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PROGRAM

Moving Head Disk Diagnostic

TAPES

Binary 095-000069-02

ABSTRACT

The Moving Head Disk Diagnostic Program is a hardware diagnostic for the 4046 moving head disk controller and adapter logic. It is assumed that the disk terminal is functioning properly.

097-000039-02

```
0001   .MAIN
01
02                    ;MOVING HEAD DISK CONTROL DIAGNOSTIC
03
04                ;****** AUTO-RUN AUTO LOAD MODIFIED 3/7/72
05
06
07                ; 1. ABSTRACT
08                ;       THIS PROGRAM IS A HARDWARE DIAGNOSTIC FOR THE
09                ;       4046 MOVING HEAD DISK CONTROLLER AND ADAPTER
10                ;       LOGIC.  IT IS ASSUMED THAT THE DISK TERMINAL
11                ;       IS FUNCTIONING PROPERLY.
12
13                ; 2. REQUIREMENTS
14                ;       1. NOVA FAMILY CENTRAL PROCESSOR
15                ;       2. MINIMUM OF 4K READ/WRITE MEMORY
16                ;       3. 4046 MOVING HEAD DISK CONTROL
17                ;       4. 4047,4048,4049 OR 4057
18                ;          DISK ADAPTER
19                ;       5. 1 TO 4 DISK TERMINALS
20                ;       6. TELETYPE AND CONTROL
21
22                ; 3. OPERATING PROCEDURE
23                ;       1. LOAD USING THE BINARY LOADER
24                ;       2. STARTING ADDRESSES
25                ;             SA2= TO IDENTIFY DISK TYPE
26                ;                  PROGRAM THEN PROCEEDS TO 400.
27                ;             SA4= SET DISK CONTROL ADDRESS TO 33
28                ;             SA5= SET DISK CONTROL ADDRESS TO 73
29                ;             SA400= START DIAGNOSTIC
30                ;       3. THE PROGRAM PRINTS "PASS" FOLLOWING EACH
31                ;          COMPLETE PASS THROUGH THE TESTS.
32                ;       4. SWITCH SETTINGS
33                ;             SW0= FROM ERROR, GO TO NEXT TEST.
34                ;             SW1= INHIBIT TELETYPE PRINTING.
35                ;             SW2= PRINT FAILURE RATE.
36                ;             SW3= RECALIBRATE DURING SCOPE LOOP
37                ;             SW4= 1 SEC DELAY IN SCOPE LOOP
38                ;             SW5-6= UNIT # FOR RECAL DURING SCOPE LOOP
39
40                ; 4. ERRORS
41                ;       WHEN AN ERROR IS DETECTED THE PROGRAM HALTS.
42                ;       (AC3) POINTS TO THE LOCATION FOLLOWING THE
43                ;       ERROR HALT CALL "EHALT".  CONSULT THE COMMENTS
44                ;       AREA OF THE DIAGNOSTIC PROGRAM LISTING FOR
45                ;       CLUES AND POSSIBLE CAUSES OF THE FAILURE.
46                ;       PUSHING CONTINUE WILL CAUSE THE PROGRAM TO
47                ;       PRINT THE (AC3) AND ENTER A SCOPE LOOP.
48                ;       SET SW2 TO CAUSE THE ERROR RATE (0-100%) TO BE
49                ;       PRINTED.  SET SW0 TO EXIT FROM THE SCOPE LOOP
50                ;       AND PROCEED TO THE NEXT TEST.
```

```
A 0002  .MAIN
01
02                ;       SOME SCOPE LOOPS WILL REQUIRE A RECALIBRATE
03                ;       TO INITIALIZE THE DISK DRIVE FOLLOWING A FAILURE.
04                ;       SET SWITCH 3 TO INTRODUCE THE RECALIBRATE.  THE
05                ;       UNIT TO BE RECALIBRATED MUST BE SET INTO SWITCHES
06                ;       5 AND 6.
07
08                ;       TESTS THAT PERFORM A RECALIBRATE HAVE A 2 SEC.
09                ;       DELAY BUILT INTO THE SCOPE LOOP AS PROTECTION
10                ;       FOR THE DISK DRIVE ELECTRONICS.  SFT SWITCH 4
11                ;       TO INTRODUCE AN ADDITIONAL 1 SECOND DELAY DURING
12                ;       THE SCOPE LOOP.
13
14                ;       IN GENERAL EACH SUCCESSIVE TEST ASSUMES ALL
15                ;       PREVIOUS TESTS WORK.  BYPASSING ERRORS
16                ;       CAN RESULT IN CONFUSING SITUATIONS
17                ;       IN THE SETUP OF MORE COMPLEX TESTS.
18
19                ; 5. DISK PACKS
20                ;       ONLY USE DISK PACKS FORMATTED BY THE DGC DISK
21                ;       PACK FORMATTER PROGRAM.  THE DIAGNOSTIC PROGRAM
22                ;       WILL WRITE OVER MOST OF THE DISK SURFACE.
23                ;       THE FORMAT MODE IS NOT CHECKED.
```

```
▲ 0003  .MAIN
01
02          000001              .LOC 1
03
04  00001  005771              IRET                ;INTERRUPT RETURN
05  00002  006251              INIT                ;INITIALIZE
06  00003  002006              JMP @TS             ;GO TO 400
07  00004  002244              JMP @IS33           ;SET ADDR TO 33
08  00005  002245              JMP @IS73           ;SET ADDR TO 73
09  00006  000400  TS:         START
10
11          000045              .LOC 45
12  00045  000046              EGGS
13  00046  000000  EGGS:       0                   ;HEN FLAG
14  00047  000000              0                   ;DEVICE CODE THIS RUN
15  00050  000000              0                   ;NOT USED
16  00051  000000              0                   ;# OF PASS THIS RUN
17  00052  000000              0                   ;RETURN ADDRESS
18
19  00053  000000  .TU:        0
20  00054  040000              40000
21  00055  100000              100000
22  00056  140000              140000
23  00057  000001  UNTBIT:     1
24  00060  000002  KB14:       2
25  00061  000004  KB13:       4
26  00062  000010  KB12:       10
27  00063  000020  KB11:       20
28  00064  000040  KB10:       40
29  00065  000100  KB9:        100
30  00066  000200  KB8:        200
31  00067  000400  KB7:        400
32  00070  001000  KB6:        1000
33  00071  002000  KB5:        2000
34  00072  004000  KB4:        4000
35  00073  010000  KB3:        10000
36  00074  020000  KB2:        20000
37          000054  KB1=.TU+1
38
39  00075  177775  ZB14:       177775
40  00076  177773  ZB13:       177773
41  00077  177767  ZB12:       177767
42  00100  177757  ZB11:       177757
43  00101  177737  ZB10:       177737
44  00102  177677  ZB9:        177677
45  00103  177577  ZB8:        177577
46  00104  177377  ZB7:        177377
47  00105  176777  ZB6:        176777
48  00106  175777  ZB5:        175777
49  00107  173777  ZB4:        173777
50  00110  167777  ZB3:        167777
51  00111  157777  ZB2:        157777
52  00112  137777  ZB1:        137777
53
54  00113  006231  TRCL:       RECL0
55  00114  006232              RECL1
56  00115  006233              RECL2
57  00116  006234              RECL3
```

```
▲ 0004   .MAIN
01
02 00117 000003 C3:       3
03 00120 000007 C7:       7
04 00121 000017 C17:      17
05 00122 000037 C37:      37
06 00123 000077 C77:      77
07 00124 000177 C177:     177
08 00125 000377 C377:     377
09 00126 000777 C777:     777
10 00127 001777 C1777:    1777
11 00130 003777 C3777:    3777
12 00131 007777 C7777:    7777
13 00132 017777 C017:     17777
14 00133 037777 C037:     37777
15
16 00134 010421 BIT1:     010421
17 00135 021042 BIT2:     021042
18 00136 042104 BIT4:     042104
19 00137 104210 BIT8:     104210
20
21 00140 052525 C2525:    052525
22 00141 125252 C5252:    125252
23 00142 123456 RANDOM:   123456
24 00143 123456 RELRAN:   123456
25 00144 000000 TEMP:     0
26 00145 000000 TIME:     0
27 00146 000000 TIME1:    0
28 00147 062000 KDOB:     DOB 0,0
29 00150 000000 DTYPE:    0                    ;0=CART, 1=2311, 15=2314
30 00151 000001 NDSKS:    000001               ;15=UNIT 0, 14=1, 13=2, 12=3
31 00152 000000 TESTU:    0                    ; 0&1 = UNIT #
32 00153 000000 UNUM:     0                    ; 14-15 = UNIT #
33 00154 000033 CDSK:     33
34 00155 000000 CYL:      0
35 00156 000000 HEAD:     0
36 00157 000000 SECT:     0
37 00160 006607 BUFF:     PRGEND
38 00161 160037 MSK1:     160037
39 00162 060033 DPTO:     060033
40 00163 177700 MSK2:     177700
41 00164 000000 ITRCNT:   0
42 00165 005635 STALL:    .STL
```

```
A 0005  .MAIN
01
02 00166 000004 C4:      4
03 00167 000005 C5:      5
04 00170 000006 C6:      6
05 00171 000011 C11:     11
06 00172 000012 C12:     12
07 00173 000015 C15:     15
08 00174 000016 C16:     16
09 00175 000030 C30:     30
10 00176 000033 C33:     33
11 00177 000036 C36:     36
12 00200 000060 C60:     60
13 00201 000063 C63:     63
14 00202 000070 C70:     70
15 00203 000120 C120:    120
16 00204 000137 C137:    137
17 00205 000157 C157:    157
18 00206 000277 C277:    277
19 00207 000312 C312:    312
20 00210 000317 C317:    317
21 00211 000402 C402:    402
22 00212 000420 C420:    420
23 00213 177400 C1774:   177400
24
25
26 00214 177400 M400:    -400
27 00215 001400 C1400:   1400
28 00216 003600 C3600:   3600
29 00217 020400 C2004:   20400
30 00220 074000 C74K:    74000
31       000056 C140K=.TU+3
32 00221 174000 C174K:   174000
33       000070 C1000=KB6
34
35 00222 024047 BEGIN:   LDA 1,EGGS+1
36 00223 020176          LDA 0,C33
37 00224 106414          SUB# 0,1,SZR
38 00225 002245          JMP .IS73
39 00226 002244          JMP .IS33
```

```
A 0006   .MAIN
01 000227 005657 I.WAIT: .WAIT
02 000230 005644 I.SSEK: .SSEK
03 000231 005677 I.RC0:  .RCL0
04 000232 005701 I.RC1:  .RCL1
05 000233 005703 I.RC2:  .RCL2
06 000234 005704 I.RC3:  .RCL3
07 000235 005757 I.IWT:  .IWT
08 000236 005773 I.ADSK: .ADSK
09 000237 006022 ISET:   .SET
10 000240 006025 I.SETP: .SETP
11 000241 006030 I.STUP: .SETUP
12 000242 006160 I.EHA:  .EHALT
13 000243 006060 I.LOO:  .LOOP
14 000244 005601 IS33:   .S33
15 000245 005602 IS73:   .S73
16 000246 006001 I.S:    .SK
17 000247 006455 ICRLF:  CRLF
18 000250 006312 IMESS:  MESS
19 000251 005464 I.INI:  .INI
20 000252 006155 I.EH1:  .EH1
21 000253 005715 I.DO:   .DORW
22 000254 005241 IRAN:   RAN
23 000255 005320 IGEN:   .GEN
24 000256 005360 IREAD:  .READ
25 000257 005333 IWRT:   .WRITE
26 000260 005276 ICHK:   .CHECK
27 000261 005376 IDOS:   .DOSEK
28 000262 006052 I.LD:   .LUPD
29
30        006241 .DUSR   SETUP=JSR @I.STUP
31        006240 .DUSR   SETP1=JSR @I.SETP
32        006242 .DUSR   EHALT=JSR @I.EHA
33        006243 .DUSR   LOOP=JSR @I.LOO
34        000033 .DUSR   DSKP=33
35        006252 .DUSR   EHLT=JSR @I.EH1
36        006262 .DUSR   LOOPD=JSR @I.LD
37
38        006250 MESSAGE=JSR @IMESS
39        006247 PCRLF=JSR @ICRLF
40        006227 WAIT=JSR @I.WAIT
41        006230 SSEEK=JSR @I.SSEK
42        006231 RECL0=JSR @I.RC0
43        006232 RECL1=JSR @I.RC1
44        006233 RECL2=JSR @I.RC2
45        006234 RECL3=JSR @I.RC3
46        006235 ITRWT=JSR @I.IWT
47        006236 GADSK=JSR @I.ADSK
48        006246 SEEK=JSR @I.S
49        006251 INIT=JSR @I.INI
50        006255 GENDAT=JSR @IGEN
51        006256 READ=JSR @IREAD
52        006257 WRITE=JSR @IWRT
53        006260 CHECK=JSR @ICHK
54        006261 DOSEK=JSR @IDOS
55        006253 DORW=JSR @I.DO
56
57                       .EOT
```

```
  0007   .MAIN
01         000400          .LOC 400
02
03  000400 000401 START:   JMP .+1
04  000401 024046          LDA 1,FGGS
05  000402 125004          MOV 1,1,SZR
06  000403 000405          JMP A.
07  000404 020150          LDA 0,DTYPE
08  000405 101005          MOV 0,0,SNR       ;IF PARAMETERS NOT YET SPECIFIED
09  000406 006251          INIT              ;DO IT NOW.
10  000407 000403          JMP A0
11  000410 126620 A.:      SUBZR 1,1
12  000411 044150          STA 1,DTYPE
13
14  000412 020151 A0:      LDA 0,NDSKS       ;UNIT 0 SPECIFIED ?
15  000413 101202          MOVR 0,0,SZC
16  000414 006231          RECL0             ;YES, RECALIBRATE IT
17  000415 062677          IORST
18
19  000416 020151          LDA 0,NDSKS       ;UNIT 1 SPECIFIED ?
20  000417 024060          LDA 1,KB14
21  000420 123404          AND 1,0,SZR
22  000421 006232          RECL1             ;YES RECALIBRATE IT
23  000422 062677          IORST
24
25  000423 020151          LDA 0,NDSKS       ;UNIT 2 SPECIFIED ?
26  000424 024061          LDA 1,KB13
27  000425 123404          AND 1,0,SZR
28  000426 006233          RECL2             ;YES, RECALIBRATE IT
29  000427 062677          IORST
30
31  000430 020151          LDA 0,NDSKS       ;UNIT 3 SPECIFIED ?
32  000431 024062          LDA 1,KB12
33  000432 123404          AND 1,0,SZR
34  000433 006234          RECL3             ;YES, RECALIBRATE IT
```

```
A 0008   .MAIN
01
02 00434 006241 A1:     SETUP           ;CHECK SELD BUS LINE
03 00435 063700         SKPDZ 0         ;SKIP IF LINE HIGH
04 00436 006242         EHALT           ;DSKP HAS SELD GROUNDED.
05 00437 006243         LOOP
06
07 00440 006241 A2:     SETUP           ;CHECK SELB BUS LINE
08 00441 063500         SKPBZ 0         ;SKIP IF LINE HIGH
09 00442 006242         EHALT           ;DSKP HAS SELB GROUNDED
10 00443 006243         LOOP
11
12 00444 006241 A3:     SETUP           ;CHECK DISK PACK BUSY
13 00445 063533         SKPBZ DSKP      ;SKIP IF BUSY 0
14 00446 006242         EHALT           ;"DP BUSY" STUCK ON
15 00447 006243         LOOP
16
17 00450 006241 A4:     SETUP           ;CHECK DISK PACK DONE
18 00451 063733         SKPDZ DSKP      ;SKIP IF DONE 0
19 00452 006242         EHALT           ;"DP DONE" STUCK ON
20 00453 006243         LOOP
21
22 00454 006241 A5:     SETUP           ;CHECK I/O DATA LINES
23 00455 060400         DIA 0,0         ;DTA TO DEVICE 0
24 00456 101004         MOV 0,0,SZR
25 00457 006242         EHALT           ;GROUNDED DATA LINE(S)
26 00460 006243         LOOP
27
28 00461 006241 A6:     SETUP           ;CHECK CA REGISTER FOR
29 00462 061433         DIB 0,DSKP      ;ZEROS AFTER "RESET"
30 00463 101004         MOV 0,0,SZR     ;POSSIBLE FAILURE OF "RESET"
31 00464 006242         EHALT           ;OR THE REGISTER.
32 00465 006243         LOOP
33
34 00466 006241 A7:     SETUP           ;CHECK DISK ADDRESS REG.
35 00467 062433         DIC 0,DSKP      ;FOR ZEROS FOLLOWING IORST
36 00470 101004         MOV 0,0,SZR     ;FAILING REGISTER IC OR
37 00471 006242         EHALT           ;POSSIBLE FAILURE OF "RESET"
38 00472 006243         LOOP            ;OR "RESET S".
39
40 00473 006241 A8:     SETUP           ;TRY TO LOAD CA WITH
41 00474 102000         ADC 0,0         ;ALL ONES
42 00475 062033         DOB 0,DSKP      ;LOAD CA REGISTER
43 00476 065433         DIB 1,DSKP      ;READ IT BACK
44 00477 122434         SUBZ# 1,0,SZR   ;CHECK "DP DATOB",
45 00500 006242         EHALT           ;"DPDATIB", CA REGISTER,
46 00501 006243         LOOP            ;AND DATA PATH THRU MUXIS.
```

```
A 0009   .MAIN
01
02 00502 006241 A9:     SETUP           ;SEE IF DOB LOADS
03 00503 102000         ADC 0,0         ;DISK ADDRESS REGISTER
04 00504 062033         DOB 0,DSKP      ;LOAD CA REG.
05 00505 066433         DIC 1,DSKP      ;READ DISK ADDR REG.
06 00506 125004         MOV 1,1,SZR     ;IT SHOULD STILL BE ALL 0'S
07 00507 006242         EHALT
08 00510 006243         LOOP
09
10 00511 006241 A10:    SETUP           ;SEE IF DOC LOADS THE
11 00512 102000         ADC 0,0         ;CA REGISTER
12 00513 063033         DOC 0,DSKP      ;LOAD DISK ADDR REG
13 00514 065433         DIB 1,DSKP      ;READ CA REGISTER
14 00515 125004         MOV 1,1,SZR     ;CA REGISTER SHOULD
15 00516 006242         EHALT           ;REMAIN ALL ZERO
16
17 00517 006241 A11:    SETUP           ;SEE IF THE DISK ADDRESS
18 00520 102000         ADC 0,0         ;REGISTER EXISTS
19 00521 063033         DOC 0,DSKP      ;LOAD IT WITH ALL 1'S
20 00522 066433         DIC 1,DSKP      ;READ IT BACK
21 00523 122414         SUB# 1,0,SZR    ;CHECK REGISTER AND
22 00524 006242         EHALT           ;DATA PATHS THROUGH
23 00525 006243         LOOP            ;THE MUX'S
24
25 00526 006241 A12:    SETUP           ;SEE IF IORST WILL
26 00527 102000         ADC 0,0         ;CLEAR THE CA REGISTER
27 00530 062033         DOB 0,DSKP      ;LOAD IT WITH ALL 1'S
28 00531 062677         IORST           ;CLEAR IT TO ZEROS (RESET)
29 00532 065433         DIB 1,DSKP      ;READ IT BACK
30 00533 125004         MOV 1,1,SZR
31 00534 006242         EHALT
32 00535 006243         LOOP
33
34 00536 006241 A13:    SETUP           ;SEE IF IORST WILL
35 00537 102000         ADC 0,0         ;CLEAR DISK ADDRESS
36 00540 063033         DOC 0,DSKP      ;REGISTER. LOAD ALL 1'S
37 00541 062677         IORST           ;CLEAR TO ZEROS
38 00542 066433         DIC 1,DSKP      ;READ BACK
39 00543 125004         MOV 1,1,SZR     ;(S1,S2,S4,S8,ARE CLEARED
40 00544 006242         EHALT           ;VIA "RESET" THRU "RESET S")
41 00545 006243         LOOP
42
43 00546 006241 A14:    SETUP           ;TEST CA REGISTER FOR
44 00547 102520         SUBZL 0,0       ;SINGLE 1 BITS
45 00550 062033         DOB 0,DSKP      ;LOAD "CA15"
46 00551 065433         DIB 1 DSKP      ;READ CA REGISTER
47 00552 122414         SUB# 1,0,SZR    ;AC0=GOOD
48 00553 006242         EHALT           ;AC1=BAD
49 00554 006243         LOOP
50
51 00555 006241 A15:    SETUP           ;TEST CA REGISTER FOR
52 00556 020060         LDA 0,KB14      ;SINGLE 1 BITS
53 00557 062033         DOB 0,DSKP      ;LOAD "CA14"
54 00560 065433         DIB 1,DSKP      ;READ CA REGISTER
55 00561 122414         SUB# 1,0,SZR    ;AC0=GOOD
56 00562 006242         EHALT           ;AC1=BAD
57 00563 006243         LOOP
```

```
A 0010   .MAIN
01
02 000564 006241 A16:    SETUP              ;TEST CA REGISTER FOR
03 000565 020061          LDA 0,KB13         ;SINGLE 1 BITS
04 000566 062033          DOB 0,DSKP         ;LOAD "CA13"
05 000567 065433          DIB 1,DSKP         ;READ CA REGISTER
06 000570 122414          SUB# 1,0,SZR       ;AC0=GOOD
07 000571 006242          EHALT              ;AC1=BAD
08 000572 006243          LOOP
09
10 000573 006241 A17:    SETUP              ;TEST CA REGISTER FOR
11 000574 020062          LDA 0,KB12         ;SINGLE 1 BITS
12 000575 062033          DOB 0,DSKP         ;LOAD "CA12"
13 000576 065433          DIB 1,DSKP         ;READ CA REGISTER
14 000577 122414          SUB# 1,0,SZR       ;AC0=GOOD
15 000600 006242          EHALT              ;AC1=BAD
16 000601 006243          LOOP
17
18 000602 006241 A18:    SETUP              ;TEST CA REGISTER FOR
19 000603 020063          LDA 0,KB11         ;SINGLE 1 BITS
20 000604 062033          DOB 0,DSKP         ;LOAD "CA11"
21 000605 065433          DIB 1,DSKP         ;READ CA REGISTER
22 000606 122414          SUB# 1,0,SZR       ;AC0=GOOD
23 000607 006242          EHALT              ;AC1=BAD
24 000610 006243          LOOP
25
26 000611 006241 A19:    SETUP              ;TEST CA REGISTER FOR
27 000612 020064          LDA 0,KB10         ;SINGLE 1 BITS
28 000613 062033          DOB 0,DSKP         ;LOAD "CA10"
29 000614 065433          DIB 1,DSKP         ;READ CA REGISTER
30 000615 122414          SUB# 1,0,SZR       ;AC0=GOOD
31 000616 006242          EHALT              ;AC1=BAD
32 000617 006243          LOOP
33
34 000620 006241 A20:    SETUP              ;TEST CA REGISTER FOR
35 000621 020065          LDA 0,KB9          ;SINGLE 1 BITS
36 000622 062033          DOB 0,DSKP         ;LOAD "CA9"
37 000623 065433          DIB 1,DSKP         ;READ CA REGISTER
38 000624 122414          SUB# 1,0,SZR       ;AC0=GOOD
39 000625 006242          EHALT              ;AC1=BAD
40 000626 006243          LOOP
41
42 000627 006241 A21:    SETUP              ;TEST CA REGISTER FOR
43 000630 020066          LDA 0,KB8          ;SINGLE 1 BITS
44 000631 062033          DOB 0,DSKP         ;LOAD "CA8"
45 000632 065433          DIB 1,DSKP         ;READ CA REGISTER
46 000633 122414          SUB# 1,0,SZR       ;AC0=GOOD
47 000634 006242          EHALT              ;AC1=BAD
48 000635 006243          LOOP
```

```
A 0011  .MAIN
01
02 000636 006241 A22:   SETUP           ;TEST CA REGISTER FOR
03 000637 020067        LDA 0,KB7       ;SINGLE 1 BITS
04 000640 062033        DOB 0,DSKP      ;LOAD "CA7"
05 000641 065433        DIB 1 DSKP      ;READ CA REGISTER
06 000642 122414        SUB# 1,0,SZR    ;AC0=GOOD
07 000643 006242        EHALT           ;AC1=BAD
08 000644 006243        LOOP
09
10 000645 006241 A23:   SETUP           ;TEST CA REGISTER FOR
11 000646 020033        LDA 0,DSKP      ;SINGLE 1 BITS
12 000647 061433        DIB 0,DSKP      ;LOAD "CA6"
13 000650 065433        DIB 1,DSKP      ;READ CA REGISTER
14 000651 122414        SUB# 1,0,SZR    ;AC0=GOOD
15 000652 006242        EHALT           ;AC1=BAD
16
17 000653 006241 A24:   SETUP           ;TEST CA REGISTER FOR
18 000654 020071        LDA 0,KB5       ;SINGLE 1 BITS
19 000655 062033        DOB 0,DSKP      ;LOAD "CA5"
20 000656 065433        DIB 1,DSKP      ;READ CA REGISTER
21 000657 122414        SUB# 1,0,SZR    ;AC0=GOOD
22 000660 006242        EHALT           ;AC1=BAD
23 000661 006243        LOOP
24
25 000662 006241 A25:   SETUP           ;TEST CA REGISTER FOR
26 000663 020072        LDA 0,KB4       ;SINGLE 1 BITS
27 000664 062033        DOB 0,DSKP      ;LOAD "CA4"
28 000665 065433        DIB 1,DSKP      ;READ CA REGISTER
29 000666 122414        SUB# 1,0,SZR    ;AC0=GOOD
30 000667 006242        EHALT           ;AC1=BAD
31 000670 006243        LOOP
32
33 000671 006241 A26:   SETUP           ;TEST CA REGISTER FOR
34 000672 020073        LDA 0,KB3       ;SINGLE 1 BITS
35 000673 062033        DOB 0,DSKP      ;LOAD "CA3"
36 000674 065433        DIB 1,DSKP      ;READ CA REGISTER
37 000675 122414        SUB# 1,0,SZR    ;AC0=GOOD
38 000676 006242        EHALT           ;AC1=BAD
39 000677 006243        LOOP
40
41 000700 006241 A27:   SETUP           ;TEST CA REGISTER FOR
42 000701 020074        LDA 0,KB2       ;SINGLE 1 BITS
43 000702 062033        DOB 0,DSKP      ;LOAD "CA2"
44 000703 065433        DIB 1,DSKP      ;READ CA REGISTER
45 000704 122414        SUB# 1,0,SZR    ;AC0=GOOD
46 000705 006242        EHALT           ;AC1=BAD
47 000706 006243        LOOP
```

```
A 0012   .MAIN
01
02 000707 006241 A28:    SETUP              ;TEST CA REGISTER FOR
03 000710 020054          LDA 0,KB1          ;SINGLE 1 BITS
04 000711 062033          DOB 0,DSKP         ;LOAD "CA1"
05 000712 065433          DIB 1,DSKP         ;READ CA REGISTER
06 000713 122414          SUB# 1,0,SZR       ;AC0=GOOD
07 000714 006242          EHALT              ;AC1=BAD
08 000715 006243          LOOP
09
10 000716 006241 A29:     SETUP              ;TEST CA REGISTER
11 000717 102620          SUBZR 0,0          ;SINGLE 1 BITS
12 000720 062033          DOB 0,DSKP         ;LOAD "CA0"
13 000721 065433          DIB 1,DSKP         ;READ CA REGISTER
14 000722 122414          SUB# 1,0,SZR       ;AC0=GOOD
15 000723 006242          EHALT              ;AC1=BAD
16 000724 006243          LOOP
17
18 000725 006241 A30:     SETUP              ;TEST CA REGISTER FOR
19 000726 102120          ADCZL 0,0          ;SINGLE 0 BITS
20 000727 062033          DOB 0,DSKP         ;LOAD 177776
21 000730 065433          DIB 1,DSKP         ;READ CA REGISTER
22 000731 122414          SUB# 1,0,SZR       ;AC0=GOOD
23 000732 006242          EHALT              ;AC1=BAD
24 000733 006243          LOOP
25
26 000734 006241 A31:     SETUP              ;TEST CA REGISTER FOR
27 000735 020075          LDA 0,7B14         ;SINGLE 0 BITS
28 000736 062033          DOB 0,DSKP         ;LOAD 177775
29 000737 065433          DIB 1,DSKP         ;READ CA REGISTER
30 000740 122414          SUB# 1,0,SZR       ;AC0=GOOD
31 000741 006242          EHALT              ;AC1=BAD
32 000742 006243          LOOP
33
34 000743 006241 A32:     SETUP              ;TEST CA REGISTER FOR
35 000744 020076          LDA 0,7B13         ;SINGLE 0 BITS
36 000745 062033          DOB 0,DSKP         ;LOAD 177773
37 000746 065433          DIB 1,DSKP         ;READ CA REGISTER
38 000747 122414          SUB# 1,0,SZR       ;AC0=GOOD
39 000750 006242          EHALT              ;AC1=BAD
40 000751 006243          LOOP
41
42 000752 006241 A33:     SETUP              ;TEST CA REGISTER FOR
43 000753 020077          LDA 0,7B12         ;SINGLE 0 BITS
44 000754 062033          DOB 0,DSKP         ;LOAD 177767
45 000755 065433          DIB 1,DSKP         ;READ CA REGISTER
46 000756 122414          SUB# 1,0,SZR       ;AC0=GOOD
47 000757 006242          EHALT              ;AC1=BAD
48 000760 006243          LOOP
```

```
A 0013  .MAIN
01
02 000761 006241 A34:   SETUP           ;TEST CA REGISTER FOR
03 000762 020100        LDA 0,ZB11      ;SINGLE 0 BITS
04 000763 062033        DOB 0,DSKP      ;LOAD 177757
05 000764 065433        DIB 1,DSKP      ;READ CA REGISTER
06 000765 122414        SUB# 1,0,SZR    ;AC0=GOOD
07 000766 006242        EHALT           ;AC1=BAD
08 000767 006243        LOOP
09
10 000770 006241 A35:   SETUP           ;TEST CA REGISTER FOR
11 000771 020101        LDA 0,ZB10      ;SINGLE ZERO BITS
12 000772 062033        DOB 0,DSKP      ;LOAD 177737
13 000773 065433        DIB 1,DSKP      ;READ CA REGISTER
14 000774 122414        SUB# 1,0,SZR    ;AC0=GOOD
15 000775 006242        EHALT           ;AC1=BAD
16 000776 006243        LOOP
17
18 000777 006241 A36:   SETUP           ;TEST CA REGISTER FOR
19 001000 020102        LDA 0,ZB9       ;SINGLE ZERO BITS
20 001001 062033        DOB 0,DSKP      ;LOAD 177677
21 001002 065433        DIB 1,DSKP      ;READ CA REGISTER
22 001003 122414        SUB# 1,0,SZR    ;AC0=GOOD
23 001004 006242        EHALT           ;AC1=BAD
24 001005 006243        LOOP
25
26 001006 006241 A37:   SETUP           ;TEST CA REGISTER FOR
27 001007 020103        LDA 0,ZB8       ;SINGLE 0 BITS
28 001010 062033        DOB 0,DSKP      ;LOAD 177577
29 001011 065433        DIB 1,DSKP      ;READ CA REGISTER
30 001012 122414        SUB# 1,0,SZR    ;AC0=GOOD
31 001013 006242        EHALT           ;AC1=BAD
32 001014 006243        LOOP
33
34 001015 006241 A38:   SETUP           ;TEST CA REGISTER FOR
35 001016 020104        LDA 0,ZB7       ;SINGLE 0 BITS
36 001017 062033        DOB 0,DSKP      ;LOAD 177377
37 001020 065433        DIB 1,DSKP      ;READ CA REGISTER
38 001021 122414        SUB# 1,0,SZR    ;AC0=GOOD
39 001022 006242        EHALT           ;AC1=BAD
40 001023 006243        LOOP
41
42 001024 006241 A39:   SETUP           ;TEST CA REGISTER FOR
43 001025 020105        LDA 0,ZB6       ;SINGLE ZERO BITS
44 001026 062033        DOB 0,DSKP      ;LOAD 176777
45 001027 065433        DIB 1,DSKP      ;READ CA REGISTER
46 001030 122414        SUB# 1,0,SZR    ;AC0=GOOD
47 001031 006242        EHALT           ;AC1=BAD
48 001032 006243        LOOP
```

```
A 0014   .MAIN
01
02 01033 006241 A40:    SETUP           ;TEST CA REGISTER FOR
03 01034 020106         LDA 0,ZB5       ;SINGLE ZERO BITS
04 01035 062033         DOB 0,DSKP      ;LOAD 175777
05 01036 065433         DIB 1,DSKP      ;READ CA REGISTER
06 01037 122414         SUB# 1,0,SZR    ;AC0=GOOD
07 01040 006242         EHALT           ;AC1=BAD
08 01041 006243         LOOP
09
10 01042 006241 A41:    SETUP           ;TEST CA REGISTER FOR
11 01043 020107         LDA 0,ZB4       ;SINGLE 0 BITS
12 01044 062033         DOB 0,DSKP      ;LOAD 173777
13 01045 065433         DIB 1,DSKP      ;READ CA REGISTER
14 01046 122414         SUB# 1,0,SZR    ;AC0=GOOD
15 01047 006242         EHALT           ;AC1=BAD
16 01050 006243         LOOP
17
18 01051 006241 A42:    SETUP           ;TEST CA REGISTER FOR
19 01052 020110         LDA 0,ZB3       ;SINGLE 0 BITS
20 01053 062033         DOB 0,DSKP      ;LOAD 167777
21 01054 065433         DIB 1,DSKP      ;READ CA REGISTER
22 01055 122414         SUB# 1,0,SZR    ;AC0=GOOD
23 01056 006242         EHALT           ;AC1=BAD
24 01057 006243         LOOP
25
26 01060 006241 A43:    SETUP           ;TEST CA REGISTER FOR
27 01061 020111         LDA 0,ZB2       ;SINGLE ZERO BITS
28 01062 062033         DOB 0,DSKP      ;LOAD 157777
29 01063 065433         DIB 1,DSKP      ;READ CA REGISTER
30 01064 122414         SUB# 1,0,SZR    ;AC0=GOOD
31 01065 006242         EHALT           ;AC1=BAD
32 01066 006243         LOOP
33
34 01067 006241 A44:    SETUP           ;TEST CA REGISTER FOR
35 01070 020112         LDA 0,ZB1       ;SINGLE 0 BIT
36 01071 062033         DOB 0,DSKP      ;LOAD 137777
37 01072 065433         DIB 1,DSKP      ;READ CA REGISTER
38 01073 122414         SUB# 1,0,SZR    ;AC0=GOOD
39 01074 006242         EHALT           ;AC1=BAD
40 01075 006243         LOOP
41
42 01076 006241 A45:    SETUP           ;TEST CA REGISTER FOR
43 01077 102220         ADCZR 0,0       ;SINGLE ZERO BIT
44 01100 062033         DOB 0,DSKP      ;LOAD 077777
45 01101 065433         DIB 1,DSKP      ;READ CA REGISTER
46 01102 122414         SUB# 1,0,SZR    ;AC0=GOOD
47 01103 006242         EHALT           ;AC1=BAD
48 01104 006243         LOOP
```

```
A 0015  .MAIN
01
02 01105 006241 A46:    SETUP              ;TEST DISK ADDRESS REGISTER
03 01106 102520          SUBZL 0,0          ;FOR SINGLE 1 BIT
04 01107 063033          DOC 0,DSKP         ;LOAD "SC1"
05 01110 066433          DIC 1,DSKP         ;READ BACK
06 01111 122414          SUB# 1,0,SZR       ;AC0=GOOD
07 01112 006242          EHALT              ;AC1=BAD
08 01113 006243          LOOP
09
10 01114 006241 A47:     SETUP              ;TEST DISK ADDRESS REGISTER
11 01115 020060          LDA 0,KB14         ;FOR SINGLE 1 BITS
12 01116 063033          DOC 0,DSKP         ;LOAD "SC2"
13 01117 066433          DIC 1,DSKP         ;READ BACK
14 01120 122414          SUB# 1,0,SZR       ;AC0=GOOD
15 01121 006242          EHALT              ;AC1=BAD
16 01122 006243          LOOP
17
18 01123 006241 A48:     SETUP              ;TEST DISK ADDRESS REGISTER
19 01124 020061          LDA 0,KB13         ;FOR SINGLE 1 BITS
20 01125 063033          DOC 0,DSKP         ;LOAD "SC4"
21 01126 066433          DIC 1,DSKP         ;READ BACK
22 01127 122414          SUB# 1,0,SZR       ;AC0=GOOD
23 01130 006242          EHALT              ;AC1=BAD
24 01131 006243          LOOP
25
26 01132 006241 A49:     SETUP              ;TEST DISK ADDRESS REGISTER
27 01133 020062          LDA 0,KB12         ;FOR SINGLE 1 BITS
28 01134 063033          DOC 0,DSKP         ;LOAD "SC8"
29 01135 066433          DIC 1,DSKP         ;READ BACK
30 01136 122414          SUB# 1,0,SZR       ;AC0=GOOD
31 01137 006242          EHALT              ;AC1=BAD
32 01140 006243          LOOP
33
34 01141 006241 A50:     SETUP              ;TEST DISK ADDRESS REGISTER
35 01142 020063          LDA 0,KB11         ;FOR SINGLE 1 BITS
36 01143 063033          DOC 0,DSKP         ;LOAD "S1"
37 01144 066433          DIC 1,DSKP         ;READ BACK
38 01145 122414          SUB# 1,0,SZR       ;AC0=GOOD
39 01146 006242          EHALT              ;AC1=BAD
40 01147 006243          LOOP
41
42 01150 006241 A51:     SETUP              ;TEST DISK ADDRESS REGISTER
43 01151 020064          LDA 0,KB10         ;FOR SINGLE 1 BITS
44 01152 063033          DOC 0,DSKP         ;LOAD "S2"
45 01153 066433          DIC 1,DSKP         ;READ BACK
46 01154 122414          SUB# 1,0,SZR       ;AC0=GOOD
47 01155 006242          EHALT              ;AC1=BAD
48 01156 006243          LOOP
```

```
A 0016  .MAIN
01
02 01157 006241 A52:    SETUP              ;TEST DISK ADDRESS REGISTER
03 01160 020065          LDA 0,KB9          ;FOR SINGLE 1 BITS
04 01161 063033          DOC 0,DSKP         ;LOAD "S4"
05 01162 066433          DIC 1,DSKP         ;READ IT BACK
06 01163 122414          SUB# 1,0,SZR       ;AC0=GOOD
07 01164 006242          EHALT              ;AC1=BAD
08 01165 006243          LOOP
09
10 01166 006241 A53:    SETUP              ;TEST DISK ADDRESS REGISTER
11 01167 020066          LDA 0,KB8          ;FOR SINGLE 1 BITS
12 01170 063033          DOC 0,DSKP         ;LOAD "S8"
13 01171 066433          DIC 1,DSKP         ;READ IT BACK
14 01172 122414          SUB# 1,0,SZR       ;AC0=GOOD
15 01173 006242          EHALT              ;AC1=BAD
16 01174 006243          LOOP
17
18 01175 006241 A54:    SETUP              ;TEST DISK ADDRESS REGISTER
19 01176 020067          LDA 0,KB7          ;FOR SINGLE 1 BITS
20 01177 063033          DOC 0,DSKP         ;LOAD "HD1"
21 01200 066433          DIC 1,DSKP         ;READ IT BACK
22 01201 122414          SUB# 1,0,SZR       ;AC0=GOOD
23 01202 006242          EHALT              ;AC1=BAD
24 01203 006243          LOOP
25
26 01204 006241 A55:    SETUP              ;TEST DISK ADDRESS REGISTER
27 01205 020070          LDA 0,KB6          ;FOR SINGLE 1 BITS
28 01206 063033          DOC 0,DSKP         ;LOAD "HD2"
29 01207 066433          DIC 1,DSKP         ;READ BACK
30 01210 122414          SUB# 1,0,SZR       ;AC0=GOOD
31 01211 006242          EHALT              ;AC1=BAD
32 01212 006243          LOOP
33
34 01213 006241 A56:    SETUP              ;TEST DISK ADDRESS REGISTER
35 01214 020071          LDA 0,KB5          ;FOR SINGLE 1 BITS
36 01215 063033          DOC 0,DSKP         ;LOAD "HD4"
37 01216 066433          DIC 1,DSKP         ;READ IT BACK
38 01217 122414          SUB# 1,0,SZR       ;AC0=GOOD
39 01220 006242          EHALT              ;AC1=BAD
40 01221 006243          LOOP
41
42 01222 006241 A57:    SETUP              ;TEST DISK ADDRESS REGISTER
43 01223 020072          LDA 0,KB4          ;FOR SINGLE 1 BITS
44 01224 063033          DOC 0,DSKP         ;LOAD "HD8"
45 01225 066433          DIC 1,DSKP         ;READ IT BACK
46 01226 122414          SUB# 1,0,SZR       ;AC0=GOOD
47 01227 006242          EHALT              ;AC1=BAD
48 01230 006243          LOOP
```

```
A 0017   .MAIN
01
02 01231 006241 A58:    SETUP              ;TEST DISK ADDRESS REGIE;STER
03 01232 020073          LDA 0,KB3          ;FOR SINGLE 1 BITS
04 01233 063033          DOC 0,DSKP         ;LOAD "HD16"
05 01234 066433          DIC 1,DSKP         ;READ IT BACK
06 01235 122414          SUB# 1,0,SZR       ;AC0=GOOD
07 01236 006242          EHALT              ;AC1=BAD
08 01237 006243          LOOP
09
10 01240 006241 A59:    SETUP              ;TEST DISK ADDRESS REGISTER
11 01241 020074          LDA 0,KB2          ;FOR SINGLE 1 BITS
12 01242 063033          DOC 0,DSKP         ;LOAD "FORMAT"
13 01243 066433          DIC 1,DSKP         ;READ IT BACK
14 01244 122414          SUB# 1,0,SZR       ;AC0=GOOD
15 01245 006242          EHALT              ;AC1=BAD
16 01246 006243          LOOP
17
18 01247 006241 A60:    SETUP              ;TEST DISK ADDRESS REGISTER
19 01250 020054          LDA 0,KB1          ;FOR SINGLE 1 BIT
20 01251 063033          DOC 0,DSKP         ;LOAD "D1"
21 01252 066433          DIC 1,DSKP         ;READ IT BACK
22 01253 122414          SUB# 1,0,SZR       ;AC0=GOOD
23 01254 006242          EHALT              ;AC1=BAD
24 01255 006243          LOOP
25
26 01256 006241 A61:    SETUP              ;TEST DISK ADDRESS REGTSTER
27 01257 102620          SUBZR 0,0          ;FOR SINGLE 1 BITS
28 01260 063033          DOC 0,DSKP         ;LOAD "D0"
29 01261 066433          DIC 1,DSKP         ;READ IT BACK
30 01262 122414          SUB# 1,0,SZR       ;AC0=GOOD
31 01263 006242          EHALT              ;AC1=BAD
32 01264 006243          LOOP
33
34 01265 006241 A62:    SETUP              ;TEST DISK ADDRESS REGTSTER
35 01266 102120          ADCZL 0,0          ;FOR SINGLE 0 BITS
36 01267 063033          DOC 0,DSKP         ;"SC1"=0
37 01270 066433          DIC 1,DSKP         ;READ THE REGISTER
38 01271 122414          SUB# 1,0,SZR       ;AC0=GOOD
39 01272 006242          EHALT              ;AC1=BAD
40 01273 006243          LOOP
41
42 01274 006241 A63:    SETUP              ;TEST DISK ADDRESS REGISTER
43 01275 020075          LDA 0,ZB14         ;FOR SINGLE 0 BITS
44 01276 063033          DOC 0,DSKP         ;"SC2" = 0
45 01277 066433          DIC 1,DSKP         ;READ REGISTER
46 01300 122414          SUB# 1,0,SZR       ;AC0=GOOD
47 01301 006242          EHALT              ;AC1=BAD
48 01302 006243          LOOP
```

```
A 0018   .MAIN
01
02 01303 006241 A64:    SETUP              ;TEST DISK ADDRESS REGISTER
03 01304 020076          LDA 0,ZB13         ;FOR SINGLE 0 BITS
04 01305 063033          DOC 0,DSKP         ;"SC4" = 0
05 01306 066433          DIC 1,DSKP         ;READ REGISTER
06 01307 122414          SUB# 1,0,SZR       ;AC0=GOOD
07 01310 006242          EHALT              ;AC1=BAD
08 01311 006243          LOOP
09
10 01312 006241 A65:    SETUP              ;TEST DISK ADDRESS REGISTER
11 01313 020077          LDA 0,ZB12         ;FOR SINGLE 0 BITS
12 01314 063033          DOC 0,DSKP         ;"SC8" = 0
13 01315 066433          DIC 1,DSKP         ;READ REGISTER
14 01316 122414          SUB# 1,0,SZR       ;AC0=GOOD
15 01317 006242          EHALT              ;AC1=BAD
16 01320 006243          LOOP
17
18 01321 006241 A66:    SETUP              ;TEST DISK ADDRESS REGISTER
19 01322 020100          LDA 0,ZB11         ;FOR SINGLE 0 BITS
20 01323 063033          DOC 0,DSKP         ;"S1" = 0
21 01324 066433          DIC 1,DSKP         ;READ REGISTER
22 01325 122414          SUB# 1,0,SZR       ;AC0=GOOD
23 01326 006242          EHALT              ;AC1=BAD
24 01327 006243          LOOP
25
26 01330 006241 A67:    SETUP              ;TEST DISK ADDRESS REGISTER
27 01331 020101          LDA 0,ZB10         ;FOR SINGLE ZERO BITS
28 01332 063033          DOC 0,DSKP         ;"S2" = 0
29 01333 066433          DIC 1,DSKP         ;READ IT BACK
30 01334 122414          SUB# 1,0,SZR       ;AC0=GOOD
31 01335 006242          EHALT              ;AC1=BAD
32 01336 006243          LOOP
33
34 01337 006241 A68:    SETUP              ;TEST DISK ADDRESS REGISTER
35 01340 020102          LDA 0,ZB9          ;FOR SINGLE ZERO BIT
36 01341 063033          DOC 0,DSKP         ;"S4" = 0
37 01342 066433          DIC 1,DSKP         ;READ IT BACK
38 01343 122414          SUB# 1,0,SZR       ;AC0=GOOD
39 01344 006242          EHALT              ;AC1=BAD
40 01345 006243          LOOP
41
42 01346 006241 A69:    SETUP              ;TEST DISK ADDRESS REGISTER
43 01347 020103          LDA 0,ZB8          ;FOR SINGLE ZERO BITS
44 01350 063033          DOC 0,DSKP         ;"S8" = 0
45 01351 066433          DIC 1,DSKP         ;READ IT BACK
46 01352 122414          SUB# 1,0,SZR       ;AC0=GOOD
47 01353 006242          EHALT              ;AC1=BAD
48 01354 006243          LOOP
```

```
A 0019   .MAIN
01
02 01355 006241 A70:    SETUP           ;TEST DISK ADDRESS REGISTER
03 01356 020104         LDA 0,ZB7       ;FOR SINGLE 0 BIT
04 01357 063033         DOC 0,DSKP      ;"HD1" = 0
05 01360 066433         DIC 1,DSKP      ;READ IT BACK
06 01361 122414         SUB# 1,0,SZR    ;AC0=GOOD
07 01362 006242         EHALT           ;AC1=BAD
08 01363 006243         LOOP
09
10 01364 006241 A71:    SETUP           ;TEST DISK ADDRESS REGISTER
11 01365 020105         LDA 0,ZB6       ;FOR SINGLE 0 BIT
12 01366 063033         DOC 0,DSKP      ;"HD2" = 0
13 01367 066433         DIC 1,DSKP      ;READ IT BACK
14 01370 122414         SUB# 1,0,SZR    ;AC0=GOOD
15 01371 006242         EHALT           ;AC1=BAD
16 01372 006243         LOOP
17
18 01373 006241 A72:    SETUP           ;TEST DISK ADDRESS REGISTER
19 01374 020106         LDA 0,ZB5       ;FOR SINGLE ZERO BITS
20 01375 063033         DOC 0,DSKP      ;"HD4" = 0
21 01376 066433         DIC 1,DSKP      ;READ IT BACK
22 01377 122414         SUB# 1,0,SZR    ;AC0=GOOD
23 01400 006242         EHALT           ;AC1=BAD
24 01401 006243         LOOP
25
26 01402 006241 A73:    SETUP           ;TEST DISK ADDRESS REGISTER
27 01403 020107         LDA 0,ZB4       ;FOR SINGLE 0 BIT
28 01404 063033         DOC 0,DSKP      ;"HD8" = 0
29 01405 066433         DIC 1,DSKP      ;READ IT BACK
30 01406 122414         SUB# 1,0,SZR    ;AC0=GOOD
31 01407 006242         EHALT           ;AC1=BAD
32 01410 006243         LOOP
33
34 01411 006241 A74:    SETUP           ;TEST DISK ADDRESS REGISTER
35 01412 020110         LDA 0,ZB3       ;FOR SINGLE 0 BIT
36 01413 063033         DOC 0,DSKP      ;"HD16" = 0
37 01414 066433         DIC 1,DSKP      ;READ IT BACK
38 01415 122414         SUB# 1,0,SZR    ;AC0=GOOD
39 01416 006242         EHALT           ;AC1=BAD
40 01417 006243         LOOP
41
42 01420 006241 A75:    SETUP           ;TEST DISK ADDRESS REGISTER
43 01421 020111         LDA 0,ZB2       ;FOR SINGLE ZERO BITS
44 01422 063033         DOC 0,DSKP      ;"FORMAT" = 0
45 01423 066433         DIC 1,DSKP      ;READ IT BACK
46 01424 122414         SUB# 1,0,SZR    ;AC0=GOOD
47 01425 006242         EHALT           ;AC1=BAD
48 01426 006243         LOOP
49
50                      .EOT
```

```
  0020  .MAIN
01
02 01427 006241 A76:    SETUP           ;TEST DISK ADDRESS REGISTER
03 01430 020112         LDA 0,ZB1       ;FOR SINGLE 0 BIT
04 01431 063033         DOC 0,DSKP      ;"D1" = 0
05 01432 066433         DIC 1,DSKP      ;READ IT BACK
06 01433 122414         SUB# 1,0,SZR    ;AC0=GOOD
07 01434 006242         EHALT           ;AC1=BAD WORD
08 01435 006243         LOOP
09
10 01436 006241 A77:    SETUP           ;TEST DISK ADDRESS REGISTER
11 01437 102220         ADCZR 0,0       ;FOR SINGLE ZERO BIT
12 01440 063033         DOC 0,DSKP      ;"D0" = 0
13 01441 066433         DIC 1,DSKP      ;READ IT BACK
14 01442 122414         SUB# 1,0,SZR    ;AC0=GOOD
15 01443 006242         EHALT           ;AC1=BAD
16 01444 006243         LOOP
17
18 01445 102400 A78:    SUB 0,0         ;CHECK CA REGISTER, ALL
19 01446 006237         JSR @ISET       ;POSSIBLE PATTERNS
20 01447 062033         DOB 0,DSKP      ;LOAD CA.
21 01450 065433         DIB 1,DSKP      ;READ IT BACK
22 01451 122414         SUB# 1,0,SZR    ;AC0=GOOD
23 01452 006242         EHALT           ;AC1=BAD
24 01453 006243         LOOP            ;DO IT ONLY ONCE FOR EACH PAT
25 01454 101404         INC 0,0,SZR     ;NEXT PATTERN
26 01455 000771         JMP .-7
27
28 01456 006237 A79:    JSR @ISET       ;CHECK DISK ADDRESS REGISTER
29 01457 063033         DOC 0,DSKP      ;ALL POSSIBLE PATTERNS
30 01460 066433         DIC 1,DSKP      ;LOAD/READ BACK
31 01461 122414         SUB# 1,0,SZR    ;AC0=GOOD
32 01462 006242         EHALT           ;AC1=BAD
33 01463 006243         LOOP
34 01464 101404         INC 0,0,SZR     ;NEXT PATTERN
35 01465 000771         JMP .-7
36
37 01466 006241 A80:    SETUP           ;SPECIAL TEST FOR R291
38 01467 102400         SUB 0,0         ;IC PACKS.  SET RIGHTMOST
39 01470 030134         LDA 2,BIT1      ;BIT IN EACH PACK WITH
40 01471 072033         DOB 2,DSKP      ;3 SUCCESSIVE LOADS, THEN
41 01472 072033         DOB 2,DSKP      ;LOAD ZERO.  MARGINAL
42 01473 072033         DOB 2,DSKP      ;PACKS WILL HOLD THE "1".
43 01474 062033         DOB 0,DSKP
44 01475 065433         DIB 1,DSKP      ;TESTING CA REGISTER
45 01476 125004         MOV 1,1,SZR     ;AC0=GOOD
46 01477 006242         EHALT           ;AC1=BAD
47 01500 006243         LOOP
```

```
A 0021  .MAIN
01
02 01501 006241 A81:    SETUP           ;SPECIAL TEST FOR 8291
03 01502 102400         SUB 0,0         ;IC PACKS.  SET POSITION 2
04 01503 030135         LDA 2,BIT2      ;(PIN 9) IN EACH PACK WITH
05 01504 072033         DOB 2,DSKP      ;3 SUCCESSIVE LOADS, THEN
06 01505 072033         DOB 2,DSKP      ;LOAD ZEROS.  MARGINAL
07 01506 072033         DOB 2,DSKP      ;PACKS WILL HOLD A "1"
08 01507 062033         DOB 0,DSKP
09 01510 065433         DIB 1,DSKP      ;TESTING CA REGISTER
10 01511 122414         SUB# 1,0,SZR    ;AC0=GOOD
11 01512 006242         EHALT           ;AC1=BAD
12 01513 006243         LOOP
13
14 01514 006241 A82:    SETUP           ;SPECIAL TEST FOR 8291
15 01515 102400         SUB 0,0         ;IC PACKS.  SET POSITION 4
16 01516 030136         LDA 2,BIT4      ;(PIN 2) IN EACH PACK WITH
17 01517 072033         DOB 2,DSKP      ;3 SUCCESSIVE LOADS, THEN
18 01520 072033         DOB 2,DSKP      ;LOAD ZEROS.  MARGINAL
19 01521 072033         DOB 2,DSKP      ;PACKS WILL HOLD A "1".
20 01522 062033         DOB 0,DSKP
21 01523 065433         DIB 1,DSKP      ;TESTING CA REGISTER
22 01524 122414         SUB# 1,0,SZR    ;AC0=GOOD
23 01525 006242         EHALT           ;AC1=BAD
24 01526 006243         LOOP
25
26 01527 006241 A83:    SETUP           ;SPECIAL TEST FOR 8291
27 01530 102400         SUB 0,0         ;IC PACKS.  SET POSITION 8
28 01531 030137         LDA 2,BIT8      ;(PIN 12) IN EACH PACK WITH
29 01532 072033         DOB 2,DSKP      ;3 SUCCESSIVE LOADS.  THEN
30 01533 072033         DOB 2,DSKP      ;LOAD ZEROS.  MARGINAL
31 01534 072033         DOB 2,DSKP      ;PACKS WILL HOLD A "1"
32 01535 062033         DOB 0,DSKP
33 01536 065433         DIB 1,DSKP      ;TESTING CA REGISTER
34 01537 122414         SUB# 1,0,SZR    ;AC0=GOOD
35 01540 006242         EHALT           ;AC1=BAD
36 01541 006243         LOOP
37
38 01542 006241 A84:    SETUP           ;SPECIAL TEST FOR 8291
39 01543 102400         SUB 0,0         ;IC PACKS.  SET POSITION 1
40 01544 030134         LDA 2,BIT1      ;(PIN 5) OF EACH PACK WITH
41 01545 073033         DOC 2,DSKP      ;3 SUCCESSIVE LOADS, THEN
42 01546 073033         DOC 2,DSKP      ;LOAD ZEROS.  MARGINAL
43 01547 073033         DOC 2,DSKP      ;PACKS WILL HOLD A "1".
44 01550 063033         DOC 0,DSKP
45 01551 066433         DIC 1,DSKP      ;TESTING DISK ADDR REG.
46 01552 122414         SUB# 1,0,SZR    ;AC0=GOOD
47 01553 006242         EHALT           ;AC1=BAD
48 01554 006243         LOOP
```

```
A 0022  .MAIN
01
02 01555 006241 A85:    SETUP           ;SPECIAL TEST FOR 8291
03 01556 102400         SUB 0,0         ;IC PACKS.  SET POSITION 2
04 01557 030135         LDA 2,BIT2      ;(PIN 9) OF EACH PACK WITH
05 01560 073033         DOC 2,DSKP      ;3 SUCCESSIVE LOADS, THEN
06 01561 073033         DOC 2,DSKP      ;LOAD ZEROS.  MARGINAL
07 01562 073033         DOC 2,DSKP      ;PACKS WILL RETAIN A "1".
08 01563 063033         DOC 0,DSKP
09 01564 066433         DIC 1,DSKP      ;TESTING DISK ADDR REG.
10 01565 122414         SUB# 1,0,SZR    ;AC0=GOOD
11 01566 006242         EHALT           ;AC1=BAD
12 01567 006243         LOOP
13
14 01570 006241 A86:    SETUP           ;SPECIAL TEST FOR 8291
15 01571 102400         SUB 0,0         ;IC PACKS.  SET POSITION 4
16 01572 030136         LDA 2,BIT4      ;(PIN 2) OF EACH PACK WITH
17 01573 073033         DOC 2,DSKP      ;3 SUCCESSIVE LOADS, THEN
18 01574 073033         DOC 2,DSKP      ;LOAD ZEROS.  MARGINAL
19 01575 073033         DOC 2,DSKP      ;PACKS WILL RETAIN A "1".
20 01576 063033         DOC 0,DSKP
21 01577 066433         DIC 1,DSKP      ;TESTING DISK ADDR REG.
22 01600 122414         SUB# 1,0,SZR    ;AC0=GOOD
23 01601 006242         EHALT           ;AC1=BAD
24 01602 006243         LOOP
25
26 01603 006241 A87:    SETUP           ;SPECIAL TEST FOR 8291
27 01604 102400         SUB 0,0         ;IC PACKS.  SET POSITION 8
28 01605 030137         LDA 2,BIT8      ;(PIN 12) OF EACH PACK WITH
29 01606 073033         DOC 2,DSKP      ;3 SUCCESSIVE LOADS, THEN
30 01607 073033         DOC 2,DSKP      ;LOAD ALL ZEROS.  MARGINAL
31 01610 073033         DOC 2,DSKP      ;PACKS WILL RETAIN A "1".
32 01611 063033         DOC 0,DSKP
33 01612 066433         DIC 1,DSKP      ;TESTING DISK ADDR REG.
34 01613 122414         SUB# 1,0,SZR    ;AC0=GOOD
35 01614 006242         EHALT           ;AC1=BAD
36 01615 006243         LOOP
37
38 01616 020147 B1:     LDA 0,KDOB      ;CHECK FOR ILLEGAL
39 01617 040403         STA 0,B1.1      ;DEVICE SELECT BY
40 01620 024140         LDA 1,C2525     ;DISK PACK CONTROL
41 01621 006240         SETP1           ;PERFORM "DOB" TO EVERY
42 01622 066000 B1.1:   DOB 1,0         ;OTHER DEVICE ADDRESS
43 01623 061433         DIB 0,DSKP      ;AND CHECK DSKP
44 01624 122415         SUB# 1,0,SNR    ;EACH TIME TO SEE
45 01625 006242         EHALT           ;IT RECOGNIZED THE "DOB".
46 01626 006243         LOOP
47 01627 010773 B1.2:   ISZ B1.1        ;CODE FROM HERE ON IS
48 01630 020772         LDA 0,B1.1      ;FOR INCREMENTING TO
49 01631 030123         LDA 2,C77       ;NEXT DEVICE ADDRESS
50 01632 143405         AND 2,0,SNR
51 01633 000405         JMP B2
52 01634 030154         LDA 2,CDSK
53 01635 142415         SUB# 2,0,SNR
54 01636 000771         JMP B1,2
55 01637 000762         JMP B1.1-1
```

```
▲ 0023  .MAIN
01
02 01640 006241 B2:     SETUP              ;SEE IF (S) PULSE WILL SET
03 01641 020070          LDA 0,C1000        ;"DP BUSY".  START A
04 01642 061133          DOAS 0,DSKP        ;SEEK
05 01643 063433          SKPBN DSKP         ;SKIP IF "DP BUSY" = 1
06 01644 006252          EHLT               ;CHECK "DP START", "DP BUSY",
07 01645 006262          LOOPD              ;"SELB" OC GATE.
08
09 01646 006241 B3:      SETUP              ;SEE IF (C) PULSE WILL CLEAR
10 01647 020070          LDA 0,C1000        ;"DP BUSY".  START A SEEK.
11 01650 061133          DOAS 0,DSKP        ; THEN CLEAR
12 01651 060233          NIOC DSKP
13 01652 063533          SKPBZ DSKP         ;CHECK "CLEAR"
14 01653 006252          EHLT
15 01654 006262          LOOPD
16
17 01655 006241 B4:      SETUP              ;SEE IF IORST WILL CLEAR
18 01656 020070          LDA 0,C1000        ;"DP BUSY".  START A SEEK.
19 01657 061133          DOAS 0,DSKP        ; THEN CLEAR IT
20 01660 062677          IORST
21 01661 063533          SKPBZ DSKP         ;CHECK "RESET", "CLEAR"
22 01662 006252          EHLT
23 01663 006262          LOOPD
24
25 01664 006241 B5:      SETUP              ;CHECK TO INSURE THAT
26 01665 064433          DIA 1,DSKP         ;ALL SEEKING FF'S ARE
27 01666 020216          LDA 0,C3600        ;CLEARED BY IORST
28 01667 107404          AND 0,1,SZR        ;AC1=BAD SEEKING
29 01670 006242          EHALT              ;STATUS FROM DIA.
30 01671 006243          LOOP               ;CHECK DATA THRU MUX
31
32 01672 006241 B6:      SETUP              ;CHECK FOR PROPER
33 01673 102000          ADC 0,0            ;INPUT OF STATUS THRU
34 01674 062033          DOB 0,DSKP         ;THE MULTIPLEXORS TO
35 01675 063033          DOC 0,DSKP         ;THE DATA BUSS OC GATES
36 01676 064433          DIA 1,DSKP
37 01677 020216          LDA 0,C3600
38 01700 107414          AND# 0,1,SZR
39 01701 006242          EHALT              ;SEEKING STATUS ON
40 01702 006243          LOOP               ;ALL SHOULD BE ZERO. (AC1)=STATUS
41
42 01703 006241 B7:      SETUP              ;TRY TO SET "SEEKING 0"
43 01704 020070          LDA 0,C1000        ;VIA (S) PULSE
44 01705 061133          DOAS 0,DSKP
45 01706 064433          DIA 1,DSKP         ;"DP START" SETS "START"
46 01707 020071          LDA 0,KB5          ;CHECK "ADAPTER SEL", "SEEK"
47 01710 123415          AND# 1,0,SNR       ;AND "START SEEK"
48 01711 006252          EHLT
49 01712 006262          LOOPD
```

```
▲ 0024  .MAIN
01
02 01713 006241 B8:     SETUP            ;TRY TO SET "SEEKING 0"
03 01714 020070          LDA 0,C1000      ;WITH A (P) PULSE
04 01715 061333          DOAP 0,DSKP
05 01716 024071          LDA 1,KB5        ;CHECK "DP IOP"
06 01717 060433          DIA 0,DSKP       ;SET LINE TO "START"
07 01720 123415          AND# 1,0,SNR
08 01721 006252          EHLT
09 01722 006262          LOOPD
10
11 01723 006241 B9:      SETUP            ;CHECK UNIT SELECTION
12 01724 020070          LDA 0,C1000      ;START UNIT 0 SEEKING
13 01725 061333          DOAP 0,DSKP      ;AND VERIFY THAT NO
14 01726 070433          DIA 2,DSKP       ;OTHER UNIT SEEKS.
15 01727 020071          LDA 0,KB5        ;AC2=STATUS DURING SEEK
16 01730 024216          LDA 1,C3600      ;AC1=BAD SEEKING STATUS
17 01731 147400          AND 2,1          ;AC0=GOOD
18 01732 122414          SUB# 1,0,SZR     ;CHECK UNIT # DECODER
19 01733 006252          EHLT
20 01734 006262          LOOPD
21
22 01735 006241 B10:     SETUP            ;CHECK UNIT SELECTION 1
23 01736 020054          LDA 0,KB1        ;START UNIT 1 SEEKING
24 01737 063033          DOC 0,DSKP       ;AND VERIFY THAT NO
25 01740 020070          LDA 0,C1000      ;OTHER UNIT SEEKS.
26 01741 061333          DOAP 0,DSKP      ;AC2=STATUS DURING SEEK
27 01742 070433          DIA 2,DSKP       ;AC1=BAD SEEKING STATUS
28 01743 024216          LDA 1,C3600      ;AC0=GOOD
29 01744 020070          LDA 0,KB6        ;CHECK UNIT # DECODER,
30 01745 147400          AND 2,1          ;"UNIT 1", AND "SEEKING 1"
31 01746 122414          SUB# 1,0,SZR
32 01747 006252          EHLT
33 01750 006262          LOOPD
34
35 01751 006241 B11:     SETUP            ;CHECK UNIT SELECTION
36 01752 102620          SUBZR 0,0        ;START UNIT 2 SEEKING AND
37 01753 063033          DOC 0,DSKP       ;VERIFY THAT NO OTHER
38 01754 020070          LDA 0,C1000      ;UNIT SEEKS
39 01755 061333          DOAP 0,DSKP      ;AC2=STATUS DURING SEEK
40 01756 070433          DIA 2,DSKP       ;AC1=BAD SEEKING STATUS
41 01757 024216          LDA 1,C3600      ;AC0=GOOD
42 01760 020067          LDA 0,KB7        ;CHECK "UNIT 2",
43 01761 147400          AND 2,1          ;"SEEKING 2"
44 01762 122414          SUB# 1,0,SZR
45 01763 006252          EHLT
46 01764 006262          LOOPD
```

```
A 0025  .MAIN
01
02 01765 006241 B12:    SETUP              ;CHECK UNIT SELECTION
03 01766 020056          LDA 0,C140K        ;START UNIT 3 SEEKING
04 01767 063033          DOC 0,DSKP         ;AND VERIFY THAT NO
05 01770 020070          LDA 0,C1000        ;OTHER UNIT SEEKS.
06 01771 061333          DOAP 0,DSKP        ;AC2=STATUS DURING SEEK
07 01772 070433          DIA 2,DSKP         ;AC1=BAD SEEKING STATUS
08 01773 024216          LDA 1,C3600        ;AC0=GOOD
09 01774 020066          LDA 0,KB8          ;CHECK "UNIT 3", AND
10 01775 147400          AND 2,1            ;"SEEKING 3"
11 01776 122414          SUB# 1,0,SZR
12 01777 006252          EHLT
13 02000 006262          LOOPD
14
15 02001 006241 B13:    SETUP              ;CHECK THE "CLEAR"
16 02002 152520          SUBZL 2,2          ;RESET OF "SEEKING 0".
17 02003 006230          SSEEK              ;START UNIT 0 SEEKING
18 02004 060233          NIOC DSKP          ;ISSUE (C) PULSE
19 02005 020071          LDA 0,KB5
20 02006 064433          DIA 1,DSKP         ;READ STATUS
21 02007 107404          AND 0,1,SZR        ;"SEEKING 0" BIT NOT
22 02010 006252          EHLT               ;CLEARED BY (C) PULSE
23 02011 006262          LOOPD
24
25 02012 006241 B14:    SETUP              ;CHECK THE "CLEAR"
26 02013 030060          LDA 2,KB14         ;RESET OF "SEEKING 1"
27 02014 006230          SSEEK              ;START UNIT 1 SEEKING.
28 02015 060233          NIOC DSKP          ;ISSUE (C) PULSE
29 02016 020070          LDA 0,KB6          ;READ STATUS
30 02017 064433          DIA 1,DSKP         ;"SEEKING 1" BIT NOT
31 02020 107404          AND 0,1,SZR        ;CLEARED BY (C) PULSE
32 02021 006252          EHLT
33 02022 006262          LOOPD
34
35 02023 006241 B15:    SETUP              ;CHECK THE "CLEAR" RESET
36 02024 030061          LDA 2,KB13         ;OF "SEEKING 2".
37 02025 006230          SSEEK              ;START UNIT 2 SEEKING.
38 02026 060233          NIOC DSKP          ;ISSUE (C) PULSE
39 02027 020067          LDA 0,KB7
40 02030 064433          DIA 1,DSKP         ;READ STATUS
41 02031 107404          AND 0,1,SZR        ;"SEEKING 2" BIT NOT
42 02032 006252          EHLT               ;RESET BY (C) PULSE
43 02033 006262          LOOPD
44
```

```
A 0026  .MAIN
01
02 02034 006241 B16:    SETUP          ;CHECK THE "CLEAR" RESET
03 02035 030062          LDA 2,KB12     ;OF "SEEKING 3"
04 02036 006230          SSEEK          ;START UNIT 3 SEEKING.
05 02037 060233          NIOC DSKP      ;ISSUE (C) PULSE
06 02040 020066          LDA 0,KB8
07 02041 064433          DIA 1,DSKP     ;READ STATUS
08 02042 107404          AND 0,1,SZR    ;"SEEKING 3" BIT NOT
09 02043 006252          EHLT           ;CLEARED BY (C) PULSE
10 02044 006262          LOOPD
11
12 02045 020151 B17:     LDA 0,NDSKS    ;ATTEMPT TO OBTAIN
13 02046 101203          MOVR 0,0,SNC   ;"SEEK DONE 0" FROM
14 02047 000407          JMP B18        ;A RECALIBRATE
15 02050 006237          JSR @ISET      ;(SKIP OVER IF NO UNIT 0)
16 02051 006231          RECL0          ;RECAL UNIT 0
17 02052 020054          LDA 0,KB1      ;AC1=STATUS
18 02053 123415          AND# 1,0,SNR   ;"ATTEN0" DID NOT SET
19 02054 006252          EHLT           ;"SEEK DONE 0"
20 02055 006243          LOOP
21
22 02056 020151 B18:     LDA 0,NDSKS    ;ATTEMPT TO OBTAIN
23 02057 101200          MOVR 0,0       ;"SEEK DONE 1" FROM
24 02060 101203          MOVR 0,0,SNC   ;A RECALIBRATE
25 02061 000407          JMP B19        ;(SKIP OVER IF NO UNIT 1)
26 02062 006237          JSR @ISET
27 02063 006232          RECL1          ;RECAL UNIT 1
28 02064 020074          LDA 0,KB2      ;AC1=STATUS
29 02065 123415          AND# 1,0,SNR   ;"ATTEN1" DID NOT SET
30 02066 006252          EHLT           ;"SEEK DONE 1"
31 02067 006243          LOOP
32
33 02070 020151 B19:     LDA 0,NDSKS    ;ATTEMPT TO OBTAIN
34 02071 024061          LDA 1,KB13     ;"SEEK DONE 2" FROM
35 02072 123405          AND 1,0,SNR    ;A RECALIBRATE
36 02073 000407          JMP B20        ;(SKIP OVER IF NO UNIT 2)
37 02074 006237          JSR @ISET
38 02075 006233          RECL2          ;RECAL UNIT 2
39 02076 020073          LDA 0,KB3      ;AC1=STATUS
40 02077 123415          AND# 1,0,SNR   ;"ATTEN2" DID NOT SET
41 02100 006252          EHLT           ;"SEEK DONE 2"
42 02101 006243          LOOP
```

```
A 0W27   .MAIN
01
02 02102 020151 B20:    LDA 0,NDSKS      ;ATTEMPT TO OBTAIN
03 02103 024062          LDA 1,KB12       ;"SEEK DONE 3" FROM
04 02104 123405          AND 1,0,SNR      ;A RECALIBRATE
05 02105 000407          JMP B21          ;(SKIP OVER IF NO UNIT 3)
06 02106 006237          JSR @ISET
07 02107 006234          RECL3            ;RECAL UNIT 3
08 02110 020072          LDA 0,KB4        ;AC1=STATUS
09 02111 123415          AND# 1,0,SNR     ;"ATTEN3" FAILED TO SET
10 02112 006252          EHLT             ;"SEEK DONE 3"
11 02113 006243          LOOP
12
13 02114 062677 B21:    IORST            ;DISK DRIVE WILL NOT TAKE
14 02115 030167          LDA 2,C5         ;SUCCESSIVE RECALIBRATES
15 02116 006227          WAIT             ;DO A DELAY
16
17 02117 020151          LDA 0,NDSKS      ;SEE IF "SEEK DONE 0"
18 02120 101203          MOVR 0,0,SNC     ;WILL RESET "SEEKING 0"
19 02121 000407          JMP B22          ;(SKIP IF NO UNIT 0)
20 02122 006237          JSR @ISET
21 02123 006231          RECL0            ;RECAL UNIT 0
22 02124 020071          LDA 0,KB5        ;AC1=STATUS
23 02125 123414          AND# 1,0,SZR     ;"SEEKING 0" SHOULD GET
24 02126 006252          EHLT             ;RESET BY "SEEK DONE 0"
25 02127 006243          LOOP
26
27 02130 020151 B22:    LDA 0,NDSKS      ;SEE IF "SEEK DONE 1"
28 02131 101200          MOVR 0,0         ;WILL RESET "SEEKING 1"
29 02132 101203          MOVR 0,0,SNC
30 02133 000407          JMP B23          ;(SKIP OVER IF NO UNIT 1)
31 02134 006237          JSR @ISET
32 02135 006232          RECL1            ;RECAL UNIT 1
33 02136 020070          LDA 0,KB6        ;AC1=STATUS
34 02137 123414          AND# 1,0,SZR     ;"SEEKING 1" SHOULD GET
35 02140 006252          EHLT             ;RESET BY "SEEK DONE 1"
36 02141 006243          LOOP
```

```
▲ 0028  .MAIN
01
02 02142 020151 B23:    LDA 0,NDSKS        ;SEE IF "SEEK DONE 2"
03 02143 024061          LDA 1,KB13         ;WILL RESET "SEEKING 2"
04 02144 123405          AND 1,0,SNR
05 02145 000407          JMP B24            ;(SKIP OVER IF NO UNIT 2)
06 02146 006237          JSR @ISET
07 02147 006233          RECL2              ;RECAL UNIT 2
08 02150 020067          LDA 0,KB7          ;AC1=STATUS
09 02151 123414          AND# 1,0,SZR       ;"SEEKING 2" SHOULD GET
10 02152 006252          EHLT               ;RESET BY "SEEK DONE 2"
11 02153 006243          LOOP
12
13 02154 020151 B24:    LDA 0,NDSKS        ;SEE IF "SEEK DONE 3"
14 02155 024062          LDA 1,KB12         ;WILL RESET "SEEKING 3"
15 02156 123405          AND 1,0,SNR
16 02157 000407          JMP B25            ;(SKIP IF NO UNIT 3)
17 02160 006237          JSR @ISET
18 02161 006234          RECL3              ;RECAL UNIT 3
19 02162 020066          LDA 0,KB6          ;AC1=STATUS
20 02163 123414          AND# 1,0,SZR       ;"SEEKING 3" SHOULD GET
21 02164 006252          EHLT               ;RESET VIA "SEEK DONE 3"
22 02165 006243          LOOP
23
24 02166 062677 B25:     IORST              ;DISK DRIVE WILL NOT TAKE
25 02167 030173          LDA 2,C15          ;SUCCESSIVE RECALIBRATES
26 02170 006227          WAIT               ;WAIT 1.3 SEC
27
28 02171 020151          LDA 0,NDSKS        ;ATTEMPT TO RESET "SEEK DONE 0"
29 02172 101203          MOVR 0,0,SNC       ;WITH "DATOA"
30 02173 000411          JMP B26            ;SKIP OVER IF NO UNIT 0
31 02174 006237          JSR @ISET
32 02175 006231          RECL0              ;SET "SEEK DONE 0" VIA
33 02176 020054          LDA 0,KB1          ;RECALIBRATE
34 02177 061033          DOA 0,DSKP         ;ATTEMPT RESET
35 02200 064433          DIA 1,DSKP         ;READ STATUS
36 02201 123414          AND# 1,0,SZR
37 02202 006252          EHLT               ;"SEEK DONE 0" RESET FAILED
38 02203 006243          LOOP
39
40 02204 020151 B26:     LDA 0,NDSKS        ;ATTEMPT TO RESET "SEEK DONE 1"
41 02205 101200          MOVR 0,0           ;WITH "DATOA"
42 02206 101203          MOVR 0,0,SNC
43 02207 000411          JMP B27            ;(SKIP OVER IF NO UNIT 1)
44 02210 006237          JSR @ISET
45 02211 006232          RECL1              ;SET "SEEK DONE 1"
46 02212 020074          LDA 0,KB2          ;WITH A RECALIBRATE
47 02213 061033          DOA 0,DSKP         ;ATTEMPT RESET
48 02214 064433          DIA 1,DSKP         ;READ STATUS
49 02215 123414          AND# 1,0,SZR
50 02216 006252          EHLT               ;"SEEK DONE 1" RESET FAILED
51 02217 006243          LOOP
```

```
A 0029  .MAIN
01
02 02220 020151 B27:    LDA 0,NDSKS     ;ATTEMPT TO RESET "SEEK DONE 2"
03 02221 024061         LDA 1,KB13      ;WITH "DATOA"
04 02222 123405         AND 1,0,SNR
05 02223 000411         JMP B28         ;(SKIP OVER IF NO UNIT 2)
06 02224 006237         JSR @ISET
07 02225 006233         RECL2           ;SET "SEEK DONE 2"
08 02226 020073         LDA 0,KB3       ;WITH A RECALIBRATE
09 02227 061033         DOA 0,DSKP      ;ATTEMPT RESET
10 02230 064433         DIA 1,DSKP      ;READ STATUS
11 02231 123414         AND# 1,0,SZR
12 02232 006252         EHLT            ;"SEEK DONE 2" RESET FAILED
13 02233 006243         LOOP
14
15 02234 020151 B28:    LDA 0,NDSKS     ;ATTEMPT TO RESET "SEEK DONE 3"
16 02235 024062         LDA 1,KB12      ;WITH "DATOA"
17 02236 123405         AND 1,0,SNR
18 02237 000411         JMP B29         ;(SKIP OVER IF NO UNIT 3)
19 02240 006237         JSR @ISET
20 02241 006234         RECL3           ;SET "SEEK DONE 3"
21 02242 020072         LDA 0,KB4       ;WITH A RECALIBRATE
22 02243 061033         DOA 0,DSKP      ;ATTEMPT RESET
23 02244 064433         DIA 1,DSKP      ;READ STATUS
24 02245 123414         AND# 1,0,SZR
25 02246 006252         EHLT            ;"SEEK DONE 3" RESET FAILED
26 02247 006243         LOOP
27
28 02250 020151 B29:    LDA 0,NDSKS     ;ATTEMPT TO RESET "SEEK DONE 0"
29 02251 101203         MOVR 0,0,SNC    ;WITH A (C) PULSE
30 02252 000411         JMP B30         ;(SKIP OVER IF NO UNIT 0)
31 02253 006237         JSR @ISET
32 02254 006231         RECL0           ;SET "SEEK DONE 0" VIA RECAL
33 02255 020054         LDA 0,KB1
34 02256 060233         NIOC DSKP       ;ATTEMPT CLEAR
35 02257 064433         DIA 1,DSKP      ;READ STATUS
36 02260 123414         AND# 1,0,SZR
37 02261 006252         EHLT            ;"SEEK DONE 0" RESET FAILED
38 02262 006243         LOOP
39
40 02263 020151 B30:    LDA 0,NDSKS     ;ATTEMPT TO RESET "SEEK DONE 1"
41 02264 101200         MOVR 0,0        ;WITH A (C) PULSE
42 02265 101203         MOVR 0,0,SNC
43 02266 000411         JMP B31         ;(SKIP IF NO UNIT 1)
44 02267 006237         JSR @ISET
45 02270 006232         RECL1           ;SET "SEEK DONE 1" VIA RECAL
46 02271 020074         LDA 0,KB2
47 02272 060233         NIOC DSKP       ;ATTEMPT RESET
48 02273 064433         DIA 1,DSKP      ;READ STATUS
49 02274 123414         AND# 1,0,SZR
50 02275 006252         EHLT            ;"SEEK DONE 1" RESET FAILED
51 02276 006243         LOOP
```

```
A 0030   .MAIN
01
02 02277 020151 B31:     LDA 0,NDSKS       ;ATTEMPT TO RESET "SEEK DONE 2"
03 02300 024061           LDA 1,KB13        ;WITH A (C) PULSE
04 02301 123405           AND 1,0,SNR
05 02302 000411           JMP B32           ;(SKIP OVER IF NO UNIT 2)
06 02303 006237           JSR @ISET
07 02304 006233           RECL2             ;SET "SEEK DONE 2" VIA RECAL
08 02305 020073           LDA 0,KB3
09 02306 060233           NIOC DSKP         ;ATTEMPT RESET
10 02307 064433           DIA 1,DSKP        ;READ STATUS
11 02310 123414           AND# 1,0,SZR
12 02311 006252           EHLT              ;"SEEK DONE 2" RESET FAILED
13 02312 006243           LOOP
14
15 02313 020151 B32:     LDA 0,NDSKS       ;ATTEMPT TO RESET "SEEK DONE 3"
16 02314 024062           LDA 1,KB12        ;WITH A (C) PULSE
17 02315 123405           AND 1,0,SNR
18 02316 000411           JMP B35           ;(SKIP OVER IF NO UNIT 3)
19 02317 006237           JSR @ISET
20 02320 006234           RECL3             ;SET "SEEK DONE 3" VIA RECAL
21 02321 020072           LDA 0,KB4
22 02322 060233           NIOC DSKP         ;ATTEMPT RESET
23 02323 064433           DIA 1,DSKP        ;READ STATUS
24 02324 123414           AND# 1,0,SZR
25 02325 006252           EHLT              ;"SEEK DONE 3" RESET FAILED
26 02326 006243           LOOP
27
28 02327 006241 B35:     SETUP             ;IDLE STATE STATUS CHECK
29 02330 064433           DIA 1,DSKP
30 02331 102620           SUBZR 0,0
31 02332 107414           AND# 0,1,SZR
32 02333 006242           EHALT             ;R/W DONE = 1
33 02334 006243           LOOP
34
35 02335 006241 B36:     SETUP             ;IDLE STATE STATUS CHECK
36 02336 064433           DIA 1,DSKP
37 02337 020175           LDA 0,C30
38 02340 123414           AND# 1,0,SZR
39 02341 006242           EHALT             ;ADDR ERR OR END CYL
40 02342 006243           LOOP
```

```
A 0031   .MAIN
01
02 02343 006241 B37:    SETUP              ;IDLE STATE STATUS CHECK
03 02344 064433          DIA 1,DSKP
04 02345 020061          LDA 0,KB13
05 02346 107414          AND# 0,1,SZR
06 02347 006242          EHALT              ;CHECK WORD ERROR = 1
07 02350 006243          LOOP
08
09 02351 006241 B38:    SETUP              ;IDLE STATE STATUS CHECK
10 02352 064433          DIA 1,DSKP
11 02353 020117          LDA 0,C3
12 02354 123414          AND# 1,0,SZR
13 02355 006242          EHALT              ;DATA LATE OR ERR
14 02356 006243          LOOP
15
16 02357 020151 B39:    LDA 0,NDSKS        ;SEE IF "SEEK DONE 0"
17 02360 101203          MOVR 0,0,SNC       ;WILL CAUSE INTERRUPT
18 02361 000406          JMP B40            ;(SKIP IF NO UNIT 0)
19 02362 006237          JSR @ISET
20 02363 006231          RECL0              ;SET "SEEK DONE 0"
21 02364 006235          ITRWT              ;IS THERE AN INTERRUPT?
22 02365 006252          EHLT               ;NO, CHECK "INTERRUPT",
23 02366 006243          LOOP               ;"DP INT REQ".
24
25 02367 020151 B40:    LDA 0,NDSKS        ;SEE IF "SEEK DONE 1"
26 02370 101200          MOVR 0,0           ;WILL CAUSE INTERRUPT
27 02371 101203          MOVR 0,0,SNC
28 02372 000406          JMP B41            ;(SKIP IF NO UNIT 1)
29 02373 006237          JSR @ISET
30 02374 006232          RECL1              ;SET "SEEK DONE 1"
31 02375 006235          ITRWT              ;IS THERE AN INTERRUPT ?
32 02376 006252          EHLT               ;NO, CHECK "INTERRUPT",
33 02377 006243          LOOP               ;"DP INT REQ".
34
35 02400 020151 B41:    LDA 0,NDSKS        ;SEE IF "SEEK DONE 2"
36 02401 024061          LDA 1,KB13         ;WILL CAUSE INTERRUPT
37 02402 123405          AND 1,0,SNR
38 02403 000406          JMP B42            ;(SKIP IF NO UNIT 2)
39 02404 006237          JSR @ISET
40 02405 006233          RECL2              ;SET "SEEK DONE 2"
41 02406 006235          ITRWT              ;IS THERE AN INTERRUPT ?
42 02407 006252          EHLT               ;NO, CHECK "INTERRUPT",
43 02410 006243          LOOP               ;"DP INT REQ".
44
45                       .EOT
```

```
  0032  .MAIN
01
02 02411 020151 B42:    LDA 0,NDSKS      ;SEE IF "SEEK DONE 3"
03 02412 024062          LDA 1,KB12       ;WILL CAUSE INTERRUPT
04 02413 123405          AND 1,0,SNR
05 02414 000406          JMP B43          ;(SKIP IF NO UNIT 3)
06 02415 006237          JSR @ISET
07 02416 006234          RECL3            ;SET "SEEK DONE 3"
08 02417 006235          ITRWT            ;IS THERE AN INTERRUPT ?
09 02420 006252          EHLT             ;NO, CHECK "INTERRUPT",
10 02421 006243          LOOP             ;"DP INT REQ".
11
12 02422 006240 B43:     SETP1            ;TEST SEEK TO CYLINDER 0
13 02423 020152          LDA 0,TESTU      ;(FIRST ATTEMPT AT COMPLETE SEEK)
14 02424 063033          DOC 0,DSKP       ;SELECT AN ACTIVE UNIT #
15 02425 020070          LDA 0,KB6
16 02426 061333          DOAP 0,DSKP      ;SEEK !
17 02427 030167          LDA 2,C5
18 02430 006227          WAIT             ;WAIT 500MS (OR UNTIL "DONE")
19 02431 020220          LDA 0,C74K       ;AC1=STATUS
20 02432 123415          AND# 1,0,SNR     ;NO SEEK DONE STATUS
21 02433 006242          EHALT            ;CHECK "SEEK","CONTROL 1","CYL",
22 02434 006243          LOOP             ;"HD+DIR","CONTROL 2", SEQUENCING.
23
24 02435 006240 B44:     SETP1            ;TEST SEEK TO CYLINDER 0
25 02436 020152          LDA 0,TESTU
26 02437 063033          DOC 0,DSKP       ;SELECT AN ACTIVE UNIT #
27 02440 020070          LDA 0,KB6
28 02441 061333          DOAP 0,DSKP      ;SEEK !
29 02442 030167          LDA 2,C5
30 02443 006227          WAIT             ;WAIT 500MS (OR UNTIL "DONE")
31 02444 020064          LDA 0,KB10       ;AC1=STATUS
32 02445 123414          AND# 1,0,SZR     ;SEEK ERROR STATUS
33 02446 006242          EHALT            ;CHECK "SEEK","CONTROL 1","CYL",
34 02447 006243          LOOP             ;"HD+DIR", "DIFF","CONTROL 2".
35
36 02450 006240 B45:     SETP1            ;TEST SEEK CYLINDER 77 (OCTAL)
37 02451 006236          GADSK
38 02452 006246          SEEK
39 02453 000077          77
40 02454 020065          LDA 0,KB9        ;AC1=ENDING STATUS
41 02455 030064          LDA 2,KB10
42 02456 107414          AND# 0,1,SZR
43 02457 147414          AND# 2,1,SZR     ;SEEK ERROR OR
44 02460 006242          EHALT            ;NO READY STATUS
45 02461 006243          LOOP
46
47 02462 006240 B46:     SETP1            ;TEST SEEK CYLINDER 300 (OCTAL)
48 02463 006236          GADSK
49 02464 006246          SEEK
50 02465 000300          300
51 02466 020065          LDA 0,KB9        ;AC1=ENDING STATUS
52 02467 030064          LDA 2,KB10
53 02470 107414          AND# 0,1,SZR
54 02471 147414          AND# 2,1,SZR     ;SEEK ERROR OR
55 02472 006242          EHALT            ;NO READY STATUS
56 02473 006243          LOOP
```

```
A 0033   .MAIN
01
02 02474 006240 R47:    SETP1              ;CHOOSE AN ACTIVE DISK
03 02475 006236          GADSK              ;AND SET INTERRUPT VIA SEEK.
04 02476 006246          SEEK               ;CHECK FOR PROPER DISK
05 02477 000000          0                  ;ADDRESS RESPONSE TO INTA
06 02500 006235          ITRWT              ;ALLOW INTERRUPT
07 02501 000401          JMP .+1
08 02502 020154          LDA 0,CDSK
09 02503 065477          INTA 1             ;GET THE ADDRESS
10 02504 122414          SUB# 1,0,SZR       ;INTA FAILED.
11 02505 006242          EHALT              ;AC0=GOOD
12 02506 006243          LOOP               ;AC1=BAD
13
14 02507 006240 R48:     SETP1              ;SEE IF (C) PULSE WILL
15 02510 006236          GADSK              ;CLEAR "DP INT REQ"
16 02511 006246          SEEK               ;SET "INTERRUPT" WITH
17 02512 000000          0                  ;A SEEK
18 02513 060233          NIOC DSKP          ;CLEAR INT REQ
19 02514 006235          ITRWT              ;CHECK FOR INTERRUPT
20 02515 000402          JMP .+2            ;NO INTERRUPT, OK!!
21 02516 006242          EHALT              ;(C) THRU "CLEAR ALL" FAILS TO
22 02517 006243          LOOP               ;CLEAR "DP INT REQ".
23
24 02520 006240 R49:     SETP1              ;INSURE THAT "DP INT DISABLE"
25 02521 020067          LDA 0,KB7          ;INHIBITS INTERRUPTS
26 02522 062077          MSKO 0             ;SET DISABLE
27 02523 006236          GADSK              ;GET ACTIVE UNIT # IN (AC2)
28 02524 006246          SEEK               ;START A SEEK
29 02525 000000          0
30 02526 006235          ITRWT              ;IS THERE AN INTERRUPT ?
31 02527 000402          JMP .+2            ;NO, GOOD
32 02530 006242          EHALT              ;MSKO BIT 7 DID NOT SET "DP DISABLE
33 02531 006243          LOOP               ;AND INHIBIT "DP INT REQ".
34
35 02532 006240 R50:     SETP1              ;INSURE THAT IORST WILL
36 02533 020067          LDA 0,KB7          ;CLEAR "DP INT DISABLE"
37 02534 062077          MSKO 0             ;SET "DP INT DISABLE"
38 02535 062677          IORST              ;CLEAR IT
39 02536 006236          GADSK              ;GET ACTIVE UNIT # IN (AC2)
40 02537 006246          SEEK               ;START A SEEK
41 02540 000000          0
42 02541 006235          ITRWT              ;IS THERE AN INTERRUPT
43 02542 006242          EHALT              ;NO, CHECK RESET OF "DP INT
44 02543 006243          LOOP               ;DISABLE".
```

```
A 0034  .MAIN
01
02 02544 020151 B51:    LDA 0,NDSKS       ;IF UNIT 0 NOT AVAILABLE
03 02545 101203         MOVR 0,0,SNC      ;GO ON TO UNIT 1
04 02546 000423         JMP B53           ;(UNIT 0 NOT BEING TESTED)
05 02547 006241         SETUP             ;IDLE STATE STATUS CHECK
06 02550 152520         SUBZL 2,2         ;SELECT THE ADAPTER
07 02551 006246         SEEK              ;WITH A SEEK 0
08 02552 000000         0
09 02553 064433         DIA 1,DSKP        ;READ STATUS
10 02554 020065         LDA 0,KB9
11 02555 123415         AND# 1,0,SNR
12 02556 006242         EHALT             ;NO READY STATUS, UNIT 0
13 02557 006243         LOOP
14
15 02560 006241 B52:    SETUP             ;IDLE STATE STATUS CHECK
16 02561 152520         SUBZL 2,2         ;SELECT THE ADAPTER
17 02562 006246         SEEK              ;WITH A SEEK 0
18 02563 000000         0
19 02564 064433         DIA 1,DSKP        ;READ STATUS
20 02565 020064         LDA 0,KB10
21 02566 123414         AND# 1,0,SZR
22 02567 006242         EHALT             ;SEEK ERROR STATUS, UNIT 0
23 02570 006243         LOOP
24
25
26 02571 020151 B53:    LDA 0,NDSKS       ;IF UNIT 1 IS NOT
27 02572 101200         MOVR 0,0          ;AVAILABLE, GO ON TO UNIT 2
28 02573 101203         MOVR 0,0,SNC
29 02574 000423         JMP B55           ;SKIP THIS TEST
30 02575 006241         SETUP             ;IDLE STATE STATUS CHECK
31 02576 030060         LDA 2,KB14        ;SELECT THE ADAPTER
32 02577 006246         SEEK              ;WITH A SEEK 0
33 02600 000000         0
34 02601 064433         DIA 1,DSKP        ;READ STATUS
35 02602 020065         LDA 0,KB9
36 02603 123415         AND# 1,0,SNR
37 02604 006242         EHALT             ;NO READY STATUS, UNIT 1
38 02605 006243         LOOP
39
40 02606 006241 B54:    SETUP             ;IDLE STATE STATUS CHECK
41 02607 030060         LDA 2,KB14
42 02610 006246         SEEK              ;SELECT THE ADAPTER
43 02611 000000         0                 ;WITH A SEEK 0
44 02612 064433         DIA 1,DSKP        ;READ STATUS
45 02613 020064         LDA 0,KB10
46 02614 123414         AND# 1,0,SZR
47 02615 006242         EHALT             ;SEEK ERROR STATUS, UNIT 1
48 02616 006243         LOOP
```

```
A 0035  .MAIN
01
02 02617 020151 B55:    LDA 0,NDSKS        ;IF UNIT 2 IS NOT AVAILABLE
03 02620 024061          LDA 1,KB13         ;GO ON TO UNIT 3
04 02621 107405          AND 0,1,SNR
05 02622 000423          JMP B57            ;SKIP THIS TEST, NO UNIT 2
06 02623 006241          SETUP              ;IDLE STATE STATUS CHECK
07 02624 030061          LDA 2,KB13         ;SELECT THE ADAPTER
08 02625 006246          SEEK               ;WITH A SEEK 0
09 02626 000000          0
10 02627 064433          DIA 1,DSKP         ;READ STATUS
11 02630 020065          LDA 0,KB9
12 02631 123415          AND# 1,0,SNR
13 02632 006242          EHALT              ;NO READY STATUS, UNIT 2
14 02633 006243          LOOP
15
16 02634 006241 B56:    SETUP              ;IDLE STATE STATUS CHECK
17 02635 030061          LDA 2,KB13         ;SELECT THE ADAPTER
18 02636 006246          SEEK               ;WITH A SEEK 0
19 02637 000000          0
20 02640 064433          DIA 1,DSKP         ;READ STATUS
21 02641 020064          LDA 0,KB10
22 02642 123414          AND# 1,0,SZR
23 02643 006242          EHALT              ;SEEK ERROR STATUS, UNIT 2
24 02644 006243          LOOP
25
26 02645 020151 B57:    LDA 0,NDSKS        ;IF UNIT 3 IS NOT AVAILABLE
27 02646 024062          LDA 1,KB12         ;GO TO NEXT TEST.
28 02647 123405          AND 1,0,SNR        ;
29 02650 000423          JMP D1             ;SKIP, NO UNIT 3
30 02651 006241          SETUP              ;IDLE STATE STATUS CHECK
31 02652 030062          LDA 2,KB12         ;SELECT THE ADAPTER
32 02653 006246          SEEK               ;WITH A SEEK 0
33 02654 000000          0
34 02655 064433          DIA 1,DSKP         ;READ STATUS
35 02656 020065          LDA 0,KB9
36 02657 123415          AND# 1,0,SNR
37 02660 006242          EHALT              ;NO READY STATUS, UNIT 3
38 02661 006243          LOOP
39
40 02662 006241 B58:    SETUP              ;IDLE STATE STATUS CHECK
41 02663 030062          LDA 2,KB12         ;SELECT THE ADAPTER
42 02664 006246          SEEK               ;WITH A SEEK 0
43 02665 000000          0
44 02666 064433          DIA 1,DSKP         ;READ STATUS
45 02667 020064          LDA 0,KB10
46 02670 123414          AND# 1,0,SZR
47 02671 006242          EHALT              ;SEEK ERROR STATUS, UNIT 3
48 02672 006243          LOOP
```

```
A 0036  .MAIN
01
02 02673 006241 D1:     SETUP           ;CHECK THE FIRST 2 DATA
03 02674 020152          LDA 0,TESTU     ;CHANNEL CYCLES OF A WRITE
04 02675 063033          DOC 0,DSKP      ;(FIRST ATTEMPT AT WRITE)
05 02676 030160          LDA 2,BUFF
06 02677 072033          DOB 2,DSKP      ;LOAD CA REG.
07 02700 020067          LDA 0,KB7
08 02701 061133          DOAS 0,DSKP     ;WRITE !!
09 02702 006165          JSR @STALL      ;ALLOW TIME FOR DCH CYCLES
10 02703 060233          NIOC DSKP       ;CLEAR THE WRITE OPERATION
11 02704 061433          DIB 0,DSKP      ;AC0=ENDING MEMORY ADDRESS
12 02705 024060          LDA 1,KB14      ;AC2=STARTING MEMORY ADDRESS
13 02706 147000          ADD 2,1         ;2 DCH CYCLES SHOULD HAVE
14 02707 122414          SUB# 1,0,SZR    ;OCCURRED
15 02710 006242          FHALT           ;AC0=BAD, AC1=GOOD
16 02711 006243          LOOP            ;CHECK THE SEQUENCE "DP FLAG"-
17                                       ;"REQ1"-"2ND REQ", "DP FLAG"
18                                       ;SETS "DP DCH REQ" WHICH STAYS
19                                       ;ON FOR 2 MEMORY CYCLES.
20
21 02712 006241 D2:     SETUP           ;CHECK THE FIRST 2 DATA
22 02713 020152          LDA 0,TESTU     ;CHANNEL CYCLES OF A WRITE
23 02714 063033          DOC 0,DSKP
24 02715 030160          LDA 2,BUFF
25 02716 072033          DOB 2,DSKP      ;SET MEM ADDR REG.
26 02717 024140          LDA 1,C2525
27 02720 045000          STA 1,0,2       ;DATA = 052525
28 02721 045001          STA 1,1,2       ; 2 WORDS
29 02722 020067          LDA 0,KB7
30 02723 061133          DOAS 0,DSKP     ;WRITE !!
31 02724 006165          JSR @STALL      ;ALLOW TIME FOR 2 DCHIS
32 02725 060233          NIOC DSKP       ;CLEAR THE WRITE
33 02726 021000          LDA 0,0,2       ;IS THE DATA STILL IN MEMORY
34 02727 031001          LDA 2,1,2       ;IF NOT A DCHI MAY HAVE
35 02730 106415          SUB# 0,1,SNR    ;BEEN PERFORMED INSTEAD
36 02731 146414          SUB# 2,1,SZR    ;OF A DCHO
37 02732 006242          FHALT           ;AC0&AC2=BAD WORDS
38 02733 006243          LOOP            ;AC1=GOOD
```

```
A 0037   .MAIN
01
02 02734 006241 D3:     SETUP              ;CHECK PROPER CA REGISTER
03 02735 020152          LDA 0,TESTU        ;INCREMENT BY ALLOWING
04 02736 063033          DOC 0,DSKP         ;THE FIRST 2 DATA CHANNEL
05 02737 102400          SUB 0,0            ;CYCLES AT THE BEGINNING
06 02740 062033          DOB 0,DSKP         ;OF A WRITE.
07 02741 024067          LDA 1,KB7
08 02742 065133          DOAS 1,DSKP        ; WRITE !!
09 02743 006165          JSR @STALL
10 02744 060233          NIOC DSKP          ;STOP THE WRITE
11 02745 030060          LDA 2,KB14         ;AC0=STARTING MEMORY ADDRESS
12 02746 065433          DIB 1,DSKP         ;AC1=ACTUAL ENDING MEMORY
13 02747 113000          ADD 0,2            ;    ADDRESS
14 02750 146414          SUB# 2,1,SZR       ;AC2=CORRECT ENDING MEMORY
15 02751 006242          EHALT              ;    ADDRESS
16 02752 006243          LOOP
17
18 02753 006241 D4:     SETUP              ;CHECK PROPER CA REGISTER
19 02754 020152          LDA 0,TESTU        ;INCREMENT BY ALLOWING
20 02755 063033          DOC 0,DSKP         ;THE FIRST 2 DATA CHANNEL
21 02756 102520          SUBZL 0,0          ;CYCLES AT THE BEGINNING
22 02757 062033          DOB 0,DSKP         ;OF A WRITE.
23 02760 024067          LDA 1,KB7
24 02761 065133          DOAS 1,DSKP        ; WRITE !!
25 02762 006165          JSR @STALL
26 02763 060233          NIOC DSKP          ;STOP THE WRITE
27 02764 030060          LDA 2,KB14         ;AC0=STARTING MEMORY ADDRESS
28 02765 065433          DIB 1,DSKP         ;AC1=ACTUAL ENDING MEMORY
29 02766 113000          ADD 0,2            ;    ADDRESS
30 02767 146414          SUB# 2,1,SZR       ;AC2=CORRECT ENDING MEMORY
31 02770 006242          EHALT              ;    ADDRESS
32 02771 006243          LOOP
33
34 02772 006241 D5:     SETUP              ;CHECK PROPER CA REGISTER
35 02773 020152          LDA 0,TESTU        ;INCREMENT BY ALLOWING
36 02774 063033          DOC 0,DSKP         ;THE FIRST 2 DATA CHANNEL
37 02775 020117          LDA 0,C3           ;CYCLES AT THE BEGINNING
38 02776 062033          DOB 0,DSKP         ;OF A WRITE.
39 02777 024067          LDA 1,KB7
40 03000 065133          DOAS 1,DSKP        ; WRITE !!
41 03001 006165          JSR @STALL
42 03002 060233          NIOC DSKP          ;STOP THE WRITE
43 03003 030060          LDA 2,KB14         ;AC0=STARTING MEMORY ADDRESS
44 03004 065433          DIB 1,DSKP         ;AC1=ACTUAL ENDING MEMORY
45 03005 113000          ADD 0,2            ;    ADDRESS
46 03006 146414          SUB# 2,1,SZR       ;AC2=CORRECT ENDING MEMORY
47 03007 006242          EHALT              ;    ADDRESS
48 03010 006243          LOOP
```

```
A 0038   .MAIN
01
02 03011 006241 D61:     SETUP              ;CHECK PROPER CA REGISTER
03 03012 020152          LDA 0,TESTU        ;INCREMENT BY ALLOWING
04 03013 063033          DOC 0,DSKP         ;THE FIRST 2 DATA CHANNEL
05 03014 020120          LDA 0,C7           ;CYCLES AT THE BEGINNING
06 03015 062033          DOB 0,DSKP         ;OF A WRITE.
07 03016 024067          LDA 1,KB7
08 03017 065133          DOAS 1,DSKP        ; WRITE !!
09 03020 006165          JSR @STALL
10 03021 060233          NIOC DSKP          ;STOP THE WRITE
11 03022 030060          LDA 2,KB14         ;AC0=STARTING MEMORY ADDRESS
12 03023 065433          DIB 1,DSKP         ;AC1=ACTUAL ENDING MEMORY
13 03024 113000          ADD 0,2            ;    ADDRESS
14 03025 146414          SUB# 2,1,SZR       ;AC2=CORRECT ENDING MEMORY
15 03026 006242          EHALT              ;    ADDRESS
16 03027 006243          LOOP
17
18 03030 006241 D71:     SETUP              ;CHECK PROPER CA REGISTER
19 03031 020152          LDA 0,TESTU        ;INCREMENT BY ALLOWING
20 03032 063033          DOC 0,DSKP         ;THE FIRST 2 DATA CHANNEL
21 03033 020121          LDA 0,C17          ;CYCLES AT THE BEGINNING
22 03034 062033          DOB 0,DSKP         ;OF A WRITE.
23 03035 024067          LDA 1,KB7
24 03036 065133          DOAS 1,DSKP        ; WRITE !!
25 03037 006165          JSR @STALL
26 03040 060233          NIOC DSKP          ;STOP THE WRITE
27 03041 030060          LDA 2,KB14         ;AC0=STARTING MEMORY ADDRESS
28 03042 065433          DIB 1,DSKP         ;AC1=ACTUAL ENDING MEMORY
29 03043 113000          ADD 0,2            ;    ADDRESS
30 03044 146414          SUB# 2,1,SZR       ;AC2=CORRECT ENDING MEMORY
31 03045 006242          EHALT              ;    ADDRESS
32 03046 006243          LOOP
33
34 03047 006241 D81:     SETUP              ;CHECK PROPER CA REGISTER
35 03050 020152          LDA 0,TESTU        ;INCREMENT BY ALLOWING
36 03051 063033          DOC 0,DSKP         ;THE FIRST 2 DATA CHANNEL
37 03052 020122          LDA 0,C37          ;CYCLES AT THE BEGINNING
38 03053 062033          DOB 0,DSKP         ;OF A WRITE.
39 03054 024067          LDA 1,KB7
40 03055 065133          DOAS 1,DSKP        ; WRITE !!
41 03056 006165          JSR @STALL
42 03057 060233          NIOC DSKP          ;STOP THE WRITE
43 03060 030060          LDA 2,KB14         ;AC0=STARTING MEMORY ADDRESS
44 03061 065433          DIB 1,DSKP         ;AC1=ACTUAL ENDING MEMORY
45 03062 113000          ADD 0,2            ;    ADDRESS
46 03063 146414          SUB# 2,1,SZR       ;AC2=CORRECT ENDING MEMORY
47 03064 006242          EHALT              ;    ADDRESS
48 03065 006243          LOOP
```

```
A 0039   .MAIN
01
02 03066 006241 D9:     SETUP           ;CHECK PROPER CA REGISTER
03 03067 020152         LDA 0,TESTU     ;INCREMENT BY ALLOWING
04 03070 063033         DOC 0,DSKP      ;THE FIRST 2 DATA CHANNEL
05 03071 020123         LDA 0,C77       ;CYCLES AT THE BEGINNING
06 03072 062033         DOB 0,DSKP      ;OF A WRITE.
07 03073 024067         LDA 1,KB7
08 03074 065133         DOAS 1,DSKP     ; WRITE !!
09 03075 006165         JSR @STALL
10 03076 060233         NIOC DSKP       ;STOP THE WRITE
11 03077 030060         LDA 2,KB14      ;AC0=STARTING MEMORY ADDRESS
12 03100 065433         DIB 1,DSKP      ;AC1=ACTUAL ENDING MEMORY
13 03101 113000         ADD 0,2         ;    ADDRESS
14 03102 146414         SUB# 2,1,SZR    ;AC2=CORRECT ENDING MEMORY
15 03103 006242         EHALT           ;    ADDRESS
16 03104 006243         LOOP
17
18 03105 006241 D10:    SETUP           ;CHECK PROPER CA REGISTER
19 03106 020152         LDA 0,TESTU     ;INCREMENT BY ALLOWING
20 03107 063033         DOC 0,DSKP      ;THE FIRST 2 DATA CHANNEL
21 03110 020124         LDA 0,C177      ;CYCLES AT THE BEGINNING
22 03111 062033         DOB 0,DSKP      ;OF A WRITE.
23 03112 024067         LDA 1,KB7
24 03113 065133         DOAS 1,DSKP     ; WRITE !!
25 03114 006165         JSR @STALL
26 03115 060233         NIOC DSKP       ;STOP THE WRITE
27 03116 030060         LDA 2,KB14      ;AC0=STARTING MEMORY ADDRESS
28 03117 065433         DIB 1,DSKP      ;AC1=ACTUAL ENDING MEMORY
29 03120 113000         ADD 0,2         ;    ADDRESS
30 03121 146414         SUB# 2,1,SZR    ;AC2=CORRECT ENDING MEMORY
31 03122 006242         EHALT           ;    ADDRESS
32 03123 006243         LOOP
33
34 03124 006241 D11:    SETUP           ;CHECK PROPER CA REGISTER
35 03125 020152         LDA 0,TESTU     ;INCREMENT BY ALLOWING
36 03126 063033         DOC 0,DSKP      ;THE FIRST 2 DATA CHANNEL
37 03127 020125         LDA 0,C377      ;CYCLES AT THE BEGINNING
38 03130 062033         DOB 0,DSKP      ;OF A WRITE.
39 03131 024067         LDA 1,KB7
40 03132 065133         DOAS 1,DSKP     ; WRITE !!
41 03133 006165         JSR @STALL
42 03134 060233         NIOC DSKP       ;STOP THE WRITE
43 03135 030060         LDA 2,KB14      ;AC0=STARTING MEMORY ADDRESS
44 03136 065433         DIB 1,DSKP      ;AC1=ACTUAL ENDING MEMORY
45 03137 113000         ADD 0,2         ;    ADDRESS
46 03140 146414         SUB# 2,1,SZR    ;AC2=CORRECT ENDING MEMORY
47 03141 006242         EHALT           ;    ADDRESS
48 03142 006243         LOOP
```

```
A 0040   .MAIN
01
02 03143 006241 D12:    SETUP              ;CHECK PROPER CA REGISTER
03 03144 020152          LDA 0,TESTU        ;INCREMENT BY ALLOWING
04 03145 063033          DOC 0,DSKP         ;THE FIRST 2 DATA CHANNEL
05 03146 020126          LDA 0,C777         ;CYCLES AT THE BEGINNING
06 03147 062033          DOB 0,DSKP         ;OF A WRITE.
07 03150 024067          LDA 1,KB7
08 03151 065133          DOAS 1,DSKP        ; WRITE !!
09 03152 006165          JSR @STALL
10 03153 060233          NIOC DSKP          ;STOP THE WRITE
11 03154 030060          LDA 2,KB14         ;AC0=STARTING MEMORY ADDRESS
12 03155 065433          DIB 1,DSKP         ;AC1=ACTUAL ENDING MEMORY
13 03156 113000          ADD 0,2            ;    ADDRESS
14 03157 146414          SUB# 2,1,SZR       ;AC2=CORRECT ENDING MEMORY
15 03160 006242          EHALT              ;    ADDRESS
16 03161 006243          LOOP
17
18 03162 006241 D13:    SETUP              ;CHECK PROPER CA REGISTER
19 03163 020152          LDA 0,TESTU        ;INCREMENT BY ALLOWING
20 03164 063033          DOC 0,DSKP         ;THE FIRST 2 DATA CHANNEL
21 03165 020127          LDA 0,C1777        ;CYCLES AT THE BEGINNING
22 03166 062033          DOB 0,DSKP         ;OF A WRITE.
23 03167 024067          LDA 1,KB7
24 03170 065133          DOAS 1,DSKP        ; WRITE !!
25 03171 006165          JSR @STALL
26 03172 060233          NIOC DSKP          ;STOP THE WRITE
27 03173 030060          LDA 2,KB14         ;AC0=STARTING MEMORY ADDRESS
28 03174 065433          DIB 1,DSKP         ;AC1=ACTUAL ENDING MEMORY
29 03175 113000          ADD 0,2            ;    ADDRESS
30 03176 146414          SUB# 2,1,SZR       ;AC2=CORRECT ENDING MEMORY
31 03177 006242          EHALT              ;    ADDRESS
32 03200 006243          LOOP
33
34 03201 006241 D14:    SETUP              ;CHECK PROPER CA REGISTER
35 03202 020152          LDA 0,TESTU        ;INCREMENT BY ALLOWING
36 03203 063033          DOC 0,DSKP         ;THE FIRST 2 DATA CHANNEL
37 03204 020130          LDA 0,C3777        ;CYCLES AT THE BEGINNING
38 03205 062033          DOB 0,DSKP         ;OF A WRITE.
39 03206 024067          LDA 1,KB7
40 03207 065133          DOAS 1,DSKP        ; WRITE !!
41 03210 006165          JSR @STALL
42 03211 060233          NIOC DSKP          ;STOP THE WRITE
43 03212 030060          LDA 2,KB14         ;AC0=STARTING MEMORY ADDRESS
44 03213 065433          DIB 1,DSKP         ;AC1=ACTUAL ENDING MEMORY
45 03214 113000          ADD 0,2            ;    ADDRESS
46 03215 146414          SUB# 2,1,SZR       ;AC2=CORRECT ENDING MEMORY
47 03216 006242          EHALT              ;    ADDRESS
48 03217 006243          LOOP
```

```
A 0041   .MAIN
01
02 03220 006241 D15:    SETUP           ;CHECK PROPER CA REGISTER
03 03221 020152         LDA 0,TESTU     ;INCREMENT BY ALLOWING
04 03222 063033         DOC 0,DSKP      ;THE FIRST 2 DATA CHANNEL
05 03223 020131         LDA 0,C7777     ;CYCLES AT THE BEGINNING
06 03224 062033         DOB 0,DSKP      ;OF A WRITE.
07 03225 024067         LDA 1,KB7
08 03226 065133         DOAS 1,DSKP     ; WRITE !!
09 03227 006165         JSR @STALL
10 03230 060233         NIOC DSKP       ;STOP THE WRITE
11 03231 030060         LDA 2,KB14      ;AC0=STARTING MEMORY ADDRESS
12 03232 065433         DIB 1,DSKP      ;AC1=ACTUAL ENDING MEMORY
13 03233 113000         ADD 0,2         ;    ADDRESS
14 03234 146414         SUB# 2,1,SZR    ;AC2=CORRECT ENDING MEMORY
15 03235 006242         EHALT           ;    ADDRESS
16 03236 006243         LOOP
17
18 03237 006241 D16:    SETUP           ;CHECK PROPER CA REGISTER
19 03240 020152         LDA 0,TESTU     ;INCREMENT BY ALLOWING
20 03241 063033         DOC 0,DSKP      ;THE FIRST 2 DATA CHANNEL
21 03242 020132         LDA 0,C017      ;CYCLES AT THE BEGINNING
22 03243 062033         DOB 0,DSKP      ;OF A WRITE.
23 03244 024067         LDA 1,KB7
24 03245 065133         DOAS 1,DSKP     ; WRITE !!
25 03246 006165         JSR @STALL
26 03247 060233         NIOC DSKP       ;STOP THE WRITE
27 03250 030060         LDA 2,KB14      ;AC0=STARTING MEMORY ADDRESS
28 03251 065433         DIB 1,DSKP      ;AC1=ACTUAL ENDING MEMORY
29 03252 113000         ADD 0,2         ;    ADDRESS
30 03253 146414         SUB# 2,1,SZR    ;AC2=CORRECT ENDING MEMORY
31 03254 006242         EHALT           ;    ADDRESS
32 03255 006243         LOOP
33
34 03256 006241 D17:    SETUP           ;CHECK PROPER CA REGISTER
35 03257 020152         LDA 0,TESTU     ;INCREMENT BY ALLOWING
36 03260 063033         DOC 0,DSKP      ;THE FIRST 2 DATA CHANNEL
37 03261 020133         LDA 0,C037      ;CYCLES AT THE BEGINNING
38 03262 062033         DOB 0,DSKP      ;OF A WRITE.
39 03263 024067         LDA 1,KB7
40 03264 065133         DOAS 1,DSKP     ; WRITE !!
41 03265 006165         JSR @STALL
42 03266 060233         NIOC DSKP       ;STOP THE WRITE
43 03267 030060         LDA 2,KB14      ;AC0=STARTING MEMORY ADDRESS
44 03270 065433         DIB 1,DSKP      ;AC1=ACTUAL ENDING MEMORY
45 03271 113000         ADD 0,2         ;    ADDRESS
46 03272 146414         SUB# 2,1,SZR    ;AC2=CORRECT ENDING MEMORY
47 03273 006242         EHALT           ;    ADDRESS
48 03274 006243         LOOP
```

```
A 0042   .MAIN
01
02 03275 006241 D18:     SETUP              ;CHECK PROPER CA REGISTER
03 03276 020152          LDA 0,TESTU        ;INCREMENT BY ALLOWING
04 03277 063033          DOC 0,DSKP         ;THE FIRST 2 DATA CHANNEL
05 03300 102220          ADCZR 0,0          ;CYCLES AT THE BEGINNING
06 03301 062033          DOB 0,DSKP         ;OF A WRITE.
07 03302 024067          LDA 1,KB7
08 03303 065133          DOAS 1,DSKP        ; WRITE !!
09 03304 006165          JSR @STALL
10 03305 060233          NIOC DSKP          ;STOP THE WRITE
11                                          ;AC0=STARTING MEMORY ADDRESS
12 03306 065433          DIB 1,DSKP         ;AC1=ACTUAL ENDING MEMORY
13 03307 152520          SUBZL 2,2          ;    ADDRESS
14 03310 146414          SUB# 2,1,SZR       ;AC2=CORRECT ENDING MEMORY
15 03311 006242          EHALT              ;    ADDRESS
16 03312 006243          LOOP
17
18 03313 006241 D19:     SETUP              ;CHECK PROPER CA REGISTER
19 03314 020152          LDA 0,TESTU        ;INCREMENT BY ALLOWING
20 03315 063033          DOC 0,DSKP         ;THE FIRST 2 DATA CHANNEL
21 03316 102000          ADC 0,0            ;CYCLES AT THE BEGINNING
22 03317 062033          DOB 0,DSKP         ;OF A WRITE.
23 03320 024067          LDA 1,KB7
24 03321 065133          DOAS 1,DSKP        ; WRITE !!
25 03322 006165          JSR @STALL
26 03323 060233          NIOC DSKP          ;STOP THE WRITE
27 03324 065433          DIB 1,DSKP         ;AC0=STARTING MEMORY ADDRESS
28 03325 152620          SUBZR 2,2          ;AC1=ACTUAL ENDING MEMORY
29 03326 151400          INC 2,2            ;    ADDRESS
30 03327 146414          SUB# 2,1,SZR       ;AC2=CORRECT ENDING MEMORY
31 03330 006242          EHALT              ;    ADDRESS
32 03331 006243          LOOP
33
34
35                       .EOT
```

```
  0043  .MAIN
01
02 03332 006240 D20:    SETP1           ;ATTEMPT A COMPLETE WRITE
03 03333 024160         LDA 1,BUFF      ;(FIRST WRITE WITH WC OVFLO)
04 03334 066033         DOB 1,DSKP      ;ONE SECTOR
05 03335 020152         LDA 0,TESTU
06 03336 024121         LDA 1,C17
07 03337 123000         ADD 1,0         ;UNIT # + SECT CNT
08 03340 063033         DOC 0,DSKP      ;SELECT UNIT
09 03341 020067         LDA 0,KB7
10 03342 061133         DOAS 0,DSKP     ;WRITE !!
11 03343 006235         ITRWT           ;WAIT 100MS OR UNTIL INTERRUPT
12 03344 006242         EHALT           ;TIMEOUT, NO INTERRUPT
13 03345 006243         LOOP
14
15 03346 006240 D21:    SETP1           ;ATTEMPT TO CLEAR "DP DONE"
16 03347 024160         LDA 1,BUFF      ;WITH (C) PULSE.
17 03350 066033         DOB 1,DSKP
18 03351 020152         LDA 0,TESTU
19 03352 024121         LDA 1,C17       ;SET "DP DONE" WITH A ONE
20 03353 123000         ADD 1,0         ;SECTOR WRITE.
21 03354 063033         DOC 0,DSKP      ;SELECT UNIT
22 03355 020067         LDA 0,KB7
23 03356 061133         DOAS 0,DSKP     ;WRITE !!
24 03357 152520         SUBZL 2,2
25 03360 006227         WAIT            ;WAIT 100MS OR UNTIL DONE
26 03361 060233         NIOC DSKP       ;ATTEMPT CLEAR
27 03362 063733         SKPDZ DSKP      ;(C) PULSE DOES NOT
28 03363 006242         EHALT           ;CLEAR "DP DONE" FF.
29 03364 006243         LOOP
30
31 03365 006240 D22:    SETP1           ;ATTEMPT TO RESET
32 03366 024160         LDA 1,BUFF      ;"DP DONE" WITH "DP DATOA"
33 03367 066033         DOB 1,DSKP      ;AND "DATA 0".
34 03370 020152         LDA 0,TESTU
35 03371 024121         LDA 1,C17       ;SET "DP DONE" WITH A 1 SECT.
36 03372 123000         ADD 1,0         ;WRITE.
37 03373 063033         DOC 0,DSKP      ;SELECT UNIT
38 03374 020067         LDA 0,KB7
39 03375 061133         DOAS 0,DSKP     ;WRITE !!
40 03376 152520         SUBZL 2,2
41 03377 006227         WAIT            ;WAIT 100MS OR UNTIL DONE
42 03400 102620         SUBZR 0,0
43 03401 061033         DOA 0,DSKP      ;ATTEMPT RESET
44 03402 063733         SKPDZ DSKP      ;"DP DATOA" AND "DATA 0" DOES
45 03403 006242         EHALT           ;NOT CLEAR "DP DONE".
46 03404 006243         LOOP
```

```
A 0044   .MAIN
01
02 03405 006240 D23:    SETP1           ;CHECK BUSY=DONE
03 03406 024160         LDA 1,BUFF      ;FOLLOWING A 1 SECTOR WRITE
04 03407 066033         DOB 1,DSKP
05 03410 020152         LDA 0,TESTU
06 03411 024121         LDA 1,C17
07 03412 123000         ADD 1,0
08 03413 063033         DOC 0,DSKP      ;SELECT UNIT / 1 SECT XFER
09 03414 020067         LDA 0,KB7
10 03415 061133         DOAS 0,DSKP     ;WRITE !!
11 03416 152520         SUBZL 2,2
12 03417 006227         WAIT            ;WAIT 100MS (OR UNTIL "DONE")
13 03420 063733         SKPDZ DSKP
14 03421 063533         SKPBZ DSKP      ;ERROR IF "DP DONE" = 0
15 03422 006242         EHALT           ;OR "DP BUSY" = 1
16 03423 006243         LOOP
17
18 03424 006240 D24:    SETP1           ;SEE IF A 1 SECTOR
19 03425 024160         LDA 1,BUFF      ;WRITE CAUSES "DATA LATE"
20 03426 066033         DOB 1,DSKP
21 03427 020152         LDA 0,TESTU
22 03430 024121         LDA 1,C17
23 03431 123000         ADD 1,0
24 03432 063033         DOC 0,DSKP      ;SELECT UNIT / 1 SECT XFER
25 03433 020067         LDA 0,KB7
26 03434 061133         DOAS 0,DSKP     ;WRITE !!
27 03435 152520         SUBZL 2,2
28 03436 006227         WAIT            ;WAIT 100MS, (OR UNTIL "DONE")
29 03437 064433         DIA 1,DSKP
30 03440 020060         LDA 0,KB14
31 03441 107414         AND# 0,1,SZR    ;"REQ1" DOES NOT CLEAR
32 03442 006242         EHALT           ;"DP FLAG".  RESULTS IN
33 03443 006243         LOOP            ;"DATA LATE" STATUS.
34
35 03444 006240 D25:    SETP1           ;CHECK ENDING MEMORY
36 03445 024160         LDA 1,BUFF      ;ADDRESS (CA REGISTER)
37 03446 066033         DOB 1,DSKP      ;FOLLOWING A 1 SECTOR WRITE
38 03447 020152         LDA 0,TESTU
39 03450 024121         LDA 1,C17
40 03451 123000         ADD 1,0
41 03452 063033         DOC 0,DSKP      ;SELECT UNIT / 1 SECT XFER
42 03453 020067         LDA 0,KB7
43 03454 061133         DOAS 0,DSKP     ;WRITE !!
44 03455 152520         SUBZL 2,2
45 03456 006227         WAIT            ;WAIT 100MS ( OR UNTIL "DONE" )
46 03457 065433         DIB 1,DSKP      ;AC1=ENDING MEMORY ADDRESS
47 03460 020160         LDA 0,BUFF      ;CORRECT ENDING ADDRESS =
48 03461 030211         LDA 2,C402      ;(BUFF)+400+2, IN (AC0)
49 03462 143000         ADD 2,0
50 03463 122414         SUB# 1,0,SZR    ;ENDING MEM ADDR ERROR.
51 03464 006242         EHALT           ;AC0=GOOD
52 03465 006243         LOOP            ;AC1=BAD
```

```
A 0045  .MAIN
01
02 03466 006240 D26:    SETP1           ;CHECK FOR PROPER ENDING
03 03467 024160         LDA 1,BUFF      ;DISK ADDRESS FOLLOWING
04 03470 060033         DOB 1,DSKP      ;1 SECTOR WRITE ON HEAD 0
05 03471 020152         LDA 0,TESTU     ;SECTOR 0
06 03472 024121         LDA 1,C17       ;"INC SC" CAUSES "SC1-SC8"
07 03473 123000         ADD 1,0         ;TO GO FROM 1111 TO 0000
08 03474 063033         DOC 0,DSKP      ;AND SETS "S1".
09 03475 020067         LDA 0,KB7
10 03476 061133         DOAS 0,DSKP     ;WRITE !!
11 03477 152520         SUBZL 2,2
12 03500 006227         WAIT            ;WAIT 100MS (OR UNTIL "DONE")
13 03501 066433         DIC 1, DSKP     ;READ ENDING DISK ADDRESS
14 03502 030133         LDA 2,C037
15 03503 147400         AND 2,1         ;MASK OUT UNIT #
16 03504 020063         LDA 0,KB11      ;SECTOR = 1
17 03505 122414         SUB# 1,0,SZR
18 03506 006242         EHALT           ;ENDING DISK ADDRESS NOT
19 03507 006243         LOOP            ;HEAD=0, SECTOR=1, SC=0
20
21 03510 006240 D27:    SETP1           ;ATTEMPT A 2 SECTOR
22 03511 020160         LDA 0,BUFF      ;WRITE.
23 03512 062033         DOB 0,DSKP      ;FIRST ATTEMPT AT A WRITE
24 03513 020152         LDA 0,TESTU     ;LONGER THAN 1 SECTOR
25 03514 024174         LDA 1,C16
26 03515 123000         ADD 1,0
27 03516 063033         DOC 0,DSKP      ;SELECT UNIT / 2 SECTORS
28 03517 020067         LDA 0,KB7
29 03520 061133         DOAS 0,DSKP     ;WRITE !!
30 03521 152520         SUBZL 2,2
31 03522 006227         WAIT            ;WAIT 100MS (OR UNTIL "DONE")
32 03523 066433         DIC 1,DSKP      ;READ ENDING DISK ADDRESS
33 03524 020133         LDA 0,C037      ;MASK OFF UNIT #
34 03525 107400         AND 0,1
35 03526 020064         LDA 0,KB10
36 03527 122414         SUB# 1,0,SZR    ;ENDING DISK ADDRESS NOT
37 03530 006242         EHALT           ;HEAD=0, SECT=2, SC=0
38 03531 006243         LOOP            ;AC0=GOOD ADDR, AC1=BAD
39
40 03532 006240 D28:    SETP1           ;ATTEMPT A 2 SECTOR WRITE
41 03533 020160         LDA 0,BUFF
42 03534 062033         DOB 0,DSKP
43 03535 020152         LDA 0,TESTU
44 03536 024174         LDA 1,C16
45 03537 123000         ADD 1,0
46 03540 063033         DOC 0,DSKP      ;SELECT UNIT / 2 SECTORS
47 03541 020067         LDA 0,KB7
48 03542 061133         DOAS 0,DSKP     ;WRITE !!
49 03543 152520         SUBZL 2,2
50 03544 006227         WAIT            ;WAIT 100MS )OR UNTIL "DONE")
51 03545 064433         DIA 1,DSKP      ;READ STATUS
52 03546 063633         SKPDN DSKP      ;NO "DP DONE"
53 03547 006242         EHALT           ;FOLLOWING 2 SECTOR WRITE
54 03550 006243         LOOP            ;(AC1)=STATUS REG.
```

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^ 0046   .MAIN
01
02 03551 006240 D29:    SETP1           ;INSURE THAT "INC HEAD"
03 03552 020160          LDA 0,BUFF      ;FUNCTIONS PROPERLY
04 03553 062033          DOB 0,DSKP      ;TRANSFER 7 SECTORS OR 13
05 03554 020152          LDA 0,TESTU     ;SECTORS DEPENDING UPON
06 03555 030150          LDA 2,DTYPE     ;THE DISK TYPE
07 03556 024171          LDA 1,C11
08 03557 153103          ADDL 2,2,SNC
09 03560 024117          LDA 1,C3
10 03561 123000          ADD 1,0
11 03562 063033          DOC 0,DSKP      ;LOAD UNIT # & # SECTORS
12 03563 020067          LDA 0,KB7
13 03564 061133          DOAS 0,DSKP     ;WRITE !!
14 03565 152520          SUBZL 2,2
15 03566 006227          WATT            ;WAIT 100 MS (OR UNTIL "DONE")
16 03567 066433          DIC 1,DSKP      ;READ ENDING DISK ADDRESS
17 03570 030133          LDA 2,C037
18 03571 147400          AND 2,1         ;THROW AWAY UNIT #
19 03572 020212          LDA 0,C420      ;AC0=GOOD,    HEAD=1 SECT=1
20 03573 122414          SUB# 1,0,SZR    ;AC1=BAD
21 03574 006242          EHALT           ;CHECK "ADV HD", "INC HEAD"
22 03575 006243          LOOP
23
24 03576 006240 D30:     SETP1           ;ATTEMPT A 16 SECTOR WRITE
25 03577 020160          LDA 0,BUFF      ;VERIFY CORRECT ENDING
26 03600 062033          DOB 0,DSKP      ;DISK ADDRESS
27 03601 020152          LDA 0,TESTU
28 03602 063033          DOC 0,DSKP      ;UNIT # / 16 SECTORS
29 03603 020067          LDA 0,KB7
30 03604 061133          DOAS 0,DSKP     ;WRITE !!
31 03605 152520          SUBZL 2,2
32 03606 006227          WATT            ;WAIT 100MS FOR UNTIL "DONE")
33 03607 066433          DIC 1,DSKP      ;READ ENDING DISK ADDRESS
34 03610 020065          LDA 0,KB9       ;SECTOR 4
35 03611 034070          LDA 3,KB6       ;HEAD 2
36 03612 030150          LDA 2,DTYPE
37 03613 153103          ADDL 2,2,SNC    ;SKIP IF 2311
38 03614 175220          MOVZR 3,3       ;HEAD 1
39 03615 163000          ADD 3,0
40 03616 034133          LDA 3,C037
41 03617 167400          AND 3,1
42 03620 122414          SUB# 1,0,SZR    ;AC1=ACTUAL ENDING DISK ADDRESS
43 03621 006242          EHALT           ;AC0=CORRECT ENDING DISK ADDRESS
44 03622 006243          LOOP            ; 16 SECTOR TRANSFER.
```

```
A 0047  .MAIN
01
02 03623 006240 D31:    SETP1           ;ATTEMPT A 16 SECTOR WRITE
03 03624 020160         LDA 0,BUFF      ;AND VERIFY CORRECT ENDING
04 03625 062033         DOR 0,DSKP      ;MEMORY ADDRESS
05 03626 020152         LDA 0,TESTU
06 03627 063033         DOC 0,DSKP      ;UNIT # / 16 SECTORS
07 03630 020067         LDA 0,KB7
08 03631 061133         DOAS 0,DSKP     ;WRITE !!
09 03632 152520         SUBZL 2,2
10 03633 006227         WAIT            ;WAIT 100MS (OR UNTIL "DONE")
11 03634 020160         LDA 0,BUFF      ;STARTING ADDRESS
12 03635 024060         LDA 1,KB14      ; TWO
13 03636 030073         LDA 2,KB3       ; 10,000
14 03637 123000         ADD 1,0
15 03640 143000         ADD 2,0         ;ENDING MEMORY ADDRESS
16 03641 065433         DIB 1,DSKP      ;ERROR FOLLOWING A 16 SECTOR
17 03642 122414         SUB# 1,0,SZR    ;WRITE
18 03643 006242         FHALT           ;AC0=GOOD
19 03644 006243         LOOP            ;AC1=BAD
20
21 03645 006240 D32:    SETP1           ;CAUSE "END OF CYLINDER"
22 03646 020150         LDA 0,DTYPE     ;TO OCCUR DURING A
23 03647 030427         LDA 2,DAD1-1    ;2 SECTOR WRITE
24 03650 101112         MOVL# 0,0,SZC
25 03651 000404         JMP .+4         ;CARTRIDGE DISK
26 03652 151400         INC 2,2
27 03653 101202         MOVR 0,0,SZC    ;SKIP IF 2311 DISK PACK
28 03654 151400         INC 2,2         ;2314 DISK PACK
29 03655 021000         LDA 0,0,2       ;GET PROPER DISK ADDRESS TO
30 03656 024152         LDA 1,TESTU     ;CAUSE "EOC"
31 03657 123000         ADD 1,0         ;ADD IN UNIT #
32 03660 063033         DOC 0,DSKP      ;FINALLY
33 03661 020160         LDA 0,BUFF
34 03662 062033         DOR 0,DSKP      ;LOAD MEM ADDR.
35 03663 020067         LDA 0,KB7
36 03664 061133         DOAS 0,DSKP     ;WRITE !!
37 03665 152520         SUBZL 2,2
38 03666 006227         WAIT            ;WAIT 100MS (OR UNTIL "DONE")
39 03667 064433         DIA 1,DSKP      ;READ STATUS
40 03670 020412         LDA 0,DAD4
41 03671 107400         AND 0,1
42 03672 106414         SUB# 0,1,SZR    ;NO "EOC" OR "ERR" OR "DP DONE"
43 03673 006242         FHALT           ;FOLLOWING WRITE OVER END CYL
44 03674 006243         LOOP            ;AC0=EXPECTED ENDING STATUS
45 03675 000406         JMP D33         ;AC1=ENDING STATUS
46
47 03676 003677         .+1
48 03677 000676 DAD1:   676             ;CART   HEAD 1  SECT 13 2 SECTORS
49 03700 004536         4536            ;2311   HEAD 9  SECT 5  2 SECTORS
50 03701 011676         11676           ;2314   HEAD 23 SECT 13 2 SECTORS
51 03702 100021 DAD4:   100021          ;"DP DONE","EOC","ERR",STATUS MASK.
```

```
A 0048  .MAIN
01
02 03703 006240 D33:    SETP1           ;ATTEMPT A READ
03 03704 020152          LDA 0,TESTU     ;( FIRST READ !!!!! )
04 03705 024121          LDA 1,C17
05 03706 123000          ADD 1,0
06 03707 063033          DOC 0,DSKP      ;UNIT # / 1 SECTOR XFER
07 03710 020074          LDA 0,KB2
08 03711 062033          DOB 0,DSKP      ;CA = 20000
09 03712 102400          SUB 0,0
10 03713 061133          DOAS 0,DSKP     ;READ !!
11 03714 152520          SUBZL 2,2
12 03715 006227          WAIT            ;WAIT 100MS FOR UNTIL "DONE")
13 03716 064433          DIA 1,DSKP      ;READ STATUS
14 03717 125113          MOVL# 1,1,SNC   ; DONE ?
15 03720 006242          EHALT           ;NO "DP DONE" ON READ
16 03721 006243          LOOP            ;AC1=BAD ENDING STATUS
17
18 03722 006240 D34:    SETP1           ;ATTEMPT A READ
19 03723 020152          LDA 0,TESTU     ; 1 SECTOR
20 03724 024121          LDA 1,C17
21 03725 123000          ADD 1,0
22 03726 063033          DOC 0,DSKP      ;UNIT # / 1 SECTOR XFER
23 03727 020074          LDA 0,KB2
24 03730 062033          DOB 0,DSKP      ;CA = 20000
25 03731 102400          SUB 0,0
26 03732 061133          DOAS 0,DSKP     ;READ !!
27 03733 152520          SUBZL 2,2
28 03734 006227          WAIT            ;WAIT 100MS FOR UNTIL "DONE")
29 03735 064433          DIA 1,DSKP      ;READ STATUS
30 03736 020060          LDA 0,KB14      ;"DATA LATE" STATUS ON
31 03737 123414          AND# 1,0,SZR    ;A 1 SECT READ
32 03740 006242          EHALT           ;AC1=BAD ENDING STATUS
33 03741 006243          LOOP
34
35 03742 006240 D35:    SETP1           ;ATTEMPT A READ
36 03743 020152          LDA 0,TESTU     ; 1 SECTOR READ
37 03744 024121          LDA 1,C17
38 03745 123000          ADD 1,0
39 03746 063033          DOC 0,DSKP      ; UNIT # / 1 SECT XFER
40 03747 020074          LDA 0,KB2
41 03750 062033          DOB 0,DSKP      ;CA = 20000
42 03751 102400          SUB 0,0
43 03752 061133          DOAS 0,DSKP     ;READ !!
44 03753 152520          SUBZL 2,2
45 03754 006227          WAIT            ;WAIT 100MS (OR UNTIL "DONE")
46 03755 065433          DIB 1,DSKP      ;READ STATUS
47 03756 020217          LDA 0,C204H     ;ENDING MEMORY ADDRESS
48 03757 122414          SUB# 1,0,SZR    ;IS WRONG FOLLWOING 1 SECT READ
49 03760 006242          EHALT           ;AC0=GOOD
50 03761 006243          LOOP            ;AC1=BAD
```

```
A 0049   .MAIN
01
02 03762 006240 D36:    SETP1           ;ATTEMPT A READ
03 03763 020152         LDA 0,TESTU     ; 1 SECTOR READ
04 03764 024121         LDA 1,C17
05 03765 123000         ADD 1,0
06 03766 063033         DOC 0,DSKP      ;UNIT # / 1 SECT XFER
07 03767 020074         LDA 0,KB2
08 03770 062033         DOB 0,DSKP      ;CA = 20000
09 03771 060133         NIOS DSKP       ;READ !!
10 03772 152520         SUBZL 2,2
11 03773 006227         WAIT            ;WAIT 100MS (OR UNTIL "DONE")
12 03774 020202         LDA 0,C7B       ;AC1=STATUS
13 03775 123414         AND# 1,0,S7R    ;ERROR STATUS FOLLOWING A
14 03776 006242         EHALT           ;READ. "SEEK ER", OR "ADDRESS/
15 03777 006243         LOOP            ;UNSAFE"
16
17 04000 020152 D37:    LDA 0,DTYPE     ;IF CARTRIDGE DISK
18 04001 121102         MOVL 0,0,SZC    ;DON'T ATTEMPT A FORMAT
19 04002 000416         JMP E1          ;MODE READ
20 04003 006240         SETP1           ;ATTEMPT A READ
21 04004 020152         LDA 0,TESTU     ;IN THE FORMAT MODE
22 04005 024074         LDA 1,KB2       ;(FIRST USE OF FORMAT MODE)
23 04006 123000         ADD 1,0
24 04007 063033         DOC 0,DSKP      ;UNIT # FORMAT MODE BIT
25 04010 020074         LDA 0,KB2
26 04011 062033         DOB 0,DSKP      ;CA = 20000
27 04012 060133         NIOS DSKP       ;READ!!
28 04013 152520         SUBZL 2,2
29 04014 006227         WAIT            ;WAIT 100MS (OR UNTIL "DONE")
30 04015 125113         MOVL# 1,1,SNC   ;AC1=STATUS
31 04016 006242         EHALT           ;NO "DP DONE" FOLLOWING FMT READ
32 04017 006243         LOOP            ;CHECK "F DONE","R/W DONE"
33
34                      .EOT
```

```
  0050  .MAIN
01
02 04020 006237 F1:     JSR @ISET          ;DO SEEK/WRITE/READ
03 04021 006261          DOSEK              ;CHECK DATA
04 04022 000000          0                  ;SEEK CYLINDER ZERO
05 04023 006242          EHALT              ;ERROR DURING SEEK, AC1=STATUS
06 04024 000422          JMP E1E            ;SKIP REMAINDER OF TEST
07
08 04025 006255          GENDAT             ;GENERATE DATA
09 04026 005425          ZEROS              ;DATA=ALL ZEROS
10 04027 006607          PRGEND             ;DATA BUFFER ADDRESS
11
12 04030 006257          WRITE              ;DO THE WRITE
13 04031 006607          PRGEND             ;DATA BUFFER ADDRESS
14 04032 000017          17                 ;HEAD=0, SECT=0, 1 SECTOR
15 04033 006242          EHALT              ;ERROR IN WRITE, AC1=STATUS
16 04034 000412          JMP E1E            ;SKIP REMAINDER OF TEST
17
18 04035 006256          READ               ;READ THE DATA
19 04036 007207          PRGEND+400         ;DATA BUFFER ADDRESS
20 04037 000017          17                 ;HEAD=0, SECT=0, 1 SECTOR
21 04040 006242          EHALT              ;ERROR IN READ, AC1=STATUS
22 04041 000405          JMP E1F
23
24 04042 006260          CHECK              ;COMPARE DATA BUFFERS
25 04043 006607          PRGEND             ;GOOD BUFFER
26 04044 007207          PRGEND+400         ;QUESTIONABLE BUFFER
27 04045 006242          EHALT              ;ERROR, AC0=GOOD WORD
28 04046 006243 E1F:     LOOP               ;AC1=BAD WORD
29
30 04047 006237 F2:      JSR @ISET          ;DO SEEK/WRITE/READ
31 04050 006261          DOSEK              ;CHECK DATA
32 04051 000000          0                  ;SEEK CYLINDER ZERO
33 04052 006242          EHALT              ;ERROR DURING SEEK, AC1=STATUS
34 04053 000422          JMP E2E            ;SKIP REMAINDER OF TEST
35
36 04054 006255          GENDAT             ;GENERATE DATA
37 04055 005424          ONES               ;DATA=ALL ONES
38 04056 006607          PRGEND             ;DATA BUFFER ADDRESS
39
40 04057 006257          WRITE              ;DO THE WRITE
41 04060 006607          PRGEND             ;DATA BUFFER ADDRESS
42 04061 000017          17                 ;HEAD=0, SECT=0, 1 SECTOR
43 04062 006242          EHALT              ;ERROR IN WRITE, AC1=STATUS
44 04063 000412          JMP E2E            ;SKIP REMAINDER OF TEST
45
46 04064 006256          READ               ;READ THE DATA
47 04065 007207          PRGEND+400         ;DATA BUFFER ADDRESS
48 04066 000017          17                 ;HEAD=0, SECT=0, 1 SECTOR
49 04067 006242          EHALT              ;ERROR IN READ, AC1=STATUS
50 04070 000405          JMP E2E
51
52 04071 006260          CHECK              ;COMPARE DATA BUFFERS
53 04072 006607          PRGEND             ;GOOD BUFFER
54 04073 007207          PRGEND+400         ;QUESTIONABLE BUFFER
55 04074 006242          EHALT              ;ERROR, AC0=GOOD WORD
56 04075 006243 E2E:     LOOP               ;AC1=BAD WORD
```

```
A 0051   .MAIN
01
02 04076 006237 E3:      JSR @ISET          ;DO SEEK/WRITE/READ
03 04077 006261          DOSEK              ;CHECK DATA
04 04100 000000          0                  ;SEEK CYLINDER ZERO
05 04101 006242          EHALT              ;ERROR DURING SEEK, AC1=STATUS
06 04102 000422          JMP E3F            ;SKIP REMAINDER OF TEST
07
08 04103 006255          GENDAT             ;GENERATE DATA
09 04104 005443          NUMSEQ             ;DATA=NUMBERS 0-377
10 04105 006607          PRGEND             ;DATA BUFFER ADDRESS
11
12 04106 006257          WRITE              ;DO THE WRITE
13 04107 006607          PRGEND             ;DATA BUFFER ADDRESS
14 04110 000017          17                 ;HEAD=0, SECT=0, 1 SECTOR
15 04111 006242          EHALT              ;ERROR IN WRITE, AC1=STATUS
16 04112 000412          JMP E3E            ;SKIP REMAINDER OF TEST
17
18 04113 006256          READ               ;READ THE DATA
19 04114 007207          PRGEND+400         ;DATA BUFFER ADDRESS
20 04115 000017          17                 ;HEAD=0, SECT=0, 1 SECTOR
21 04116 006242          EHALT              ;ERROR IN READ, AC1=STATUS
22 04117 000405          JMP E3F
23
24 04120 006260          CHECK              ;COMPARE DATA BUFFERS
25 04121 006607          PRGEND             ;GOOD BUFFER
26 04122 007207          PRGEND+400         ;QUESTIONABLE BUFFER
27 04123 006242          EHALT              ;ERROR, AC0=GOOD WORD
28 04124 006243 F3F:     LOOP               ;AC1=BAD WORD
29
30 04125 006237 E4:      JSR @ISET          ;DO SEEK/WRITE/READ
31 04126 006261          DOSEK              ;CHECK DATA
32 04127 000000          0                  ;SEEK CYLINDER ZERO
33 04130 006242          EHALT              ;ERROR DURING SEEK, AC1=STATUS
34 04131 000422          JMP E4E            ;SKIP REMAINDER OF TEST
35
36 04132 006255          GENDAT             ;GENERATE DATA
37 04133 005433          ALT1               ;DATA PATTERN = 1010101 ETC.
38 04134 006607          PRGEND             ;DATA BUFFER ADDRESS
39
40 04135 006257          WRITE              ;DO THE WRITE
41 04136 006607          PRGEND             ;DATA BUFFER ADDRESS
42 04137 000017          17                 ;HEAD=0, SECT=0, 1 SECTOR
43 04140 006242          EHALT              ;ERROR IN WRITE, AC1=STATUS
44 04141 000412          JMP E4F            ;SKIP REMAINDER OF TEST
45
46 04142 006256          READ               ;READ THE DATA
47 04143 007207          PRGEND+400         ;DATA BUFFER ADDRESS
48 04144 000017          17                 ;HEAD=0, SECT=0, 1 SECTOR
49 04145 006242          EHALT              ;ERROR IN READ, AC1=STATUS
50 04146 000405          JMP E4F
51
52 04147 006260          CHECK              ;COMPARE DATA BUFFERS
53 04150 006607          PRGEND             ;GOOD BUFFER
54 04151 007207          PRGEND+400         ;QUESTIONABLE BUFFER
55 04152 006242          EHALT              ;ERROR, AC0=GOOD WORD
56 04153 006243 E4F:     LOOP               ;AC1=BAD WORD
```

```
A 0054   .MAIN
01
02              ;DISCUSSION OF TESTS E7/E8 AND E9/E10
03
04              ;       AT THIS POINT IN TESTING IT HAS BEEN DETERMINED
05              ;THAT READING AND WRITING CAN BE PERFORMED CORRECTLY.  THE
06              ;NEXT FOUR TESTS ARE A CYLINDER ADDRESS CHECK.  CYLINDERS
07              ;ARE FIRST SELECTED IN ORDER (0-312) AND DATA EQUAL TO THE
08              ;CYLINDER NUMBER IS WRITTEN (TEST E7) ON HEAD-0
09              ;SECTOR-0 OF EACH.  THE FOLLOWING TEST THEN READS THIS DATA
10              ;BACK IN THE SAME SEQUENCE IN WHICH IT WAS WRITTEN.  IF ONE
11              ;CYLINDER IS WRITTEN ON MORE THAN ONCE DUE TO A (ALWAYS 0 OR
12              ;ALWAYS 1) CYLINDER ADDRESS BIT LINE AN ERROR WILL SHOW UP
13              ;IN THE DATA COMPARE CHECK.
14
15              ; T.E.  IF "CYL 4" IS ALWAYS A ZERO THEN AN ATTEMPT
16              ;       TO SEEK TO CYLINDER 4 ACTUALLY SELECTS
17              ;       CYLINDER 0.  DATA WORDS OF "4" ARE WRITTEN
18              ;       THERE AND WHEN THE DATA AT CYLINDER 0 IS
19              ;       LATER READ AND CHECKED IT WILL BE "4" WHEN
20              ;       IT SHOULD BE "0".
21
22              ;TESTS E7&E8 CHECK ALL CYLINDERS IN SEQUENCE 0-312
23              ;AND TESTS E9&E10 CHECK THE CYLINDERS IN ORDER
24              ;FROM 312 TO 0, USING THE COMPLEMENT OF THE CYLINDER
25              ;NUMBER AS THE DATA WORDS.
```

```
A 0055  .MAIN
01
02 04236 102400          SUB 0,0          ;CYL. ADDRESSING CHECK. SEE DISCUSSION
03 04237 040403          STA 0,F7.1       ;PRECEDING E7. WRITE ON HEAD=0, SECTOR=0
04 04240 006237 F7:      JSR @ISET        ;OF EACH CYLINDER.  IN EACH SECTOR DATA
05                                        ;EQUALS THE CYL #.  WRITE IN ASCENDING
06                                        ;ORDER FROM CYL 0 TO 312.
07 04241 006261          DOSEK            ;SEEK
08 04242 000000 F7.1:    0                ;CYLINDER NUMBER (IT CHANGES)
09 04243 006242          FHALT            ;ERROR DURING SEEK, AC1=STATUS
10 04244 000411          JMP F7F          ;SKIP TO END OF TEST
11 04245 006255          GENDAT           ;GENERATE DATA
12 04246 005441          CYLN             ;ADDRESS OF DATA GENERATOR
13 04247 006607          PRGEND           ;DATA BUFFER ADDRESS
14 04250 006257          WRITE            ;WRITE !
15 04251 006607          PRGEND           ;DATA BUFFER ADDRESS
16 04252 000017          17               ;DISK ADDRESS
17 04253 006242          FHALT            ;ERROR DURING WRITE, AC1=STATUS
18 04254 000401          JMP .+1
19 04255 006243 F7F:     LOOP
20 04256 010764          ISZ F7.1         ;(E7.1)=CYL #
21 04257 020763          LDA 0,E7.1       ;DO IT ONCE FOR
22 04260 024207          LDA 1,C312       ;EACH CYLINDER
23 04261 122427          SUBZ 1,0,SNR
24 04262 000756          JMP E7
25
26
27
28
29 04263 102400          SUB 0,0          ;CYLINDER ADDRESS CHECK.  SEE DISCUSSION
30 04264 040403          STA 0,E8.1       ;PREVIOUS TO TEST F7.  READ FIRST SECTOR
31 04265 006237 E8:      JSR @ISET        ;OF EACH CYLINDER AND CHECK FOR PROPER
32                                        ;DATA.  IN EACH CASE DATA SHOULD EQUAL
33                                        ;THE CYLINDER #.
34 04266 006261          DOSEK            ;SEEK
35 04267 000000 E8.1:    0                ;CYLINDER NUMBER (IT CHANGES)
36 04270 006242          FHALT            ;ERROR DURING SEEK, AC1=STATUS
37 04271 000412          JMP E8F
38 04272 006256          READ             ;READ
39 04273 006607 E8.2:    PRGEND           ;DATA BUFFER ADDRESS
40 04274 000017          17               ;DISK ADDRESS
41 04275 006242          FHALT            ;ERROR DURING READ, AC1=STATUS
42 04276 000405          JMP E8F          ;SKIP TO END OF TEST
43 04277 026774          LDA 1,@E8.2      ;FIRST WORD IN DATA BUFFER
44 04300 020767          LDA 0,E8.1       ;SHOULD = CYLINDER #
45 04301 122414          SUB# 1,0,SZR     ;AC0=GOOD
46 04302 006242          FHALT            ;AC1=BAD
47 04303 006243 E8F:     LOOP             ;READ THE TEST DESCRIPTION
48 04304 010763          ISZ E8.1         ;REPEAT THE TEST FOR
49 04305 020762          LDA 0,E8.1       ;EACH CYLINDER
50 04306 024207          LDA 1,C312
51 04307 122427          SUBZ 1,0,SNR
52 04310 000755          JMP E8
```

```
A 0056   .MAIN
01
02 04311 020207          LDA 0,C312       ;CYL. ADDRESSING CHECK. SEE DISCUSSION
03 04312 040403          STA 0,F9.1       ;PRECEDING TEST E7.  WRITE ON HEAD=0
04 04313 006237 F9:      JSR @ISET        ;SECTOR=0, OF EACH CYLINDER.  IN
05                                        ;EACH THE DATA WORDS EQUAL THE COMP.
06                                        ;OF THE CYL #.  WRITE IN DESCENDING
07                                        ;ORDER FROM CYL 312 TO 0.
08 04314 006261          DOSEK            ;SEEK
09 04315 000000 F9.1:    0                ;CYLINDER NUMBER (IT CHANGES)
10 04316 006242          EHALT            ;ERROR DURING SEEK, AC1=STATUS
11 04317 000411          JMP F9E          ;SKIP TO END OF TEST
12 04320 006255          GENDAT           ;GENERATE DATA
13 04321 005437          CYLNC            ;ADDRESS OF DATA GENERATOR
14 04322 006607          PRGEND           ;DATA BUFFER ADDRESS
15 04323 006257          WRITE            ;WRITE
16 04324 006607          PRGEND           ;DATA BUFFER ADDRESS
17 04325 000017          17               ;DISK ADDRESS
18 04326 006242          EHALT            ;ERROR DURING WRITE, AC1=STATUS
19 04327 000401          JMP .+1
20 04330 006243 F9E:     LOOP
21 04331 014764          DSZ F9.1         ;(E9.1)=CYL #
22 04332 000401          JMP .+1
23 04333 020762          LDA 0,F9.1       ;DO IT ONCE FOR
24 04334 101103          MOVL 0,0,SNC     ;EACH CYLINDER
25 04335 000756          JMP F9
26
27
28
29
30 04336 020207          LDA 0,C312       ;CYLINDER ADDRESS CHECK.  SEE DISCUSSION
31 04337 040403          STA 0,E10.1      ;PREVIOUS TO TEST F7.  READ FIRST SECTOR
32 04340 006237 F10:     JSR @ISET        ;OF EACH CYLINDER AND CHECK FOR PROPER
33                                        ;DATA.  IN EACH CASE DATA SHOULD EQUAL
34                                        ;THE COMPLEMENT OF THE CYL #
35 04341 006261          DOSEK            ;SEEK
36 04342 000000 E10.1:   0                ;CYLINDER NUMBER (IT CHANGES)
37 04343 006242          EHALT            ;ERROR DURING SEEK, AC1=STATUS
38 04344 000413          JMP E10E
39 04345 006256          READ             ;READ
40 04346 006607 E10.2:   PRGEND           ;DATA BUFFER ADDRESS
41 04347 000017          17               ;DISK ADDRESS
42 04350 006242          EHALT            ;ERROR DURING READ, AC1=STATUS
43 04351 000406          JMP E10E         ;SKIP TO END OF TEST
44 04352 026774          LDA 1,@E10.2     ;FIRST WORD IN DATA BUFFER
45 04353 020767          LDA 0,E10.1      ;SHOULD = CYLINDER #
46 04354 100000          COM 0,0
47 04355 122414          SUB# 1,0,SZR     ;AC0=GOOD
48 04356 006242          EHALT            ;AC1=BAD
49 04357 006243 E10E:    LOOP             ;READ THE TEST DESCRIPTION
50 04360 014762          DSZ E10.1        ;REPEAT THE TEST FOR
51 04361 000401          JMP .+1
52 04362 020760          LDA 0,E10.1      ;EACH CYLINDER
53 04363 101103          MOVL 0,0,SNC
54 04364 000754          JMP E10
55
56                       .EOT
```

```
0057  .MAIN
01
02                ;DISCUSSION OF THE SECTOR ADDRESSING CHECK.
03                ;(TESTS E11/E12 AND E13/E14)
04
05                ;USING CYLINDER=0, HEAD=0 TEST E11 WRITES ON
06                ;EACH SUCCESSIVE SECTOR INDIVIDUALLY FROM 0-5,
07                ;OR 0-11.  IN EACH CASE EACH DATA WORD EQUALS
08                ;THE SECTOR NUMBER.  TEST E12 READS THE INDIV-
09                ;IDUAL SECTORS BACK IN THE SAME ORDER AND
10                ;CHECKS THE DATA.  TESTS E13/E14 PERFORM THE SAME
11                ;TASK EXCEPT THAT THE SECTOR SEQUENCE IS IN THE
12                ;REVERSE ORDER AND THE DATA WRITTEN EQUALS THE
13                ;COMPLEMENT OF THE SECTOR NUMBER.
14
15                ;THIS TEST IS DESIGNED TO CATCH ERRONEOUS SECTOR
16                ;SELECTION ERRORS.
17
18                ;  I.E. IF "SC2" IS ALWAYS AT GROUND WHEN SECTOR
19                ;       2 IS SELECTED, SECTOR 0 WILL ACTUALLY
20                ;       BE CHOSEN AND "2'S" WILL BE WRITTEN THERE.
21                ;       IN THE SUBSEQUENT READ A DATA COMPARE
22                ;       ERROR WILL RESULT WITH THE GOOD="0",
23                ;       AND THE BAD="2".
24
25 04365 102400          SUB 0,0          ;SEE DISCUSSION PRECEDING THIS TEST.
26 04366 040157          STA 0,SECT       ;WRITE ON CYL=0, HEAD=0, ONCE
27 04367 020121          LDA 0,C17        ;FOR EACH SECTOR.  IN EACH
28 04370 040413          STA 0,E11.1      ;CASE THE DATA WORDS EQUAL
29 04371 006237 E11:     JSR @ISET        ;THE SECTOR NUMBER
30 04372 006261          DOSEK            ;SEEK !
31 04373 000000          0                ;CYLINDER 0
32 04374 006242          EHALT            ;ERROR IN SEEK, AC1=STATUS
33 04375 000411          JMP E11E         ;SKIP TO END OF TEST
34 04376 006255          GENDAT           ;GENERATE DATA
35 04377 005462          SECTN            ;ADDRESS OF DATA GEN ROUT.
36 04400 006607          PRGEND           ;ADDRESS OF DATA BUFFER
37 04401 006257          WRITE            ;WRITE !
38 04402 006607          PRGEND           ;DATA BUFFER ADDRESS
39 04403 000017 E11.1:   17               ;DISK ADDRESS (IT CHANGES)
40 04404 006242          EHALT            ;ERROR IN WRITE, AC1=STATUS
41 04405 000401          JMP .+1
42 04406 006243 E11E:    LOOP
43
44 04407 010157          ISZ SECT         ;INCREMENT THE SECTOR
45 04410 020773          LDA 0,E11.1      ;NUMBER
46 04411 024763          LDA 1,KB11
47 04412 123000          ADD 1,0
48 04413 040770          STA 0,E11.1
49 04414 024150          LDA 1,DTYPE      ;SEE IF DONE
50 04415 030205          LDA 2,C157
51 04416 127103          ADDL 1,1,SNC
52 04417 030210          LDA 2,C317
53 04420 112404          SUB 0,2,SZR
54 04421 000750          JMP E11          ;DO ANOTHER
```

```
A 0058   .MAIN
01
02 04422 102400           SUB 0,0          ;SEE THE DISCUSSION PRECEDING
03 04423 040157           STA 0,SECT       ;TEST E11.  READ ONCE FROM
04 04424 020121           LDA 0,C17        ;EACH SECTOR AT CYL=0, HEAD=0.
05 04425 040410           STA 0,E12.2      ;CHECK DATA IN EACH CASE.
06 04426 006237 E12:      JSR @ISET        ;DATA WORDS=SECTOR #.
07 04427 006261           DOSEK            ;SEEK
08 04430 000000           0                ;CYLINDER 0
09 04431 006242           EHALT            ;ERROR IN SEEK, AC1=STATUS
10 04432 000412           JMP E12E         ;SKIP TO END OF TEST
11 04433 006256           READ             ;READ !
12 04434 006607 E12.1:    PRGEND           ;DATA BUFFER ADDRESS
13 04435 000017 E12.2:    17               ;DISK ADDRESS (IT CHANGES)
14 04436 006242           EHALT            ;ERROR IN READ, AC1=STATUS
15 04437 000405           JMP E12E         ;SKIP TO END OF TEST
16 04440 020157           LDA 0,SECT       ;GET SECT #
17 04441 026773           LDA 1,@E12.1     ;GET A WORD READ
18 04442 122414           SUB# 1,0,SZR     ;DATA ERROR, SEE ABOVE DESCRIPTION
19 04443 006242           EHALT            ;AC0=GOOD WORD
20 04444 006243 E12E:     LOOP             ;AC1=BAD
21
22 04445 010157           TS7 SECT         ;INCREMENT THE SECTOR
23 04446 020767           LDA 0,E12.2      ;NUMBER
24 04447 024063           LDA 1,KB11
25 04450 123000           ADD 1,0
26 04451 040764           STA 0,E12.2
27 04452 024150           LDA 1,DTYPE      ;SEE IF DONE
28 04453 030205           LDA 2,C157
29 04454 127103           ADDL 1,1,SNC
30 04455 030210           LDA 2,C317
31 04456 112404           SUB 0,2,SZR
32 04457 000747           JMP E12          ;GO AGAIN
```

```
A 0059  .MAIN
01
02 04460 020150          LDA 0,DTYPE      ;SEE DISCUSSION PRECEDING
03 04461 024204          LDA 1,C137       ;TEST E11.  WRITE ON CYL-0,
04 04462 103103          ADDL 0,0,SNC     ;HEAD-0, ONCE FOR EACH SECTOR.
05 04463 024206          LDA 1,C277       ;IN EACH CASE THE DATA EQUALS
06 04464 044420          STA 1,E13.1      ;THE COMPLEMENT OF THE SECTOR
07 04465 125220          MOVZR 1,1        ;NUMBER
08 04466 125220          MOVZR 1,1
09 04467 125220          MOVZR 1,1
10 04470 125220          MOVZR 1,1
11 04471 044157          STA 1,SECT       ;BEGINNING SECTOR
12 04472 006237 E13:     JSR @ISET        ;SETUP
13 04473 006261          DOSEK            ;SEEK !
14 04474 000000          0                ;CYLINDER 0
15 04475 006242          EHALT            ;ERROR IN SEEK, AC1=STATUS
16 04476 000411          JMP E13E         ;SKIP TO END OF TEST
17 04477 006255          GENDAT           ;GENERATE DATA
18 04500 005460          SETNC            ;ADDRESS OF DATA GENERATOR
19 04501 006607          PRGEND           ;ADDRESS OF DATA BUFFER
20 04502 006257          WRITE            ;WRITE !
21 04503 006607          PRGEND           ;ADDRESS OF DATA BUFFER
22 04504 000017 E13.1:   17               ;DISK ADDRESS (IT CHANGES)
23 04505 006242          EHALT            ;ERROR IN WRITE, AC1=STATUS
24 04506 000401          JMP .+1
25 04507 006243 E13E:    LOOP
26
27 04510 014157          DSZ SECT         ;DECREMENT THE SECTOR
28 04511 000401          JMP .+1          ;NUMBER
29 04512 020772          LDA 0,E13.1
30 04513 024063          LDA 1,KB11
31 04514 122400          SUB 1,0
32 04515 040767          STA 0,E13.1
33 04516 101404          INC 0,0,SZR      ;SEE IF DONE
34 04517 000753          JMP E13          ;NOT YET
```

```
A 0060   .MAIN
01
02 04520 020150          LDA 0,DTYPE      ;SEE THE DISCUSSION PRECEDING
03 04521 024204          LDA 1,C137       ;TEST 11.  READ ONCE FROM
04 04522 103103          ADDL 0,0,SNC     ;SECTOR OF CYL-0, HEAD-0,
05 04523 024206          LDA 1,C277       ;READ SUCCESSIVE SECTORS
06 04524 044415          STA 1,E14.2      ;IN ORDER FROM HI TO LOW.
07 04525 125220          MOVZR 1,1        ;IN EACH CASE THE DATA EQUALS
08 04526 125220          MOVZR 1,1        ;THE COMPLEMENT OF THE
09 04527 125220          MOVZR 1,1        ;SECTOR NUMBER
10 04530 125220          MOVZR 1,1
11 04531 044157          STA 1,SECT       ;STARTING SECTOR #
12 04532 006237 E14:     JSR @ISET
13 04533 006261          DOSEK            ;SEEK !
14 04534 000000          0                ;CYLINDER 0
15 04535 006242          EHALT            ;ERROR IN SEEK, AC1=STATUS
16 04536 000413          JMP E14E         ;SKIP TO END OF TEST
17 04537 006256          READ             ;READ !
18 04540 006607 E14.1:   PRGEND           ;DATA BUFFER ADDRESS
19 04541 000017 E14.2:   17               ;DISK ADDRESS (IT CHANGES)
20 04542 006242          EHALT            ;ERROR IN READ, AC1=STATUS
21 04543 000406          JMP E14E         ;SKIP TO END OF TEST
22 04544 020157          LDA 0,SECT       ;GET SECTOR #
23 04545 100000          COM 0,0
24 04546 006772          LDA 1,@E14.1     ;GET A WORD READ
25 04547 122414          SUB# 1,0,SZR     ;DATA ERROR, SEE ABOVE DESCRIPTION
26 04550 006242          EHALT            ;AC0=GOOD WORD
27 04551 006243 E14E:    LOOP             ;AC1=BAD
28
29 04552 014157          DSZ SECT         ;DECREMENT TO NEXT SECTOR
30 04553 000401          JMP .+1
31 04554 020765          LDA 0,E14.2
32 04555 024063          LDA 1,KB11
33 04556 122400          SUB 1,0
34 04557 040762          STA 0,E14.2
35 04560 101404          INC 0,0,SZR      ;DONE ?
36 04561 000751          JMP E14          ;NO, GO AGAIN
```

```
A 0061   .MAIN
01
02              !DISCUSSION OF THE HEAD ADDRESSING CHECK.
03              ! (TESTS E15/E16 AND E17/E18)
04
05              !USING CYLINDER=0, SECTOR=0, TEST E15 WRITES ONE
06              !SECTOR ON EACH SUCCESSIVE HEAD INDIVIDUALLY.
07              !IN EACH CASE THE DATA WORDS EQUAL THE HEAD
08              !NUMBER.  TEST E16 READS EACH OF THESE SECTORS
09              !BACK IN THE SAME ORDER THEY WERE WRITTEN AND
10              !CHECKS THE DATA.  TESTS E17 AND E18 PERFORM
11              !THE SAME FUNCTIONS EXCEPT THAT THE HEADS ARE
12              !SELECTED IN REVERSE ORDER AND THE COMPLEMENT
13              !OF THE HEAD NUMBER IS USED AS THE DATA.
14
15              !THESE TEST ARE DESIGNED TO CATCH ERRONEOUS
16              !HEAD SELECTION OR MULTIPLE HEAD SELECTION
17              !ERRORS.
18
19              !  I.E. IF "HD2" IS ALWAYS AT GROUND WHEN HEAD 2
20              !       IS SELECTED, HEAD 0 WILL ACTUALLY BE
21              !       CHOSEN.  "2!S" WILL BE WRITTEN ON THIS
22              !       SECTOR WHERE "0!S" HAD BEEN WRITTEN
23              !       PREVIOUSLY.  THE SUBSEQUENT READ WILL
24              !       THEN ENCOUNTER A DATA ERROR WITH THE
25              !       GOOD WORD = 0 AND THE BAD WORD = 2.
```

```
^ 0002  .MAIN
01
02 04562 102400          SUB 0,0          ;SEE THE DISCUSSION ABOVE.
03 04563 040156          STA 0,HEAD       ;WRITE ON CYL=0, SECT=0,
04 04564 020121          LDA 0,C17        ;ONCE FOR EACH HEAD.
05 04565 040413          STA 0,E15.1      ;DATA WORDS = HEAD #
06 04566 006237 E15:     JSR @ISET
07 04567 006261          DOSEK            ;SEEK !
08 04570 000000          0                ;CYLINDER 0
09 04571 006242          EHALT            ;ERROR IN SEEK, AC1=STATUS
10 04572 000411          JMP E15E         ;SKIP TO END OF TEST
11 04573 006255          GENDAT           ;GENERATE DATA
12 04574 005456          HDN              ;ADDRESS OF DATA GENERATOR
13 04575 006607          PRGEND           ;DATA BUFFER ADDRESS
14 04576 006257          WRITE            ;WRITE !
15 04577 006607          PRGEND           ;DATA BUFFER ADDRESS
16 04600 000017 E15.1:   17               ;DISK ADDRESS (IT CHANGES)
17 04601 006242          EHALT            ;ERROR IN WRITE, AC1=STATUS
18 04602 000401          JMP .+1
19 04603 006243 E15E:    LOOP
20
21 04604 010156          ISZ HEAD         ;INCREMENT TO NEXT HEAD
22 04605 020773          LDA 0,E15.1
23 04606 024067          LDA 1,KB7
24 04607 123000          ADD 1,0
25 04610 040770          STA 0,E15.1
26 04611 024150          LDA 1,DTYPE      ;DONE ?
27 04612 030454          LDA 2,ADR-1
28 04613 125112          MOVL# 1,1,SZC
29 04614 000404          JMP .+4          ;CART DISK
30 04615 151400          INC 2,2
31 04616 125202          MOVR 1,1,SZC     ;SKIP IF 2311
32 04617 151400          INC 2,2          ;2314
33 04620 025000          LDA 1,0,2        ;GET END DISK ADDR
34 04621 122404          SUB 1,0,SZR
35 04622 000744          JMP E15          ;NOT DONE YET
```

```
A 0063  .MAIN
01
02 04623 102400           SUB 0,0          ;SEE THE DISCUSSION PRECEDING
03 04624 040156           STA 0,HEAD       ;TEST E15.  READ ONCE FROM
04 04625 020121           LDA 0,C17        ;EACH HEAD ON CYL=0, SECT=0.
05 04626 040410           STA 0,E16.2      ;VERIFY THAT DATA=HEAD #
06 04627 006237 E16:      JSR @ISET
07 04630 006261           DOSEK            ;SEEK !
08 04631 000000           0                ;CYLINDER 0
09 04632 006242           EHALT            ;ERROR IN SEEK, AC1=STATUS
10 04633 000412           JMP E16E         ;SKIP TO END OF TEST
11 04634 006256           READ             ;READ !
12 04635 006607 E16.1:    PRGEND           ;ADDRESS OF DATA BUFFER
13 04636 000017 E16.2:    17               ;DISK ADDRESS (IT CHANGES)
14 04637 006242           EHALT            ;ERROR IN READ, AC1=STATUS
15 04640 000405           JMP E16E         ;SKIP TO END OF TEST
16 04641 020156           LDA 0,HEAD       ;GET HEAD #
17 04642 026773           LDA 1,@E16.1     ;GET A WORD READ
18 04643 122414           SUB# 1,0,SZR     ;DATA ERROR, SEE ABOVE DISCUSSION
19 04644 006242           EHALT            ;AC0=GOOD WORD
20 04645 006243 E16E:     LOOP             ;AC1=BAD
21
22 04646 010156           ISZ HEAD         ;INCREMENT TO NEXT HEAD
23 04647 020767           LDA 0,E16.2
24 04650 024767           LDA 1,KB7
25 04651 123000           ADD 1,0
26 04652 040764           STA 0,E16.2
27 04653 024150           LDA 1,DTYPE      ;DONE YET ??
28 04654 030412           LDA 2,ADR-1
29 04655 125112           MOVL# 1,1,SZC
30 04656 000404           JMP .+4          ;CART DISK
31 04657 151400           INC 2,2
32 04660 125202           MOVR 1,1,SZC     ;SKIP IF 2311
33 04661 151400           INC 2,2          ;2314
34 04662 025000           LDA 1,0,2        ;GET ENDING DISK ADDRESS
35 04663 122404           SUB 1,0,SZR
36 04664 000743           JMP E16          ;MORE TO GO
37 04665 000405           JMP .+5          ;GO TO NEXT TEST
38
39 04666 004667           .+1
40 04667 001017 ADR:      1017             ;CART,  HEAD 2  SECT 0  1 SECT
41 04670 005017           5017             ;2311,  HEAD 12 SECT 0  1 SECT
42 04671 012017           12017            ;2314,  HEAD 24 SECT 0  1 SECT
```

```
A 0064   .MAIN
01
02 04672 020150          LDA 0,DTYPE       ;SEE THE DISCUSSION
03 04673 030506          LDA 2,ADR1-1      ;PRECEDING TEST E15.
04 04674 101112          MOVL# 0,0,SZC     ;WRITE ON CYL=0, SECT=0,
05 04675 000404          JMP .+4           ;ONCE FOR EACH HEAD.
06 04676 151400          INC 2,2           ;DATA = HEAD #
07 04677 101202          MOVR 0,0,SZC
08 04700 151400          INC 2,2
09 04701 025000          LDA 1,0,2         ;STARTING DISK ADDRESS
10 04702 044416          STA 1,E17.1       ;SELECT HEADS IN REVERSE ORDER
11 04703 020213          LDA 0,C1774
12 04704 123700          ANDS 1,0
13 04705 040156          STA 0,HEAD        ;CURRENT HEAD #
14 04706 006237 E17:     JSR @ISET
15 04707 006261          DOSEK             ;SEEK !
16 04710 000000          0                 ;CYLINDER 0
17 04711 006242          FHALT             ;ERROR IN SEEK, AC1=STATUS
18 04712 000411          JMP E17E          ;SKIP TO END OF TEST
19 04713 005255          GENDAT            ;GENERATE DATA
20 04714 005454          HDNC              ;ADDRESS OF DATA GENERATOR
21 04715 006607          PRGEND            ;DATA BUFFER ADDRESS
22 04716 006257          WRITE             ;WRITE !
23 04717 006607          PRGEND            ;DATA BUFFER ADDRESS
24 04720 000017 E17.1:   17                ;DISK ADDRESS (IT CHANGES)
25 04721 006242          FHALT             ;ERROR IN WRITE, AC1=STATUS
26 04722 000401          JMP .+1
27 04723 006243 E17E:    LOOP
28
29 04724 014156          DSZ HEAD
30 04725 000401          JMP .+1
31 04726 020772          LDA 0,E17.1       ;DECREMENT HEAD #
32 04727 024767          LDA 1,KB7
33 04730 122400          SUB 1,0
34 04731 040767          STA 0,E17.1
35 04732 101103          MOVL 0,0,SNC      ;DONE YET ?
36 04733 000753          JMP E17           ;NO
```

```
A 0065  .MAIN
01
02 04734 020150          LDA 0,DTYPE      ;SEE THE DISCUSSION PRECEDING
03 04735 030444          LDA 2,ADR1-1     ;TEST E15.  READ ONCE FROM
04 04736 101112          MOVL# 0,0,SZC    ;EACH HEAD ON CYL-0, SECT-0.
05 04737 000404          JMP .+4          ;VERIFY THAT DATA=HEAD #
06 04740 151400          INC 2,2
07 04741 101202          MOVR 0,0,SZC     ;SKIP IF 2311
08 04742 151400          INC 2,2          ;2314
09 04743 025000          LDA 1,0,2        ;GET DISK ADDRESS TO BEGIN WITH
10 04744 044413          STA 1,E18.2
11 04745 020213          LDA 0,C1774
12 04746 123700          ANDS 1,0
13 04747 040156          STA 0,HEAD       ;BEGINNING HEAD #
14 04750 006237 E18:     JSR @ISET
15 04751 006261          DOSEK            ;SEEK !
16 04752 000000          0                ;CYLINDER 0
17 04753 006242          EHALT            ;ERROR IN SEEK, AC1=STATUS
18 04754 000413          JMP E18E         ;SKIP TO END OF TEST
19 04755 006256          READ             ;READ !
20 04756 006607 E18.1:   PRGEND           ;ADDRESS OF DATA BUFFER
21 04757 000017 E18.2:   17               ;DISK ADDRESS (IT CHANGES)
22 04760 006242          EHALT            ;ERROR IN READ, AC1=STATUS
23 04761 000406          JMP E18E         ;SKIP TO END OF TEST
24 04762 020156          LDA 0,HEAD       ;GET HEAD #
25 04763 100000          COM 0,0          ;USE THE COMP.
26 04764 026772          LDA 1,@E18.1     ;GET A WORD READ
27 04765 122414          SUB# 1,0,SZR     ;DATA ERROR, SEE ABOVE DISCUSSION
28 04766 006242          EHALT            ;AC0=GOOD WORD
29 04767 006243 E18E:    LOOP             ;AC1=BAD
30
31 04770 014156          DSZ HEAD
32 04771 000401          JMP .+1
33 04772 020765          LDA 0,E18.2      ;DECREMENT HEAD #
34 04773 024767          LDA 1,KB7
35 04774 122400          SUB 1,0
36 04775 040762          STA 0,E18.2
37 04776 101103          MOVL 0,0,SNC     ;DONE YET ?
38 04777 000751          JMP E18          ;NO
39 05000 000405          JMP E19          ;YES, GO TO NEXT TEST
40
41 05001 005002          .+1
42 05002 000417 ADR1:    417              ;CART,  HEAD 1  SECT 0  1 SECT
43 05003 004417          4417             ;2311,  HEAD 11 SECT 0  1 SECT
44 05004 011417          11417            ;2314,  HEAD 23 SECT 0  1 SECT
```

```
A 0066   .MAIN
01
02 05005 006240 E19:    SETP1              ;CAUSE SEEK ERROR BY
03 05006 006261          DOSEK              ;SEEKING TO CYL 313
04 05007 000313          313
05 05010 000403          JMP .+3
06 05011 000402          JMP .+2            ;AC1=STATUS
07 05012 006242          EHALT              ;NO ERRORS ON SEEK
08 05013 006243          LOOP               ;TO CYL 313
09
10 05014 030153          LDA 2,UNUM         ;RECALIBRATE THE
11 05015 021113          LDA 0,TRCL,2       ;UNIT WITH A SEEK ERR
12 05016 040401          STA 0,.+1
13 05017 006231          RECL0
14
15 05020 006240 E20:     SETP1              ;CAUSE SEEK ERROR BY
16 05021 006261          DOSEK              ;SEEKING TO CYL 313
17 05022 000313          313
18 05023 020064          LDA 0,KB10
19 05024 123415          AND# 1,0,SNR       ;AC1=STATUS
20 05025 006242          EHALT              ;NO SEEK ERROR STATUS
21 05026 006243          LOOP               ;FOLLOWING SEEK TO CYL 313
22
23 05027 030153          LDA 2,UNUM         ;RECALIBRATE THE UNIT
24 05030 021113          LDA 0,TRCL,2       ;WITH A SEEK ERROR
25 05031 040401          STA 0,.+1
26 05032 006231          RECL0
27
28 05033 006240 E21:     SETP1              ;CHECK FOR ILLEGAL ERRORS
29 05034 006261          DOSEK              ;ALONG WITH SEEK ERROR
30 05035 000313          313                ;AC1=STATUS
31 05036 020177          LDA 0,C36          ;INTENTIONAL SEEK ERROR
32 05037 123414          AND# 1,0,SZR       ;ILLEGAL STATUS; "END CYL"
33 05040 006242          EHALT              ;OR "UNSAFE" OR "CHK WD"
34 05041 006243          LOOP               ;OR "DATA LATE"
35
36 05042 030153          LDA 2,UNUM         ;RECALIBRATE THE UNIT
37 05043 021113          LDA 0,TRCL,2       ;WITH A SEEK ERROR
38 05044 040401          STA 0,.+1
39 05045 006231          RECL0
```

```
A 0067   .MAIN
01
02 05046 006253 F22E:     DORW              ;SETUP SECTOR 3 & 4
03 05047 000000           0                 ;CYL #
04 05050 005427           THREE             ;DATA TYPE
05 05051 000077           77                ;DISK ADDRESS
06
07 05052 006253           DORW              ;SECT 4
08 05053 000000           0
09 05054 005431           FOUR
10 05055 000117           117
11
12 05056 006237           JSR @ISET         ;TEST READ SECT 3=WRITE SECT 4
13                                          ;SEQUENCE
14 05057 006256           READ              ;READ A SECTOR
15 05060 006607           PRGEND            ;MEM BUFFER ADDRESS
16 05061 000077           77                ;SECTOR THREE
17 05062 006242           EHALT             ;ERROR, AC1=STATUS
18 05063 000422           JMP F22E          ;SKIP TO END OF TEST
19
20 05064 006257           WRITE             ;WRITE A SECTOR
21 05065 006607           PRGEND            ;BUFF ADDR (SIS JUST READ)
22 05066 000117           117               ;SECTOR 4
23 05067 006242           EHALT             ;ERROR, AC1=STATUS
24 05070 000415           JMP F22E          ;SKIP TO END OF TEST
25
26 05071 006255           GENDAT            ;GENERATE DATA BUFFER
27 05072 005427           THREE             ;ADDR OF DATA GEN
28 05073 006607           PRGEND            ;BUFFER ADDR.
29
30 05074 006256           READ              ;READ A SECTOR
31 05075 007207           PRGEND+400        ;BUFF ADDR.
32 05076 000117           117               ;SECTOR 4
33 05077 006242           EHALT             ;ERROR, AC1=STATUS
34 05100 000405           JMP F22E          ;SKIP TO END OF TEST
35
36 05101 006260           CHECK             ;COMPARE BUFFERS A/B
37 05102 006607           PRGEND            ;ADDR OF BUFF A (CORRECT)
38 05103 007207           PRGEND+400        ;ADDR OF BUFF B
39 05104 006242           EHALT             ;COMPARE ERROR, AC0=GOOD
40 05105 006243 F22E:     LOOP              ;AC1=BAD
```

```
A 0068   .MAIN
01
02 05106 006253 E23:     DORW              ;SETUP SECTOR 3 & 4
03 05107 000000           0                 ;CYL # 0
04 05110 005427           THREE             ;DATA TYPE
05 05111 000077           77                ;DISK ADDRESS (SECT 3)
06
07 05112 006253           DORW
08 05113 000000           0
09 05114 005431           FOUR
10 05115 000117           117               ;SECTOR 4
11
12 05116 006237           JSR @ISET         ;TEST WRITE SECT 3-READ SECT 4
13                                          ;SEQUENCE.
14 05117 006255           GENDAT            ;GENERATE DATA
15 05120 005431           FOUR              ;4'S
16 05121 006607           PRGEND            ;ADDR OF DATA BUFF
17
18 05122 006257           WRITE             ;WRITE A SECTOR
19 05123 006607           PRGEND            ;ADDR OF DATA BUFF
20 05124 000077           77                ;SECTOR 3
21 05125 006242           EHALT             ;ERROR, AC1=STATUS
22 05126 000417           JMP E23E          ;SKIP TO END OF TEST
23
24 05127 006256           READ              ;READ A SECTOR
25 05130 007207           PRGEND+400        ;MEM BUFF ADDRESS
26 05131 000117           117               ;SECTOR 4
27 05132 006242           EHALT             ;ERROR, AC1=STATUS
28 05133 000412           JMP E23E          ;SKIP TO END OF TEST
29
30 05134 006256           READ              ;READ A SECTOR
31 05135 006607           PRGEND            ;MEM ADDR
32 05136 000077           77                ;SECTOR 3
33 05137 006242           EHALT             ;ERROR, AC1=STATUS
34 05140 000405           JMP E23E          ;SKIP TO END OF TEST
35
36 05141 006260           CHECK             ;COMPARE SECTOR 3 & 4
37 05142 006607           PRGEND            ;SECT 3
38 05143 007207           PRGEND+400        ;SECT 4
39 05144 006242           EHALT             ;COMPARE ERROR, AC0=GOOD (SECT 3)
40 05145 006243 E23E:     LOOP              ;AC1=BAD (SECT 4)
```

```
A 0069  .MAIN
01
02 05146 102400 E24:    SUB 0,0          ;WRITE CYL # INTO EACH
03 05147 040405          STA 0,.CL        ;SECT 0, HEAD 0, OF ALL
04 05150 040420          STA 0,.SCYL      ;CYLINDERS
05 05151 020207          LDA 0,C312
06 05152 040434          STA 0,LCYL
07 05153 006253          DORW
08 05154 000000 .CL:     0                ;CYL #
09 05155 005441          CYLN             ;ADDR OF DATA GEN ROUT.
10 05156 000017          17               ;DISK ADDRESS
11
12 05157 010775          ISZ .CL
13 05160 020774          LDA 0,.CL
14 05161 024207          LDA 1,C312
15 05162 122437          SUBZ# 1,0,SBN
16 05163 000770          JMP .CL-1
17 05164 020454          LDA 0,C500
18 05165 040452          STA 0,CCNT       ; DO 500 SEEKS
19
20 05166 006237 GO:      JSR @ISET
21 05167 006261          DOSEK            ;SEEK !!
22 05170 000000 .SCYL:   0                ;CYL #
23 05171 006242          EHALT            ;ERROR, AC1=STATUS
24 05172 000412          JMP E24E         ;SKIP TO END OF TEST
25
26 05173 006256          READ             ;READ DATA IN SECT 0
27 05174 006607          PRGEND           ;MEM ADDR
28 05175 000017          17               ;DISK ADDR
29 05176 006242          EHALT            ;ERROR, AC1=STATUS
30 05177 000405          JMP E24E         ;SKIP TO END OF TEST
31
32 05200 020155          LDA 0,CYL        ;CURRENT CYLINDER #
33 05201 026160          LDA 1,@BUFF      ;ACTUAL CYL #
34 05202 122414          SUB# 1,0,SZR     ;(LCYL) = LAST CORRECT
35 05203 006242          EHALT            ;CYLINDER #
36 05204 006243 E24E:    LOOP
37 05205 101001          MOV 0,0,SKP
38 05206 000000 LCYL:    0
39 05207 020761          LDA 0,.SCYL      ;SAVE CYLINDER JUST DONE
40 05210 040776          STA 0,LCYL
41 05211 006254 GRAN:    JSR @IRAN        ;GET RANDOM CYLINDER #
42 05212 024207          LDA 1,C312
43 05213 032125          LDA 2,C377       ;# MUST BE <313
44 05214 143400          AND 2,0
45 05215 106433          SUBZ# 0,1,SNC
46 05216 000773          JMP GRAN         ;TRY AGAIN
47 05217 040751          STA 0,.SCYL
48 05220 014417          DSZ CCNT
49 05221 000745          JMP GO
```

```
^ 0070   .MAIN
01
02 05222 006247           PCRLF              ;END TEST
03 05223 006250           MESSAGE
04 05224 006604           MSG6               ;"PASS"
05 05225 030045           LDA 2,45
06 05226 025000           LDA 1,0,2
07 05227 125005           MOV 1,1,SNR
08 05230 002406           JMP @.+6
09 05231 015003           DSZ 3,2
10 05232 002404           JMP @.+4
11 05233 060277           INTDS
12 05234 035004           LDA 3,4,2
13 05235 001400           JMP 0,3
14 05236 000412           A0
15
16 05237 000000 CCNT:     0
17 05240 000764 C500:     500.
18
19                        .EOT
```

```
  0071  .MAIN
01
02                            ;RANDOM NUMBER GENERATOR
03
04 05241 054431 RAN:    STA 3,.UD03      ;GENERATE A RANDOM
05 05242 050427         STA 2,.UD02
06 05243 044425         STA 1,.UD01
07 05244 020142         LDA 0,RANDOM     ;NUMBER IN AC0
08 05245 004410         JSR .UD50
09 05246 034426         LDA 3,.UD20
10 05247 163000         ADD 3,0
11 05250 040142         STA 0,RANDOM     ;STORE NEW VALUE.
12 05251 111100         MOVL 0,2
13 05252 030417         LDA 2,.UD02
14 05253 024415         LDA 1,.UD01
15 05254 002416         JMP @.UD03
16
17 05255 024420 .UD50:  LDA 1,.UD21      ;RANDOM CONTINUED
18 05256 044415         STA 1,.UD10
19 05257 100120         MOVZL 0,1
20 05260 102120         MOVZL 1,1
21 05261 014412         DSZ .UD10
22 05262 000776         JMP .-2
23 05263 107000         ADD 0,1
24 05264 102120         MOVZL 1,1
25 05265 102120         MOVZL 1,1
26 05266 123000         ADD 1,0
27 05267 001400         JMP 0,3
28 05270 000000 .UD01:  0
29 05271 000000 .UD02:  0
30 05272 000000 .UD03:  0
31 05273 000000 .UD10:  0
32 05274 033031 .UD20:  33031
33 05275 000010 .UD21:  10
```

```
A 0072  .MAIN
01
02                          ;CHECK DATA SUBROUTINE
03                          ; CALL  CHECK
04                          ;       ADDRESS OF DATA BUFFER 1
05                          ;       ADDRESS OF DATA BUFFER 2
06                          ;       ERROR RETURN, (AC1)=BAD (AC0)=GOOD
07                          ;       NORMAL RETURN
08
09 05276 054460 .CHECK: STA 3,GENRET
10 05277 030214          LDA 2,M400
11 05300 050417          STA 2,CTR
12 05301 031400          LDA 2,0,3
13 05302 035401          LDA 3,1,3
14 05303 010453          ISZ GENRET
15 05304 010452          ISZ GENRET
16 05305 021000 .CHE1:   LDA 0,0,2
17 05306 025400          LDA 1,0,3
18 05307 106414          SUB# 0,1,SZR
19 05310 002446          JMP @GENRET      ;ERROR
20 05311 151400          INC 2,2
21 05312 175400          INC 3,3
22 05313 010404          ISZ CTR
23 05314 000771          JMP .CHE1        ;CHECK MORE
24 05315 010441          ISZ GENRET
25 05316 002440          JMP @GENRET      ;NORMAL RETURN
26 05317 000000 CTR:     0
27
28                          ;GENERATE ONE SECTOR OF DATA
29                          ; CALL  GENDAT
30                          ;       ADDRESS OF DATA GEN ROUTINE
31                          ;       DATA BUFFER ADDRESS
32                          ;       RETURN
33
34 05320 054436 .GEN:    STA 3,GENRET
35 05321 024214          LDA 1,M400
36 05322 031401          LDA 2,1,3
37 05323 034433 .GEN1:   LDA 3,GENRET
38 05324 007400          JSR @0,3         ;GET A DATA WORD
39 05325 041000          STA 0,0,2
40 05326 151400          INC 2,2
41 05327 125404          INC 1,1,SZR
42 05330 000773          JMP .GEN1        ;DO MORE
43 05331 034425          LDA 3,GENRET     ;DONE
44 05332 001402          JMP 2,3
```

```
A 0073  .MAIN
01
02                          ;WRITE SUBROUTINE
03                          ; CALL  WRITE
04                          ;       DATA BUFFER ADDRESS
05                          ;       DISK ADDRESS
06                          ;       ERROR RETURN, (AC1) = STATUS
07                          ;       JMP TO END OF TEST
08                          ;       NORMAL RETURN
09
10                          ;ERROR RETURN IF
11                          ;       TIMEOUT (100MS)
12                          ;       DATA LATE
13                          ;       ADDRESS ERROR/UNSAFE
14                          ;       END CYLINDER
15                          ;       SEEK ERROR
16                          ;       ANY "SEEKING"
17                          ;       ANY "SEEK DONE"
18                          ;       NO "R/W DONE"
19
20 05333 054423 .WRITE: STA 3,GENRET
21 05334 021400          LDA 0,0,3
22 05335 062033          DOB 0,DSKP         ;CA
23 05336 020152          LDA 0,TESTU
24 05337 025401          LDA 1,1,3
25 05340 123000          ADD 1,0
26 05341 063233          DOCC 0,DSKP        ;UNIT # & DISK ADDRESS
27 05342 020126          LDA 0,C777         ;BIT 7 AND ALL CYL BITS=1
28 05343 061133          DOAS 0,DSKP        ;WRITE !
29 05344 010412          ISZ GENRET
30 05345 010411          ISZ GENRET
31 05346 006035          ITRWT              ;WAIT 100MS FOR INTERRUPT
32 05347 002407          JMP @GENRET        ;TIMEOUT
33 05350 020407 .WR1:    LDA 0,.WM          ;ERROR BIT MASK
34 05351 107415          AND# 0,1,SNR
35 05352 125113          MOVL# 1,1,SNC
36 05353 002403          JMP @GENRET        ;ERROR STATUS
37 05354 034402          LDA 3,GENRET
38 05355 001402          JMP 2,3
39
40 05356 000000 GENRET: 0
41 05357 077677 .WM:     77677
```

```
A 0074  .MAIN
01
02                          ;READ SUBROUTINE
03                          ; CALL  READ
04                          ;       DATA BUFFER ADDRESS
05                          ;       DISK ADDRESS
06                          ;       ERROR RETURN, (AC1)=STATUS
07                          ;       JMP TO END TEST
08                          ;       NORMAL RETURN
09
10                          ;ERROR RETURN IF
11                          ;       TIMEOUT (100MS)
12                          ;       DATA LATE
13                          ;       CHECK WORD ERROR
14                          ;       ADDRESS ERROR/UNSAFE
15                          ;       END CYLINDER
16                          ;       SEEK ERROR
17                          ;       ANY "SEEKING"
18                          ;       ANY "SEEK DONE"
19                          ;       NO "R/W DONE"
20
21 05360 054776 .READ:  STA 3,GENRET
22 05361 021400         LDA 0,0,3
23 05362 062033         DOB 0,DSKP      ;CA
24 05363 020152         LDA 0,TESTU
25 05364 025401         LDA 1,1,3
26 05365 123000         ADD 1,0
27 05366 063233         DOCC 0,DSKP     ;UNIT # & DISK ADDRESS
28 05367 102400         SUB 0,0
29 05370 061133         DOAS 0,DSKP     ;READ !
30 05371 010765         ISZ GENRET
31 05372 010764         ISZ GENRET
32 05373 006235         ITRWT           ;WAIT 100 MS FOR INTERRUPT
33 05374 002762         JMP @GENRET     ;TIMEOUT
34 05375 000753         JMP .WR1        ;CHECK STATUS
```

```
A 0075  .MAIN
01
02                          ;SEEK SUBROUTINE
03                          ; CALL  DOSEK
04                          ;       CYL #
05                          ;       ERROR RETURN (AC1)=STATUS
06                          ;       JMP TO END TEST
07                          ;       NORMAL RETURN
08
09                          ;ERROR RETURN IF
10                          ;       TIMEOUT (500MS)
11                          ;       DATA LATE
12                          ;       CHECK WORD ERROR
13                          ;       ADDRESS ERROR/UNSAFE
14                          ;       END CYLINDER
15                          ;       SEEK ERROR
16                          ;       ANY "SEEKING"
17                          ;       NO "SEEK DONE"
18                          ;       "R/W DONE"
19
20 05376 054760 .DOSEK: STA 3,GENRET
21 05377 010757         ISZ GENRET
22 05400 020152         LDA 0,TESTU
23 05401 063233         DOCC 0,DSKP      ;SELECT UNIT
24 05402 021400         LDA 0,0,3
25 05403 024125         LDA 1,C377
26 05404 123400         AND 1,0
27 05405 040155         STA 0,CYL        ;SAVE CYL #
28 05406 024070         LDA 1,KB6
29 05407 123000         ADD 1,0          ;CYL # + SEEK
30 05410 061333         DOAP 0,DSKP
31 05411 030167         LDA 2,C5
32 05412 006227         WAIT             ;WAIT 500MS (OR UNTIL "DONE")
33 05413 020410         LDA 0,.DM
34 05414 123414         AND# 1,0,SZR
35 05415 002741         JMP @GENRET      ;ERROR STATUS
36 05416 020220         LDA 0,C74K
37 05417 123415         AND# 1,0,SNR
38 05420 002736         JMP @GENRET      ;NO SEEK DONE
39 05421 034735         LDA 3,GENRET
40 05422 001402         JMP 2,3
41
42 05423 103677 .DM:    103677
```

```
A 0076  .MAIN
01
02 05424 102001 ONES:   ADC 0,0,SKP
03 05425 102400 ZEROS:  SUB 0,0
04 05426 001400         JMP 0,3
05
06 05427 020117 THREE:  LDA 0,C3
07 05430 001400         JMP 0,3
08
09 05431 020166 FOUR:   LDA 0,C4
10 05432 001400         JMP 0,3
11
12 05433 020140 ALT1:   LDA 0,C2525
13 05434 001400         JMP 0,3
14
15 05435 020141 ALT0:   LDA 0,C5252
16 05436 001400         JMP 0,3
17
18 05437 020155 CYLNC:  LDA 0,CYL
19 05440 100001         COM 0,0,SKP
20 05441 020155 CYLN:   LDA 0,CYL
21 05442 001400         JMP 0,3
22
23 05443 054407 NUMSEQ: STA 3,NSRET
24 05444 010407         TSZ NS1
25 05445 000401         JMP .+1
26 05446 020405         LDA 0,NS1
27 05447 034125         LDA 3,C377
28 05450 163400         AND 3,0
29 05451 002401         JMP @NSRET
30 05452 000000 NSRET:  0
31 05453 000000 NS1:    0
32
33 05454 020156 HDNC:   LDA 0,HEAD
34 05455 100001         COM 0,0,SKP
35 05456 020156 HDN:    LDA 0,HEAD
36 05457 001400         JMP 0,3
37
38 05460 020157 SETNC:  LDA 0,SECT
39 05461 100001         COM 0,0,SKP
40 05462 020157 SECTN:  LDA 0,SECT
41 05463 001400         JMP 0,3
```

```
A 0077   .MAIN
01
02                              ;PROGRAM INITILAIZATION
03
04 05464 054504 .INI:   STA 3,.INRET
05 05465 006247         PCRLF
06 05466 006250         MESSAGE
07 05467 006512         MSG1                ;DISK PACK TYPE
08 05470 006247         PCRLF
09 05471 006250         MESSAGE
10 05472 006525         MSG2                ;TYPE 0 FOR CART
11 05473 006247         PCRLF               ;     1 FOR 2311
12 05474 006250         MESSAGE             ;     2 FOR 2314
13 05475 006543         MSG3
14
15 05476 006247 .INI1:  PCRLF
16 05477 060210         NIOC TTI            ;WAIT FOR TTI INPUT
17 05500 063610         SKPDN TTI
18 05501 000777         JMP .-1
19 05502 060410         DIA 0,TTI           ;READ CHAR
20 05503 061111         DOAS 0,TTO          ;ECHO IT
21 05504 024124         LDA 1,C177          ;7 BIT MASK
22 05505 107400         AND 0,1
23 05506 030200         LDA 2,C60
24 05507 034201         LDA 3,C63
25 05510 132437         SUBZ# 1,2,SBN       ;CHAR MUST 0,1, OR 2
26 05511 166432         SUBZ# 3,1,SZC
27 05512 000457         JMP QUEST           ;ILLEGAL CHAR TYPED
28 05513 024117         LDA 1,C3
29 05514 123400         AND 1,0
30 05515 101224         MOVZR 0,0,SZR
31 05516 000404         JMP .+4             ;=2, 2314, BIT 15 IS SET, DONE
32 05517 101205         MOVR 0,0,SNR
33 05520 101241         MOVOR 0,0,SKP       ;=0, CART, MUST SET BIT 0
34 05521 101220         MOVZR 0,0           ;=1, 2311, MUST SET BIT 1
35 05522 040150         STA 0,DTYPE
```

```
A 0078   .MAIN
01
02 05523 102400           SUB 0,0
03 05524 040151           STA 0,NDSKS
04 05525 006247 .INI2:    PCRLF
05 05526 006250           MESSAGE
06 05527 006564           MSG5                ;TYPE UNIT NUMBERS TO TEST
07 05530 006247           PCRLF
08
09 05531 060210 .INI3:    NIOC TTI
10 05532 063610           SKPDN TTI
11 05533 000777           JMP .-1
12 05534 060410           DIA 0,TTI           ;READ CHAR TYPED
13 05535 061111           DOAS 0,TTO          ;ECHO THE CHAR
14 05536 024124           LDA 1,C177
15 05537 107400           AND 0,1             ;7 BIT ASCII
16 05540 030173           LDA 2,C15
17 05541 132415           SUB# 1,2,SNR
18 05542 000422           JMP CR              ;CR TYPED
19 05543 030200           LDA 2,C60
20 05544 034201           LDA 3,C63
21 05545 166437           SUBZ# 3,1,SBN       ;# MUST BE 0,1,2, OR 3
22 05546 132436           SUBZ# 1,2,SEZ
23 05547 000426           JMP QST1            ;ILLEGAL CHAR TYPED
24 05550 030117           LDA 2,C3
25 05551 113400           AND 0,2
26 05552 021057           LDA 0,UNTBIT,2
27 05553 025053           LDA 1,.TU,2
28 05554 044152           STA 1,TESTU
29 05555 050153           STA 2,UNUM
30 05556 110000           COM 0,2
31 05557 024151           LDA 1,NDSKS
32 05560 147400           AND 2,1             ;(NDSKS) = BIT 15 = UNIT 0
33 05561 107000           ADD 0,1             ;          BIT 14 = UNIT 1
34 05562 044151           STA 1,NDSKS         ;          BIT 13 = UNIT 2
35 05563 000746           JMP .INI3           ;          BIT 12 = UNIT 3
36
37 05564 020151 CR:       LDA 0,NDSKS         ;IF NO UNIT NUMBERS TYPED
38 05565 101005           MOV 0,0,SNR         ;IT IS AN ERROR
39 05566 000407           JMP QST1
40 05567 002401           JMP @.INRET
41 05570 000000 .INRET:   0
42
43 05571 006247 QUEST:    PCRLF
44 05572 006250           MESSAGE
45 05573 006561           MSG4
46 05574 000702           JMP .INI1
47
48 05575 006247 QST1:     PCRLF
49 05576 006250           MESSAGE
50 05577 006561           MSG4
51 05600 000725           JMP .INI2
```

```
▲ 0079  .MAIN
01
02                              ;SET ALL I/O ADDRESSES
03
04 05601 102401 .S33:   SUB 0,0,SKP     ;SET TO 33
05 05602 020064 .S73:   LDA 0,KB10      ;SET TO 73
06 05603 024176         LDA 1,C33
07 05604 123000         ADD 1,0
08 05605 040154         STA 0,CDSK
09 05606 030425         LDA 2,FIRST
10 05607 021000 .SN0:   LDA 0,0,2
11 05610 024161         LDA 1,MSK1
12 05611 107400         AND 0,1
13 05612 034162         LDA 3,DPID
14 05613 166404         SUB 3,1,SZR
15 05614 000406         JMP .SN1        ;GO ON
16 05615 024163         LDA 1,MSK2      ;DISK PACK ID INST.
17 05616 034154         LDA 3,CDSK
18 05617 123400         AND 1,0
19 05620 163000         ADD 3,0
20 05621 041000         STA 0,0,2
21 05622 151400 .SN1:   INC 2,2
22 05623 024411         LDA 1,LAST
23 05624 132414         SUB# 1,2,SZR
24 05625 000762         JMP .SN0
25 05626 024046         LDA 1,EGGS
26 05627 125005         MOV 1,1,SNR
27 05630 063077         HALT
28 05631 002401         JMP @.+1
29 05632 000400         START
30
31 05633 000400 FIRST:  START
32 05634 006022 LAST:   .SET
33
34                              ;DELAY SUBROUTINE
35
36 05635 054406 .STL:   STA 3,.STLRET
37 05636 034060         LDA 3,KB14
38 05637 054000         STA 3,0
39 05640 014000         DSZ 0
40 05641 000777         JMP .-1
41 05642 002401         JMP @.STLRET
42 05643 000000 .STLRET:0
```

```
A 00R0  .MAIN
01
02                      ;"SET A SEEKING FLOP" SUBROUTINE
03                      ;FOR THE UNITS INDICATED BY (AC2).
04                      ;       BIT 15 = UNIT 0
05                      ;       BIT 14 = UNIT 1
06                      ;       BIT 13 = UNIT 2
07                      ;       BIT 12 = UNIT 3
08
09 05644 020056 .SSEK:  LDA 0,C140K
10 05645 151005         MOV 2,2,SNR
11 05646 001400         JMP 0,3             ;DONE
12 05647 024054         LDA 1,KB1
13 05650 123000         ADD 1,0
14 05651 151223         MOVZR 2,2,SNC
15 05652 000773         JMP .SSEK+1         ;TRY ANOTHER UNIT
16 05653 063033         DOC 0,DSKP          ;RECAL THIS UNIT
17 05654 024070         LDA 1,C1000
18 05655 065333         DOAP 1,DSKP         ;SEEK !!
19 05656 000767         JMP .SSEK+1
20
21                      ;WAIT ROUTINE FOR "DONE"
22                      ;RUN TIMER
23                      ;(AC2) = MAX RUN TIME. (100MS/COUNT)
24
25 05657 050164 .WAIT:  STA 2,ITRCNT        ;# 100MS ITERATIONS
26 05660 030145         LDA 2,TIME          ;100 MS / COUNT
27 05661 050144         STA 2,TEMP          ;TEMP COUNTER
28 05662 030221         LDA 2,C174K         ;DISK DONE FLAG MASK
29 05663 063700         SKPDZ 0             ;DUMMY FOR TIME FILLER
30 05664 063077         HALT
31 05665 064433         DIA 1,DSKP          ;READ STATUS
32 05666 133414         AND# 1,2,SZR
33 05667 000406         JMP WTO             ;SOMEONE IS DONE
34 05670 014144         DSZ TEMP
35 05671 000772         JMP .-6
36 05672 014164         DSZ ITRCNT          ;DONE 100 MS
37 05673 000765         JMP .WAIT+1         ;DO SOME MORE
38 05674 001400         JMP 0,3             ;TIME OUT
39 05675 064433 WTO:    DIA 1,DSKP
40 05676 001400         JMP 0,3
```

```
A 0001   .MAIN
01
02
03                              ;RECALIBRATE SUBROUTINE
04
05 05677 102400 .RCL0:  SUB 0,0          ;UNIT 0 ENTRY
06 05700 000405         JMP .RCL3+1
07 05701 020054 .RCL1:  LDA 0,KB1        ;UNIT 1 ENTRY
08 05702 000403         JMP .RCL3+1
09 05703 102621 .RCL2:  SUBZR 0,0,SKP    ;UNIT 2 ENTRY
10 05704 020056 .RCL3:  LDA 0,C140K      ;UNIT 3 ENTRY
11 05705 063233         DOCC 0,DSKP      ;SELECT UNIT
12 05706 020215         LDA 0,C1400
13 05707 061333         DOAP 0,DSKP      ;RECALIBRATE
14 05710 054404         STA 3,RCLRET
15 05711 030173         LDA 2,C15
16 05712 006227         WAIT             ;WAIT 1.3SEC (OR UNTIL DONE)
17 05713 002401         JMP @RCLRET
18 05714 000000 RCLRET: 0
```

```
A 0002  .MAIN
01
02                      ;SEEK WRITE/READ/CHECK SUBROUTINE
03                      ;CALL   DORW
04                      ;       CYL#
05                      ;       ADDRESS OF DATA GENERATOR
06                      ;       DISK ADDRESS
07                      ;       RETURN
08
09 05715 054441 .DORW:  STA 3,DRWRET
10 05716 021400         LDA 0,0,3       ;XFER CYL #
11 05717 040410         STA 0,.D0
12 05720 021401         LDA 0,1,3       ;XFER ADDR DAT GEN
13 05721 040412         STA 0,.D01
14 05722 021402         LDA 0,2,3       ;XFER DISK ADDR
15 05723 040414         STA 0,.D02
16 05724 040420         STA 0,.D03
17
18 05725 006237         JSR @ISET
19 05726 006261         DOSEK           ;SEEK !!
20 05727 000000 .D0:    0               ;CYL #
21 05730 006242         EHALT           ;ERROR, AC1=STATUS
22 05731 000422         JMP E.D0        ;SKIP TO END OF TEST
23
24 05732 006255         GENDAT          ;GENERATE DATA
25 05733 005424 .D01:   ONES            ;ADDRESS OF DATA GEN
26 05734 006607         PRGEND          ;MEM ADDR
27
28 05735 006257         WRITE           ;WRITE !!
29 05736 006607         PRGEND          ;MEM ADDR
30 05737 000017 .D02:   17              ;DISK ADDRESS
31 05740 006242         EHALT           ;ERROR, AC1=STATUS
32 05741 000412         JMP E.D0        ;SKIP TO END OF TEST
33
34 05742 006256         READ            ;READ !!
35 05743 007207         PRGEND+400      ;MEM ADDR
36 05744 000017 .D03:   17              ;DISK ADDRESS
37 05745 006242         EHALT           ;ERROR, AC1=STATUS
38 05746 000405         JMP E.D0        ;SKIP TO END OF TEST
39
40 05747 006260         CHECK           ;COMPARE BUFFER A/B
41 05750 006607         PRGEND          ; A
42 05751 007207         PRGEND+400      ; B
43 05752 006242         EHALT           ;COMPARE ERROR, AC0=GOOD
44 05753 006243 E.D0:   LOOP            ;AC1=BAD
45
46 05754 034402         LDA 3,DRWRET
47 05755 001403         JMP 3,3
48
49 05756 000000 DRWRET: 0
```

```
A 0083  .MAIN
01
02                          ;WAIT FOR INTERRUPT TIMEOUT AFTER 100 MS
03                          ;RETURN+1  IF TIMEOUT
04                          ;RETURN+2  IF INTERRUPT
05
06 05757 020146 .IWT:       LDA 0,TIME1
07 05760 040144             STA 0,TEMP
08 05761 060177             INTEN
09 05762 063700             SKPDZ 0             ;TIME FILLER
10 05763 063077             HALT
11 05764 014144             DSZ TEMP
12 05765 000775             JMP .-3
13 05766 060277             INTDS               ;NO INTERRUPT
14 05767 064433             DIA 1,DSKP
15 05770 001400             JMP 0,3             ;ERROR RETURN
16
17 05771 064433 IRET:       DIA 1,DSKP
18 05772 001401             JMP 1,3             ;NORM INTERRUPT RETURN
19
20                          ;CHOOSE AN ACTIVE DISK UNIT
21                          ;RETURN WITH UNIT # IN AC2
22                          ;       UNIT 0 = 1
23                          ;       UNIT 1 = 2
24                          ;       UNIT 2 = 4
25                          ;       UNIT 3 = 10
26
27 05773 152521 .ADSK:      SUBZL 2,2,SKP
28 05774 151120             MOVZL 2,2
29 05775 020151             LDA 0,NDSKS
30 05776 143405             AND 2,0,SNR
31 05777 000775             JMP .-3
32 06000 001400             JMP 0,3
33
34                          ;SEEK SUBROUTINE
35                          ; CALL  SEEK                ;AC2 = UNIT
36                          ;       N                   ;CYL #
37                          ;       RETURN              ;AC1 = STATUS
38
39 06001 054420 .SK:        STA 3,SKRET
40 06002 126400             SUB 1,1
41 06003 020054             LDA 0,KB1
42 06004 151222             MOVZR 2,2,SZC
43 06005 000403             JMP .SK1
44 06006 107000             ADD 0,1
45 06007 000775             JMP .-3
46
47 06010 067033 .SK1:       DOC 1,DSKP          ;SELECT UNIT
48 06011 021400             LDA 0,0,3
49 06012 024070             LDA 1,KB6
50 06013 123000             ADD 1,0             ;SEEK + CYL #
51 06014 061333             DOAP 0,DSKP
52 06015 030167             LDA 2,C5
53 06016 006227             WAIT                ;WAIT 500MS (OR UNTIL DONE)
54 06017 010402             ISZ SKRET           ;AC1=STATUS
55 06020 002401             JMP @SKRET
56 06021 000000 SKRET:      0
```

```
A 00R4  .MAIN
01
02 06022 054426 .SET:   STA 3,LOOPR      ;ITERATE ONCE
03 06023 176520         SUBZL 3,3
04 06024 000406         JMP .SETUP+2
05
06 06025 054423 .SETP1: STA 3,LOOPR      ;ITERATE 5 TIMES
07 06026 034167         LDA 3,C5
08 06027 000403         JMP .SETUP+2
09
10 06030 054420 .SETUP: STA     3,LOOPR  ;ADDRESS OF TOP OF LOOP
11 06031 034407         LDA 3,ITR        ;THIS ROUTINE INITIALIZES
12 06032 054407         STA 3,ITRCT      ;EACH TEST
13 06033 176400         SUB 3,3
14 06034 054406         STA 3,ESWIT
15 06035 054406         STA 3,ERRCT
16 06036 062677         IORST            ;,I/O RESET
17 06037 002411         JMP @LOOPR
18
19 06040 000144 ITR:    144
20 06041 000000 ITRCT:  0
21 06042 000000 ESWIT:  0
22 06043 000000 ERRCT:  0
23 06044 000000 .RTRN:  0
24 06045 000000 SAV2:   0
25 06046 000000 SAV1:   0
26 06047 000000 SAV0:   0
27 06050 000000 LOOPR:  0
28 06051 000000 DSWT:   0
```

```
A 0005   .MAIN
01
02 06052 054772 .LUPD:   STA 3,.RTRN      ;INTRODUCE A SHORT
03 06053 034122          LDA 3,C37        ;DELAY IN THE LOOP
04 06054 054000          STA 3,0          ;ROUTINE TO ALLOW THE
05 06055 014000          DSZ 0            ;DISK CART. ATTENTION
06 06056 000777          JMP .-1          ;LINE TO COME UP
07 06057 000402          JMP .+2
08
09 06060 054764 .LOOP:   STA 3,.RTRN      ;END OF TEST ITERATION
10 06061 050764          STA 2,SAV2
11 06062 044764          STA 1,SAV1
12 06063 040764          STA 0,SAV0
13 06064 014755          DSZ ITRCT
14 06065 000430          JMP CYCTS        ;NOT 100 TIMES ITERATED
15 06066 034752          LDA 3,ITR        ;RESET ITERATION CNTR
16 06067 054752          STA 3,ITRCT
17 06070 034752          LDA     3,ESWIT
18 06071 175005          MOV     3,3,SNR
19 06072 002752          JMP     @.RTRN
20 06073 074477          READS 3
21 06074 175120          MOVZL 3,3
22 06075 175100          MOVL 3,3
23 06076 175103          MOVL 3,3,SNC
24 06077 000414          JMP PCENT+1
25 06100 006247          PCRLF            ;PRINT CARRIAGE
26 06101 024742          LDA 1,ERRCT
27 06102 030736          LDA 2,ITR
28 06103 004555          JSR MULT
29 06104 030734          LDA 2,ITR
30 06105 004537          JSR DIVD
31 06106 006511          JSR @IPDEC       ;PRINT VALUE
32 06107 020403          LDA 0,PCENT      ;EXAMPLE:  89%
33 06110 006506          JSR @ICHAR
34 06111 000402          JMP PCENT+1
```

```
A 0086  .MAIN
01
02 06112 000045 PCENT:  "%                      ;CHARACTOR
03 06113 176400         SUB     3,3
04 06114 034727         STA     3,ERRCT
05 06115 034725 CYCTS:  LDA 3,ESWIT
06 06116 175004         MOV 3,3,SZR
07 06117 000410         JMP CNS                 ;THERE HAS BEEN AN ERROR
08 06120 062677 CYC1:   IORST                   ;I/O RESET
09 06121 020726         LDA 0,SAV0              ;RESTORE ACS
10 06122 024724         LDA 1,SAV1
11 06123 030722         LDA 2,SAV2
12 06124 175113         MOVL# 3,3,SNC           ;SWITCH 0
13 06125 002723         JMP @LOOPR              ;(0)=LOOP ROUTINE
14 06126 002716         JMP @.RTRN              ;(1)=PROCEED TO NEXT TEST
15
16 06127 074477 CNS:    READS 3                 ;ERROR LOOP, IS A RECAL
17 06130 024073         LDA 1,KB3               ;REQUESTED ?
18 06131 137415         AND# 1,3,SNR
19 06132 000410         JMP CNS1                ;NO  GO-ON
20 06133 175300         MOVS 3,3                ;YES, ASSEMBLE THE
21 06134 024170         LDA 1,C6                ;UNIT # FROM SW5-6
22 06135 137620         ANDZR 1,3
23 06136 021513         LDA 0,TRCL,3
24 06137 040401         STA 0,.+1               ;PICK A RECAL
25 06140 006234         RECL3                   ;RECALIBRATE !!
26 06141 004533         JSR .DLY                ;DELAY 1 SEC
27
28 06142 074477 CNS1:   READS 3                 ;IF SW4=1 DELAY
29 06143 020072         LDA 0,KB4               ; 1 SEC.
30 06144 117404         AND 0,3,SZR
31 06145 004527         JSR .DLY
32 06146 034703         LDA 3,DSWT              ;FORCED 2 SEC DELAY ??
33 06147 175005         MOV 3,3,SNR
34 06150 000403         JMP .+3                 ;NO
35 06151 004523         JSR .DLY                ;YES,   1 SEC
36 06152 004522         JSR .DLY                ;       1 SEC
37 06153 074477         READS 3
38 06154 000744         JMP CYC1
39
```

```
A 0087   .MAIN
01
02 06155 054667 .EH1:   STA 3,.RTRN      ;ERR WITH FORCED 1 SEC DELAY
03 06156 176520         SUBZL 3,3
04 06157 000403         JMP .EH2
05 06160 054664 .EHALT: STA 3,.RTRN      ;ERROR SUBROUTINE
06 06161 176400         SUB 3,3          ;ERROR WITH NO DELAY FORCED
07 06162 054667 .EH2:   STA 3,DSWT       ;DELAY SWITCH
08 06163 034657         LDA 3,FSWIT
09 06164 175004         MOV 3,3,SZR
10 06165 000410         JMP FRET
11 06166 034656 ERR1:   LDA 3,.RTRN
12
13                      ;ERROR, C(3)=PC
14 06167 004433         JSR AUTOER       ;OPERATOR,SET SWITCHS!
15 06170 054652         STA 3,FSWIT
16 06171 074477         READS 3
17 06172 177112         ADDL# 3,3,SZC    ;LOOK AT SWITCH 1
18 06173 000402         JMP FRET
19 06174 004404         JSR FPRINT
20 06175 010646 FRET:   ISZ ERRCT
21 06176 002646         JMP @.RTRN
22 06177 002645         JMP @.RTRN
23
24 06200 054645 FPRINT: STA 3,SAV2
25 06201 040646         STA     0,SAV0
26 06202 044644         STA     1,SAV1
27 06203 006247         PCRLF            ;PRINT CARRIAGE
28 06204 006250         MESSAGE          ;AND HEADER
29 06205 006220         HEADER
30 06206 020636         LDA 0,.RTRN
31 06207 040633         STA     0,FSWIT
32 06210 126000         ADC 1,1
33 06211 107000         ADD 0,1
34 06212 004524         JSR POCT         ;PC OF ERROR
35 06213 020634         LDA     0,SAV0
36 06214 024632         LDA     1,SAV1
37 06215 002630         JMP @SAV2
38
39 06216 006417 TCHAR:  CHAR.
40 06217 006341 IPDEC:  PDEC
41
42              HEADER: .TXTE !
43 06220 141520 PC      !
   06221 000011
44
45 06222 054415 AUTOER: STA 3,.AA03
46 06223 044413         STA 1,.AA01
47 06224 024046         LDA 1,EGGS
48 06225 125004         MOV 1,1,SZR
49 06226 000405         JMP .+5
50 06227 024407         LDA 1,.AA01
51 06230 034614         LDA 3,.RTRN
52 06231 063077         HALT
53 06232 002405         JMP @.AA03
54 06233 004745         JSR EPRINT
55 06234 060277         INTDS
56 06235 002052         JMP @EGGS+4
57 06236 000000 .AA01:  0
58 06237 000000 .AA03:  0
```

0088 .MAIN

```
A 0089  .MAIN
01
02                      ;AC1 REM AC0=(AC0,AC1)/AC2
03 06240 102400 DIVIO:  SUB     0,0
04 06241 054431 DIVDO:  STA     3,MSAV
05 06242 142432         SUBZ#   2,0,SZC
06 06243 000413         JMP     DEXT
07 06244 054426 DIVD:   STA 3,MSAV      ;DIVIDE
08 06245 034426         LDA 3,M20
09 06246 125120         MOVZL 1,1
10 06247 101100 DLOOP:  MOVL 0,0
11 06250 142412         SUB# 2,0,SZC
12 06251 142400         SUB 2,0
13 06252 125100         MOVL 1,1
14 06253 175404         INC 3,3,SZR
15 06254 000773         JMP DLOOP
16 06255 176441         SUBO    3,3,SKP
17 06256 176420 DEXT:   SUBZ    3,3
18 06257 002413         JMP @MSAV
19
20                      ;(AC0,AC1)=AC1*AC2+AC0
21 06260 102460 MULT:   SUBC 0,0        ;MULTIPLY
22 06261 054411         STA 3,MSAV
23 06262 034411         LDA 3,M20
24 06263 125203 MLOOP:  MOVR 1,1,SNC
25 06264 101201         MOVR 0,0,SKP
26 06265 143220         ADDZR 2,0
27 06266 175404         INC 3,3,SZR
28 06267 000774         JMP MLOOP
29 06270 125260         MOVCR 1,1
30 06271 002401         JMP @MSAV
31 06272 000000 MSAV:   0
32
33 06273 177760 M20:    -20
34
35 06274 020172 .DLY:   LDA 0,C12       ;DELAY 1 SEC
36 06275 040164         STA 0,ITRCNT    ;10.X100MS
37 06276 020145 .DLY1:  LDA 0,TIME
38 06277 040144         STA 0,TEMP
39 06300 063700         SKPDZ 0         ;
40 06301 063077         HALT            ;
41 06302 060433         DIA 0,DSKP      ;
42 06303 103411         AND# 0,0,SKP    ; 100 MS
43 06304 063077         HALT            ; DELAY LOOP
44 06305 014144         DSZ TEMP        ;
45 06306 000772         JMP .-6         ;
46 06307 014164         DSZ ITRCNT
47 06310 000766         JMP .DLY1
48 06311 001400         JMP 0,3
```

```
A 0000   .MAIN
01                ;TTO NON INTERRUPT PACKAGE
02                ;"MESS" PRINTS ASCII MESSAGES AS SPECIFIED BY ASSEMBLR
03                ;"CHAR" PRINTS ASCII CHARACTOR, C(0)R,C(0)L MUST BE 0
04                ;WILL RETURN +2 IF C(0)R=0,CORRECTS THE PARITY,33 SIMULATE
05                ;"TYPE" PRINTS C(0)R. MUST HAVE PROPER PARITY. RETURN IS
06                ;TO CALL+1.REPLACE THIS ROUTINE WITH INTERRUPT TYPE IF DESIRED.
07                ;"CRLF" PRINTS A CARRIAGE RETURN
08                ;"POCT" PRINTS C(1) IN OCTAL FOLLOWED BY A TAB
09                ;"PDEC" PRINTS C(1) IN DECIMAL,LEADING ZEROS SUPPRESSED,
10                ;FOLLOWED BY A TAB.
11  06312 054570  MESS:   STA 3,MESSR      ;PRINT A TEXT MESSAGE
12  06313 070477          READS 2
13  06314 153102          ADDL 2,2,SZC      ;NO PRINT IF SW1=1
14  06315 001401          JMP 1,3
15  06316 010564          ISZ MESSR
16  06317 031400          LDA 2,0,3         ;C(2) POINTS TO MESSAGE
17  06320 024125          LDA 1,C377        ;A 8 BIT MASK
18  06321 021000  MES.1:  LDA 0,0,2         ;C(2)=DATA WORD
19  06322 125112          MOVL# 1,1,SZC
20  06323 123701          ANDS 1,0,SKP
21  06324 123401          AND 1,0,SKP       ;C(0)=DATA CHARACTOR RIGHT
22  06325 151400          INC 2,2           ;INC TO NEXT WORD
23  06326 124000          COM 1,1           ;FLIP MASK
24  06327 004470          JSR CHAR.         ;PRINT
25  06330 000771          JMP MES.1         ;ANOTHER
26  06331 063511          SKPBZ TTO
27  06332 000777          JMP .-1
28  06333 060211          NIOC TTO
29  06334 002546          JMP @MESSR        ;LAST
30
31  06335 102401  ZOCT:   SUB 0,0,SKP
32  06336 020200  POCT:   LDA 0,C60
33  06337 030437          LDA 2,OCTAB       ;PRINT C(1) IN OCTAL
34  06340 000403          JMP .+3
35  06341 030445  PDEC:   LDA 2,DECTB       ;PRINT C(1) IN DECIMAL
36  06342 102400          SUB 0,0
37  06343 054453          STA 3,RADRET      ;BOTH ENTRYS PRINT NUMBER
38  06344 074477          READS 3
39  06345 177102          ADDL 3,3,SZC      ;NO PRINT IF SW1=1
40  06346 002450          JMP @RADRET
41  06347 040446          STA 0,ZSUPP       ;THEN TAB TO NEXT POSITION
42  06350 050401          STA 2,.+1
43  06351 000000  DECOCT: 0                 ;A"LDA 2,TABLE" INSTRUCTION
44  06352 010777          ISZ .-1
45  06353 034443          LDA 3,RADRET      ;SETUP "TAB" AT END
46  06354 020516          LDA 0,CHTAB
47  06355 151005          MOV 2,2,SNR       ;IF TABLE ENTRY=0
48  06356 000441          JMP CHAR.         ;EXIT WITH TAB
49  06357 034436          LDA 3,ZSUPP       ;ZEROS SUPPRESS STUF
50  06360 102400          SUB 0,0
51  06361 146512  DECOT:  SUBL# 2,1,SZC
52  06362 000405          JMP DECP
53  06363 146400          SUB 2,1           ;FORM THE DIGIT
54  06364 034200          LDA 3,C60
55  06365 101400          INC 0,0
56  06366 000773          JMP DECOT
```

```
A 0001   .MAIN
01
02 06367 151235 DECP:   MOVZR# 2,2,SNR
03 06370 034200         LDA 3,C60
04 06371 054424         STA 3,ZSUPP      ;C(0)=DIGIT
05 06372 163000         ADD 3,0          ;MAKE ASCII
06 06373 175004         MOV 3,3,SZR
07 06374 004423         JSR CHAR.        ;PRINT
08 06375 000754         JMP DECOCT       ;GET NEXT DIGIT
09
10
11 06376 030426 OCTAB:  LDA 2,.+1+.-DECOCT
12 06377 100000         100000
13 06400 010000         10000
14 06401 001000         1000
15 06402 000100         100
16 06403 000010         10
17 06404 000001         1
18 06405 000000         0
19
20 06406 030436 DECTB:  LDA 2,.+1+.-DECOCT
21       000012 .RDX 10
22 06407 023420         10000
23 06410 001750         1000
24 06411 000144         100
25 06412 000012         10
26 06413 000001         1
27 06414 000000         0
28       000010 .RDX 8
29
30 06415 000000 ZSUPP:  0
31 06416 000000 RADRET: 0
```

```
A 0002   .MAIN
01
02 06417 054454 CHAR.:  STA 3,CHRET      !PRINT C(0) RIGHT
03 06420 101325         MOVZS 0,0,SNR    !RETURN +2 IF NULL
04 06421 001401         JMP 1,3
05 06422 040452         STA 0,CHSAV
06 06423 176000         ADC 3,3          !COMPUTE THE PARITY
07 06424 117000         ADD 0,3
08 06425 163404         AND 3,0,SZR
09 06426 000775         JMP .-3
10 06427 176660         SUBCR 3,3        !COMBIND PARITY WITH CHAR
11 06430 020444         LDA 0,CHSAV
12 06431 163300         ADDS 3,0
13
14 06432 034440 CHAR1:  LDA 3,CHTAB      !IS THIS A TAB
15 06433 116415         SUB# 0,3,SNR
16 06434 000407         JMP .+7          !YES
17 06435 004446         JSR TYPE         !NO PRINT IT
18 06436 000413         JMP CHAR2+1      !EXIT
19
20 06437 020436         LDA 0,CHORZ      !SIMULATE A TAB
21 06440 034432         LDA 3,CHTAB      !VIA 1 TO 9 SPACES
22 06441 162426         SUBZ 3,0,SEZ
23 06442 000777         JMP .-1
24 06443 101005         MOV 0,0,SNR
25 06444 000404         JMP CHAR2
26 06445 020431         LDA 0,CH240
27 06446 004435         JSR TYPE
28 06447 000770         JMP .-10
29 06450 040425 CHAR2:  STA 0,CHORZ
30 06451 063511         SKPBZ TTO
31 06452 000777         JMP .-1
32 06453 060211         NIOC TTO
33 06454 002417         JMP @CHRET
```

```
A 0003   .MAIN
01
02 06455 050477 CRLF:   READS 0
03 06456 103102         ADDL 0,0,SZC     ;NO PRINT IF SW1=1
04 06457 001400         JMP 0,3
05 06460 054417         STA 3,CRLFR      ;SAVE RETURN
06 06461 020417         LDA 0,C215
07 06462 004735         JSR CHAR.        ;PRINT CARRIAGE AND LF
08 06463 020416         LDA 0,C212
09 06464 004733         JSR CHAR.
10 06465 020125         LDA 0,C377       ;PRINT RUB
11 06466 004731         JSR CHAR.
12 06467 102400         SUB 0,0
13 06470 040405         STA 0,CHORZ      ;CLEAR HORZ POSISTION
14 06471 002406         JMP @CRLFR       ;EXIT
15
16 06472 000011 CHTAR:  11
17 06473 000000 CHRET:  0
18 06474 000000 CHSAV:  0
19 06475 000000 CHORZ:  0
20 06476 000240 CH240:  240
21 06477 000000 CRLFR:  0
22 06500 000215 C215:   215
23 06501 000212 C212:   212
24
25 06502 000000 MESSR:  0
26 06503 054406 TYPE:   STA 3,TYPRET     ;TYPE THE C(0)R IF
27 06504 010771         ISZ CHORZ
28 06505 063511         SKPBZ TTO
29 06506 000777         JMP .-1
30 06507 061111         DOAS 0,TTO
31 06510 002401         JMP @TYPRET
32 06511 000000 TYPRET: 0
```

```
A 0094  .MAIN
01
02                              !TYPE   0 FOR CARTRIDGE
03                      MSG1:   .TXTE !TYPE     0 FOR CARTRIDGE!
    06512 054724
    06513 142520
    06514 030011
    06515 143240
    06516 151317
    06517 141640
    06520 151101
    06521 151324
    06522 042311
    06523 142507
    06524 000000
04                              !       1 FOR 10 SURFACE DISK PACK
05                      MSG2:   .TXTE ! 1 FOR 10 SURFACE DISK PACK!
    06525 130411
    06526 143240
    06527 151317
    06530 130640
    06531 120060
    06532 052523
    06533 143322
    06534 141501
    06535 120305
    06536 144504
    06537 045523
    06540 050240
    06541 141501
    06542 000113
06                              !       2 FOR 20 SURFACE DISK PACK
07                      MSG3:   .TXTE ! 2 FOR 20 SURFACE DISK PACK!
    06543 131011
    06544 143240
    06545 151317
    06546 131240
    06547 120060
    06550 052523
    06551 143322
    06552 141501
    06553 120305
    06554 144504
    06555 045523
    06556 050240
    06557 141501
    06560 000113
08                              ! -?-
09                      MSG4:   .TXTE ! -?-!
    06561 026640
    06562 026477
    06563 000000
10                              !TYPE UNIT NUMBERS (0-3) TO TEST
11                      MSG5:   .TXTE !TYPE UNIT NUMBERS (0-3) TO TEST!
    06564 054724
    06565 142520
    06566 052640
    06567 144516
    06570 120324
    06571 052516
```

```
0005   .MAIN
 06572 041115
 06573 151305
 06574 120123
 06575 030050
 06576 031455
 06577 120251
 06600 147724
 06601 152240
 06602 051705
 06603 000324
01                          !PASS
02                  MSG6:   .TXTE !PASS!
 06604 040520
 06605 051523
 06606 000000
03
04
05 06607 000000 PRGEND: 0
06
07        006700            .LOC 6700
08                          .TXTE  !DKP DIAG 1!
 06700 045504
 06701 120120
 06702 144504
 06703 043501
 06704 130540
 06705 000000
09 06706 000002            000002
10 06707 000222            BEGIN
11 06710 000001            000001
12 06711 000000            000000
13 06712 000020            000020
14 06713 000000            000000
15 06714 000000            000000
16 06715 100033            100033
17
18                          .END
```

A0	000412	7/10	7/14	70/14
A1	000434	8/02		
A10	000511	9/10		
A11	000517	9/17		
A12	000526	9/25		
A13	000536	9/34		
A14	000546	9/43		
A15	000555	9/51		
A16	000564	10/02		
A17	000573	10/10		
A18	000602	10/18		
A19	000611	10/26		
A2	000440	8/07		
A20	000620	10/34		
A21	000627	10/42		
A22	000636	11/02		
A23	000645	11/10		
A24	000653	11/17		
A25	000662	11/25		
A26	000671	11/33		
A27	000700	11/41		
A28	000707	12/02		
A29	000716	12/10		
A3	000444	8/12		
A30	000725	12/18		
A31	000734	12/26		
A32	000743	12/34		
A33	000752	12/42		
A34	000761	13/02		
A35	000770	13/10		
A36	000777	13/18		
A37	001006	13/26		
A38	001015	13/34		
A39	001024	13/42		
A4	000450	8/17		
A40	001033	14/02		
A41	001042	14/10		
A42	001051	14/18		
A43	001060	14/26		
A44	001067	14/34		
A45	001076	14/42		
A46	001105	15/02		
A47	001114	15/10		
A48	001123	15/18		
A49	001132	15/26		
A5	000454	8/22		
A50	001141	15/34		
A51	001150	15/42		
A52	001157	16/02		
A53	001166	16/10		
A54	001175	16/18		
A55	001204	16/26		
A56	001213	16/34		
A57	001222	16/42		
A58	001231	17/02		
A59	001240	17/10		
A6	000461	8/28		
A60	001247	17/18		
A61	001256	17/26		

A62	001265	17/34				
A63	001274	17/42				
A64	001303	18/02				
A65	001312	18/10				
A66	001321	18/18				
A67	001330	18/26				
A68	001337	18/34				
A69	001346	18/42				
A7	000466	8/34				
A70	001355	19/02				
A71	001364	19/10				
A72	001373	19/18				
A73	001402	19/26				
A74	001411	19/34				
A75	001420	19/42				
A76	001427	20/02				
A77	001436	20/10				
A78	001445	20/18				
A79	001456	20/28				
A8	000473	8/40				
A80	001466	20/37				
A81	001501	21/02				
A82	001514	21/14				
A83	001527	21/26				
A84	001542	21/38				
A85	001555	22/02				
A86	001570	22/14				
A87	001603	22/26				
A9	000502	9/02				
ADR	004667	62/27	63/28	63/40		
ADR1	005002	64/03	65/03	65/42		
ALT0	005435	52/09	76/15			
ALT1	005433	51/37	76/12			
AUTOF	006222	87/14	87/45			
A.	000410	7/06	7/11			
B1	001616	22/38				
B10	001735	24/22				
B11	001751	24/35				
B12	001765	25/02				
B13	002001	25/15				
B14	002012	25/25				
B15	002023	25/35				
B16	002034	26/02				
B17	002045	26/12				
B18	002056	26/14	26/22			
B19	002070	26/25	26/33			
B1.1	001622	22/39	22/42	22/47	22/48	22/55
B1.2	001627	22/47	22/54			
B2	001640	22/51	23/02			
B20	002102	26/36	27/02			
B21	002114	27/05	27/13			
B22	002130	27/19	27/27			
B23	002142	27/30	28/02			
B24	002154	28/05	28/13			
B25	002166	28/16	28/24			
B26	002204	28/30	28/40			
B27	002220	28/43	29/02			
B28	002234	29/05	29/15			
B29	002250	29/18	29/28			

D12	003143	40/02							
D13	003162	40/18							
D14	003201	40/34							
D15	003220	41/02							
D16	003237	41/18							
D17	003256	41/34							
D18	003275	42/02							
D19	003313	42/18							
D2	002712	36/21							
D20	003332	43/02							
D21	003346	43/15							
D22	003365	43/31							
D23	003405	44/02							
D24	003424	44/18							
D25	003444	44/35							
D26	003466	45/02							
D27	003510	45/21							
D28	003532	45/40							
D29	003551	46/02							
D3	002734	37/02							
D30	003576	46/24							
D31	003623	47/02							
D32	003645	47/21							
D33	003723	47/45	48/02						
D34	003722	48/18							
D35	003742	48/35							
D36	003762	49/02							
D37	004000	49/17							
D4	002753	37/18							
D5	002772	37/34							
D6	003011	38/02							
D7	003030	38/18							
D8	003047	38/34							
D9	003066	39/02							
DAD1	003677	47/23	47/48						
DAD4	003702	47/40	47/51						
DECDC	006351	90/43	91/08	91/11	91/20				
DECDT	006361	90/51	90/56						
DECP	006367	90/52	91/02						
DECTR	006406	90/35	91/20						
DEXT	006256	89/06	89/17						
DIVD	006244	85/30	89/07						
DIVDO	006241	89/04							
DIVIO	006240	89/03							
DLOOP	006247	89/10	89/15						
DORW	006253	6/55	67/02	67/07	68/02	68/07	69/07		
DOSEK	006261	6/54	50/03	50/31	51/03	51/31	52/03	53/05	55/07
		55/34	56/08	56/35	57/30	58/07	59/13	60/13	62/07
		63/07	64/15	65/15	66/03	66/16	66/29	69/21	82/19
DPTO	000162	4/39	79/13						
DRWRF	005756	82/09	82/46	82/49					
DSWT	006051	84/28	86/32	87/07					
DTYPF	000150	4/29	7/07	7/12	46/06	46/36	47/22	49/17	57/49
		58/27	59/02	60/02	62/26	63/27	64/02	65/02	77/35
E1	004020	49/19	50/02						
E10	004340	56/32	56/54						
E10E	004357	56/38	56/43	56/49					
E10.1	004342	56/31	56/36	56/45	56/50	56/52			
E10.2	004346	56/40	56/44						

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0101  .MAIN

E11       004371    57/29    57/54
E11E      004406    57/33    57/42
E11.1     004403    57/28    57/39    57/45    57/48
E12       004426    58/06    58/32
E12E      004444    58/10    58/15    58/20
E12.1     004434    58/12    58/17
E12.2     004435    58/05    58/13    58/23    58/26
E13       004472    59/12    59/34
E13E      004507    59/16    59/25
E13.1     004504    59/06    59/22    59/29    59/32
E14       004532    60/12    60/36
E14E      004551    60/16    60/21    60/27
E14.1     004540    60/18    60/24
E14.2     004541    60/06    60/19    60/31    60/34
E15       004566    62/06    62/35
E15E      004603    62/10    62/19
E15.1     004600    62/05    62/16    62/22    62/25
E16       004627    63/06    63/36
E16E      004645    63/10    63/15    63/20
E16.1     004635    63/12    63/17
E16.2     004636    63/05    63/13    63/23    63/26
E17       004706    64/14    64/36
E17E      004723    64/18    64/27
E17.1     004720    64/10    64/24    64/31    64/34
E18       004750    65/14    65/38
E18E      004767    65/18    65/23    65/29
E18.1     004766    65/20    65/26
E18.2     004757    65/10    65/21    65/33    65/36
E19       005005    65/39    66/02
F1F       004046    50/06    50/16    50/22    50/28
E2        004047    50/30
E20       005020    66/15
E21       005033    66/28
E22       005046    67/02
E22E      005105    67/18    67/24    67/34    67/40
E23       005106    68/02
E23E      005145    68/22    68/28    68/34    68/40
E24       005146    69/02
E24E      005234    69/24    69/30    69/36
E2F       004075    50/34    50/44    50/50    50/56
E3        004076    51/02
E3E       004124    51/06    51/16    51/22    51/28
E4        004125    51/30
E4F       004153    51/34    51/44    51/50    51/56
E5        004154    52/02
E5F       004202    52/06    52/16    52/22    52/28
E6        004205    53/04
E6F       004235    53/08    53/20    53/26    53/32
E7        004240    55/04    55/24
E7F       004255    55/10    55/19
E7.1      004242    55/03    55/08    55/20    55/21
E8        004265    55/31    55/52
E8F       004303    55/37    55/42    55/47
E8.1      004267    55/30    55/35    55/44    55/48    55/49
E8.2      004273    55/39    55/43
E9        004313    56/04    56/25
F9E       004330    56/11    56/20
E9.1      004315    56/03    56/09    56/21    56/23
EGGS      000046     3/12     3/13     5/35     7/04    79/25    87/47    87/56
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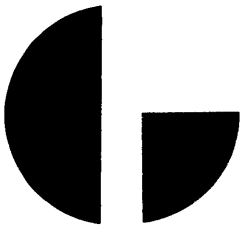

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