENDMOD

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
002230                          DEVTYP  <RL01,RL02>
002230  122  114  060                   .ASCIZ  #RL01,RL02#
002233  061  054  122
002236  114  060  062
002241  000

                                        .EVEN

002242                          BGNMOD  GLBEQAT

002242                                  EQUALS
                                ;
                                ; BIT DIFINITIONS
```

```
                        ;
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

```
                                        BGNMOD  GLBDAT
                                        .SBTTL  GLOBAL DATA
002242  000000              PWRFLG: .WORD   0
002244  000000              UUT:    .WORD   0
002246  000000              UNITST: .WORD   0
002250  000000              RLCS:   .WORD   0               ;LOGICAL ADDRESS OF CS
002252  000000              RLBA:   .WORD   0               ;LOGICAL ADDRESS OF BA
002254  000000              RLDA:   .WORD   0               ;LOGICAL ADDRESS OF DA
002256  000000              RLMP:   .WORD   0               ;LOGICAL ADDRESS OF MP
002260  000000              RLBE:   .WORD   0               ;LOGICAL ADDRESS OF BE
002262  000000              BCSR:   .WORD   0
002264  000000              BPRIOR: .WORD   0
002266  000000              BVEC:   .WORD   0
002270  000000              DRIVE:  .WORD   0               ;DRIVE UNDER TEST
002272  000000              B.CS:   .WORD   0               ;CS - BEFORE OPERATION
002274  000000              B.BA:   .WORD   0               ;BA - BEFORE OPERATION
002276  000000              B.DA:   .WORD   0               ;DA - BEFORE OPERATION
002300  000000              B.MP:   .WORD   0               ;MP - BEFORE OPERATION
002302  000000              B.BE:   .WORD   0               ;BE - BEFORE OPERATION
002304  000000              DERFLG: .WORD
002306  000000              E.CS:   .WORD   0               ;CS - AT OCCURANCE OF ERROR
002310  000000              E.BA:   .WORD   0               ;BA - AT OCCRUANCE OF ERROR
002312  000000              E.DA:   .WORD   0               ;DA - AT OCCURANCE OF ERROR
002314  000000              E.MP:   .WORD   0               ;MP - AT OCCURANCE OF ERROR
002316  000000              E.MP1:  .WORD   0
002320  000000              E.MP2:  .WORD   0               ;MP - AT OCCURANCE OF ERROR READ HEADER
002322  000000              E.BE:   .WORD   0               ;BE - AT OCCURANCE OF ERROR RLV12 ONLY
002324  000000              PFLG:   .WORD   0               ;PROCESSOR TYPE, 0=UNIBUS, 1=Q-BUS
002326  000000              TRPFLG: .WORD   0
002330  000000              INTFLG: .WORD   0               ;INTERRUPT OCCURRENCE FLAG
002332  000000              LDCSR:  .WORD   0               ;LOCATION TO FORM RLCS
002334  000077              SECMSK: .WORD   77              ;MASK OUT SECTOR
002336  120001              XPOLY:  .WORD   120001          ;POLYNOMIAL FOR CRC 16
002340  000004              ERRVEC: .WORD   4
002342  000000              BCCFBK: .WORD   0               ;LOCATION USED BY "SIMBCC"
002344  000000              CALBCC: .WORD   0               ;LOCATION USED BY "SIMBCC"
002346  000000              TEMP2:  .WORD   0               ;LOCATION USED BY "SIMBCC"
002350  000000              TEMP3:  .WORD   0               ;LOCATION USED BY "SIMBCC"
002352  000000              TEMP4:  .WORD   0               ;LOCATION USED BY "SIMBCC"
002354  000000              TMP0:   .WORD   0
002356  000000              TMP1:   .WORD   0
002360  000000              TMP2:   .WORD   0
002362  000000              GDDAT:  .WORD   0
002364  000000              BDDAT:  .WORD   0
002366  000000              FIRST:  .WORD   0               ;FIRST SECTOR READ
002370  177700              CYLMSK: .WORD   177700          ;MASK CYLINDER AND HEAD SELECT
002372  000050              MXSEC1: .WORD   40.             ;MAX SECTOR ADDRESS +1
002374  000047              MAXSEC: .WORD   39.             ;MAX SECTOR ADDRESS
002376  000000              DWORD:  .WORD   0               ;DIFFERENCE WORD (SEEK)
002400  177600              MAXCYL: .WORD   177600          ;MAXIMUM CYLINDER ADDRESS
002402  000000              SVHD:   .WORD   0               ;SAVE CURRENT HEAD SELECT
002404  000000              WHY:    .WORD   0               ;REASON FOR DROP UNIT

002406  000000              T.DRIVE:        .WORD   0       ;DRIVE TYPE
002410  000000              T.CNTLR:        .WORD   0       ;CONTOLLER TYPE
```

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

```
    251 002562  177776                        177776
    252 002564  177775                        177775
    253 002566  177773                        177773
    254 002570  177767                        177767
    255 002572  177757                        177757
    256 002574  177737                        177737
    257 002576  177677                        177677
    258 002600  177577                        177577
    259 002602  177377                        177377
    260 002604  176777                        176777
    261 002606  175777                        175777
    262 002610  173777                        173777
    263 002612  167777                        167777
    264 002614  157777                        157777
    265 002616  137777                        137777
    266 002620  077777                        077777
    267 002622  177777                        177777
    268 002624  000000              ENDPAT:   000000
    269
    270                             .SBTTL  PATTERNS FOR DIFFERENCE WORD
    271
    272 002626  000200              SKLST:    .WORD   BIT7
    273 002630  000400                        .WORD   BIT8            ;SHIFTING 1
    274 002632  001000                        .WORD   BIT9
    275 002634  002000                        .WORD   BIT10
    276 002636  004000                        .WORD   BIT11
    277 002640  010000                        .WORD   BIT12
    278 002642  020000                        .WORD   BIT13
    279 002644  040000                        .WORD   BIT14
    280 002646  077600                        .WORD   77600           ;SHIFTING 0
    281 002650  077400                        .WORD   77400
    282 002652  076600                        .WORD   76600
    283 002654  075600                        .WORD   75600
    284 002656  073600                        .WORD   73600
    285 002660  067600                        .WORD   67600
    286 002662  057600                        .WORD   57600
    287 002664  037600                        .WORD   37600
    288 002666  077600                        .WORD   77600
    289 002670  000200                        .WORD   200
    290 002672  000600                        .WORD   600             ;GROWING 1
    291 002674  001600                        .WORD   1600
    292 002676  003600                        .WORD   3600
    293 002700  007600                        .WORD   7600
    294 002702  017600              QUAMAX:   .WORD   17600
    295 002704  037600              HALMAX:   .WORD   37600
    296 002706  077600                        .WORD   77600
    297 002710  077400                        .WORD   77400           ;GROWING 0
    298 002712  077000                        .WORD   77000
    299 002714  076000                        .WORD   76000
    300 002716  074000                        .WORD   74000
    301 002720  070000                        .WORD   70000
    302 002722  060000                        .WORD   60000
    303 002724  040000                        .WORD   40000
    304 002726  000000              SKEND:    .WORD   00000
    305 002730  100000              RL2:      .WORD   BIT15
    306 002732  037600              QMAX:     .WORD   37600
    307 002734  077600              HMAX:     .WORD   77600
```

PATTERNS FOR DIFFERENCE WORD

```
                                                .WORD   177600
                                                .WORD   177400
                                                .WORD   176600
                                                .WORD   173600
                                                .WORD   167600
                                                .WORD   157600
                                                .WORD   137600
                                                .WORD   177000
                                                .WORD   176000
                                                .WORD   174000
                                                .WORD   170000
                                                .WORD   60000
                                                .WORD   40000
                                        SKEEND: .WORD   000000

                                        ;PATTERNS FOR TEST OF RLCS

                                        CSPAT:  .WORD   0               ;SHIFTING 1
                                                .WORD   BIT1
                                                .WORD   BIT2
                                                .WORD   BIT3
                                                .WORD   BIT4
                                                .WORD   BIT5
                                                .WORD   BIT6
                                                .WORD   BIT8
                                                .WORD   BIT9
                                                .WORD   1576            ;GROWING 0
                                                .WORD   1574
                                                .WORD   1570
                                                .WORD   1560
                                                .WORD   1540
                                                .WORD   1500
                                                .WORD   1400
                                                .WORD   1576            ;SHIFT 0
                                                .WORD   1574
                                                .WORD   1566
                                                .WORD   1556
                                                .WORD   1536
                                                .WORD   1436
                                                .WORD   1136
                                                .WORD   76
                                                .WORD   6               ;GROWING 1
                                                .WORD   16
                                                .WORD   36
                                                .WORD   76
                                                .WORD   176             ;
                                                .WORD   576
                                                .WORD   1576
                                        CSEND:  .WORD   0
                                        ERPOINT: .WORD  0
                                        ERCOUNT: .BLKW  64.
                                        HDRBUF: .BLKW   160.
                                        ENDMOD

                                        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: %O6%A  DRIVE: %O1/
    544 011064      045     116     045  FRMT2:  .ASCIZ  /%N%T%T%O6%T%O6/
    545 011103      045     124     045  FRMT2A: .ASCIZ  /%T%O6%T%O6/
    546 011116      045     124     045  FRMT2B: .ASCIZ  /%T%O6%T%O6%/
    547 011132      045     116     045  FRMT3:  .ASCIZ  /%N%T/
    548 011137      045     116     045  FRMT4:  .ASCII  /%N%AEXP'D: %O6%A REC'D: %O6/
    549 011172      045     116     000  FRMT99: .ASCIZ  /%N/
    550 011175      045     116     045  FRMT5:  .ASCIZ  /%N%ALAST: %O6%A PRES: %O6%A EXP'D: %O6%N/
    551 011246      045     116     045  FRMT6:  .ASCIZ  /%N%AAT PROCESSOR LEVEL %O6%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

```
655 012244  062700  000002            ADD     #2,R0
656 012250  010037  002252            MOV     R0,RLBA
657 012254  062700  000002            ADD     #2,R0
658 012260  010037  002254            MOV     R0,RLDA
659 012264  062700  000002            ADD     #2,R0
660 012270  010037  002256            MOV     R0,RLMP
661 012274  022737  000002  C02410    CMP     #2,T.CNTLR              ;IF THIS IS AN RLV12, BUILD LOGICAL
662 012302  001004                    BNE     1$                      ;ADDRESS FOR BUS ADDRESS EXTENSION.
663 012304  062700  000002            ADD     #2,R0
664 012310  010037  002260            MOV     R0,RLBE
665
666 012314  005737  002242      1$:   TST     PWRFLG                  ;RECENT POWER FAILURE?
667 012320  001476                    BEQ     END                     ;NO
668
669                               ;THERE WAS A RECENT POWER FAILURE, THEREFORE WE WILL WAIT
670                               ;FOR THE DRIVE TO COME READY
671
672 012322  012701  000170            MOV     #120.,R1                ;INITIALIZE WAIT COUNT
673 012326  012777  000200  167714    MOV     #200,@RLCS              ;SET CRDY
674 012334  053777  002270  167706    BIS     DRIVE,@RLCS             ;SET IN DRIVE SELECT
675 012342  032777  000001  167700  DRVRDY: BIT   #DRDY,@RLCS         ;DRIVE READY???
676 012350  001042                    BNE     BGNTST                  ;YES, THEN START TEST
677 012352  012737  000050  002414    MOV     #40.,DLYCNT             ;INITIALIZE DELAY COUNT
678 012360                        WAITO:  DELAY   1                       ;IMPLEMENT 100-USEC DELAY
    012360  012727  000001            MOV     #1,(PC)+
    012364  000000                    .WORD   0
    012366  013727  002116            MOV     L$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
679 012410  005337  002414            DEC     DLYCNT                  ;DECREMENT DELAY COUNT
680 012414  001361                    BNE     WAITO                   ;BRANCH IF TIME DELAY NOT EXPIRED
681 012416  005301                    DEC     R1                      ;SIXTY SECONDS GONE BY
682 012420  001350                    BNE     DRVRDY                  ;NO, GO BACK
683 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$PNTB
    012436  062706  000004            ADD     #4,SP
684                                                                 ;/FROM POWER FAILURE
685 012442  004737  010504      6$:   JSR     PC,LINE1                ;GIVE DRIVE INFO
686 012446                            DODU    UNITST                  ;TELL SUPERVISOR TO DROP IT
    012446  013700  002246            MOV     UNITST,R0
    012452  104451                    TRAP    C$DODU
687 012454                            DOCLN                           ;FORCE AN ABORT
    012454  104444                    TRAP    C$DCLN
688 012456  012777  000013  167570  BGNTST: MOV   #13,@RLDA           ;SETUP DR RST
689 012464  012777  000204  167556    MOV     #204,@RLCS              ;GS FUNC
690 012472  053777  002270  167550    BIS     DRIVE,@RLCS             ;SELECT DRIVE
691 012500  042777  000200  167542    BIC     #200,@RLCS              ;ISSUE IT
692 012506  032777  000200  167534  4$:   BIT   #200,@RLCS           ;WAIT FOR READY
693 012514  001774                    BEQ     4$
694 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

```
                                        ENDDU
                                L10016:
013054  104453                          TRAP    C$DU

ENDMOD

BGNMOD  ADDCODE

        BGNAU

013056  000240                          NOP

        ENDAU
                                L10017:
013060  104452                          TRAP    C$AU

ENDMOD

        .SBTTL  GLOBAL SUBROUTINES

BGNMOD  GLBSUB

CKERLT: INLOOP
013062  104420                          TRAP    C$INLP
        BCOMPLETE       99$
013064  103427                          BCS     99$
013066  005737  011624                  TST     DROP
013072  001424                          BEQ     99$
013074  005277  167772                  INC     @ERPOINT
013100  027737  167766  011626          CMP     @ERPOINT,MERLMT
013106  002416                          BLT     99$

013110                                  PRINTF  #FRMT11
013110  012746  011303                  MOV     #FRMT11,-(SP)
013114  012746  000001                  MOV     #1,-(SP)
013120  010600                          MOV     SP,R0
013122  104417                          TRAP    C$PNTF
013124  062706  000004                  ADD     #4,SP
013130  004737  010504                  JSR     PC,LINE1
013134                                  DODU    UNITST          ;DROP THE UNIT
013134  013700  002246                  MOV     UNITST,R0
013140  104451                          TRAP    C$DODU
013142                                  DOCLN
013142  104444                          TRAP    C$DCLN
013144                          99$:
013144  000205                          RTS     R5

        .SBTTL  ROUTINE TO CHECK FOR CONTROLLER ERRORS

        ;*******************************************************************
        ;*THIS ROUTINE WILL CHECK RLCS FOR ERRORS AND PRINT THEM
        ;*ACCORDINGLY.  IT WILL MERGE THE ERROR PRINTOUT WITH THE TEST
        ;*ERROR MESSAGE.
        ;*
        ;*EXAMPLE:   RLCS CONTAINED FOLLOWING ERROR(S):
        ;*                   DRV   OPI   HCRC   HNF
        ;*           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     @.CS,-(SP)
    896 013464  012777  000013  166562          MOV     #13,@RLDA
    897 013472  012737  000004  002272          MOV     #GSTAT,@.CS
    898 013500  053737  002270  002272          BIS     DRIVE,@.CS
    899 013506  013777  002272  166534          MOV     @.CS,@RLCS
    900 013514  012637  002272                  MOV     (SP)+,@.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
```

LOAD RLCS

```
923 013652  042777  000200  166370  5$:     BIC     #200,@RLCS
924 013660  012603                  MOV     (SP)+,R3        ;RESTORE R3
925 013662  000205                  RTS     R5              ;EXIT
926
927 013664  000000          FNDFNC: .WORD   0
928
929 013666  004126          HDRLST: NOPMES
930 013670  004157                  NOPINT
931 013672  004211                  WCKMES
932 013674  004251                  WCKINT
933 013676  004476          OKHDR:  GSTMES
934 013700  004535                  GSTINT
935 013702  004413                  SEKMES
936 013704  004444                  SEKINT
937 013706  004312                  RHDMES
938 013710  004352                  RHDINT
939
940                         ;*****************************************************************
941                         ;*ROUTINE TO MOVE ASCII STRINGS
942                         ;*USES REGISTERS R1 - WHERE STRING IS BEING BUILT
943                         ;*
944                         ;*      CALL    JSR     R5,FIX
945                         ;*              .WORD           ;ADDRESS OF STRING TO MOVE
946
947 013712  012500          FIX:    MOV     (R5)+,R0        ;GET ADDRESS AND MOVE RETURN
948 013714  112021          1$:     MOVB    (R0)+,(R1)+     ;GET BYTE AND UPDATE
949 013716  001376                  BNE     1$              ;WATCH 0 BYTE TERMINATOR
950 013720  105741                  TSTB    -(R1)           ;BACK UP OVER ZERO BYTE
951 013722  000205                  RTS     R5              ;EXIT
952
953                         ;LOAD REGISTERS BEFORE OPERATION
954                         ;CALL:  JSR     R5,BEFORE
955
956 013724  017737  166320  002272  BEFORE: MOV     @RLCS,B.CS      ;READ CS
957 013732  017737  166314  002274          MOV     @RLBA,B.BA      ;READ BA
958 013740  017737  166310  002276          MOV     @RLDA,B.DA      ;READ DA
959 013746  017737  166304  002300          MOV     @RLMP,B.MP      ;READ MP
960 013754  022737  000002  002410          CMP     #2,T.CNTLR      ;IF THE CONTOLLER IS AN RLV12
961 013762  001003                          BNE     1$              ;READ BE
962 013764  017737  166270  002302          MOV     @RLBE,B.BE
963
964 013772  000205          1$:     RTS     R5
965
966                         ;LOAD REGISTERS AT ERROR
967                         ;CALL:  JSR     R5,AFTER
968
969 013774  017737  166250  002306  AFTER:  MOV     @RLCS,E.CS      ;READ CS
970 014002  017737  166244  002310          MOV     @RLBA,E.BA      ;READ BA
971 014010  017737  166240  002312          MOV     @RLDA,E.DA      ;READ DA
972 014016  017737  166234  002314          MOV     @RLMP,E.MP      ;READ MP
973 014024  017737  166226  002316          MOV     @RLMP,E.MP1     ;READ MP SECOND WORD IN SILO
974 014032  017737  166220  002320          MOV     @RLMP,E.MP2     ;READ MP THIRD WORD IN SILO
975 014040  022737  000002  002410          CMP     #2,T.CNTLR      ;IF THE CONTROLLER IS AN RLV12
976 014046  001003                          BNE     1$              ;READ BE
977 014050  017737  166204  002322          MOV     @RLBE,E.BE
978
979 014056  000205          1$:     RTS     R5
```

```
                                        .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  002530            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,GODAT        ;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.
 1110 014530                            STARS
                                        ;;*************************************************************
 1111
 1112 014530  005037  002326            1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
 1113 014534                            2$:     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$SVEC
      014556  062706  000010                    ADD     @10,SP
 1114
 1115 014562  005777  165464                    TST     @RLBA           ;ADDRESS RLBA
 1116 014566                                    CLRVEC  ERRVEC          ;RELEASE TRAP VECTOR
      014566  013700  002340                    MOV     ERRVEC,R0
      014572  104436                            TRAP    C$CVEC
 1117 014574  005737  002326                    TST     TRPFLG          ;TRAP OCCURRED???
 1118 014600  001407          M
BEQ     3$              ;NO, CONTINUE
 1119 014602  013737  002252  002362            MOV     RLBA,GDDAT      ;GET UP ERROR DATA
 1120
 1121 014610                                    ERRSF   1.,EM2,ERR1     ;BUS TIMEOUT IN ADDRESSING RLBA
      014610  104454                            TRAP    C$ERSF
      014612  000001                            .WORD   1
      014614  004765                            .WORD   EM2
      014616  010176                            .WORD   ERR1
 1122 014620                            3$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
      014620  104406                            TRAP    C$CLP1
 1123 014622                            ENDTST                          ;****END OF TEST****
      014622                            L10022:
      014622  104401                            TRAP    C$ETST
 1124
 1125                                   .SBTTL  **TEST 3** - RLDA ADDRESSABILITY
 1126
 1127 014624                            BGNTST                          ;****START OF TEST****
 1128 014624                            STARS
                                        ;;*************************************************************
 1129                                   ;TEST TO SEE IF WE CAN ADDRESS THE DISK ADDRESS
 1130                                   ;REGISTER IF WE TRAP WE WILL REPORT THE ERROR
 1131                                   ;AND ABORT.  AFTER THIS TEST WE ONLY KNOW THAT
 1132                                   ;WE CAN ADDRESS THE REGISTER.
 1133 014624                            STARS
                                        ;;*************************************************************
 1134
 1135 014624  005037  002326            1$:     CLR     TRPFLG          ;CLEAR TRAP OCCURANCE
 1136 014630                            2$:     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
 1137
 1138 014656  005777  165372                    TST     @RLDA           ;ADDRESS RLDA
 1139 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

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

                                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.
                                STARS
                                ;;*****************************************************************

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

                                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

                                        ERRDF   4.,EM5,ERR2     ;WRONG DATA IN RLCS
015104  1044%u                          TRAP    C$ERDF
015106  000004                          .WORD   4
015110  005064                          .WORD   EM5
015112  010210                          .WORD   ERR2
                                1$:     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

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

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

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

                                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.
1381 015704                             STARS
                                        ;;*****************************************************************
1382
1383 015704  012703  002416                    MOV     #BEGPAT,R3      ;GET START OF LIST
1384 015710                             BGNSEG                          ;****START OF SEGMENT****
     015710  104404                             TRAP    C$BSEG
1385 015712                             1$:
1386 015712  012777  177776  164332            MOV     #-2,@RLBA       ;SET RLBA TO ALL 1'S (BIT 0=0)
1387 015720  012737  177776  002362            MOV     #-2,GDDAT       ;SET UP EXPECTED RESULTS
1388 015726  041337  002362                    BIC     (R3),GDDAT      ;IN GDDAT
1389 015732  041377  164314                    BIC     (R3),@RLBA      ;BIC RLBA
1390 015736  017737  164310  002364            MOV     @RLBA,BDDAT     ;READ RLBA
1391 015744  023737  002364  002362            CMP     BDDAT,GDDAT     ;BIC WORK OKAY?
1392 015752  001404                          BEQ     2$              ;IF YES BRANCH
1393
1394 015754                                    ERRDF   10.,EM64,ERR2   ;WRONG DATA IN RLBA
     015754  104455                             TRAP    C$ERDF
     015756  000012                             .WORD   10
     015760  007105                             .WORD   EM64
     015762  010210                             .WORD   ERR2
1395 015764                             2$:    ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
     015764  104410                             TRAP    C$ESCAPE
     015766  000012                             .WORD   10000$-.
1396
1397 015770  005723                            TST     (R3)+           ;GET NEXT PATTERN
1398 015772  020327  002624                    CMP     R3,#ENDPAT      ;HAVE WE COMPLETED LIST
1399 015776  001345                          BNE     1$              ;NO, GO BACK FOR NEXT
1400 016000                             ENDSEG                          ;****END OF SEGMENT****
     016000                             10000$:
     016000  104405                             TRAP    C$ESEG
1401 016002                             ENDTST                          ;****END OF TEST****
     016002                             L10033:
     016002  104401                             TRAP    C$ETST
1402
1403                                    .SBTTL  **TEST 12** - BIS OF RLDA
1404
1405 016004                             BGNTST                          ;****START OF TEST****
1406
1407 016004                             STARS
                                        ;;*****************************************************************
1408                                    ;TEST THAT THE "BIS" INSTRUCTION WILL WORK ON THE DISK ADDRESS
1409                                    ;REGISTER.  BITS 15-0 ARE TESTED WITH 4 PATTERNS, GROWING 1,
1410                                    ;SHIFTING 1, GROWING 0, AND SHIFTING 0.
1411 016004                             STARS
                                        ;;*****************************************************************
1412
1413 016004  012703  002416                    MOV     #BEGPAT,R3      ;GET START OF LIST
1414 016010                             BGNSEG                          ;****START OF SEGMENT****
     016010  104404                             TRAP    C$BSEG
1415 016012                             1$:
1416 016012  005077  164236                    CLR     @RLDA           ;CLEAR "DA"
1417 016016  011337  002362                    MOV     (R3),GDDAT      ;SET EXPECTED
1418 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 RLBA

```
 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,@DDAT       ;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,@DDAT       ;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.
016702                                  STARS
                                        ;;*****************************************************************

016702  012737  000200  002362          MOV     #CRDY,GDDAT     ;CONTROLLER READY
016710  032777  040000  163332          BIT     #DERR,@RLCS     ;IF DRIVE ERROR SET
016716  001403                          BEQ     99$             ;THEN EXPECT IT LATER
016720  052737  140000  002362          BIS     #ERR!DERR,GDDAT
016726  013777  002362  163314  99$:    MOV     GDDAT,@RLCS     ;LOAD CS
016734  012777  177776  163310          MOV     #-2,@RLBA       ;LOAD BA WITH ALL 1'S
016742  005077  163306                  CLR     @RLDA           ;CLEAR RLDA

                                        ;CHECK IF RLCS IS OKAY

016746  017737  163276  002364          MOV     @RLCS,BDDAT     ;READ RLCS
016754  042737  000001  002364          BIC     #DRDY,BDDAT     ;IGNORE DRIVE READY
016762  023737  002362  002364          CMP     GDDAT,BDDAT     ;RLCS OKAY?
016770  001404                          BEQ     1$              ;YES, THEN BRANCH

016772                                  ERRDF   20.,EM76,ERR2   ;DA MODIFIED CS
016772  104455                          TRAP    C$ERDF
016774  000024                          .WORD   20
016776  007635                          .WORD   EM76
017000  010210                          .WORD   ERR2
017002                          1$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
017002  104406                          TRAP    C$CLP1

017004  022777  177776  163240          CMP     #-2,@RLBA       ;IS RLBA OKAY?
017012  001412                          BEQ     2$              ;BRANCH IF OKAY

017014  012737  177776  002362          MOV     #-2,GDDAT       ;SET UP EXPECTED
017022  017737  163224  002364          MOV     @RLBA,BDDAT     ;READ RLBA

017030                                  ERRDF   21.,EM77,ERR2   ;DA MODIFIED BA
017030  104455                          TRAP    C$ERDF
017032  000025                          .WORD   21
017034  007670                          .WORD   EM77
017036  010210                          .WORD   ERR2
017040                          2$:

017040                          ENDTST                          ;****END OF TEST****
017040                          L10043:
017040  104401                          TRAP    C$ETST

                                        .SBTTL  **TEST 20** - UNIQUENESS OF RLMP

017042                                  BGNTST                  ;****START OF TEST****

017042                                  STARS
                                        ;;*****************************************************************
                                        ;TEST THE UNIQUENESS OF THE MULTI-PURPOSE REGISTER
                                        ;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,GDDAT
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
```

TEST 23 TEST OF INTERRUPT (RL11 ONLY)

```
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
```

TEST 28 OPI UNDER INTERRUPT

```
 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$SPRI
 1970 020240  005037  002330                    CLR     INTFLG
 1971 020244  012777  000001  162002            MOV     #1K,@RLDA       ;SET ONLY MARKER BIT!!
 1972 020252  004537  013446                    JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
 1973 020256  000104                            GSTAT!INTEN             ;GET STATUS
 1974 020260  004537  014334                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
 1975                                   ;        SETPRI  #PRI07                                          ;JSD REV A
 1976 020264                                    SETPRI  #PRI06                                          ;JSD REV A
      020264  012700  000300                    MOV     #PRI06,R0
      020270  104441                            TRAP    C$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.
```

TEST 29 READ HEADER FUNCTION

```
 1999 020360                            STARS
                                        ;;**********************************************************************
 2000
 2001 020360  004537  013446                    JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
 2002 020364  000010                            RDHDR                   ;READ HEADER
 2003 020366  004537  014334                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH READY
 2004 020372                            2$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
      020372  104406                            TRAP    C$CLP1
 2005 020374  004537  013146                    JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
 2006
 2007 020400                            ENDTST                          ;****END OF TEST****
      020400                            L10055:
      020400  104401                            TRAP    C$ETST
 2008
 2009                                   .SBTTL  **TEST 30** - READ HEADER FUNCTION INTERRUPT
 2010
 2011 020402                            BGNTST                          ;****START OF TEST****
 2012
 2013 020402                            STARS
                                        ;;**********************************************************************
 2014                                   ;CHECK THAT READ HEADER WILL GENERATE AN INTERRUPT
 2015                                   ;UPON COMPLETION WITHOUT ANY ERRORS SETTING
 2016 020402                            STARS
                                        ;;**********************************************************************
 2017
 2018 020402                                    SETPRI  #PRI00          ;PSW TO 0
      020402  012700  000000                    MOV     #PRI00,R0
      020406  104441                            TRAP    C$SPRI
 2019 020410  005037  002330                    CLR     INTFLG          ;CLEAR INTERRUPT OCCURENCE
 2020 020414  004537  013446                    JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
 2021 020420  000110                            RDHDR!INTEN             ;READ HEADER, INTR. ENA
 2022 020422  004537  014334                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
 2023                                   ;       SETPRI  #PRI07                                          ;JSD REV A
 2024 020426                                    SETPRI  #PRI06                                          ;JSD REV A
      020426  012700  000300                    MOV     #PRI06,R0
      020432  104441                            TRAP    C$SPRI
 2025 020434  005737  002330                    TST     INTFLG          ;INTERRUPT HAPPEN
 2026 020440  001004                            BNE     2$              ;YES-CONTINUE
 2027 020442                                    ERRDF   35.,EM37,ERR0
      020442  104455                            TRAP    C$ERDF
      020444  000043                            .WORD   35
      020446  005716                            .WORD   EM37
      020450  010160                            .WORD   ERR0
 2028 020452                            2$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
      020452  104406                            TRAP    C$CLP1
 2029
 2030 020454  004537  013146                    JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
 2031
 2032 020460                            ENDTST                          ;****END OF TEST****
      020460                            L10056:
      020460  104401                            TRAP    C$ETST
 2033
 2034                                   .SBTTL  **TEST 31** - REPEATED RD HDRS YIELD SAME CYL AND HD
 2035
 2036 020462                            BGNTST                          ;****START OF TEST****
 2037
 2038 020462                            STARS
```

```
                                        ;;*****************************************************************
2039                                    ;CHECK THAT READ HEADERS WILL RELIABLY READ THE SAME
2040                                    ;CYLINDER AND HEAD SELECT.  WE WILL READ HEADERS VERIFYING
2041                                    ;THAT WE ALWAYS READ THE SAME CYLINDER AND HEAD SELECT.
2042 020462                            STARS
                                        ;;*****************************************************************
2043
2044 020462  012701  000144                    MOV     #100.,R1        ;SET UP TO DO 100 RD HDR'S
2045 020466  004537  013446                    JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2046 020472  000010                            RDHDR                   ;READ HEADER
2047 020474  004537  014334                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2048 020500                            99$:    ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
     020500  104410                            TRAP    C$ESCAPE
     020502  000122                            .WORD   L10057-.
2049
2050 020504  004537  013146                    JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2051 020510                                    ESCAPE  TST             ;IF /FL:LOE SET LOOP, ELSE EXIT TST
     020510  104410                            TRAP    C$ESCAPE
     020512  000112                            .WORD   L10057-.
2052
2053 020514  013737  002314  002362            MOV     E.MP,GDDAT      ;READ FIRST HEADER (ASSUME GOOD)
2054 020522  043737  002334  002362            BIC     SECMSK,GDDAT    ;MASK AWAY SECTOR BITS
2055 020530                            BGNSEG                          ;****START OF SEGMENT****
     020530  104404                            TRAP    C$BSEG
2056 020532                            2$:
2057 020532  004537  013446                    JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2058 020536  000010                            RDHDR
2059 020540  004537  014334                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2060 020544                            97$:    ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
     020544  104410                            TRAP    C$ESCAPE
     020546  000054                            .WORD   10000$-.
2061
2062 020550  004537  013146                    JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2063 020554                                    ESCAPE  SEG             ;IF /FL:LOE SET LOOP, ELSE EXIT SEG
     020554  104410                            TRAP    C$ESCAPE
     020556  000044                            .WORD   10000$-.
2064
2065 020560  013737  002314  002364            MOV     E.MP,BDDAT      ;READ HEADER
2066 020566  043737  002334  002364            BIC     SECMSK,BDDAT    ;MASK AWAY SECTOR BITS
2067 020574  023737  002362  002364            CMP     GDDAT,BDDAT     ;IS HEADER CORRECT
2068 020602  001404                            BEQ     4$
2069
2070 020604                                    ERRDF   36.,EM41,ERR4
     020604  104455                            TRAP    C$ERDF
     020606  000044                            .WORD   36
     020610  005756                            .WORD   EM41
     020612  010324                            .WORD   ERR4
2071                                                                    ;CONSTANT CYL & HS
2072 020614                            4$:     CKLOOP                  ;CHECK IF /FL:LOE IS SET
     020614  104406                            TRAP    C$CLP1
2073
2074 020616  005301                            DEC     R1              ;PERFORM ALL READ HDR'S
2075 020620  001344                            BNE     2$              ;IF NOT GO BACK AND DO ANOTHER
2076 020622                            ENDSEG                          ;****END OF SEGMENT****
     020622                            10000$:
     020622  104405                            TRAP    C$ESEG
2077 020624                            ENDTST                          ;****END OF TEST****
```

```
                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                    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
```

```
2213                                    .SBTTL  **TEST 35**  CHECK DRIVE READY ON SEEK
2214
2215 021376                             BGNTST                          ;****START OF TEST****
2216
2217 021376                             STARS
                                        ;;*****************************************************************
2218                                    ;CHECK THE SEEK FUNCTION RETURNS DRIVE READY WITH
2219                                    ;NO ERRORS.  WE ISSUE A ONE TRACK INWARD SEEK.  WE DO
2220                                    ;NOT CHECK THE RESULT FOR POSITION
2221 021376                             STARS
                                        ;;*****************************************************************
2222
2223 021376  012777  000201  160650            MOV     #BIT7!MK,@RLDA  ;SET DA, MARKER, DIFF=1.
2224 021404  004537  013446                    JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2225 021410  000006                            SEEK                    ;SEEK
2226 021412  004537  014334                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2227 021416                                    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021416  104406                            TRAP    C$CLP1
2228
2229 021420  004537  013146                    JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2230 021424                                    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021424  104406                            TRAP    C$CLP1
2231
2232 021426  004537  014246                    JSR     R5,WTDRDY       ;WAIT FOR DRIVE READY
2233 021432                                    CKLOOP                  ;CHECK IF /FL:LOE IS SET
     021432  104406                            TRAP    C$CLP1
2234
2235 021434  004537  013146                    JSR     R5,CHERR        ;CHECK CONTROLLER FOR ERRORS
2236
2237 021440                             ENDTST                          ;****END OF TEST****
     021440                             L10063:
     021440  104401                            TRAP    C$ETST
2238
2239                                    .SBTTL  **TEST 36** - SEEK FUNCTION INTERRUPT
2240
2241 021442                             BGNTST                          ;****START OF TEST****
2242
2243 021442                             STARS
                                        ;;*****************************************************************
2244                                    ;CHECK THAT CONTROLLER READY RESETTING WHEN THE SEEK IS
2245                                    ;INITIATED CAUSES AN INTERRUPT BUT DRIVE READY WILL
2246                                    ;NOT.  WE ALSO MONITOR FOR ANY ERROR BITS SETTING.
2247 021442                             STARS
                                        ;;*****************************************************************
2248
2249 021442  005037  002330                    CLR     INTFLG
2250 021446                                    SETPRI  #PRI00          ;SET PSW TO 0
     021446  012700  000000                    MOV     #PRI00,R0
     021452  104441                            TRAP    C$SPRI
2251 021454  012777  000205  160572            MOV     #BIT7!MK!SIGN,@RLDA  ;SET UP RLDA
2252 021462  004537  013446                    JSR     R5,LDFUNC       ;ISSUE FUNCTION OF FOLLOWING WORD
2253 021466  000106                            SEEK!INTEN              ;SEEK AND INTR. ENA.
2254 021470  004537  014334                    JSR     R5,WTCRDY       ;WAIT FOR CONTROLLER READY HIGH
2255 021474  000240                            NOP                     ;
2256 021476  005737  002330            1$:     TST     INTFLG          ;DID INTERRUPT OCCUR
2257 021502  001004                            BNE     2$              ;YES, GO CHECK DRDY
2258 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$:    MOV     @MK,@RLDA       ;SET MARKER IN RLDA
2409 022212  005037  002362                  CLR     GDDAT           ;SET EXPECTED
2410                                                                 ;LOAD HS=0 INTO RLDA
2411 022216                          2$:
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$ETST
 2533
 2534                               .SBTTL  **TEST 41** - VERIFY HEAD SELECT 1 VIA GET STATUS
 2535
 2536 022640                        BGNTST                          ;****START OF TEST****
 2537
 2538 022640                        STARS
                                    ;;**************************************************************
 2539                               ;CHECK THAT WE CAN READ BACK HEAD SELECT 1 WITH A GET
 2540                               ;STATUS FUNCTION.  SELECT H.S. 1 WITH A SEEK AND VERIFIY WITH
 2541                               ;GET STATUS
 2542 022640                        STARS
                                    ;;**************************************************************
 2543
 2544 022640  012777  000001  157406        MOV     #MK,@RLDA       ;SET MARKER IN RLDA
 2545 022646  052777  000020  157400        BIS     #DAHS,@RLDA     ;LOAD HS=1 INTO RLDA
 2546 022654  012737  000100  002362  2$:   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     #RMHS,GDDAT     ;TEST M.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$:     MOV     GDDAT,TMPO      ;STORE HEADER
2609 023102  042737  000100  002354          BIC     #RMHS,TMPO      ;CLEAR M.S. FROM STORED WORD
2610 023110  023727  002406  000001          CMP     T.DRIVE,#1
2611 023116  001034                          BNE     12$
2612 023120  023737  002354  002704          CMP     TMPO,MALMAX
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                   MOV     (R3),GDDAT      ;GET EXPECTED CYLINDER
2761 023750  011337  002376           8$:     MOV     (R3),DWORD      ;SET UP DIFFERENCE FOR SEEK
2762 023754  013737  002314  002364           MOV     E.MP,BDDAT      ;READ HEADER FROM RLMP
2763 023762  043737  002334  002364           BIC     SECMSK,BDDAT    ;CLEAR OUT SECTOR BITS
2764 023770  023737  002362  002364           CMP     GDDAT,BDDAT     ;DID SEEK GO TO THE RIGHT
2765 023776  001404                           BEQ     9$              ;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     #RHHS,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 44 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
```

```
024546   104   122   105
024551   123   123   000
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
024605   102   122   040   BRMSG:  .ASCIZ  /BR LEVEL/
024610   114   105   126
024613   105   114   000
024616   126   105   103   VECMSG: .ASCIZ  /VECTOR/
024621   124   117   122
024624   000
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
024647   104   122   111   DRMSG:  .ASCIZ  /DRIVE/
024652   126   105   000
                               .EVEN

024656                                 ENDMOD

024656                         BGNMOD  SFTPRM

024656                                 BGNSFT
024656   000011                        .WORD L10076-L$SOFT/2
024660                                 GPRML   DMSG,DLT,1,YES
024660   000130                        .WORD   T$CODE
024662   024702                        .WORD   DMSG
024664   000001                        .WORD   1
024666                                 XFERF   1$
024666   006044                        .WORD   T$CODE
024670                                 GPRMD   EMSG,ELT,0,177777,0,177777,YES
024670   001032                        .WORD   T$CODE
024672   024726                        .WORD   EMSG
024674   177777                        .WORD   177777
024676   000000                        .WORD   T$LOLIM
024700   177777                        .WORD   T$HILIM
024702                         1$:     ENDSFT
                                       .EVEN
024702                         L10076:


024702   104   122   117   DMSG:   .ASCIZ  /DROP ON ERROR LIMIT/
024726   105   122   122   EMSG:   .ASCIZ  /ERROR LIMIT/


                               .EVEN

024742                                 ENDMOD
```

SEQ 0072

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        GLBEOA  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$CO     002032 G        L10015  013050          NOOPO  = 000000          SKEEND  002770
G$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$DLY    002116 G        L10023  014716          NXMMES  004001          STMS   = 000100
HDRBUF  003274           L$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$HW     011606 G        L10043  017040          PNT    = 001000 G        TRPMAN  014232
I$AU   = 000041          L$ICP    002104 G        L10044  017244          PRI    = 002000 G        TYPOR  = 000006
I$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$$MAR= 010075          T13     016074 G        T28     020232 G        T42     023012 G        WCKMES  004211
T$$MM  = 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
```