```
.REM &
```

IDENTIFICATION

PRODUCT CODE:	AC-E512C-MC
PRODUCT NAME:	CZRXDC0 RX02 SS PERF EXER
PRODUCT DATE:	29-MAR-82
MAINTAINER:	S.S.S.T.A.
AUTHOR:	L. S. PRUCHA

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1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

THIS PROGRAM EXERCISES TWO RX02 SUBSYSTEMS (FOUR DRIVES), MAINTAINS DRIVE STATISTICS AND PROVIDES RUN SUMMARIES SO THAT SEEK AND DATA ERROR RATES MAY BE DETERMINED. THE PERFORMANCE EXERCISER WILL GIVE THE USER CONFIDENCE, AFTER RUNNING SUCCESSFULLY, THAT THE SYSTEM IS PERFORMING WITHIN SPECIFICATION.

1.2 SYSTEM REQUIREMENTS

1.2.1 HARDWARE REQUIREMENTS

PDP-11/LSI-11 PROCESSOR WITH 16K OR MORE OF MEMORY
CONSOLE DEVICE (LA30, LA36, VT50, ETC.)

1.2.2 SOFTWARE REQUIREMENTS

THIS DIAGNOSTIC IS DESIGNED TO RUN WITH THE DIAGNOSTIC SUPERVISOR AS DESCRIBED IN PARAGRAPH 2.0.

1.3 RELATED DOCUMENTS AND STANDARDS

XXDP+ SUPERVISOR/USERS MANUAL CHQUS

1.4 DIAGNOSTIC HIERARCY PREREQUISITES

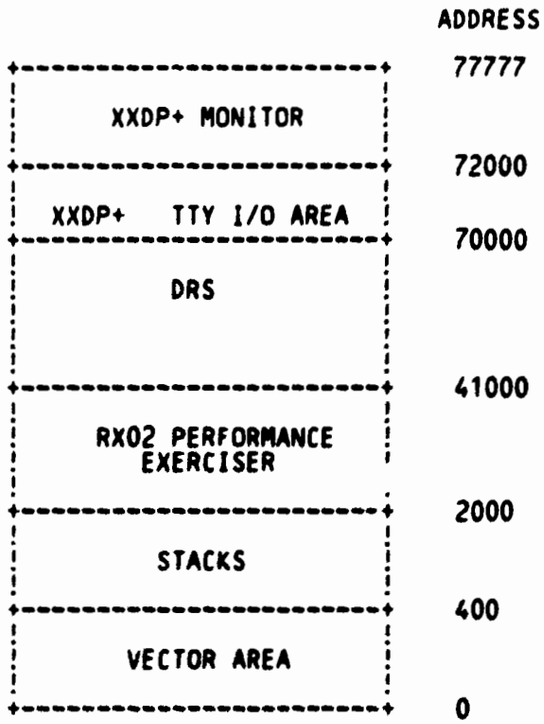
NONE

1.5 ASSUMPTIONS

THE HARDWARE OTHER THAN THE SUBSYSTEM BEING TESTED IS ASSUMED TO WORK PROPERLY. FALSE ERRORS MAY BE REPORTED IF THE PROCESSOR, MEMORY, ETC., DO NOT FUNCTION PROPERLY.

1.6 MEMORY MAP

MEMORY LAYOUT ON 16K MACHINE - XXDP ENVIRONMENT



IN A MACHINE WITH MORE MEMORY FREE SPACE WILL OCCUR BETWEEN THE DIAGNOSTIC AND THE DRS.

2.0 OPERATING INSTRUCTIONS

THIS IS A REV C SUPERVISOR DIAGNOSTIC: FOR OPERATING INSTRUCTIONS, PLEASE SEE CHAPTER 5 OF XXDP+ OPERATOR'S MANUAL. THEY ARE NO LONGER INCLUDED IN THE DIAGNOSTIC LISTING BECAUSE IT IS DESIRED THAT A CHANGE IN THOSE INSTRUCTIONS NOT REQUIRE A RE-ASSEMBLY OF ALL SUPERVISOR DIAGNOSTICS.

2.1 HARDWARE QUESTIONS

THE FOLLOWING SERIES OF QUESTIONS COMPRISE THE PARAMETERS NECESSARY TO IDENTIFY EACH FLOPPY DISK SUBSYSTEM.

RX BUS ADR -
THIS PARAMETER DEFINES THE BASE BUS ADDRESS FOR THE FLOPPY DISK SUBSYSTEM.

VECTOR ADR -
THIS PARAMETER DEFINES THE INTERRUPT VECTOR ADDRESS FOR THE FLOPPY DISK SUBSYSTEM INTERFACE.

DRIVE # -
THIS PARAMETER DEFINES THE FLOPPY DISK SUBSYSTEM DRIVE NUMBER (0 - 1).

EXP WRD-TYPE -
THIS PARAMETER IS TO BE USED FOR FUTURE EXPANSION. TYPE A CARRIAGE RETURN.

2.2 SOFTWARE QUESTIONS

EXERCISE # - ENTER # FROM TABLE SHOWN IN PARAGRAPH 6.3.

DATA PATTERN # - ENTER # FROM TABLE SHOWN IN PARAGRAPH 6.2.

TRACK SEQUENCE # - ENTER # FROM TABLE SHOWN IN PARAGRAPH 6.4.

DEVICE FATAL THRESHOLD LEVEL -
THE DEVICE FATAL THRESHOLD LEVEL (DFTL) IS INITIALLY SET=1.
THIS THRESHOLD LEVEL EQUALS THE # OF HARD ERRORS THAT
WILL CAUSE A DEVICE FATAL ERROR WHEN THE DRS "EVL" FLAG
IS SET. THE "EVL" FLAG WILL ALSO CAUSE 10 SOFT ERRORS
TO BE RECLASSIFIED A HARD ERROR, WHICH IF DFTL = 1 WILL
BECOME A DEVICE FATAL ERROR.

RUN TEST IN DOUBLE DENSITY -
IF TEST IS IN WRONG DENSITY - OPERATOR WILL BE ASKED IF
THE DISKETTE IS TO BE REFORMATTED.

RUN TEST IN DELETED DATA MODE -
IF ANSWERED YES, DELETED DATA MODE WILL BE DONE FIRST.

ANY PROGRAM CONTROL FLAGS -
IF ANSWERS YES THE FOLLOWING QUESTIONS WILL BE ASKED.
- RETRY ON ERROR, LOG SOFT + HARD ERRORS?
- IF RETRY IS NOT SET, THEN SOFT ERRORS
- WILL ALSO LOG AS HARD ERRORS.
- RECALIBRATE ON SEEK ERRORS?
- PRINT ONLY 10 DATA ERRORS + CONTINUE?
- CLEAR STATISTICAL TABLES BEFORE NEXT PASS?

MODIFY TRACK ADDRESS LIMITS -
IF ANSWERING YES, THEN THE FOLLOWING WILL BE ASKED:
- OUTER DIAMETER ADR #?
- INNER DIAMETER ADR #?

MODIFY SECTOR ADDRESS LIMITS -
IF ANSWERING YES, THEN THE FOLLOWING WILL BE ASKED:
- MIN. SECTOR ADR #?
- MAX. SECTOR ADR #?

RXXX EXPANSION <CR>
THIS WORD IS FOR FUTURE EXPANSION, ANSWER WITH A
CARRIAGE RETURN.

2.3 TIMING CONSIDERATIONS

TEST EFFICIENCY CAN BE IMPROVED WHEN RUNNING ON A LSI
PROCESSOR AS FOLLOWS:

11/03	CHANGE LOC 23706 FROM 3 TO 7	SAVES 33 MIN/PASS
11/23	CHANGE LOC 23706 FROM 3 TO 5	SAVES 30 MIN/PASS

THESE PATCHES OPTIMIZE THE INTERLEAVE FACTOR

3.0 ERROR INFORMATION

THIS PROGRAM HAS FOUR TYPES OF ERROR CLASSIFICATIONS; SYSTEM FATAL, DEVICE FATAL, HARD AND SOFT.

SYSTEM FATAL ERRORS

SYSTEM FATAL ERRORS ARE USED TO INDICATE THAT AN ERROR WAS DETECTED BY THE DIAGNOSTIC SUPERVISOR IN RELATION TO LOADING/ CONTROLLING THE DIAGNOSTIC PROCESS.

THE CONTENT OF EACH ERROR IS SUCH THAT IT SHOULD BE SELF - EXPLANATORY. HOWEVER, THE MESSAGES UTILIZE SOME TERMS THAT ARE SPECIFIC TO THE FLOPPY DISK SUBSYSTEM, AND MAY REQUIRE SOME GETTING USE TO.

DEVICE FATAL ERRORS

DEVICE FATAL ERRORS ARE A RESULT OF:

1. REACHING A DEVICE FATAL THRESHOLD LEVEL ("DFTL"). AN "DFTL" =1 WILL CAUSE 1 HARD ERROR TO BE CLASSIFIED A DEVICE FATAL ERROR. THIS LEVEL IS INITIALLY SET=1, BUT MAY BE MODIFIED BY THE OPERATOR.

2. AN ERROR THAT IS CONSIDERED FATAL TO THE DEVICE, BUT TEST.MG WILL CONTINUE.

HARD ERRORS

HARD ERRORS ARE A RESULT OF:

1. TEN RETRIES OF A SOFT ERROR OR
2. A NON-RECOVERABLE ERROR

SOFT ERRORS

SOFT ERRORS ARE MEDIA RELATED ERRORS AND IF RETRY ON ERROR IS SET WILL BE TRIED UP TO TEN TIMES THEN CLASSIFIED AS HARD ERRORS.

IF RETRY ON ERROR IS NOT SET THE ERROR WILL BE LOGGED AS BOTH SOFT AND HARD ERRORS.

3.1 WRITE ERROR

A WRITE ERROR IS AN ERROR WHICH OCCURRED DURING EXECUTION OF A WRITE FUNCTION.

READ ERROR

A READ ERROR IS AN ERROR WHICH OCCURRED DURING EXECUTION OF A READ FUNCTION.

3.2 CRC ERROR

THIS ERROR IS DETECTED BY THE DRIVE DURING A READ OPERATION AND ALSO BY THE PROGRAM IF A DATA CHECK IS PERFORMED.

3.3 NO CRC ERROR BUT DATA ERROR - BAD CRC

3.4 CRC ERROR BUT NO DATA ERROR - BAD CRC

THE ABOVE TWO ERRORS ARE DETECTED WHEN THE PROGRAM IS VERIFYING THE DATA READ OFF THE DISKETTE AGAINST THE DATA THAT SHOULD HAVE BEEN READ.

THE DATA PATTERNS WILL BE FORMATTED FOR DOUBLE DENSITY (SINGLE DENSITY) AS SHOWN.

BYTE #
- 0 <TRACK ADDRESS BITS 6 - 0>
- 1 <SECTOR ADDRESS BITS 4 - 0>
- 2 - 253 (125) CONTAIN SELECTED PATTERN.

- 254(126) <THE SUM OF ALL BYTES 0 - 253(125)>
- 255(127) <THE NEGATIVE OF 2 TIMES BYTE 254(126)>

3.5 SEEK ERROR

A SEEK ERROR CAN BE DETECTED VIA BYTE #0 IF A CRC, DATA, CHECKSUM ERROR HAS NOT OCCURRED. ALSO THE DRIVE MAY DETECT A SEEK ERROR IF THE DISKETTE HEADER IS NOT RECOGNIZED OR COULD NOT BE FOUND. A PROGRAMMED RECALIBRATE IS ISSUED TO TRY TO CORRECT EACH SEEK ERROR, IF SELECTED DURING PROGRAM DIALOG.

3.6 CHECKSUM ERROR

THE PROGRAM WILL DETECT A CHECKSUM ERROR BY SUMMING ALL THE DATA READ FROM THE DISKETTE AND COMPARING THAT SUM WITH THE CHECKSUM BYTES. A CHECKSUM ERROR RESULTS FROM AN INCORRECT TRANSFER OF DATA INTERNAL TO THE RXV211 RX21/RX02 SUBSYSTEM.

3.7 ERROR NUMBERS

ERROR	- TYPE	- ERR #
SEEK	- SOFT	- 0 -32
CRC	- SOFT	- 1 -33
CKSUM	- HARD	- -34
DATA	- SOFT	- 3 -35
DEL. DATA UNEX	- HARD	- -37
DEL. DATA MISSING	- HARD	- -38
UNK ERR	- HARD	- -40
FILL/EMPTY BUFFER	- HARD	- -41
READ	- SOFT	- 10-42
WRITE	- SOFT	- 11-43
INTER-BUT NO DONE	- HARD	- -44
DONE-BUT NO INTER	- HARD	- -45
ERR-BUT NO ERR BIT	- HARD	- -46
ERR BIT SET	- HARD	- -47
NO DONE ON INIT	- SYS FATAL	- 128
NO DONE ON FUNCTION	- DEV FATAL	- 65
NO DRIVE RDY	- DEV FATAL	- 66
NO SIDE RDY	- DEV FATAL	- 67
NO DONE AFTER RD STA	- DEV FATAL	- 68
WRG DRV RESPOND	- SYS FATAL	- 133
WRG SIDE RESPOND	- SYS FATAL	- 134
DISKETT WRG DEN	- DEV FATAL	- 73
DENSITY ERR	- DEV FATAL	- 74
T.O. ON "TR" OR "DONE"	- SYS FATAL	- 139
SYS ERR	- SYS FATAL	- 140
INITIALIZE ERROR	- DEV FATAL	- 200
ADDRESSING ERROR	- SYS FATAL	- 400

NOTES:
1. SOFT ERRORS HAVE TWO ERROR NUMBERS:
   LOW # = SOFT ERROR
   HIGH # = HARD ERROR (RECLASSIFIED SOFT ERROR)

2. IF "EVL" FLAG IS SET HARD ERRORS WILL BE RE-CLASSIFIED DEVICE FATAL ERRORS, BUT THE ERROR NUMBER WILL REFLECT THE ORIGINAL HARD ERROR.

4.0 PERFORMANCE AND PROGRESS REPORTS

AT THE END OF EACH PASS A STATISTICAL REPORT WILL BE PRINTED OUT OF ALL ACCUMULATED ERRORS.

5.0 DEVICE INFORMATION TABLES

RX02 REGISTER BITS

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
RXCS:	ERR	INT	XM	XM	RX2			SID	DEN	TR	IE	DON	DRV	FUN	FUN	FUN	GO
RXWC:	X	X	X	X	X	X	X	X	WORD COUNT								
RXBA:	BUS ADDRESS																
RXES:	X	X	X	X	NXM	WC OVF	SID #1	DRV #1	DRV RDY	DEL DAT	DSK DEN	DEN ERR	AC LOW	INT DON	SID RDY	CRC	
RXTA:	X	X	X	X	X	X	X	X	0	TRACK ADDRESS							
RXSA:	X	X	X	X	X	X	X	X	0	0	0	SECTOR ADDRESS					
RXDB:	DATA BUFFER																

READ ERROR CODE REGISTERS - (SEE LABLE "XERUU:")

WORD	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
#1	WORD COUNT							ERROR CODE								
#2	CURRENT TRACK DRV #1							CURRENT TRACK DRIVE #0								
#3	TARGET SECTOR							TARGET TRACK								
#4	BAD TRACK-ONLY VALID IF ERRCODE=150							UNT SEL	DV1 DEN	HD LD	DVO DEN	X	X	X	LCD DEN	

5.2 DEVICE PROTOCOL

RX02 FUNCTIONAL PROCESS

FUNCTION CODE BIT # 3 2 1	FUNCTION	PROCEDURE (PROTOCOL)
0 0 0	FILL BUFFER	FUNCTION WORD --->TR--->WC--->TR--->BA--->DONE
0 0 1	EMPTY BUFFER	FUNCTION WORD --->TR--->WC--->TR--->BA--->DONE
0 1 0	WRITE SECTOR	FUNCTION WORD --->TR--->SA--->TR--->TA--->DONE
0 1 1	READ SECTOR	FUNCTION WORD --->TR--->SA--->TR--->TA--->DONE
1 0 0	SET DENSITY	FUNCTION WORD --->TR--->VW--->DONE
1 0 1	READ MAINT. STATUS	FUNCTION WORD --->DONE
1 1 0	WRITE SECTOR WITH DELETED DATA	FUNCTION WORD --->TR--->SA--->TR--->TA--->DONE
1 1 1	READ ERROR CODE	FUNCTION WORD --->TR--->BA--->DONE

TR = WAIT FOR TR BIT
DONE = WAIT FOR DONE BIT
BA = BUS ADDRESS (OUTPUT TO RX)
VW = VERIFICATION WORD (OUTPUT TO RX)
WC = WORD COUNT (OUTPUT TO RX)
SA = SECTOR ADDRESS (OUTPUT TO RX)
TA = TRACK ADDRESS (OUTPUT TO RX)

6.0 TEST SUMMARIES

6.1 UNIT/DRIVE SELECTION

UNIT AND DRIVE SELECTION WILL BE ACCOMPLISHED BY MODIFYING HARDWARE P-TABLES DURING A START DIALOG.

6.2 DATA PATTERNS

AVAILABLE DATA PATTERNS ARE SELECTED BY MODIFYING THE SOFTWARE P-TABLE DURING START OR RESTART DIALOG. DATA PATTERNS AVAILABLE ARE:

0 = DEFAULT TO 7
1 = ZEROS
2 = ONES
3 = FLOATING ZERO
4 = FLOATING ONE
5 = 125
6 = 333
7 = RANDOM

6.3 EXERCISE OPTIONS

AVAILABLE EXERCISES ARE SELECTED BY MODIFYING THE SOFTWARE P-TABLE DURING A START OR RESTART DIALOG. EXERCISES AVAILABLE ARE:

0 = DEFAULT TO 7
1 = WRITE ONLY
2 = WRITE/READ
3 = WRITE/READ/DATA CHECK
4 = READ/DATA CHECK ONLY
5 = READ ONLY (CRC CHECK)
6 = WRITE/READ/DATA CHECK ON ALTERNATING DRIVES (*)
7 = WRITE/READ/DATA CHECK +/READ/DATA CHECK (**)

(*) TEST 6 WRITES THEN READ CHECKS ANY SELECTED DATA PATTERN USING ANY TRACK SEQUENCE, BUT ONE TRACK AT A TIME. FIRST ON DRIVE 0 THEN DRIVE WHEN BOTH UNIES HAVE ACCESSED THAT TRACK, IT GOES BACK TO UNIT 0 FOR THE NEXT TRACK, ETC.

(**) THE FIRST HALF OF TEST 7 FORCES THE TRACK SEQUENCE TO INCREMENT UP THROUGH ALL TRACKS DOING WRITE/READ/DATA CHECK FUNCTIONS. THIS VERIFIES THAT ALL TRACKS ARE ACCESSABLE. THE SECOND HALF OF THE PASS WILL USE THE SEQUENCE SELECTED BY THE OPERATOR AS INDICATED BELOW, AND ONLY READ AND CHECK THE DATA JUST WRITTEN. THIS VERIFIES THAT THE DATA CAN BE READ FROM A TRACK AFTER THE HEAD HAS BEEN MOVED AWAY FROM AND BACK TO THAT TRACK. AT THE COMPLETION OF THE PASS THE DELETED DATA BIT IN TEST CONDITIONS IS COMPLEMENTED AND THE NEXT PASS WILL BE RUN UNDER THIS NEW CONDITION.

6.4 TRACK SEQUENCING

TRACK SEQUENCE OR TYPE OF HEAD MOVEMENT MAY BE SELECTED BY MODIFYING THE SOFTWARE P-TABLE OF THE DIAGNOSTIC SUPERVISOR. TRACK SEQUENCES AVAILABLE FOR SELECTION ARE:

0 = DEFAULT TO 7
1 = INCREMENT O.D. UP TO I.D.
2 = DECREMENT I.D. DOWN TO O.D.
3 = INCREMENT O.D., THEN DECREMENT I.D.
4 = BOUNCE BETWEEN O.D. AND I.D.
5 = BOUNCE BETWEEN DECREASING I.D. AND INCREASING O.D.
6 = BOUNCE BETWEEN O.D. AND DECREASING I.D.
7 = RANDOM

O.D. = OUTSIDE DIAMETER (TRACK)
I.D. = INSIDE DIAMETER (TRACK)

6.5 SECTOR/TRACK ADDRESSING

IT WILL BE POSSIBLE TO TEST THE DISKETTES BETWEEN TRACK AND SECTOR ADDRESS LIMITS OTHER THAN BETWEEN THE NORMAL OUTER DIAMETER (OD) AND INNER DIAMETER (ID) TRACK ADDRESSES, AND/OR MINIMUM (FIRST) AND MAXIMUM (LAST) SECTOR ADDRESS, BY MODIFYING THE SOFTWARE P-TABLE DURING A START OR RESTART DIALOG.

6.6 DISKETTE DENSITY

ALL TESTS WILL RUN AT DOUBLE DENSITY UNLESS SELECTED AS SINGLE DENSITY DURING A START OR RESTART DIALOG.

6.7 PROGRAM CONTROL

BEHAVIOR OF THE PERFORMANCE EXERCISOR MAYBE MODIFIED BY USE OF THE FOLLOWING PROGRAM CONTROLS:

1.	HALT ON ERROR	PROVIDED BY SUPERVISOR
2.	HALT AT END OF PASS	PROVIDED BY SUPERVISOR
3.	DON'T PRINT ERROR MESSAGE	PROVIDED BY SUPERVISOR
4.	RETRY ON ERROR. LOG HARD/SOFT ERRORS	SOFTWARE P-TABLE
5.	RECALIBRATE ON SEEK ERRORS	SOFTWARE P-TABLE

7.0 LISTING INDEX

7.1 LISTING

&

```
768                     .DSABL  GBL
769                     .ENABL  AMA,ABS
```

```
                                        .TITLE PROGRAM HEADER AND TABLES
                                        .SBTTL  PROGRAM HEADER
                                                .ENABL  ABS,AMA
                    002000              .       =       2000
002000                                          BGNMOD
                                        ;++
                                        ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
                                        ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
                                        ;--
002000                                          POINTER BGNRPT,BGNSW,BGNSFT,BGNAU,BGNDU,ERRTBL,BGNSETUP
002000                                          HEADER  CZRXDC0,0,0,2100,1
                                        ;-------------------------------------------------------------------------
002122                                  DESCRIPT        ^$RX02 SS PERF EXER      $
                                                .EVEN
                                        ;-------------------------------------------------------------------------
                                        .SBTTL  DISPATCH TABLE
                                        ;++
                                        ; THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
                                        ; IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
                                        ;--
002152                                          DISPATCH 1
```

```
                                        .SBTTL  DEFAULT HARDWARE P-TABLE

                                        ;++
                                        ; THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
                                        ; THE TEST-DEVICE PARAMETERS.  THE STRUCTURE OF THIS TABLE
                                        ; IS IDENTICAL TO THE STRUCTURE OF THE RUN-TIME P-TABLE.
                                        ;--

002156                                          BGNHW   DFPTBL

002160  177170                                  .WORD   177170          ;UNIBUS ADDRESS
002162  000264                                  .WORD   264             ;VECTOR ADDRESS
002164  000000                                  .WORD   0               ;DRIVE #
002166  000000                                  .WORD   0               ;FUTURE EXPANSION

002170                                          ENDHW


                                        .SBTTL  SOFTWARE P-TABLE

                                        ;++
                                        ; THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
                                        ; PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
                                        ;--

002170                                          BGNSW   SFPTBL

002172  000000                          RXXX:  .WORD   0               ;FUTURE EXPANSION-RX
002174  000000                                 .WORD   0               ;P-TABLE CONTROL WORD
002176  000000                          TSTN:  .WORD   0               ;TEST #
002200  000000                          TSTPAT: .WORD  0               ;TEST PATTERN #
002202  000000                          TRKSEQ: .WORD  0               ;TRACK SEQUENCE #
002204  000021                          SWREG: .WORD   21              ;SOFTWARE SWITCH REG
002206  000000                          OTDITK: .WORD  0               ;OUTSIDE DIA. TRACK LIMIT
002210  000114                          INDITK: .WORD  114             ;INSIDE DIA. TRACK LIMIT.
002212  000001                          MINSEC: .WORD  1               ;MINIMUM SECTOR LIMIT
002214  000032                          MAXSEC: .WORD  32              ;MAXIMUM SECTOR LIMIT
002216  000001                          DFTL:  .WORD   1               ;DEVICE FATAL THRESHOLD LVL

002220                                          ENDSW

002220                                          ENDMOD
```

```
                                        .TITLE GLOBAL AREAS
                                        .SBTTL  GLOBAL EQUATES SECTION


002220                                          BGNMOD

                                        ;++
                                        ; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM  UATES THAT
                                        ; ARE USED IN MORE THAN ONE TEST.
                                        ;--

002220                                          EQUALS
(1)                                     ;
(1)                                     ; BIT DIFINITIONS
(1)                                     ;
(1)             100000                  BIT15== 100000
(1)             040000                  BIT14== 40000
(1)             020000                  BIT13== 20000
(1)             010000                  BIT12== 10000
(1)             004000                  BIT11== 4000
(1)             002000                  BIT10== 2000
(1)             001000                  BIT09== 1000
(1)             000400                  BIT08== 400
(1)             000200                  BIT07== 200
(1)             000100                  BIT06== 100
(1)             000040                  BIT05== 40
(1)             000020                  BIT04== 20
(1)             000010                  BIT03== 10
(1)             000004                  BIT02== 4
(1)             000002                  BIT01== 2
(1)             000001                  BIT00== 1
(1)                                     ;
(1)             001000                  BIT9==  BIT09
(1)             000400                  BIT8==  BIT08
(1)             000200                  BIT7==  BIT07
(1)             000100                  BIT6==  BIT06
(1)             000040                  BIT5==  BIT05
(1)             000020                  BIT4==  BIT04
(1)             000010                  BIT3==  BIT03
(1)             000004                  BIT2==  BIT02
(1)             000002                  BIT1==  BIT01
(1)             000001                  BIT0==  BIT00
(1)                                     ;
(1)                                     ; EVENT FLAG DEFINITIONS
(1)                                     ;   EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
(1)                                     ;
(1)             000040                  EF.START==      32.                     ; START COMMAND WAS ISSUED
(1)             000037                  EF.RESTART==    31.                     ; RESTART COMMAND WAS ISSUED
(1)             000036                  EF.CONTINUE==   30.                     ; CONTINUE COMMAND WAS ISSUED
(1)             000035                  EF.NEW==        29.                     ; A NEW PASS HAS BEEN STARTED
(1)             000034                  EF.PWR==        28.                     ; A POWER-FAIL/POWER-UP OCCURRED
(1)                                     ;
(1)                                     ;
(1)                                     ; PRIORITY LEVEL DEFINITIONS
(1)                                     ;
(1)             000340                  PRI07== 340
```

```
(1)          000300                  PRI06== 300
(1)          000240                  PRI05== 240
(1)          000200                  PRI04== 200
(1)          000140                  PRI03== 140
(1)          000100                  PRI02== 100
(1)          000040                  PRI01== 40
(1)          000000                  PRI00== 0
(1)                                  ;
(1)                                  ;OPERATOR FLAG BITS
(1)                                  ;
(1)          000004                  EVL==        4
(1)          000010                  LOT==       10
(1)          000020                  ADR==       20
(1)          000040                  IDU==       40
(1)          000100                  ISR==      100
(1)          000200                  UAM==      200
(1)          000400                  BOE==      400
(1)          001000                  PNT==     1000
(1)          002000                  PRI==     2000
(1)          004000                  IXE==     4000
(1)          010000                  IBE==    10000
(1)          020000                  IER==    20000
(1)          040000                  LOE==    40000
(1)          100000                  HOE==   100000
 983
 984                                  ;
 985                                  ;BIT DEFINITIONS
 986                                  ;
 987          100000                  BIT15== 100000
 988          040000                  BIT14== 40000
 989          020000                  BIT13== 20000
 990          010000                  BIT12== 10000
 991          004000                  BIT11== 4000
 992          002000                  BIT10== 2000
 993          001000                  BIT09== 1000
 994          000400                  BIT08== 400
 995          000200                  BIT07== 200
 996          000100                  BIT06==100
 997          000040                  BIT15== 40
 998          000020                  BIT04== 20
 999          000010                  BIT03== 10
1000          000004                  BIT02== 4
1001          000002                  BIT01== 2
1002          000001                  BIT00=  1
1003                                  ;
1004          001000                  BIT9==  BIT09
1005          000400                  BIT8==  BIT08
1006          000200                  BIT7==  BIT07
1007          000100                  BIT6==  BIT06
1008          000040                  BIT5==  BIT05
1009          000020                  BIT4==  BIT04
1010          000010                  BIT3==  BIT03
1011          000004                  BIT2==  BIT02
1012          000002                  BIT1==  BIT01
1013          000001                  BIT0==  BIT00
1014                                  ;
```

```
1015                                    ;EVENT FLAG DEFINITIONS
1016                                    ;       EF32:EF17       RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
1017                                    ;       EF16:EF01       AVAILABLE FOR PROGRAM USE
1018    000040                          EF.START==      32.             ;START COMMAND WAS ISSUED.
1019    000037                          EF.RESTART==    31.             ;RESTART COMMAND WAS ISSUED.
1020    000036                          EF.CONTINUE==   30.             ;CONTINUE COMMAND WAS ISSUED.
1021    000035                          EF.NEW==        29.             ;A NEW PASS HAS BEEN STARTED.
1022    000034                          EF.PWR==        28.             ;A POWER FAIL/POWER-UP OCCURRED
1023                                    ;
1024    000020                          EF16==  16.
1025    000017                          EF15==  15.
1026    000016                          EF14==  14.
1027    000015                          EF13==  13.
1028    000014                          EF12==  12.
1029    000013                          EF11==  11.
1030    000012                          EF10==  10.
1031    000011                          EF09==  9.
1032    000010                          EF08==  8.
1033    000007                          EF07==  7
1034    000006                          EF06==  6
1035    000005                          EF05==  5
1036    000004                          EF04==  4
1037    000003                          EF03==  3
1038    000002                          EF02==  2
1039    000001                          EF01==  1
1040                                    ;
1041                                    ;PRIORITY LEVEL DEFINITIONS
1042                                    ;
1043    000340                          PRI07== 340
1044    000300                          PRI06== 300
1045    000240                          PRI05== 240
1046    000200                          PRI04== 200
1047    000140                          PRI03== 140
1048    000100                          PRI02== 100
1049    000040                          PRI01== 40
1050    000000                          PRI00== 0
1051                                    ;
1052                                    ;PROGRAM DEFINITIONS
1053                                    ;
1054    000200                          TRBIT==200
1055    000040                          DNBIT==40
1056    004000                          RX2BIT==BIT11
1057    000003                          SOFT==3
1058    000002                          HARD==2
1059    000001                          DVFT==1
1060    000000                          SYFT==0
1061    000004                          BTRP4==4
1062    000006                          BTRP6==6
1063    000002                          RESTAR==BIT1
1064    000001                          POWERF==BIT0
1065    004000                          SYSERR==BIT11
```

```
1079                                    .SBTTL  GLOBAL DATA SECTION
1080
1081                                    ;++
1082                                    ; THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
1083                                    ; IN MORE THAN ONE TEST.
1084                                    ;--
1085
1086                                    ;
1087                                    ; STORAGE FOR DEVICE REGISTERS
1088                                    ;
1089
1090                                    ;-------------------------------------------------------------------
1091  002220  000000                    U0ADR:  .WORD   0               ;UNIT 0 ADR
1092  002222  000000                    U1ADR:  .WORD   0               ;UNIT 1 ADR
1093  002224  000000                    U0VECT: .WORD   0               ;UNIT 0 VECTOR
1094  002226  000000                    U1VECT: .WORD   0               ;UNIT 1 VECTOR
1095                                    ;-------------------------------------------------------------------
1096  002230  000000                    SDD:    .WORD   0               ;SYSTEM DRIVES DONE (SEE REG. DEF. BELOW)
1097  002232  000000                    SUT:    .WORD   0               ;SYSTEM UNDER TEST (SEE REG. DEF. BELOW)
1098  002234  000000                    UUT:    .WORD   0               ;UNIT UNDER TEST (SEE REG. DEF. BELOW)
1099  002236  000000                    UUTADR: .WORD   0               ;UUT UNIBUS ADR
1100  002240  000000                    UUTOFF: .WORD   0               ;UUT TABLE ADDRESSING OFFSET
1101  002242  000000                    DEN:    .WORD   0               ;DENSITY FLAG
1102  002244  000000                    DELDAT: .WORD   0               ;DELETED DATA FLAG
1103  002246  000000                    CSRUUT: .WORD   0               ;CONT/STATUS REG UUT
1104  002250  000000                    ESRUUT: .WORD   0               ;ERROR/STATUS REG UUT
1105                                    ;-------------------------------------------------------------------
1106  002252  000000                    WDCNT:  .WORD   0               ;WORD COUNT
1107  002254  000000                    TRACK:  .WORD   0               ;TRACK ADR
1108  002256  000000                    SECTOR: .WORD   0               ;SECTOR ADR
1109  002260  000000                    TRKDN:  .WORD   0               ;TRACK DONE (UUT) FLAG
1110  002262  000000                    SECDN:  .WORD   0               ;SECTOR DONE (UUT) FLAG
1111                                    ;-------------------------------------------------------------------
1112  002264  000000                    FLGDRS: .WORD   0               ;"DRS" FLAGS
1113  002266  000000                    FLAGS:  .WORD   0               ;DIAGNOSTIC FLAGS
1114  002270  000000                    ABORT:  .WORD   0               ;ABORT FLAG
1115  002272  000000                    PRTECD: .WORD   0               ;PRINT ERR CODE FLAG
1116                                    ;-------------------------------------------------------------------
1117  002274  000000                    ERRSY:  .WORD   0               ;ERROR SYSTEM
1118  002276  000000                    ERRTY:  .WORD   0               ;ERROR TYPE
1119  002300  000000                    HARDER: .WORD   0               ;HARD ERROR
1120  002302  000000                    HDERCT: .WORD   0               ;HARD ERROR COUNTER (USED FOR 'DFTL')
1121                                    ;-------------------------------------------------------------------
1122  002304  000000                    RETRY:  .WORD   0               ;//(10)DATART/(4)RDRT/(2)WTRT/(1)SEEK/ SEE BELOW
1123  002306  000000                    SEEKRT: .WORD   0               ;SEEK RETRY COUNT
1124  002310  000000                    CKSMRT: .WORD   0               ;CHECK SUM RETRY COUNT
1125  002312  000000                    CRCBRT: .WORD   0               ;CRC BAD RETRY COUNT
1126  002314  000000                    CRCERT: .WORD   0               ;CRC ERR RETRY COUNT
1127  002316  000000                    DATART: .WORD   0               ;DATA RETRY COUNT
1128  002320  000000                    DARDRT: .WORD   0               ;DATA READ RETRY COUNT
1129  002322  000000                    DAWTRT: .WORD   0               ;DATA WRITE RETRY COUNT
1130  002324  000000                    READRT: .WORD   0               ;READ RETRY COUNT
1131  002326  000000                    WRTRT:  .WORD   0               ;WRITE RETRY COUNT
1132  002330  000000                    DDERCT: .WORD   0               ;D.D. ERR RETRY COUNT
1133                                    ;-------------------------------------------------------------------
```

```
1136
1137  002332  000000
1138  002334  177777
1139  002336  177777
1140  002340  177777
1141  002342  177777
1142  002344  177777
1143
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1177
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```

```
;-------------------------------------------------------------------------
CMD:    0                       ;COMMAND FOR PRINT
UNIT:   -1                      ;UNIT # FOR PRINT
UT00:   -1                      ;**** UUT CODE# TABLE ****
UT01:   -1                      ;     >STORAGE OF USER UNIT #
UT10:   -1                      ;      FOR PRINT OUT, LOOKUP
UT11:   -1                      ;      & STATISTICAL TABLE PRINT
;-------------------------------------------------------------------------
;       ***** SOFTWARE REGISTER DEFINITIONS *****
;-------------------------------------------------------------------------
;          !    BIT#
;          ! 03! 02! 01! 00
;    ------+---+---+---+---+
;    SDD:  ! 11! 10! 01! 00! <- UUT CODES-EQUIV TO A BIT SET IN THIS REG
;     &  --+---'---+---+---+                 -THAT IS UUT=00 IS SDD BIT#0 SET
;    SUT:  ! 11! 10! 01! 00! <- UUT CODES-
;    ------+---+---+---+---+
;
;-------------------------------------------------------------------------
;
;      !       RX02            !    RXXX-FUTURE EXPANSION
;      +-----------------------+-------------------------
;UUT:  ! 00 = UNIT#0/DRV#0      !    SIDE#0/DRV#0
;      ! 01 = UNIT#0/DRV#1      !    SIDE#0/DRV#1
;      ! 10 = UNIT#1/DRV#0      !    SIDE#1/DRV#0
;      ! 11 = UNIT#1/DRV#1      !    SIDE#1/DRV#1
;        ^^
;        !!
;        !!---<DRIVE #
;        !----<UNIT # (RX02) OR SIDE # (RXXX)
;-------------------------------------------------------------------------
;        !   !   !   !   !   !   !   !   !   !   !   !   !   !   !   !
;        ! 15! 14! 13! 12! 11! 10! 09! 08! 07! 06! 05! 04! 03! 02! 01! 00!
;        !---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---!
;        !ERR!ERR!DON!ITR!WRT! RD!FIL!UNK!   ! DD! DD!   !   ! CK!   !   !
;ERRTY:  !BIT!NOT! NO! NO!ERR!ERR!EMP!ERR! - !MIS!UNX! - !DAT!SUM!CRC!SEK!
;        !   !SET!ITR!DON!   !   !ERR!   !   !   !   !   !   !   !   !
;========!===+===+===+===+===+===+===+===+===+===+===+===+===+===+===+===!
;        !   !   !   !DRV!   !   ! WRONG !DON!SID!DRV!NO DONE! FUNCTION  !
;ERRSY:  !UNR! TO!DEN!DEN!SYS!DAG!-------!FUN!RDY!RDY!-------!  CAUSING  !
;        !ERR!ERR!ERR!ERR!ERR!ERR!SID!DRV! #2!ERR!ERR!FUN!INT!   ERROR   !
;========!===+===+===+===+===+===+===+===+===+===+===+===+===+===+===+===!
;        !                                       !   !CRC!DAT! RD!WRT!SEK!
;RETRY:  !                                       !   ! RT! RT! RT! RT! RT!
;-------------------------------------------------------------------------
;NOTE:  RXXX IS REFERENCE FOR FURTHER EXPANSION
```

```
1197                                    .SBTTL  GLOBAL TEXT SECTION
1198
1199                                    ;++
1200                                    ; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
1201                                    ; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
1202                                    ; MORE THAN ONE TEST.
1203                                    ;--
1204
1205                                    ;
1206                                    ; NAMES OF DEVICES SUPPORTED BY PROGRAM
1207                                    ;
1208  002346                                    DEVTYP  <RX02>
1214
1215                                    ;
1216                                    ; FORMAT STATEMENTS USED IN PRINT CALLS
1217                                    ;
1218
1225
1226
```

```
                                        .SBTTL  GLOBAL ERROR REPORT SECTION

                                        ;++
                                        ; THE GLOBAL ERROR REPORT SECTION CONTAINS THE PRINTB AND PRINTX CALLS
                                        ; THAT ARE USED IN MORE THAN ONE TEST.  IT ALSO INCLUDES THE ASCII MESSAGES
                                        ; THAT ARE USED BY THE PRINTB AND PRINTX CALLS..
                                        ;--

                                        .SBTTL  -    MOD U.SFT.ERR - ERROR REPORT
                                        ;-------------------------------------------------------------------
002354  012737  004506  002402          ERROR:  MOV     #NONE,ERRBLK    ;SETUP ERROR BLOCK CODE
002362  013737  002334  002074                  MOV     UNIT,L$LUN      ;SETUP LUN FOR PRINT
002370                                          ERROR                   ;
002372  000207                                  RETURN                  ;
                                        ;-------------------------------------------------------------------
002374                                          ERRTBL
(1) 002374  000000                      ERRTYP::        .WORD   0
(1) 002376  000000                      ERRNBR::        .WORD   0
(1) 002400  000000                      ERRMSG::        .WORD   0
(1) 002402  000000                      ERRBLK::        .WORD   0
                                        ;-------------------------------------------------------------------

                                        .SBTTL  -    MOD U.PRT.ERR - PRINT ERRORS
                                        ;-------------------------------------------------------------------
002404                                  PRTERR: PRINTB  #IDENT1,UNIT,CSRUUT,ESRUUT,CMD
002444  005737  002272                  IFAUP:  TST     PRTECD          ;IF ERR CODE FLAG
002450  001452                                  BEQ     ENDUP           ;SET, THEN
002452                                          PRINTX  #XER1,<8,XERUUT>,<8,WC>,<8,CTK0>,<8,CTK1>
002522                                          PRINTX  #XER2,<8,TTRK>,<8,TSEC>,<8,SFTSTS>,<8,BTRK>
002572  005037  002272                          CLR     PRTECD          ;CLEAR ERR CODE FLAG
002576  005037  002604                  ENDUP:  CLR     ERRREG          ;CLEAR ERR REGISTER
002602  000207                                  RTS     PC              ;RETURN
                                        ;-------------------------------------------------------------------
002604  000000                          ERRREG: 0                       ;
                                        ;-------------------------------------------------------------------
040445  052440  044516                  IDENT1: .ASCIZ  /%A UNIT#%O1%A RXCSR=%O%A RXESR=%O%A CMD=%O%N/
    045  020101  051105                  XER1:   .ASCIZ  /%A ERCD=%O3%A WC=%O3%A CTRK0=%D2%A. CTRK1=%D2%A./
040445  052040  051124                  XER2:   .ASCIZ  /%A TTRK=%D2%A. TSEC=%D2%A. SFTSTAT=%O3%A BTRK=%D2%A.%N/
    003034                                  .EVEN
                                        ;MOD U.PRT.ERR ----- END MODULE ----------------------------------------
```

```
1276
1277                                    .SBTTL  -    MOD U.PRT.EC - PRINT UNIT ERROR CODE
1278                                    ;-------------------------------------------------------------------
1279
1280  003034  105737  033544            XERPRT: TSTB    XERUUT          ;IF ERROR
1281  003040  001424                            BEQ     ENDXER          ;NOT=0, THEN
1282  003042  013701  033544                    MOV     XERUUT,R1       ;SAVE EXTENDED ERR CODE IN TEMP #1
1283  003046  042701  177400                    BIC     #177400,R1      ;CLR TOP BYTE
1284  003052  006201                            ASR     R1              ;FORMAT E.C.
1285  003054  006201                            ASR     R1              ;FORMAT E.C. FOR ADR
1286  003056  062701  003114                    ADD     #ECTAB-2,R1     ;FIND ADR OF ERROR MSG
1287  003062  011137  003114                    MOV     (R1),EXMSG      ;SET ADR OF ERROR MSG FOR PRINT
1288  003066                                    PRINTX  EXMSG           ;PRINT UNIT CODE ERROR MSG
1289  003106  105037  033544                    CLRB    XERUUT          ;CLEAR ERROR CODE
1290  003112  000207                    ENDXER: RTS     PC              ;RETURN
1291                                    ;-------------------------------------------------------------------
1292
1293  003114  000000                    EXMSG:  0                       ;MSG ADR FOR PRINT
1294                                    ;-------------------------------------------------------------------
1295
1296  003116  003170                    ECTAB:  .WORD   EC1
1297  003120  003236                            .WORD   EC2
1298  003122  003304                            .WORD   EC3
1299  003124  003332                            .WORD   EC4
1300  003126  003400                            .WORD   EC5
1301  003130  003451                            .WORD   EC6
1302  003132  003477                            .WORD   EC7
1303  003134  003555                            .WORD   EC10
1304  003136  003603                            .WORD   EC11
1305  003140  003660                            .WORD   EC12
1306  003142  003714                            .WORD   EC13
1307  003144  003773                            .WORD   EC14
1308  003146  004021                            .WORD   EC15
1309  003150  004107                            .WORD   EC16
1310  003152  004153                            .WORD   EC17
1311  003154  004207                            .WORD   EC20
1312  003156  004254                            .WORD   EC21
1313  003160  004311                            .WORD   EC22
1314  003162  004360                            .WORD   EC23
1315  003164  004413                            .WORD   EC24
1316  003166  004442                            .WORD   EC25
1317                                    ;-------------------------------------------------------------------
```

```
1320
1321  003170  040445  020040  037040          ;-----------------------------------------------------------------
1322  003236  040445  020040  037040  EC1:    .ASCIZ  /%A   >NO HOME ON INITIALIZE-DRV #0.%N/
1323  003304  040445  020040  037040  EC2:    .ASCIZ  /%A   >NO HOME ON INITIALIZE-DRV #1.%N/
1324  003332  040445  020040  037040  EC3:    .ASCIZ  /%A   >ILL ERR CODE.%N/
1325  003400  040445  020040  037040  EC4:    .ASCIZ  /%A   >TRIED TO ACCESS A TRACK > 76.%N/
1326  003451     045  020101  020040  EC5:    .ASCIZ  /%A   >HOME FOUND BEFORE DESIRED TRACK.%N/
1327  003477     045  020101  020040  EC6:    .ASCIZ  /%A   >ILL ERR CODE.%N/
1328  003555     045  020101  020040  EC7:    .ASCIZ  /%A   >52 HEADERS PASSED & SECTOR NOT FOUND.%N/
1329  003603     045  020101  020040  EC10:   .ASCIZ  /%A   >ILL ERR CODE.%N/
1330  003660  040445  020040  037040  EC11:   .ASCIZ  /%A   >NO SEPCLOCK SEEN IN 40 MICROSECONDS.%N/
1331  003714  040445  020040  037040  EC12:   .ASCIZ  /%A   >PREAMBLE NOT FOUND.%N/
1332  003773     045  020101  020040  EC13:   .ASCIZ  /%A   >PREAMBLE FOUND BUT NO ID MARK IN TIME.%N/
1333  004021     045  020101  020040  EC14:   .ASCIZ  /%A   >ILL ERR CODE.%N/
1334  004107     045  020101  020040  EC15:   .ASCIZ  /%A   >GOOD TRACK ADDRESS HEADER NOT=SELECTED TRACK.%N/
1335  004153     045  020101  020040  EC16:   .ASCIZ  /%A   >TOO MANY TRIES FOR AN IDAM.%N/
1336  004207     045  020101  020040  EC17:   .ASCIZ  /%A   >NO DATA AM IN TIME.%N/
1337  004254  040445  020040  037040  EC20:   .ASCIZ  /%A   >CRC ERROR ON READING SECTOR.%N/
1338  004311     045  020101  020040  EC21:   .ASCIZ  /%A   >UNASSIGNED ERR CODE.%N/
1339  004360  040445  020040  037040  EC22:   .ASCIZ  /%A   >R-W ELECT. FAILED MAINT. TEST.%N/
1340  004413     045  020101  020040  EC23:   .ASCIZ  /%A   >WORD CNT OVERFLOW.%N/
1341  004442  040445  020040  037040  EC24:   .ASCIZ  /%A   >DENSITY ERROR.%N/
1342                                  EC25:   .ASCIZ  /%A   >SET DENSITY WRONG KEY WORD.%N/
1343                                          .EVEN
1344                                  ;-----------------------------------------------------------------
1345
1346                                  .SBTTL  -    ERROR PRINT CALLS/MSG CALLS
1347  004506                          ;-----------------------------------------------------------------
1348  004506                                  BGNMSG  NONE
1349                                          ENDMSG
1366  004510                          ;-----------------------------------------------------------------
1367  004510  004737  004536                 BGNMSG  PRTB1
1368  004514                                  CALL    PRTB1S
1369                                          ENDMSG
1370  004516                          ;-----------------------------------------------------------------
1371  004534  000207                 PRTB0S: PRINTB  R1
1372                                          RETURN
1373  004536                          ;-----------------------------------------------------------------
1374  004556  000207                 PRTB1S: PRINTB  R1,R2
1375                                          RETURN
                                        ;-----------------------------------------------------------------
```

```
1378                                    .SBTTL  GLOBAL SUBROUTINES SECTION
1379
1380                                    ;++
1381                                    ; THE GLOBAL SUBROUTINES SECTION CONTAINS THE SUBROUTINES
1382                                    ; THAT ARE USED IN MORE THAN ONE TEST.
1383                                    ;--
1384
1385                                    ;++
1386                                    ; FUNCTIONAL DESCRIPTION:
1387                                    ;     SUBROUTINE TO....
1394                                    ; INPUTS:  NONE
1400                                    ; IMPLICIT INPUTS:  NONE
1407                                    ; OUTPUTS:  RANUM
1413                                    ; IMPLICIT OUTPUTS:  NONE
1420                                    ; SUBORDINATE ROUTINES USED:  NONE
1429                                    ; FUNCTIONAL SIDE EFFECTS:  NONE
1437                                    ; CALLING SEQUENCE:  SUB
1443                                    ;--
1444
1451
1457                                    .SBTTL  -    MOD U.1.0 - RANDOM GENERATOR
1458                                    ;---------- RANDOM GENERATOR ------------------------------------
1459  004560  012700  000001             RANGEN: MOV     #1,R0
1460  004564  063700  004646                     ADD     RAN1,R0
1461  004570  063700  004650                     ADD     RAN2,R0
1462  004574  042700  170000                     BIC     #170000,R0
1463  004600  000241                             CLC
1464  004602  006100                             ROL     R0
1465  004604  006100                             ROL     R0
1466  004606  010037  004646                     MOV     R0,RAN1
1467  004612  005000                             CLR     R0
1468  004614  013700  004650                     MOV     RAN2,R0
1469  004620  006000                             ROR     R0
1470  004622  006000                             ROR     R0
1471  004624  063700  004646                     ADD     RAN1,R0
1472  004630  042700  170000                     BIC     #170000,R0
1473  004634  010037  004650                     MOV     R0,RAN2
1474  004640  010037  004652                     MOV     R0,RANUM
1475  004644  000207                             RTS     PC
1476                                    ;-------------------------------------------------------------------
1477  004646  000000                    RAN1:   0
1478  004650  000000                    RAN2:   0
1479  004652  000000                    RANUM:  0
1480                                    ;-------------------------------------------------------------------
```

```
1483                                        .SBTTL  -    MOD U.A.1 - CONVERSION UUT CODE --> SUTPTR
1484                                        ;-------------------------------------------------------------
1485
1486  004654  000240                        CVUTST: NOP                     ;
1487  004656  005037  004754                        CLR     SUTCV           ;CLEAR SYS UNDER TEST CONVERTED
1488  004662  032737  000001  004752              BIT     #1,CVUNIT       ;IF DRIVE #0.
1489  004670  001014                              BNE     2$              ;SELECTED, THEN
1490  004672  032737  000002  004752              BIT     #2,CVUNIT       ;IF UNIT #0 OR RXXX SIDE #0,
1491  004700  001004                              BNE     1$              ;THEN
1492  004702  052737  000001  004754              BIS     #1,SUTCV        ;SET FOR UNIT CODE=00 IN SUT WORD
1493  004710  000417                              BR      ENDCVT          ;BR TO END
1494  004712  052737  000004  004754        1$:   BIS     #4,SUTCV        ;ELSE, SET FOR UNIT CODE=10 IN SUT WORD
1495  004720  000413                              BR      ENDCVT          ;BR TO END
1496  004722  032737  000002  004752        2$:   BIT     #2,CVUNIT       ;IF UNIT #0 OR RXXX SIDE #0,
1497  004730  001004                              BNE     3$              ;THEN
1498  004732  052737  000002  004754              BIS     #2,SUTCV        ;SET FOR UNIT CODE=01 IN SUT WORD
1499  004740  000403                              BR      ENDCVT          ;BR TO END
1500  004742  052737  000010  004754        3$:   BIS     #10,SUTCV       ;ELSE, SET FOR UNIT CODE=11 IN SUT WORD
1501  004750  000207                        ENDCVT: RTS     PC              ;RETURN
1502                                        ;-------------------------------------------------------------
1503  004752  000000                        CVUNIT: 0                       ;UNIT CODE TO BE CONVERTED
1504  004754  000000                        SUTCV:  0                       ;SYS UNDER TEST AS CONVERTED
1505                                        ;MOD U.A.1 ----- END MODULE -----------------------------------
1506
1507                                        .SBTTL  -    MOD U.A.2 - CONVERSION SUTPTR --> UUT CODE
1508                                        ;-------------------------------------------------------------
1509
1510  004756  013705  021426                CVSTUT: MOV     SUTPTR,R5       ;SAVE SUT POINTER IN R5
1511  004762  005004                              CLR     R4              ;CLEAR R4 (RESET UNIT CODE)
1512  004764  032705  000001                1$:   BIT     #1,R5           ;IF LSB R5
1513  004770  001003                              BNE     2$              ;EQUALS 1 ,THEN BR TO 2$
1514  004772  006205                              ASR     R5              ;SHIFT RIGHT R5
1515  004774  005204                              INC     R4              ;INCREMENT R4
1516  004776  000772                              BR      1$              ;BR TO 1$
1517  005000  010437  005024                2$:   MOV     R4,UNITST       ;THEN R4 CONTAINS UUT CODE
1518  005004  006304                              ASL     R4              ;DOUBLE UNIT CODE FOR ADR
1519  005006  010437  002240                      MOV     R4,UUTOFF       ;SET UUT OFFSET
1520  005012  062704  002336                      ADD     #UT00,R4        ;GET UUT UNIT# FOR PRINT
1521  005016  011437  002334                      MOV     (R4),UNIT       ;SET UNIT=PRINT UNIT#
1522  005022  000207                              RTS     PC              ;RETURN
1523                                        ;-------------------------------------------------------------
1524  005024  000000                        UNITST: 0                       ;
1525                                        ;MOD 2.0A ----- END MODULE -------------------------------------
```

```
1528                                                .SBTTL  -    MOD U.DEV.REC - DEVICE READ ERROR CODE
1529                                                ;-----------------------------------------------------------------
1530
1531  005026  000240                                RDERCD: NOP                     ;
1532  005030  013705  002236                               MOV     UUTADR,R5       ;SET R5 = UUT ADDRESS
1533  005034  012737  000001  002272                       MOV     #1,PRTECD       ;SET PRINT ERROR CODE FLAG
1534  005042  012737  000017  005136                       MOV     #17,RECCMD      ;SET UUT EXTENDED ERROR CODE
1535  005050  053737  002242  005136                       BIS     DEN,RECCMD      ;SET DEN FOR CMD
1536  005056  013715  005136                             MOV     RECCMD,(R5)     ;SEND CMD TO UUT
1537  005062  013701  002236                             MOV     UUTADR,R1       ;GET UUT ADDR
1538  005066  062701  000002                             ADD     #2,R1           ;CAL DATA ADR
1539  005072  013737  002236  025332                       MOV     UUTADR,CSRADR   ;SET CSR ADR
1540  005100  012737  000200  025330                       MOV     #TRBIT,RDYWD    ;SET "TR" BIT TEST
1541  005106  004737  025230                             CALL    DELAY           ;CALL DELAY MODULE-WAIT FOR TR
1542  005112  032715  000200                     1AREC:  BIT     #200,(R5)       ;IF TR
1543  005116  001004                                      BNE     LAREC           ;NOT SET
1544  005120  052737  040007  002274                       BIS     #40007,ERRSY    ;THEN SET "TR" ERR ON FUNCTION
1545  005126  000402                                      BR      XREC            ;BR TO END MOD
1546  005130  012711  033544                     LAREC:  MOV     #XERUUT,(R1)    ;SEND BASE ADDR FOR EXTEND ERR CODE
1547  005134  000207                             XREC:   RETURN                  ;RETURN
1548                                                ;-----------------------------------------------------------------
1549  005136  000000                             RECCMD: 0                       ;COMMAND WORD USED IN THIS MODULE
1550                                                ;-----------------------------------------------------------------
1551
1552  005140                                             ENDMOD
1553
```

```
                                          .TITLE MISCELLANEOUS SECTIONS
                                          .SBTTL  REPORT CODING SECTION

005140                                          BGNMOD

                                          ;++
                                          ; THE REPORT CODING SECTION CONTAINS THE
                                          ; "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
                                          ;--


                                          ;------------------------------------------------------------------------
005140                                          BGNRPT
005140  000240                            REPORT: NOP                           ;
005142  012737  006074  005504                  MOV     #PT20SP,PRT1          ;SETUP CTR HDR
005150  012737  006274  005506                  MOV     #PTUNT2,PRT2          ;
005156  004737  005414                          CALL    PRTHDR                ;PRINT HEADER
005162  004737  005646                          CALL    PRTCTR                ;PRINT SEQ CTR
005166  012737  006105  005504                  MOV     #PT19SP,PRT1          ;SETUP REPORT HEADER PART 1
005174  012737  006253  005506                  MOV     #PTUNT1,PRT2          ;
005202  004737  005414                          CALL    PRTHDR                ;PRINT HEADER
005206  000240                                  NOP                           ;SETUP DATA PART 1
005210  005037  005636                          CLR     LINECT                ;      ZERO LINE COUNTER
005214  005037  005644                          CLR     PRNUM                 ;      CLEAR PRINT MODE
005220  012702  007354                          MOV     #CKSML,R2             ;      SET BEGIN ADR OF DATA-PART 1
005224  012701  006360                          MOV     #PRIDXX,R1            ;      SET BEGIN ADR OF TABLE LABLES-PART 1
005230  012737  000023  005640                  MOV     #19.,LINES            ;      SET # OF LINES TO PRINT
005236  004737  005510                          CALL    PRTDAT                ;PRINT DATA
005242  012737  006200  005504                  MOV     #PTEC,PRT1            ;SETUP HEADER PART 2
005250  012737  006253  005506                  MOV     #PTUNT1,PRT2          ;
005256  004737  005414                          CALL    PRTHDR                ;PRINT HEADER
005262  000240                                  NOP                           ;SETUP DATA PART 2
005264  012737  000001  005636                  MOV     #1,LINECT             ;      SET LINE COUNTER=1
005272  012737  000001  005644                  MOV     #1,PRNUM              ;      SET PRINT MODE=1
005300  012702  007604                          MOV     #ECLOG,R2             ;      SET BEGIN ADR ERROR CODE DATA-PART 2
005304  012701  006327                          MOV     #PTECN,R1             ;      SET ERROR CODE PRINT-FORMATED MSG-PART 2
005310  012737  000027  005640                  MOV     #23.,LINES            ;      SET # OF LINES TO PRINT
005316  012737  006327  005642                  MOV     #PTECN,LINTYP         ;
005324  004737  005510                          CALL    PRTDAT                ;PRINT DATA
005330  012737  006225  005504                  MOV     #PTTK,PRT1            ;SETUP HEADER PART 3
005336  012737  006253  005506                  MOV     #PTUNT1,PRT2          ;
005344  004737  005414                          CALL    PRTHDR                ;PRINT HEADER
005350  005037  005636                          CLR     LINECT                ;
005354  012737  000001  005644                  MOV     #1,PRNUM              ;
005362  012702  010070                          MOV     #TKXX,R2              ;SETUP DATA PART 3
005366  012737  000115  005640                  MOV     #77.,LINES            ;
005374  012737  006343  005642                  MOV     #PTTKN,LINTYP         ;
005402  004737  005510                          CALL    PRTDAT                ;PRINT DATA PART 3
005406                                    ENDRPT: ENDRPT
                                          ;------------------------------------------------------------------------
005410  000000                            UTTST:  0                             ;UNIT #
005412  000000                            UTCNT:  0                             ;UNIT COUNT
                                          ;------------------------------------------------------------------------
```

```
1656                                                    .SBTTL  -    PRINT REPORT HEADER
1657                                                    ;-----------------------------------------------------------------
1658  005414  005003                                    PRTHDR: CLR     R3                      ;
1659  005416  013705  005504                                  MOV     PRT1,R5                 ;SETUP 1ST PART OF HEADER PRINT
1660  005422  004737  006030                                  CALL    PREPT2                  ;PRINT 1ST PART
1661  005426  012737  002336  005410                          MOV     #UT00,UTTST             ;GET BEGIN ADR OF UNITS-->TESTED FLAGS
1662  005434  012737  000004  005412                          MOV     #4,UTCNT                ;SET UNIT COUNTER
1663  005442  005777  177742                          1$:     TST     @UTTST                  ;IF UNIT TESTED FLAG
1664  005446  100407                                          BMI     2$                      ;NOT=-1, THEN
1665  005450  017737  177734  006026                          MOV     @UTTST,PAR              ;SET UNIT TESTED # FOR PRINT
1666  005456  013705  005506                                  MOV     PRT2,R5                 ;SET UNIT MSG
1667  005462  004737  006002                                  CALL    PREPT1                  ;PRINT UNIT #
1668  005466  062737  000002  005410                  2$:     ADD     #2,UTTST                ;ADVANCE ADR OF UNIT TESTED FLAG
1669  005474  005337  005412                                  DEC     UTCNT                   ;DECREMENT UNIT COUNT
1670  005500  001360                                          BNE     1$                      ;IF UNIT COUNT=0, THEN
1671  005502  000207                                          RTS     PC                      ;RETURN
1672                                                    ;-----------------------------------------------------------------
1673  005504  000000                                    PRT1:   0                               ;
1674  005506  000000                                    PRT2:   0                               ;
1675                                                    ;-----------------------------------------------------------------
1676
1677                                                    .SBTTL  -    PRINT REPORT DATA
1678                                                    ;-----------------------------------------------------------------
1679  005510  000240                                    PRTDAT: NOP                             ;
1680  005512  005737  005644                          1$:     TST     PRNUM                   ;IF MODE
1681  005516  001410                                          BEQ     2$                      ;
1682  005520  013737  005636  006026                          MOV     LINECT,PAR              ;SETUP LINE # TO PRINT
1683  005526  013705  005642                                  MOV     LINTYP,R5               ;SETUP LINE TYPE TO PRINT
1684  005532  004737  006002                                  CALL    PREPT1                  ;PRINT LINE #
1685  005536  000403                                          BR      3$                      ;
1686  005540  012105                                  2$:     MOV     (R1)+,R5                ;SETUP LOG TITLE ADR
1687  005542  004737  006030                                  CALL    PREPT2                  ;PRINT LOG TITLES
1688  005546  012737  002336  005410                  3$:     MOV     #UT00,UTTST             ;GET UNIT # FOR PRINT
1689  005554  012737  000004  005412                          MOV     #4,UTCNT                ;SETUP UNIT COUNT
1690  005562  012237  006026                          4$:     MOV     (R2)+,PAR               ;SETUP DATA TO PRINT
1691  005566  005777  177616                                  TST     @UTTST                  ;IF UNIT # NOT = -1
1692  005572  100404                                          BMI     5$                      ;THEN
1693  005574  012705  006243                                  MOV     #PTDAT1,R5              ;SETUP TO PRINT
1694  005600  004737  006002                                  CALL    PREPT1                  ;PRINT DATA
1695  005604  062737  000002  005410                  5$:     ADD     #2,UTTST                ;SETUP TO CK NEXT UNIT
1696  005612  005337  005412                                  DEC     UTCNT                   ;DECREMENT UNIT COUNT
1697  005616  001361                                          BNE     4$                      ;IF DONE ALL UNITS THEN
1698  005620  005237  005636                                  INC     LINECT                  ;INCREMENT LINE COUNT
1699  005624  023737  005640  005636                          CMP     LINES,LINECT            ;IF DONE ALL
1700  005632  101327                                          BHI     1$                      ;LINES, THEN
1701  005634  000207                                          RTS     PC                      ;RETURN
1702                                                    ;-----------------------------------------------------------------
1703  005636  000000                                    LINECT: 0                               ;LINE COUNTER
1704  005640  000000                                    LINES:  0                               ;# OF LINES TO PRINT
1705  005642  000000                                    LINTYP: 0                               ;LINE PRINT TYPE.
1706  005644  000000                                    PRNUM:  0                               ;PRINT MODE
1707                                                    ;-----------------------------------------------------------------
```

```
1710                                        .SBTTL  -    PRINT READ/WRITE SECTOR COUNTERS
1711                                        ;-------------------------------------------------------------------
1712
1713  005646  000240                        PRTCTR: NOP                     ;
1714  005650  005037  005640                        CLR     LINES           ;CLEAR LINE COUNTER
1715  005654  012702  007314                        MOV     #READSC,R2      ;GET ADDRESS OF READ SECTOR CTR
1716  005660  012705  006116                        MOV     #PTRDSC,R5      ;SETUP READ SECTORS MSG
1717  005664  004737  006002                1$:     CALL    PREPT1          ;CALL PRINT REPORT-MSG
1718  005670  012737  002336  005410                MOV     #UT00,UTTST     ;GET UNIT # FOR PRINT
1719  005676  012737  000004  005412                MOV     #4,UTCNT        ;SETUP UNIT COUNT
1720  005704  005777  177500                2$:     TST     @UTTST          ;IF UNIT #
1721  005710  100410                                BMI     5$              ;NOT=-1, THEN
1722  005712  062702  000002                        ADD     #2,R2           ;INCREMENT ADR TO UPPER WORD
1723  005716  011204                                MOV     (R2),R4         ;SETUP DATA UPPER PART FOR PRINT
1724  005720  014203                                MOV     -(R2),R3        ;SETUP DATA LOWER PART FOR PRINT
1725  005722  012705  006315                        MOV     #PTFMN1,R5      ;SETUP TO PRINT DATA
1726  005726  004737  006050                        CALL    PREPT3          ;PRINT DATA
1727  005732  062737  000002  005410        5$:     ADD     #2,UTTST        ;SETUP TO CK NEXT UNIT
1728  005740  062702  000004                        ADD     #4,R2           ;SET ADR TO NEXT CTR
1729  005744  005337  005412                        DEC     UTCNT           ;DECREMENT UNIT COUNT
1730  005750  001355                                BNE     2$              ;IF DONE THIS LINE, THEN
1731  005752  005237  005640                        INC     LINES           ;INCREMENT LINE CTR
1732  005756  022737  000002  005640                CMP     #2,LINES        ;DO WHILE LINE CTR
1733  005764  001405                                BEQ     6$              ;EQUALS <2
1734  005766  012702  007334                        MOV     #WRITSC,R2      ;GET ADDRESS OF WRITE SECTOR CTR
1735  005772  012705  006147                        MOV     #PTWTSC,R5      ;SETUP WRITE SECTORS MSG
1736  005776  000732                                BR      1$              ;BR TO WRITE SECTORS SECTION
1737  006000  000207                        6$:     RETURN                  ;RETURN
1738                                        ;-------------------------------------------------------------------
```

```
1741                                        .SBTTL  -    PRINT REPORT TYPE 1
1742                                        ;-------------------------------------------------------------------
1743  006002                                PREPT1: PRINTS  R5,PAR
1744  006024  000207                               RTS     PC              ;
1745                                        ;-------------------------------------------------------------------
1746  006026  000000                       PAR:    0                       ;
1747                                        ;-------------------------------------------------------------------
1748
1749
1750
1751
1752
1753                                        .SBTTL  -    PRINT REPORT TYPE 2
1754                                        ;-------------------------------------------------------------------
1755  006030                                PREPT2: PRINTS  R5
1756  006046  000207                               RTS     PC
1757                                        ;-------------------------------------------------------------------
1758
1759
1760
1761
1762
1763                                        .SBTTL  -    PRINT REPORT TYPE 3
1764                                        ;-------------------------------------------------------------------
1765  006050                                PREPT3: PRINTS  R5,R4,R3
1766  006072  000207                               RETURN
1767                                        ;-------------------------------------------------------------------
1768  006074  047045  047045  051445        PT20SP: .ASCIZ  /%N%N%S20/
1769  006105     045  022516  022516        PT19SP: .ASCIZ  /%N%N%S19/
1770  006116  047045  040445  020043        PTRDSC: .ASCIZ  /%N%A# SECTOR READS  (8)=/
1771  006147     045  022516  021501        PTWTSC: .ASCIZ  /%N%A# SECTOR WRITES (8)=/
1772  006200  047045  047045  040445        PTEC:   .ASCIZ  /%N%N%AERR%N%ACODE#  /
1773  006225     045  022516  022516        PTTK:   .ASCIZ  /%N%N%ATRACK# /
1774  006243     045  020101  022440        PTDAT1: .ASCIZ  /%A  %D6/
1775  006253     045  030523  040445        PTUNT1: .ASCIZ  /%S1%AUNIT#%D1%S1/
1776  006274  051445  022462  052501        PTUNT2: .ASCIZ  /%S2%AUNIT#%D1%S5/
1777  006315     045  031123  047445        PTFMN1: .ASCIZ  /%S2%06%05/
1778  006327     045  022516  031117        PTECN:  .ASCIZ  /%N%02%A0%S3/
1779  006343     045  022516  030523        PTTKN:  .ASCIZ  /%N%S1%D2%S3/
1780        006360                                .EVEN
1781                                        ;-------------------------------------------------------------------
```

```
1784
1785  006360  006426                          ;-----------------------------------------------------------------
1786  006362  006455                          PRIDXX: .WORD   PRID01
1787  006364  006504                                  .WORD   PRID02
1788  006366  006533                                  .WORD   PRID03
1789  006370  006562                                  .WORD   PRID04
1790  006372  006611                                  .WORD   PRID05
1791  006374  006640                                  .WORD   PRID06
1792  006376  006667                                  .WORD   PRID07
1793  006400  006716                                  .WORD   PRID08
1794  006402  006745                                  .WORD   PRID09
1795  006404  006774                                  .WORD   PRID10
1796  006406  007023                                  .WORD   PRID11
1797  006410  007052                                  .WORD   PRID12
1798  006412  007101                                  .WORD   PRID13
1799  006414  007130                                  .WORD   PRID14
1800  006416  007157                                  .WORD   PRID15
1801  006420  007206                                  .WORD   PRID16
1802  006422  007235                                  .WORD   PRID17
1803  006424  007264                                  .WORD   PRID18
1804                                                  .WORD   PRID19
1805                                          ;-----------------------------------------------------------------
1806
1807  006426  047045  040445  044103          ;-----------------------------------------------------------------
1808  006455    045   022516  043101          PRID01: .ASCIZ  /%N%ACHECK SUM:         /
1809  006504  047045  040445  047516          PRID02: .ASCIZ  /%N%AFILL-EMP BUFF LOG:/
1810  006533    045   022516  044501          PRID03: .ASCIZ  /%N%ANO ERR BIT:        /
1811  006562  047045  040445  047111          PRID04: .ASCIZ  /%N%AINTER-NO DONE ERR:/
1812  006611    045   022516  051501          PRID05: .ASCIZ  /%N%AINTERRUPT ERR:     /
1813  006640  047045  040445  051103          PRID06: .ASCIZ  /%N%ASEEK:              /
1814  006667    045   022516  041501          PRID07: .ASCIZ  /%N%ACRC ERR:           /
1815  006716  047045  040445  042522          PRID08: .ASCIZ  /%N%ACRC BAD:           /
1816  006745    045   022516  053501          PRID09: .ASCIZ  /%N%AREAD ERR:          /
1817  006774  047045  040445  040504          PRID10: .ASCIZ  /%N%AWRITE ERR:         /
1818  007023    045   022516  042101          PRID11: .ASCIZ  /%N%ADATA L %:          /
1819  007052  047045  040445  051110          PRID12: .ASCIZ  /%N%ADEL. DATA ERR:     /
1820  007101    045   022516  044101          PRID13: .ASCIZ  /%N%AHRD SEEK:          /
1821  007130  047045  040445  051110          PRID14: .ASCIZ  /%N%AHRD CRC ERR:       /
1822  007157    045   022516  044101          PRID15: .ASCIZ  /%N%AHRD CRC BAD:       /
1823  007206  047045  040445  051110          PRID16: .ASCIZ  /%N%AHRD READ:          /
1824  007235    045   022516  044101          PRID17: .ASCIZ  /%N%AHRD WRITE:         /
1825  007264  047045  040445  051110          PRID18: .ASCIZ  /%N%AHRD DATA:          /
1826          007314                          PRID19: .ASCIZ  /%N%AHRD DEL. DATA ERR:/
1827                                                  .EVEN
                                              ;-----------------------------------------------------------------
```

```
1830                                    .SBTTL  -    STATISTICAL TABLES
1831                                    ;-----------------------------------------------------------------------
1832
1833  007314  000010                    READSC: .BLKW   8.              ;READ SECTOR COUNTER
1834  007334  000010                    WRITSC: .BLKW   8.              ;WRITE SECTOR COUNTER
1835  007354  000004                    CKSML:  .BLKW   4               ;CKSUM LOG
1836  007364  000004                    BUFERL: .BLKW   4               ;FILL/EMPTY BUFFER ERROR LOG
1837  007374  000004                    NOERL:  .BLKW   4               ;NO ERR BIT LOG
1838  007404  000004                    UKINT:  .BLKW   4               ;INTERRUPT - NO DONE LOG
1839  007414  000004                    INTER:  .BLKW   4               ;INTERRUPT ERR
1840  007424  000004                    SEK:    .BLKW   4               ;SEEK ERR
1841  007434  000004                    CRC:    .BLKW   4               ;CRC ERR
1842  007444  000004                    CRCBAD: .BLKW   4               ;CRC BAD ERR
1843  007454  000004                    RD:     .BLKW   4               ;READ ERR
1844  007464  000004                    WRT:    .BLKW   4               ;WRITE ERR
1845  007474  000004                    DATA:   .BLKW   4               ;DATA ERR
1846  007504  000004                    DLDTER: .BLKW   4               ;DEL DATA  ERR
1847  007514  000004                    HSEK:   .BLKW   4               ;HARD SEEK ERR
1848  007524  000004                    HCRC:   .BLKW   4               ;HARD CRC ERR
1849  007534  000004                    HCRCBD: .BLKW   4               ;HARD CRC BAD ERR
1850  007544  000004                    HRD:    .BLKW   4               ;HARD READ ERR
1851  007554  000004                    HWRT:   .BLKW   4               ;HARD WRITE ERR
1852  007564  000004                    HDATA:  .BLKW   4               ;HARD DATA ERR
1853  007574  000004                    HDD:    .BLKW   4               ;HARD DEL DATA ERR
1854  007604  000132                    ECLOG:  .BLKW   90.             ;ERROR CODE LOG
1855  010070  000464                    TKXX:   .BLKW   308.            ;TRACK ERR LOG
1856                                    ;-----------------------------------------------------------------------
1857  011240  000000                    ENDST:  .WORD   0               ;END TABLE
1858
1870
1871                                            .EVEN
1872
1873                                    .SBTTL  LOAD DEVICE PROTECTION
1874                                    ;-----------------------------------------------------------------------
1875  011242                                    BGNPROT
1876  011242  000000                            .WORD   0               ;RX CSR - HARDWARE P-TABLE OFFSET
1877  011244  177777                            .WORD   -1              ;DON'T CARE
1878  011246  000004                            .WORD   4               ;RX DRIVER-HARDWARE P-TABLE OFFSET
1879  011250                                    ENDPROT
1880                                    ;-----------------------------------------------------------------------
```

```
1883
1884                                    .SBTTL  INITIALIZE SECTION
1885                                    ;++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
1886                                    ; THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
1887                                    ; AT THE BEGINNING OF EACH PASS.
1888                                    ;--------------------------------------------------------------------
1889 011250                                    BGNINIT
1890 011250 005037 002266              INIT:    CLR     FLAGS                   ;CLEAR ALL FLAGS
1895 011254                                     RFLAGS  FLGDRS                  ;GET "DRS" FLAGS
1896 011262                                     READEF  #EF.PWR                 ;IF POWER FAIL FLAG IS
1897 011270                                     BNCOMPLETE 1$                   ;SET, THEN
1898 011272 052737 000001 002266                BIS     #POWERF,FLAGS           ;SET POWER FAIL FLAG
1899 011300 000507                              BR      FIN                     ;BR TO 'FIN'
1900 011302                            1$:      READEF  #EF.START               ;IF START FLAG
1901 011310                                     BNCOMPLETE      2$              ;SET, THEN
1902 011312 005037 002220                       CLR     U0ADR                   ;CLEAR SYS U0 ADDRESS
1903 011316 005037 002222                       CLR     U1ADR                   ;CLEAR SYS U1 ADDRESS
1904 011322 005037 002224                       CLR     U0VECT                  ;CLEAR SYS U0 VECTOR
1905 011326 005037 002226                       CLR     U1VECT                  ;CLEAR SYS U1 VECTOR
1906 011332 005037 002232              2$:      CLR     SUT                     ;CLEAR SYS UNDER TST WORD
1907 011336 023727 002012 000004                CMP     L$UNIT,#4               ;IF 4 UNITS OR LESS SELECTED
1908 011344 003051                              BGT     INITER                  ;THEN
1909 011346                                     READEF  #EF.RESTART             ;IF RESTART FLAG
1910 011354                                     BNCOMPLETE SETUP                ;SET, THEN
1911 011356 052737 000002 002266                BIS     #RESTAR,FLAGS           ;SET RESTART FLAG
1912 011364 005037 002270              SETUP:   CLR     ABORT                   ;CLEAR ABORT FLAG
1913 011370 012737 177777 002334                MOV     #-1,UNIT                ;RESTORE UNIT # CTR
1914 011376 012737 177777 002336                MOV     #-1,UT00                ;RESET UNIT#1
1915 011404 012737 177777 002340                MOV     #-1,UT01                ;RESET UNIT#2
1916 011412 012737 177777 002342                MOV     #-1,UT10                ;RESET UNIT#3
1917 011420 012737 177777 002344                MOV     #-1,UT11                ;RESET UNIT#4
1918 011426 062737 000001 002334       1$:      ADD     #1,UNIT                 ;INCREMENT TO NEXT UNIT
1919 011434 023737 002012 002334                CMP     L$UNIT,UNIT             ;IF LOGICAL UNIT & UNIT
1920 011442 001426                              BEQ     FIN                     ;NOT YET EQUAL, THEN
1921 011444                                     GPHARD  UNIT,PLOC               ;GET HARDWARE P-TABLE
1922 011456                                     BNCOMPLETE 1$                   ;IF P-TABLE AVAILABLE, THEN
1923 011460 000240                              NOP                             ;
1924 011462 004737 011656                       JSR     PC,UNPKHP               ;CALL UNPACK HARDWARE P-TABLE
1925 011466 000757                              BR      1$                      ;BR TO BEGIN DO
1926 011470                            INITER:  PRINTF  #INTER1                 ;PRINT "TOO MANY UNITS"
1927 011510 012737 000001 002270                MOV     #1,ABORT                ;SET ABORT
1928 011516                                     DOCLN                           ;DO CLEAN UP
1929 011520                            FIN:     SETVEC  U0VECT,#INTH0,#PRI07    ;SET SYS U0 VECTOR
1930 011546 005737 002226                       TST     U1VECT                  ;IF SYS U1 VECTOR
1931 011552 001413                              BEQ     2$                      ;NOT=0, THEN
1932 011554                            1$:      SETVEC  U1VECT,#INTH1,#PRI07    ;SET SYS U1 VECTOR
1933 011602                            2$:      ENDINIT
1953                                    ;--------------------------------------------------------------------
1954 011604 000000                     PLOC:    .WORD   0
1955                                    ;--------------------------------------------------------------------
1956 011606 047045 040445 047117       INTER1: .ASCIZ  /%N%AONLY FOUR UNITS ALLOWED, START OVER/
1957                                            .EVEN
1958                                    ;--------------------------------------------------------------------
```

```
1961
1962
1963
1964  011656  000240                          UNPKHP: NOP                     ;
1965  011660  005037  012330                          CLR     UNT             ;CLEAR UNT
1966  011664  013701  011604                          MOV     PLOC,R1         ;SAVE P-TABLE LOCATION
1967  011670  005737  002334                  IFAI1:  TST     UNIT            ;IF UNIT
1968  011674  001005                                  BNE     IFBI1           ;IS ZERO
1969  011676  012137  002220                          MOV     (R1)+,U0ADR     ;LOAD UNIT #0 ADR
1970  011702  012137  002224                          MOV     (R1)+,U0VECT    ;LOAD UNIT #0 VECTOR
1971  011706  000426                                  BR      IFEI1           ;BR TO END IF 'A'
1972  011710  021137  002220                  IFBI1:  CMP     (R1),U0ADR      ;IF THIS ADR
1973  011714  001003                                  BNE     IFCI1           ;EQUALS UNIT #0 ADR
1974  011716  062701  000004                          ADD     #4,R1           ;INCREMENT TEMP #1 BY 4
1975  011722  000420                                  BR      IFEI1           ;BR TO END IF 'A'
1976  011724  005737  002222                  IFCI1:  TST     U1ADR           ;IF UN1 ADDRESS
1977  011730  001005                                  BNE     IFDI1           ;NOT LOADED PREVIOUSLY
1978  011732  012137  002222                          MOV     (R1)+,U1ADR     ;LOAD UNIT#1 ADR
1979  011736  012137  002226                          MOV     (R1)+,U1VECT    ;LOAD UNIT #1 VECTOR
1980  011742  000405                                  BR      EICI1           ;BR TO END IF 'C'
1981  011744  021137  002222                  IFDI1:  CMP     (R1),U1ADR      ;IF UNIT ADR
1982  011750  001153                                  BNE     ELDI1           ;EQUALS UNIT #1 ADR
1983  011752  062701  000004                          ADD     #4,R1           ;THEN ADD 4 TO TEMP #1
1984  011756  012737  000001  012330         EICI1:  MOV     #1,UNT          ;SET UNT=1
1985  011764  005737  002172                  IFEI1:  TST     RXXX            ;IF RXXX
1986  011770  001445                                  BEQ     IFII1           ;THEN
1987  011772  005711                          IFFI1:  TST     (R1)            ;IF DRIVE #0
1988  011774  001021                                  BNE     IFHI1           ;THEN
1989  011776  062701  000002                  IFGI1:  ADD     #2,R1           ;ADD 2 TO TEMP #1
1990  012002  005711                                  TST     (R1)            ;IF SIDE #0 SELECTED
1991  012004  001006                                  BNE     ELGI1           ;THEN
1992  012006  052737  000001  002232                  BIS     #BIT0,SUT       ;SET SIDE #0, DRIVE #0
1993  012014  005037  012326                          CLR     UNTCOD          ;CLEAR UNIT CODE
1994  012020  000501                                  BR      EIFI1           ;BR TO END IF 'F'
1995  012022  052737  000004  002232          ELGI1:  BIS     #BIT2,SUT       ;SET SIDE #1, DRIVE #0
1996  012030  012737  000002  012326                  MOV     #2,UNTCOD       ;SET UNIT CODE = 10
1997  012036  000472                                  BR      EIFI1           ;BR TO END IF 'F'
1998  012040  062701  000002                  IFHI1:  ADD     #2,R1           ;ADD 2 TO TEMP #1
1999  012044  005711                                  TST     (R1)            ;IF SIDE #0 SELECTED
2000  012046  001007                                  BNE     ELHI1           ;THEN
2001  012050  052737  000002  002232                  BIS     #BIT1,SUT       ;SET SIDE #0, DRIVE #1
2002  012056  012737  000001  012326                  MOV     #1,UNTCOD       ;SET UNIT CODE = 01
2003  012064  000457                                  BR      EIFI1           ;BR TO END IF 'F'
2004  012066  052737  000010  002232          ELHI1:  BIS     #BIT3,SUT       ;SET SIDE #1, DRIVE #1
2005  012074  012737  000003  012326                  MOV     #3,UNTCOD       ;SET UNIT CODE = 11
2006  012102  000450                                  BR      EIFI1           ;BR TO END IF 'F'
2007  012104  062701  000002                  IFII1:  ADD     #2,R1           ;ADD 2 TO R1
2008  012110  005711                                  TST     (R1)            ;IF SIDE
2009  012112  001056                                  BNE     ELII1           ;EQUALS 0, THEN
2010  012114  162701  000002                  IFJI1:  SUB     #2,R1           ;SUBTRACT 2 FROM TEMP #1
2011  012120  005711                                  TST     (R1)            ;IF DRIVE
2012  012122  001020                                  BNE     IFLI1           ;EQUALS ZERO, THEN
2013  012124  005737  012330                  IFKI1:  TST     UNT             ;IF UNIT
2014  012130  001006                                  BNE     ELKI1           ;EQUALS ZERO
2015  012132  052737  000001  002232                  BIS     #BIT0,SUT       ;SET UNIT #0, DRIVE #0
2016  012140  005037  012326                          CLR     UNTCOD          ;CLEAR UNIT CODE
```

```
 2017  012144  000427                          BR      EIFI1           ;BR TO END IF 'F'
 2018  012146  052737  000004  002232  ELKI1:  BIS     #BIT2,SUT       ;SET UNIT #1, DRIVE #0
 2019  012154  012737  000002  012326          MOV     #2,UNTCOD       ;SET UNIT CODE = 10
 2020  012162  000420                          BR      EIFI1           ;BR TO END IF 'F'
 2021  012164  005737  012330          IFLI1:  TST     UNT             ;IF UNIT
 2022  012170  001007                          BNE     ELLI1           ;EQUALS 0
 2023  012172  052737  000002  002232          BIS     #BIT1,SUT       ;SET UNIT #0, DRIVE #1
 2024  012200  012737  000001  012326          MOV     #1,UNTCOD       ;SET UNIT CODE = 01
 2025  012206  000406                          BR      EIFI1           ;BR TO END IF 'F'
 2026  012210  052737  000010  002232  ELLI1:  BIS     #BIT3,SUT       ;SET UNIT #1, DRIVE #1
 2027  012216  012737  000003  012326          MOV     #3,UNTCOD       ;SET UNIT CODE = 11
 2028  012224  012701  002336          EIFI1:  MOV     #UT00,R1        ;GET BEGINING OF UNIT CODE TABLE
 2029  012230  013702  012326                  MOV     UNTCOD,R2       ;GET UNIT CODE
 2030  012234  006302                          ASL     R2              ;DOUBLE R2 FOR ADDRESSING
 2031  012236  060201                          ADD     R2,R1           ;FIND ADDRESS FOR THIS UNIT CODE
 2032  012240  013703  002334                  MOV     UNIT,R3         ;GET LOGICAL UNIT#
 2033  012244  010311                          MOV     R3,(R1)         ;SET USER UNIT# FOR PRINT OUT
 2034  012246  000426                          BR      ENDI1           ;BR TO END MOD
 2035  012250                          ELII1:  PRINTF  #INMSG2,UNIT    ;PRINT 'MUST SELECT RXXX TO SEL SIDE''
 2036  012274                                  DOCIN
 2037  012276  000412                          BR      ENDI1           ;BR TO END MOD
 2038  012300                          ELDI1:  PRINTF  #INMSG3,UNIT    ;PRINT 'NOT SCHEDULED-TWO BUS ADR ONLY''
 2039  012324  000207                  ENDI1:  RTS     PC              ;RETURN
 2040                                  ;---------------------------------------------------------------------
 2041  012326  000000                  UNTCOD: 0                       ;UNIT CODE
 2042  012330  000000                  UNT:    0                       ;UNIT FLAG
 2043                                  ;---------------------------------------------------------------------
 2044  012332  047045  040445  047125  INMSG2: .ASCIZ  /%N%AUNIT#%D1%A ANS RXXX EXPANSION TO SELECT SIDE #1->START OVER
 2045  012432  047045  040445  047125  INMSG3: .ASCIZ  /%N%AUNIT#%D1%A NOT SCHEDULED-TWO BUS ADDRESSESS ONLY%N/
 2046          012522                          .EVEN
 2047                                  ;MOD I.1 ----- END MODULE ---------------------------------------------
```

```
                                                .SBTTL  CLEANUP CODING SECTION

                                                ;++
                                                ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
                                                ; AT THE END OF EACH PASS.
                                                ;--

012522                                                  BGNCLN
012522  000240                                          NOP
012524                                                  CLRVEC  U0VECT
012532  005737  002226                                  TST     U1VECT
012536  001403                                          BEQ     2$
012540                                                  CLRVEC  U1VECT
012546                                          2$:     BRESET
012550                                                  ENDCLN


                                                .EVEN
```

```
2087                                            .SBTTL  AUTO DROP SECTION
2088                                            ;-----------------------------------------------------------------
2089  012552                                            BGNAUTO
2090  012552  005737  002220                  IAATDP: TST     U0ADR           ;IF SYS UNIT 0 ADDRESS
2091  012556  001447                                  BEQ     IDATDP          ;NOT=0, THEN
2092  012560  012703  002336                          MOV     #UT00,R3        ;SETUP R3 = ADR OF SELECTED UNIT
2093  012564  013702  002220                          MOV     U0ADR,R2        ;GET SYS UNIT 0 ADDRESS
2094  012570  004737  012774                          CALL    ADRTST          ;CALL ADDRESSING TEST
2095  012574  005737  002270                  IBATDP: TST     ABORT           ;IF ABORT FLAG
2096  012600  001436                                  BEQ     IDATDP          ;SET, THEN
2097  012602  005737  002336                  IGATDP: TST     UT00            ;IF UT00 SELECTED
2098  012606  100403                                  BMI     IHATDP          ;THEN
2099  012610                                          DODU    UT00            ;DROP UNIT 00
2100  012616  005737  002340                  IHATDP: TST     UT01            ;IF UT01 SELECTED
2101  012622  100403                                  BMI     ICATDP          ;THEN
2102  012624                                          DODU    UT01            ;DROP UNIT 01
2103  012632  005737  002172                  ICATDP: TST     RXXX            ;IF RXXX DEVICE
2104  012636  001417                                  BEQ     IDATDP          ;THEN
2105  012640  012703  002342                          MOV     #UT10,R3        ;SETUP R3 = ADR OF SELECTED UNIT
2106  012644  005737  002342                  IIATDP: TST     UT10            ;IF UT10 SELECTED
2107  012650  100403                                  BMI     IJATDP          ;THEN
2108  012652                                          DODU    UT10            ;DROP UNIT 10
2109  012660  005737  002344                  IJATDP: TST     UT11            ;IF UT11 SELECTED
2110  012664  100440                                  BMI     XATDP           ;THEN
2111  012666                                          DODU    UT11            ;DROP UNIT 11
2112  012674  000434                                  BR      XATDP           ;BR TO EXIT
2113  012676  005737  002222                  IDATDP: TST     U1ADR           ;IF SYS UNIT 1 ADDRESS
2114  012702  001425                                  BEQ     IFATDP          ;NOT=0, THEN
2115  012704  012703  002342                          MOV     #UT10,R3        ;SETUP R3 = ADR OF SELECTED UNIT
2116  012710  013702  002222                          MOV     U1ADR,R2        ;GET SYS UNT 1 ADDRESS
2117  012714  004737  012774                          CALL    ADRTST          ;CALL ADDRESSING TEST
2118  012720  005737  002270                  IEATDP: TST     ABORT           ;IF ABORT FLAG
2119  012724  001420                                  BEQ     XATDP           ;SET, THEN
2120  012726  005737  002342                  IKATDP: TST     UT10            ;IF UT10 SELECTED
2121  012732  100403                                  BMI     ILATDP          ;THEN
2122  012734                                          DODU    UT10            ;DPOP UNIT 10
2123  012742  005737  002344                  ILATDP: TST     UT11            ;IF UT11 SELECTED
2124  012746  100403                                  BMI     IFATDP          ;THEN
2125  012750                                          DODU    UT11            ;DROP UNIT 11
2126  012756  005737  002220                  IFATDP: TST     U0ADR           ;IF SYS UNIT 0 ADDRESS
2127  012762  001001                                  BNE     XATDP           ;EQUALS 0, THEN
2128  012764                                          DOCLN                   ;DO CLEAN
2129  012766  005037  002270                  XATDP:  CLR     ABORT           ;CLEAR ABORT FLAG
2130  012772                                          ENDAUTO
2131                                          ;-----------------------------------------------------------------
```

```
                                                .SBTTL  -    TEST 0: ADDRESSING TEST
                                                ;-------------------------------------------------------------------
                                                ; BGNSUB
                                                ;       IF FUNCTION TEST
                                                ;       :  THEN-SETUP TEST
                                                ;       :       SETUP BUS TRAPS
                                                ;       :       READ RXCSR
                                                ;       :       RESET BUS TRAPS
                                                ;       :       IF TRAP
                                                ;       :       :  THEN-SET SYSTEM FATAL FLAG
                                                ;       :       :       CALL FUNCTION TEST ERROR
                                                ;       :       :       REPORT BUS TRAP ON RXCSR
                                                ;       :       ENDIF
                                                ;       ENDIF
                                                ; ENDSUB
                                                ;-------------------------------------------------------------------
                                                ;
012774  000240                                  ADRTST: NOP                     ;
012776  005037  002270                                  CLR     ABORT           ;CLEAR ABORT FLAG
013002                                                  SETVEC  #BTRP4,#TRAP,#PRI07
013030  011201                                          MOV     (R2),R1         ;READ RXCSR
013032                                                  CLRVEC  #BTRP4
013040  005737  002270                                  TST     ABORT           ;IF ABORT FLAG
013044  001426                                          BEQ     2$              ;SET, THEN
013046  012701  013144                                  MOV     #TRPMS1,R1      ;SET TRAP MESSAGE
013052  012337  002074                                  MOV     (R3)+,L$LUN     ;IF UNIT
013056  100005                                          BPL     1$              ;NOT SELECTED, THEN
013060  011337  002074                                  MOV     (R3),L$LUN      ;IF NEXT UNIT
013064  100002                                          BPL     1$              ;NOT SELECTED, THEN
013066  005037  002074                                  CLR     L$LUN           ;CLEAR UNIT
013072  012737  000620  002376                  1$      MOV     #400.,ERRNBR    ;SETUP ERR NBR = ADR ERR
013100  012737  013124  002400                          MOV     #TOMSG,ERRMSG   ;SETUP ERROR MSG
013106  012737  004510  002402                          MOV     #PRTB1,ERRBLK   ;SETUP ERROR BLK
013114  005037  002374                                  CLR     ERRTYP          ;SETUP ERR TYP = SYS FTL
013120                                                  ERROR                   ;CALL ERROR
013122  000207                                  2$:     RETURN                  ;RETURN
                                                ;-------------------------------------------------------------------
013124  042101  051104  051505                  TOMSG:  .ASCIZ  /ADDRESSING TEST/
013144  040445  041040  051525                  TRPMS1: .ASCII  /%A BUS TRAP AT ADDRESS:%O6%N/
013200  040445  044440  052116                          .ASCIZ  /%A INTERFACE BAD OR NOT SET TO ABOVE ADDRESS%N/
        013260                                          .EVEN
```

```
 2177                                           .SBTTL  -    MOD U.SFT.TRP - BUS TRAP HANDLER
 2178                                           ;++
 2179                                           ; FUNCTIONAL DESCRIPTION:  SUBR TO HANDLE DEVICE BUS TRAP
 2180                                           ; INPUTS:  NONE
 2181                                           ; IMPLICIT INPUTS:  BUS TRAP
 2182                                           ; OUTPUTS:  BUS TRAP ERROR, ABORT TEST
 2183                                           ; IMPLICIT OUTPUTS:  NONE
 2184                                           ; SUBORDINATE ROUTINES USED:  NONE
 2185                                           ; FUNCTIONAL SIDE EFFECTS:  NONE
 2186                                           ; CALLING SEQUENCE:  INTERRUPT
 2187                                           ;--
 2188
 2189                                           ;-------------------------------------------------------------------------
 2190
 2191  013260  052737  004000  002274           TRAP:   BIS     #SYSERR,ERRSY   ;SET SYSTEM ERROR
 2192  013266  005237  002270                           INC     ABORT           ;ABORT TEST
 2193  013272  000002                                   RTI                     ;RETURN FROM TRAP INTERRUPT
 2194                                           ;-------------------------------------------------------------------------
```

```
2197                                            .SBTTL  DROP UNIT SECTION
2198
2199                                            ;++
2200                                            ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
2201                                            ; TO NO LONGER BE TESTED.
2202                                            ;--
2203
2209
2210  013274                                            BGNDU
2211
2212  013274  010037  013436                            MOV     R0,UNITDP       ;GET LOGICAL UNIT #
2213  013300  005002                                    CLR     R2              ;LET R2=UNIT CODE# & UNIT COUNT /CLEAR IT!
2214  013302  012701  002336                            MOV     #UT00,R1        ;GET BEGIN UNIT CODE ADRESS
2215  013306  023721  013436                  1$:       CMP     UNITDP,(R1)+    ;IF USER UNIT#
2216  013312  001417                                    BEQ     2$              ;IS  = UNIT CODE - UNIT#
2217  013314  005202                                    INC     R2              ;INCREMENT UNIT CODE# & UNIT COUNT
2218  013316  022702  000005                            CMP     #5,R2           ;IF MAX # OF UNITS
2219  013322  101371                                    BHI     1$              ;EXCEEDED, THEN
2220  013324                                            PRINTF  #DUMSG2,UNITDP  ;PRINT UNIT# NOT FOUND
2221  013350  000431                                    BR      3$              ;BR TO EXIT
2222  013352  012741  177777                  2$:       MOV     #-1,-(R1)       ;DESELECT UNIT
2223  013356  010237  004752                            MOV     R2,CVUNIT       ;SET UNIT CODE FOR CONVERSION
2224  013362  004737  004654                            CALL    CVUTST          ;CALL MOD U.A.1 CONVERT UNIT# TO SUT CODE
2225  013366  013737  004754  013440                    MOV     SUTCV,SUTDRP    ;SET SUT DROP CODE = SUT CONVERTED CODE
2226  013374  043737  013440  002232                    BIC     SUTDRP,SUT      ;DROP UNIT SPEC IN SUTDRP
2227  013402  043737  013440  002230                    BIC     SUTDRP,SDD      ;CLEAR UNIT SPEC IN SUT DROP
2228  013410                                            PRINTF  #DUMSG1,UNITDP
2229
2230  013434                                  3$:       ENDDU
2231                                            ;-----------------------------------------------------------------------
2232  013436  000000                            UNITDP: 0                       ;UNIT TO BE DROPPED
2233  013440  000000                            SUTDRP: 0                       ;SYS UNDER TST, DROP BIT
2234                                            ;-----------------------------------------------------------------------
2235  013442  047045  040445  042040            DUMSG1: .ASCIZ  /%N%A DROP UNIT#%D1%A FROM TEST%N/
2236  013503     045  022516  020101            DUMSG2: .ASCIZ  /%N%A COULD NOT DROP UNIT#%D1%A -NOT SELECTED%N/
2237                                            ;-----------------------------------------------------------------------
2238
2250
2251                                            .EVEN
```

```
 2254                                           .SBTTL  ADD UNIT SECTION
 2255
 2256                                           ;++
 2257                                           ; THE ADD-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
 2258                                           ;  TO BE (A) TESTED FOR THE FIRST TIME, OR (B) RESUMED IN TESTING.  IF
 2259                                           ;  ''EF.AUNIT'' IS SET, THE UNIT WILL BE TESTED AS A NEW UNIT.
 2260                                           ;--
 2261
 2262  013562                                           BGNAU
 2263
 2269
 2270  013562                                           ENDAU
 2271
 2283
 2284                                           .EVEN
```

```
2287
2288                    .TITLE HARDWARE TESTS
2289                    .SBTTL  TEST 1: RX02 SS PERF EXERCISER
2290                    ;++
2291                    ; TEST TO EXCERCISE RX02/XX SYSTEM
2292                    ;--
2293                    .SBTTL  MOD 0.0 - EXERCISE A SYSTEM
2294                    ;-----------------------------------------------------------------------
2295                    ; BGNTST
2296                    ;  BGNDO
2297                    ;  :  BGNSUB
2298                    ;  :  :  INITIALIZE (LOCATIONS, ETC.)
2299                    ;  :  :  CALL MOD 1.0
2300                    ;  :  ENDSUB
2301                    ;  :  IF ERR SYS=1
2302                    ;  :  :  THEN-
2303                    ;  :  :    CALL MOD 4.0
2304                    ;  :  ENDIF
2305                    ;  :  IF ABORT=0
2306                    ;  :  :  THEN-
2307                    ;  :  :    BGNDO
2308                    ;  :  :    :  BGNSUB
2309                    ;  :  :    :  CALL MOD 2.0
2310                    ;  :  :    :  IF ERR SYS NOT=0
2311                    ;  :  :    :  :  THEN-
2312                    ;  :  :    :  :    CALL MOD 4.0
2313                    ;  :  :    :  :    IF ABORT=0
2314                    ;  :  :    :  :    :  THEN-
2315                    ;  :  :    :  :    :    CALL MOD 3.0
2316                    ;  :  :    :  :    ENDIF
2317                    ;  :  :    :  :  ELSE-
2318                    ;  :  :    :  :    CALL MOD 3.0
2319                    ;  :  :    :  ENDIF
2320                    ;  :  :    :  CK LOOP
2321                    ;  :  :    :  ENDSUB
2322                    ;  :  :    DO UNTIL ABORT=1 OR EXCMP=1
2323                    ;  :  ENDIF
2324                    ;  DO UNTIL SWREG BIT#15 NOT SET
2325                    ;  IF ABORT=1
2326                    ;  :  THEN-
2327                    ;  :    DO CLEAN UP
2328                    ;  :  ELSE-
2329                    ;  :    DO REPORT
2330                    ;  ENDIF
2331                    ; ENDTST
                        ;-----------------------------------------------------------------------
```

```
2333  013564                                        BGNTST
2334  013564  000240                        CONTRL: NOP                     ;
2335  013566                                BG00:   BGNSUB                  ;BEGIN SUB TEST
2336  013570  005037  014020                        CLR     EXCMP           ;CLEAR EXERCISE COMPLETE
2337  013574  005037  002270                        CLR     ABORT           ;CLEAR ABORT FLAG
2338  013600  012737  000001  014016                MOV     #1,!NITL        ;SET INITIALIZE FLAG
2339  013606  005037  002304                        CLR     RETRY           ;CLEAR RETRY FLAGS
2340  013612  005037  002230                        CLR     SDD             ;CLEAR SYS DRIVES DONE
2341  013616  005037  002274                        CLR     ERRSY           ;CLEAR SYSTEM ERROR FLAGS
2342  013622  005037  002276                        CLR     ERRTY           ;CLEAR DEVICE ERROR FLAGS
2343  013626  005037  002246                        CLR     CSRUUT          ;CLEAR UUT CSR
2344  013632  005037  002250                        CLR     ESRUUT          ;CLEAR UUT ESR
2345  013636  005037  033544                        CLR     XERUUT          ;CLEAR UUT TEST ERROR REG
2346  013642  005037  002332                        CLR     CMD             ;CLEAR COMMAND PRINT WORD
2347  013646  005037  023330                        CLR     WDOT            ;CLEAR COMMAND WORD
2348  013652  012737  000001  021426                MOV     #1,SUTPTR       ;PRESET SYS UNDER TST PTR
2349  013660  004737  014022                        CALL    GTSYEX          ;CALL MOD 1.0 GET SYS EXER.
2350  013664                                        ENDSUB                  ;END SUB TEST
2351  013666  005737  002274                IA00:   TST     ERRSY           ;IF ERR SYS
2352  013672  001402                                BEQ     IB00            ;NOT=0, THEN
2353  013674  004737  032466                        CALL    OTSYER          ;CALL MOD 4.0 - O/P SYSTEM ERROR
2354  013700  005737  002270                IB00:   TST     ABORT           ;IF ABORT
2355  013704  001030                                BNE     UG00            ;NOT SET, THEN
2356  013706                                BC00:   BGNSUB                  ;BEGIN SUB TEST
2357  013710  004737  020676                        CALL    SCSYEX          ;CALL MOD 2.0 - SCHEDULE SYSTEM EXERCISE
2358  013714  005737  002274                ID00:   TST     ERRSY           ;IF ERR SYSTEM
2359  013720  001410                                BEQ     LD00            ;NOT=0, THEN
2360  013722  004737  032466                        CALL    OTSYER          ;CALL MOD 4.0 - O/P SYSTEM ERROR
2361  013726  005737  002270                IE00:   TST     ABORT           ;IF ABORT
2362  013732  001005                                BNE     ED00            ;NOT SET, THEN
2363  013734  004737  032444                        CALL    OTEXCM          ;CALL MOD 3.0 - O/P SYSTEM EXERCISE COMPLETE
2364  013740  000402                                BR      ED00            ;BR TO END 'D'
2365  013742  004737  032444                LD00:   CALL    OTEXCM          ;CALL MOD 3.0 - O/P SYSTEM EXERCISE COMPLETE
2366  013746                                ED00:   CKLOOP                  ;CHECK LOOP ON ERROR
2367  013750                                        ENDSUB                  ;END SUB TEST
2368  013752  005737  002270                UC00:   TST     ABORT           ;DOUNTIL ABORT
2369  013756  001007                                BNE     IF00            ;OR
2370  013760  005737  014020                        TST     EXCMP           ;EXERCISE COMPLETE
2371  013764  001750                                BEQ     BC00            ;SET
2372  013766  032737  100000  002204        UG00:   BIT     #100000,SWREG   ;DOUNTIL SWREG BIT=15
2373  013774  001274                                BNE     BG00            ;NOT SET
2374  013776  005737  002270                IF00:   TST     ABORT           ;IF ABORT
2375  014002  001402                                BEQ     LF00            ;SET, THEN
2376  014004                                        DOCLN                   ;DO CLEAN UP
2377  014006  000401                                BR      END00           ;BR TO END
2378  014010                                LF00:   DORPT                   ;DO REPORT
2379  014012                                END00:  EXIT    TST             ;EXIT TEST
2380                                        ;-------------------------------------------------------------------
2381  014016  000000                        INITL:  0                       ;INITIALIZE POINTERS FLAG
2382  014020  000000                        EXCMP:  0                       ;EXERCISE COMPLETE FLAG
2383                                        ;MOD 0.0 ----- END MODULE -----------------------------------------
```

```
2386
2387
2388                                        .SBTTL  MOD 1.0 - GET SYSTEM EXERCISE
2389                                        ;-------------------------------------------------------------------
2390  014022  000240                        GTSYEX: NOP
2391  014024  032737  000001  002266        IFB10:  BIT     #POWERF,FLAGS   ;IF POWER FLAG
2392  014032  001002                                BNE     IFA10           ;NOT SET, THEN
2393  014034  004737  014076                        JSR     PC,GTEXCD       ;CALL GET EXERCISE CONDITION
2394  014040  032737  040000  002204        IFA10:  BIT     #40000,SWREG    ;IF NO INITIALIZE
2395  014046  001002                                BNE     ELA10           ;NOT SET, THEN
2396  014050  004737  014216                        JSR     PC,GTSYS        ;CALL GET SYSTEM TO EXERCISE
2397  014054  004737  017302                ELA10:  JSR     PC,GTEX         ;CALL GET EXERCISE
2398  014060  042737  040000  002274                BIC     #BIT14,ERRSY    ;CLEAR ANY TIME OUT ERRORS ALREADY REPORTED
2399  014066  005037  014074                        CLR     FIRST           ;CLEAR FIRST PASS FLAG
2400  014072  000207                                RTS     PC              ;RETURN
2401                                        ;-------------------------------------------------------------------
2402  014074  000001                        FIRST:  1                       ;FIRST PASS FLAG
2403                                        ;MOD 1.0 ----- END MODULE -----------------------------------------
2404
2405
2406
2407                                        .SBTTL  MOD 1.1 - GET EXERCISE CONDITIONS
2408                                        ;-------------------------------------------------------------------
2409
2410
2411  014076  000240                        GTEXCD: NOP
2412  014100  032737  000001  002204        IFA11:  BIT     #1,SWREG        ;IF SET FOR DOUBLE DENSITY
2413  014106  001404                                BEQ     ELA11           ;THEN
2414  014110  012737  000200  002252                MOV     #200,WDCNT      ;SET WORD COUNT=256 BYTES
2415  014116  000403                                BR      EIA11           ;BR TO END IF 'A'
2416  014120  012737  000100  002252        ELA11:  MOV     #100,WDCNT      ;SET WORD COUNT=128 BYTES
2417  014126  013737  002206  020650        EIA11:  MOV     OTDITK,OD       ;SET OUTSIDE TRACK ADR. (FROM SOFTW P-TAB)
2418  014134  013737  002210  020652                MOV     INDITK,ID       ;SET INSIDE TRACK ADR. (FROM SOFT P-TAB)
2419  014142  032737  000002  002204                BIT     #2,SWREG        ;IF DEL DATA SET
2420  014150  001404                                BEQ     ELB11           ;THEN
2421  014152  012737  000010  002244                MOV     #10,DELDAT      ;SET DEL DATA MODE
2422  014160  000402                                BR      IFC11           ;BR TO END IF 'B'
2423  014162  005037  002244        ELB11:  CLR     DELDAT          ;CLEAR DEL DATA MODE
2424  014166  032737  000001  002204        IFC11:  BIT     #1,SWREG        ;IF DOUBLE DEN IS SET IN SOFT SWREG
2425  014174  001404                                BEQ     ELC11           ;THEN
2426  014176  012737  000400  002242                MOV     #400,DEN        ;SET DEN=DOUBLE
2427  014204  000402                                BR      EIC11           ;BR TO END IF 'C'
2428  014206  005037  002242        ELC11:  CLR     DEN             ;SET DEN=SINGLE
2429  014212  000240                EIC11:  NOP                     ;
2430  014214  000207                                RTS     PC              ;RETURN
2431                                        ;MOD 1.1 ----- END MODULE -----------------------------------------
```

```
2434
2435
2436                                        .SBTTL  MOD 1.2 - GET SYSTEM TO EXERCISE
2437                                        ;---------------------------------------------------------------
2438
2439  014216                                GTSYS:  BRESET                  ;ISSUE BUS RESET
2440  014220  004737  014626                        CALL    GPSUN0          ;CALL GET PRINTABLE SYSTEM 0 UNIT #
2441  014224  012737  000040  025330              MOV     #DNBIT,RDYWD    ;SET READY WORD = DONE
2442  014232  013737  002220  025332              MOV     U0ADR,CSRADR    ;SET ADDRESS
2443  014240  004737  025230                      CALL    DELAY           ;CALL MOD - DELAY FOR DONE
2444  014244  032777  000040  165746      IFA12:  BIT     #DNBIT,@U0ADR   ;IF UNIT #0 DONE BIT
2445  014252  001006                              BNE     ELA12           ;NOT SET THEN
2446  014254  012737  016167  016130              MOV     #INTER2,ITMSG   ;SET PRINT MSG#
2447  014262  004737  016016                      CALL    ITERR           ;INITIALIZE ERR-U0-NO DONE BIT
2448  014266  000442                              BR      EIA12           ;BR TO END IF 'A'
2449  014270  012777  040000  165722      ELA12:  MOV     #40000,@U0ADR   ;ELSE-ISSUE PROG INIT TO U0
2450  014276  012737  000040  025330              MOV     #DNBIT,RDYWD    ;SET READY WORD = DONE
2451  014304  013737  002220  025332              MOV     U0ADR,CSRADR    ;SET TEST ADDRESS
2452  014312  004737  025230                      CALL    DELAY           ;CALL MOD - DELAY FOR DONE
2453  014316  032777  000040  165674      IFB12:  BIT     #DNBIT,@U0ADR   ;IF UNIT #0 DONE BIT
2454  014324  001006                              BNE     ELB12           ;NOT SET THEN
2455  014326  012737  016235  016130              MOV     #INTER3,ITMSG   ;SET PRINT MSG#
2456  014334  004737  016016                      CALL    ITERR           ;INITIALIZE ERR-U0, NO DONE BIT
2457  014340  000415                              BR      EIA12           ;BR TO END IF 'A'
2458  014342  012737  000002  015276      ELB12:  MOV     #2,UNTCNT       ;SET # DRVS TO CK
2459  014350  012737  000001  015302              MOV     #1,SUTPOS       ;SET POSITION IN SUT TO TEST = 1
2460  014356  005037  015300                      CLR     UNTCD           ;SET UUT CODE = 0
2461  014362  013704  002220                      MOV     U0ADR,R4        ;SET TEMP #4 = U0 ADDRESS
2462  014366  004737  014742                      CALL    CKDVAV          ;CALL MOD 1.2.1 - CK DRIVE STATUS
2463  014372  000412                              BR      IFC12           ;BR TO IF 'C'
2464  014374  005737  002172      EIA12:  TST     RXXX            ;IF RXXX
2465  014400  001404              IFH12:  BEQ     ELH12           ;THEN
2466  014402  042737  000017  002232              BIC     #17,SUT         ;CLEAR RXXX U0 SELECTED DRIVES
2467  014410  000403                              BR      IFC12           ;BR TO IF 'C'
2468  014412  042737  000003  002232      ELH12:  BIC     #3,SUT          ;CLEAR RX02 U0 SELECTED DRIVES
2469  014420  005737  002172      IFC12:  TST     RXXX            ;IF RXXX
2470  014424  001401                              BEQ     IFD12           ;THEN
2471  014426  000463                              BR      IFG12           ;BR TO IF 'G'
2472  014430  032737  000014  002232      IFD12:  BIT     #14,SUT         ;IF U1
2473  014436  001457                              BEQ     IFG12           ;SELECTED THEN
2474  014440  004737  014702                      CALL    GPSUN1          ;CALL GET PRINTABLE SYSTEM 1 UNIT #
2475  014444  032777  000040  165550      IFE12:  BIT     #DNBIT,@U1ADR   ;IF U1 DONE BIT
2476  014452  001441                              BEQ     ELE12           ;SET THEN
2477  014454  012777  040000  165540              MOV     #40000,@U1ADR   ;INITIALIZE DEVICE U1
2478  014462  012737  000040  025330              MOV     #DNBIT,RDYWD    ;SET READY WORD = DONE BIT
2479  014470  013737  002222  025332              MOV     U1ADR,CSRADR    ;SET TEST ADR
2480  014476  004737  025230                      CALL    DELAY           ;CALL MOD - WAIT FOR DONE
2481  014502  032777  000040  165512      IFF12:  BIT     #DNBIT,@U1ADR   ;IF U1 DONE BIT
2482  014510  001416                              BEQ     ELF12           ;SET THEN
2483  014512  012737  000004  015302              MOV     #4,SUTPOS       ;SET POSITION IN SUT = 4
2484  014520  012737  000002  015276              MOV     #2,UNTCNT       ;SET # DRVS TO CK = 2
2485  014526  012737  000002  015300              MOV     #2,UNTCD        ;SET UUT CODE = 2
2486  014534  013704  002222                      MOV     U1ADR,R4        ;SET TEMP #4 = U1 ADR
2487  014540  004737  014742                      CALL    CKDVAV          ;CALL MOD 1.2.1 - CK DRIVE STATUS
2488  014544  000414                              BR      IFG12           ;BR TO IF 'G'
2489  014546  012737  016235  016130      ELF12:  MOV     #INTER3,ITMSG   ;SET MSG#-U1-"NO DONE BIT-PROG INT"
```

```
2490  014554  000403                          BR      EIE12           ;BR TO END IF 'E'
2491  014556  012737  016167  016130  ELE12:  MOV     #INTER2,ITMSG   ;SET MSG#-U1-'NO DONE BIT-BUS INIT''
2492  014564  004737  016016          EIE12:  CALL    ITERR           ;INIT ERR
2493  014570  042737  000014  002232          BIC     #14,SUT         ;CLEAR SYS 1 FROM TEST
2494  014576  005737  002232          IFG12:  TST     SUT             ;IF SYSTEM UNDER TEST
2495  014602  001007                          BNE     ELG12           ;EQUALS 0, THEN
2496  014604  012701  016305                  MOV     #INTER4,R1      ;SETUP PRINT - 'NO SYS TO TEST''
2497  014610  004737  004516                  CALL    PRTBOS          ;CALL PRINT BASIC-0 ARG
2498  014614  012737  000001  002270          MOV     #1,ABORT        ;SET ABORT FLAG
2499  014622  000240                  ELG12:  NOP                     ;
2500  014624  000207                          RTS     PC              ;RETURN
2501                                  ;MOD 1.2 ----- END MODULE ----------------------------------------
2502
2503                                  .SBTTL  -    MOD 1.2.U.1 - GET PRINTABLE SYSTEM 0 UNIT #
2504                                  ;-------------------------------------------------------------------
2505  014626  005037  002334          GPSUN0: CLR     UNIT            ;SET UNIT=0
2506  014632  005737  002336                  TST     UT00            ;IF UT00
2507  014636  100404                          BMI     2$              ;VALID, THEN
2508  014640  013737  002336  002334          MOV     UT00,UNIT       ;SETUP UNIT FOR PRINT
2509  014646  000414                          BR      XPSUN0          ;BR TO EXIT
2510  014650  005737  002340          2$:     TST     UT01            ;IF UT01
2511  014654  100404                          BMI     3$              ;VALID, THEN
2512  014656  013737  002340  002334          MOV     UT01,UNIT       ;SETUP UNIT FOR PRINT
2513  014664  000405                          BR      XPSUN0          ;BR TO EXIT
2514  014666  005737  002172          3$:     TST     RXXX            ;IF RXXX
2515  014672  001402                          BEQ     XPSUN0          ;THEN
2516  014674  004737  014702                  CALL    GPSUN1          ;CALL GET PRINTABLE SYSTEM 1 UNIT #
2517  014700  000207                  XPSUN0: RETURN                  ;RETURN
2518                                  ;-------------------------------------------------------------------
2519
2520                                  .SBTTL  -    MOD 1.2.U.2 - GET PRINTABLE SYSTEM 1 UNIT #
2521                                  ;-------------------------------------------------------------------
2522  014702  005037  002334          GPSUN1: CLR     UNIT            ;SET UNIT=0
2523  014706  005737  002342          1$:     TST     UT10            ;IF UT10
2524  014712  100404                          BMI     2$              ;VALID, THEN
2525  014714  013737  002342  002334          MOV     UT10,UNIT       ;SETUP UNIT FOR PRINT
2526  014722  000406                          BR      XPSUN1          ;BR TO EXIT
2527  014724  005737  002344          2$:     TST     UT11            ;IF UT11
2528  014730  100403                          BMI     XPSUN1          ;VALID, THEN
2529  014732  013737  002344  002334          MOV     UT11,UNIT       ;SETUP UNIT FOR PRINT
2530  014740  000207                  XPSUN1: RETURN                  ;RETURN
2531                                  ;-------------------------------------------------------------------
```

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2534                                                    .SBTTL  MOD 1.2.1 - CK DRIVE AVAILABLE
2535                                                    ;-------------------------------------------------------------------------
2536  014742  010437  015272                          CKDVAV: MOV     R4,ITCSAD       ;SAVE C & S ADR
2537  014746  062704  000002                                  ADD     #2,R4           ;SET DATA BUFFER ADR
2538  014752  010437  015274                                  MOV     R4,ITDBAD       ;SAVE DB ADR
2539  014756  000240                                 BDA121: NOP                     ;
2540  014760  033737  015302  002232                 IFA121: BIT     SUTPOS,SUT      ;IF THIS UNIT SUT & SUT
2541  014766  001521                                         BEQ     EIA121          ;EQUAL, THEN
2542  014770                                                  BGNSEG                  ;BEGIN SEGMENT-TO LOOP ON ERROR
2543  014772  013701  015300                                  MOV     UNTCD,R1        ;SAVE UNIT CODE #
2544  014776  006301                                         ASL     R1              ;DOUBLE UNIT CD FOR ADR
2545  015000  062701  002336                                 ADD     #UT00,R1        ;FIND ADR UNIT#
2546  015004  011137  002334                                 MOV     (R1),UNIT       ;SET UNIT# FOR PRINT
2547  015010  032737  000001  015300                 IFB121: BIT     #1,UNTCD        ;IF DRIVE #1 SET IN UNIT CODE
2548  015016  001407                                         BEQ     ELB121          ;THEN
2549  015020  012737  000033  015266                         MOV     #33,INTCMD      ;SET READ STATUS DRV #1
2550  015026  012737  000001  015270                         MOV     #1,DRIVEN       ;SET PRINT FOR DRV #1
2551  015034  000405                                         BR      EIB121          ;BR TO END IF 'B'
2552  015036  012737  000013  015266                 ELB121: MOV     #13,INTCMD      ;SET READ STATUS DRV #0
2553  015044  005037  015270                                 CLR     DRIVEN          ;SET PRINT FOR DRIVE #0
2554  015050  013777  015266  000214                 EIB121: MOV     INTCMD,@ITCSAD  ;EXECUTE READ STATUS ON DRIVE AT TEMP #4
2555  015056  013737  015272  025332                         MOV     ITCSAD,CSRADR   ;PASS DOWN ADRS
2556  015064  012737  000040  025330                         MOV     #DNBIT,RDYWD    ;PASS DOWN "DONE" BIT TO TEST
2557  015072  004737  025230                                 CALL    DELAY           ;CALL MOD - DELAY FOR DONE BIT
2558  015076  032777  000010  000170                 IFH121: BIT     #10,@ITDBAD     ;IF AC LOW BIT
2559  015104  001404                                         BEQ     IFC121          ;SET, THEN
2560  015106  012737  017200  016130                         MOV     #ITER3,ITMSG    ;SET MSG# -  "AC LOW"
2561  015114  000436                                         BR      EIC121          ;BR TO END IF 'C'
2562  015116  032777  000200  000150                 IFC121: BIT     #200,@ITDBAD    ;IF DRV RDY BIT
2563  015124  001004                                         BNE     IFI121          ;NOT SET, THEN
2564  015126  012737  016334  016130                         MOV     #ITMSG1,ITMSG   ;SET MSG# - "NO DRIVE READY"
2565  015134  000426                                         BR      EIC121          ;BR TO END IF 'C'
2566  015136  032777  004000  000126                 IFI121: BIT     #RX2BIT,@ITCSAD ;IF CSR RX02 BIT
2567  015144  001004                                         BNE     IFD121          ;NOT SET, THEN
2568  015146  012737  016521  016130                         MOV     #ITMSG5,ITMSG   ;SET MSG # "NOT CAP. OF DOUBLE DENS. OPS."
2569  015154  000416                                         BR      EIC121          ;BR TO END IF 'C'
2570  015156  005737  002172                 IFD121: TST     RXXX            ;IF UNIT IS TO BE TESTED AS RXXX
2571  015162  001421                                         BEQ     EID121          ;THEN
2572  015164  032737  000002  015300                 IFE121: BIT     #2,UNTCD        ;IF SIDE #1
2573  015172  001415                                         BEQ     EID121          ;SELECTED
2574  015174  032777  000002  000072                 IFF121: BIT     #2,@ITDBAD      ;IF SIDE #1
2575  015202  001011                                         BNE     EID121          ;NOT READY, THEN
2576  015204  012737  016357  016130                         MOV     #ITMSG2,ITMSG   ;SET MSG# - "NO SIDE RDY"
2577  015212  004737  016016                 EIC121: CALL    ITERR           ;CALL INITIALIZE ERROR
2578  015216                                                  ENDSEG                  ;END SEGMENT-TO LOOP ON ERROR
2579  015220  004737  016064                         CALL    ITDROP          ;CALL DROP UNIT
2580  015224  000402                                         BR      EIA121          ;BR TO ENDIF 'A'
2581  015226  004737  015306                 EID121: CALL    REFDRV          ;CALL REFORMAT DRIVE DENSITY
2582  015232  006137  015302                 EIA121: ROL     SUTPOS          ;MOVE SELECT BIT TO TEST SYS UNDER TEST
2583  015236  005337  015276                         DEC     UNTCNT          ;DECREMENT UNIT COUNT
2584  015242  005237  015300                         INC     UNTCD           ;INCREMENT UNIT UNDER TEST CODE
2585  015246  005737  015276                 DUA121: TST     UNTCNT          ;DO
2586  015252  001402                                         BEQ     END121          ;UNTIL
2587  015254  000137  014756                         JMP     BDA121          ;ALL UNITS DONE
2588  015260  000240                                 END121: NOP                     ;
2589  015262  000207                                         RTS     PC              ;RETURN
```

```
2590                                    ;-----------------------------------------------------------------------
```

```
2593
2594  015264  000000                    REFCMD: 0                       ;REFORMAT COMMAND
2595  015266  000000                    INTCMD: 0                       ;INITIAL COMMAND WORD
2596  015270  000000                    DRIVEN: 0                       ;DRIVE NUMBER
2597  015272  000000                    ITCSAD: 0                       ;INITIAL C & S ADR
2598  015274  000000                    ITDBAD: 0                       ;INITIAL DATA BUFFER ADR
2599  015276  000000                    UNTCNT: 0                       ;UNIT COUNT
2600  015300  000000                    UNTCD:  0                       ;UNIT CODE
2601  015302  000000                    SUTPOS: 0                       ;SYS UNDER TST POSITION
2602  015304  000000                    FORMCK: 0                       ;FORMATT CK FLAG
2603                                    ;-------------------------------------------------------------------------
```

```
2606                                                .SBTTL  MOD 1.2.1.1 - REFORMAT DRIVE DENSITY
2607                                                ;---------------------------------------------------------------------
2608
2609  015306  033737  015302  002232        REFDRV: BIT     SUTPOS,SUT      ;IF UNIT SELECTED IN
2610  015314  001003                                BNE     IA1211          ;SYS UNDER TFST
2611  015316  000137  016012                        JMP     X1211           ;THEN
2612  015322                                        BGNSEG                  ;BEGIN SEGMENT-FOR LOOP ON ERROR
2613  015324  032737  000001  002204        IA1211: BIT     #1,SWREG        ;IF DOUBLE DENSITY
2614  015332  001417                                BEQ     IC1211          ;SET, THEN
2615  015334  032777  000040  177732        IB1211: BIT     #40,@ITDBAD     ;IF DISKETTE IS NOT DOUBLE DENSITY
2616  015342  001011                                BNE     LB1211          ;THEN
2617  015344  012737  016401  016130                MOV     #ITMSG3,ITMSG   ;SET MSG# DSK SGL DEN
2618  015352  004737  016102                        CALL    ITPRNT          ;CALL PRINT -
2619  015356  012737  000400  015264                MOV     #BIT8,REFCMD    ;SET REFORMAT CMD TO DOUBLE DENSITY
2620  015364  000417                                BR      ID1211          ;BR TO IF 'D'
2621  015366  000137  016012        LB1211: JMP     X1211           ;ELSE BR TO END
2622  015372  032777  000040  177674        IC1211: BIT     #40,@ITDBAD     ;IF DISKETTE
2623  015400  001002                                BNE     1$              ;IS NOT SINGLE DENSITY, THEN
2624  015402  000137  016012                        JMP     X1211           ;-
2625  015406  012737  016576  016130        1$:     MOV     #ITMSG6,ITMSG   ;SET MSG# DSK DBL DEN
2626  015414  004737  016102                        CALL    ITPRNT          ;CALL PRINT -
2627  015420  005037  015264                        CLR     REFCMD          ;SET REFORMAT CMD TO SINGLE DENSITY
2628  015424                                ID1211: MANUAL                  ;IF MANUAL INTERVENTION
2629  015426                                        BNCOMPLETE      LD1211  ;IS ALLOWED,THEN
2630  015430                                        GMANIL  FCKMSG,FORMCK,1,YES
2631  015444  005737  015304        IE1211: TST     FORMCK          ;IF REFORMATT
2632  015450  001544                                BEQ     LE1211          ;OK, THEN
2633  015452  005037  015304                        CLR     FORMCK          ;CLEAR REFORMATT CK
2634  015456  052737  000011  015264                BIS     #11,REFCMD      ;SET REFORMAT CMD
2635  015464  032737  000001  015300        IF1211: BIT     #1,UNTCD        ;IF DRIVE #1
2636  015472  001403                                BEQ     IG1211          ;SELECTED
2637  015474  052737  000020  015264                BIS     #BIT4,REFCMD    ;SET DRIVE #1 ON REFORMAT CMD
2638  015502  005737  002172        IG1211: TST     RXXX            ;IF RXXX
2639  015506  001407                                BEQ     EG1211          ;DEVICE AND
2640  015510  032737  000002  015300                BIT     #2,UNTCD        ;SIDE #1
2641  015516  001403                                BEQ     EG1211          ;SELECTED, THEN
2642  015520  052737  001000  015264                BIS     #BIT9,REFCMD    ;SET SIDE #1 ON REFORMAT CMD
2643  015526  013777  015264  177536        EG1211: MOV     REFCMD,@ITCSAD  ;SEND REFORMAT CMD
2644  015534  013737  015272  025332                MOV     ITCSAD,CSRADR   ;PASS UNIT ADRS
2645  015542  012737  000200  025330                MOV     #TRBIT,RDYWD    ;PASS "TR" BIT TO TEST
2646  015550  004737  025230                        CALL    DELAY           ;CALL DELAY
2647  015554  005737  002274        IH1211: TST     ERRSY           ;IF
2648  015560  001070                                BNE     LH1211          ;T.O. ERR
2649  015562  012777  000111  177504                MOV     #111,@ITDBAD    ;SEND VARIFY WORD (ASCII "I")
2650  015570  013702  002334                        MOV     UNIT,R2         ;SETUP UNIT # PRT
2651  015574  012701  016753                        MOV     #ITMSG9,R1      ;SET MSG# WRG DEN REFORMAT
2652  015600  004737  004536                        CALL    PRTB1S          ;CALL PRINT BASIC-1 ARG
2653  015604  013737  015272  025332                MOV     ITCSAD,CSRADR   ;SET UNIT BUS ADR
2654  015612  012737  000040  025330                MOV     #DNBIT,RDYWD    ;SET DONE BIT TST
2655  015620  013737  025324  016014                MOV     RYDX,SAVDLY     ;SAVE NORMAL DELAY MULTIPLIER
2656  015626  012737  001000  025324                MOV     #1000,RYDX      ;SET DELAY MULT HIGH
2657  015634  004737  025230                        CALL    DELAY           ;DELAY UNTIL DONE OR T. O.
2658  015640  013737  016014  025324                MOV     SAVDLY,RYDX     ;RESET DELAY MULT
2659  015646  017737  177420  002246                MOV     @ITCSAD,CSRUUT  ;GET UUT CSR
2660  015654  017737  177414  002250                MOV     @ITDBAD,ESRUUT  ;GET UUT ESR
2661  015662  032777  000040  177402        II1211: BIT     #40,@ITCSAD     ;IF DONE BIT
```

```
2662  015670  001420                          BEQ     LI1211          ;SET ,THEN
2663  015672  032777  100000  177372  IJ1211: BIT     #100000,@ITCSAD ;IF ERR BIT NOT SET
2664  015700  001444                          BEQ     X1211           ;THEN BR TO EXIT
2665  015702  013737  015264  002332          MOV     REFCMD,CMD      ;SET COMMAND FOR PRINT
2666  015710  013737  015272  002236          MOV     ITCSAD,UUTADR   ;SET UUT ADR
2667  015716  004737  005026                  CALL    RDERCD          ;CALL DEVICE READ ERROR CODE
2668  015722  012737  017032  016130          MOV     #ITER1,ITMSG    ;ELSE, SET ''ERROR ON REFORMATT'' MSG
2669  015730  000407                          BR      EH1211          ;BR TO END IF 'H'
2670  015732  012737  017116  016130  LI1211: MOV     #ITER2,ITMSG    ;SET 'NO DONE BIT AFTER REFORMATT'' MSG
2671  015740  000403                          BR      EH1211          ;BR TO END IF 'H'
2672  015742  012737  016454  016130  LH1211: MOV     #ITMSG4,ITMSG   ;SET MSG# NO ''TR'' BIT TIME OUT ERR
2673  015750  004737  016016          EH1211: CALL    ITERR           ;CALL INITIALIZE ERROR
2674  015754  004737  002404                  CALL    PRTERR          ;CALL PRINT ERR
2675  015760  000411                          BR      EA1211          ;BR TO END IF 'A'
2676  015762  012737  016652  016130  LE1211: MOV     #ITMSG7,ITMSG   ;SET MSG# DISK WRG DEN
2677  015770  000403                          BR      ED1211          ;BR TO END IF 'D'
2678  015772  012737  016704  016130  LD1211: MOV     #ITMSG8,ITMSG   ;SET MSG# MAN INTERVENTION NOT ALL
2679  016000  004737  016016          ED1211: CALL    ITERR           ;CALL INITIALIZE ERROR
2680  016004                          EA1211: ENDSEG                  ;END SEGMENT-TO LOOP ON ERROR
2681  016006  004737  016064                  CALL    ITDROP          ;CALL DROP UNIT
2682  016012  000207                  X1211:  RTS     PC              ;RETURN
2683                                  ;-------------------------------------------------------------------------
2684  016014  000000                  SAVDLY: 0                       ;SAVE NORMAL DELAY MULTIPLIER
2685                                  ;-------------------------------------------------------------------------
```

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2688                                    .SBTTL  -    MOD 1.2.U.3 - INITIALIZE ERROR
2689                                    ;-------------------------------------------------------------
2690
2691  016016  012737  000310  002376    ITERR:  MOV     #200.,ERRNBR    ;SET ERR NBR = INIT ERR
2692  016024  012737  016132  002400            MOV     #ITERMG,ERRMSG  ;
2693  016032  012737  004506  002402            MOV     #NONE,ERRBLK    ;
2694  016040  012737  000001  002374            MOV     #1,ERRTYP       ;SET ERR TYP = DEV FTL
2695  016046  013737  002334  002074            MOV     UNIT,L$LUN      ;SETUP LUN FOR PRINT
2696  016054                                    ERROR                   ;CALL ERROR
2697  016056  004737  016102                    CALL    ITPRNT          ;CALL INITIALIZE PRINT
2698  016062  000207                            RETURN                  ;RETURN
2699                                    ;-------------------------------------------------------------
2700
2701                                    .SBTTL  -    MOD 1.2.U.4 - INITIALIZE DROP
2702                                    ;-------------------------------------------------------------
2703  016064  013737  015302  013240    ITDROP: MOV     SUTPOS,SUTDRP   ;SETUP SYS. UNDER TEST DROP BIT
2704  016072                                    DODU    UNIT            ;DROP THIS UNIT FROM TEST
2705  016100  000207                            RTS     PC              ;RETURN
2706                                    ;-------------------------------------------------------------
2707
2708                                    .SBTTL  -    MOD 1.2.U.5 - INITIALIZE PRINT
2709                                    ;-------------------------------------------------------------
2710
2711  016102  013702  002334            ITPRNT: MOV     UNIT,R2         ;SETUP TO PRINT UNIT #
2712  016106  012701  016153                    MOV     #ITERUT,R1      ;SETUP MSG
2713  016112  004737  004536                    CALL    PRTB1S          ;PRINT BASIC-1 ARG
2714  016116  013701  016130                    MOV     ITMSG,R1        ;SETUP TO PRINT MSG
2715  016122  004737  004516                    CALL    PRTB0S          ;PRINT BASIC-0 ARG
2716  016126  000207                            RTS     PC              ;RETURN
2717                                    ;-------------------------------------------------------------
2718  016130  000000                    ITMSG:  0                       ;INITIALIZE MSG#
2719                                    ;-------------------------------------------------------------
2720  016132  047111  052111  040511    ITERMG: .ASCIZ  /INITIALIZE ERROR/
2721  016153     045  020101  047125    ITERUT: .ASCIZ  /%A UNIT#%D1/
2722  016167     045  026501  026455    INTER2: .ASCIZ  /%A---NO DONE BIT AFTER BUS INITIALIZE/
2723  016235     045  026501  026455    INTER3: .ASCIZ  /%A---NO DONE BIT AFTER PROG. INITIALIZE/
2724  016305     045  022516  020101    INTER4: .ASCIZ  /%N%A NO SYSTEM TO TEST/
2725  016334  040445  020055  047516    ITMSG1: .ASCIZ  /%A- NO DRIVE READY/
2726  016357     045  026501  047040    ITMSG2: .ASCIZ  /%A- NO SIDE READY/
2727  016401     045  026501  053440    ITMSG3: .ASCIZ  /%A- WRONG DENSITY -SINGLE DENSITY DISKETTE/
2728  016454  040445  020055  052042    ITMSG4: .ASCIZ  /%A- "TR" BIT AFTER SET DENSITY CMD%N/
2729  016521     045  026501  047040    ITMSG5: .ASCIZ  /%A- NOT CAPABLE OF DOUBLE DENSITY OPERATIONS/
2730  016576  040445  020055  051127    ITMSG6: .ASCIZ  /%A- WRONG DENSITY - DOUBLE DENSITY DISKETTE/
2731  016652  040445  042040  051511    ITMSG7: .ASCIZ  /%A DISKETTE WRONG DENSITY/
2732  016704  040445  046440  047101    ITMSG8: .ASCIZ  /%A MAN. INTERVENTION REQ'D - REFORMATT/
2733  016753     045  020101  047125    ITMSG9: .ASCIZ  /%A UNIT#%D1%A-REFORMATTING, DO NOT INTERRUPT%N/
2734  017032  040445  020055  051105    ITER1:  .ASCIZ  /%A- ERROR BIT SET AFTER REFORMAT COMMAND SEQUENCE%N/
2735  017116  040445  020055  047516    ITER2:  .ASCIZ  /%A- NO DONE BIT AFTER REFORMAT COMMAND SEQUENCE%N/
2736  017200  040445  020055  041501    ITER3:  .ASCIZ  /%A- AC LOW BIT SET/
2737  017223     040  020040  020040    FCKMSG: .ASCIZ  /          ->REFORMAT DISKETTE - ARE YOU SURE?/
2738             017302                            .EVEN
2739                                    ;-------------------------------------------------------------
```

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2742
2743                                            .SBTTL  MOD 1.3 - GET EXERCISE
2744                                            ;-------------------------------------------------------------------
2745
2746  017302  013737  002200  017750          GTEX:   MOV     TSTPAT,PAT      ;GET TEST PATTERN #
2747  017310  004737  017376                          CALL    STSTPA          ;CALL MOD 1.3.1 SET TEST PATTERN
2748  017314  013737  002202  020654                  MOV     TRKSEQ,SEQUEN   ;GET TRACK SEQ #
2749  017322  013737  002206  020650                  MOV     OTDITK,OD       ;GET OUTSIDE DIA. TRK
2750  017330  013737  002210  020652                  MOV     INDITK,ID       ;GET INSIDE DIA. TRK
2751  017336  004737  017752                          CALL    STKSEQ          ;CALL MOD 1.3.2 SET TRACK SEQUENCE
2752  017342  005737  014074                  IFB13:  TST     FIRST           ;IF A FIRST PASS
2753  017346  001007                                  BNE     THC13           ;THEN
2754  017350  032737  000040  002204          IFC13:  BIT     #40,SWREG       ;IF CLEAR STATISTICAL TABLES
2755  017356  001406                                  BEQ     END13           ;IS SELECTED THEN
2756  017360  042737  000040  002204                  BIC     #40,SWREG       ;CLEAR SELECTED - CLR STAT TABLE
2757  017366  004737  020656                  THC13:  CALL    CLRSTA          ;CALL MOD 1.3.3 - CLEAR STATISTICAL TABLES
2758  017372  000240                                  NOP                     ;
2759  017374  000207                          END13:  RTS     PC              ;RETURN
2760                                            ;MOD 1.3 ----- END MODULE ----------------------------------------------
```

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2780  017376  042737  000377  017462          STSTPA: BIC     #377,a#BRONPT   ;CLEAR BRANCH OFFSET
2781  017404  005037  017744                          CLR     SUM             ;SET UP FOR ACCUMULATION OF CHECK SUM
2782  017410  005737  017750                          TST     PAT             ;IF NO PATTERN SPECIFIED FORCE PATTERN 7
2783  017414  001003                                  BNE     1$
2784  017416  012737  000007  017750                  MOV     #7,PAT
2785  017424  013704  017750                  1$:     MOV     PAT,R4          ;GET PATTERN BITS
2786  017430  005304                                  DEC     R4              ;ADJUST FOR CORRECT OFFSET
2787  017432  006304                                  ASL     R4
2788  017434  150437  017462                          BISB    R4,a#BRONPT     ;INSERT OFFSET
2789  017440  012704  034010                          MOV     #DATPAT+2,R4    ;SET UP ADDRESS OF FIRST BYTE
2790  017444  013705  002252                          MOV     WDCNT,R5        ;SETUP WORD COUNT
2791  017450  006305                                  ASL     R5              ;DOUBLE  WORD COUNT FOR ADR
2792  017452  062705  034006                          ADD     #DATPAT,R5      ;ADD DATA PATTERN ADR
2793  017456  162705  000004                          SUB     #4,R5           ;ADJ. FOR CHECKSUM
2794  017462  000777                  BRONPT: BR      .               ;BRANCH BY OFFSET SELECTED
2795  017464  000137  017520                          JMP     DATA0           ;000 DATA BYTE
2796  017470  000137  017536                          JMP     DATA1           ;377 DATA BYTE
2797  017474  000137  017546                          JMP     FLOAT0          ;FLOAT A 0 THROUGH ALL 1'S
2798  017500  000137  017614                          JMP     FLOAT1          ;FLOAT A 1 THROUGH ALL 0'S
2799  017504  000137  017622                          JMP     PAT125          ;125/052 DATA WORD
2800  017510  000137  017646                          JMP     PAT333          ;314/063 DATA WORD
2801  017514  000137  017656                          JMP     RANDAT          ;RANDOM DATA BYTE
2802
2803  017520  005037  017746          DATA0:  CLR     DATBYT
2804  017524  004737  017704          PG:     JSR     PC,LOAD         ;GO LOAD THE DATA BUFFER
2805  017530  005705                          TST     R5              ;IF R5
2806  017532  001463                          BEQ     END131          ;NOT =0 ,THEN
2807  017534  000773                          BR      PG
2808
2809  017536  112737  000377  017746          DATA1:  MOVB    #377,DATBYT
2810  017544  000767                          BR      PG
2811
2812  017546  112737  000376  017746          FLOAT0: MOVB    #376,DATBYT     ;SET UP A ONES FIELD
2813  017554  000261                  XPG:    SEC             ;SET THE C BIT TO ROTATE THROUGH THE DATA
2814  017556  012702  000000          1$:     MOV     #0,R2           ;CLR R2 (CAN'T USE "CLR" AS IT CLEARS "C" BIT)
2815  017562  103001                          BCC     2$              ;BR IF THE "C" BIT IS CLEARED
2816  017564  005202                          INC     R2              ;SET R2 IF NOT
2817  017566  004737  017704          2$:     JSR     PC,LOAD         ;GO LOAD THE DATA BUFFER
2818  017572  005705                          TST     R5              ;IF R5
```

```
.SBTTL  MOD 1.3.1 - SET DATA PATTERN
;-------------------------------------------------------------------------
;  PAT #        ROUTINE         DATA PATTERN
;  -----        -------         ------------
;    0          RANDAT          NO PATTERN SPECIFIED (FORCE RANDOM DATA)
;    1          DATA0           ALL ZEROS
;    2          DATA1           ALL ONES
;    3          FLOAT0          FLOAT ZERO THRU ONE'S
;    4          FLOAT1          FLOAT ONE THRU ZERO'S
;    5          PAT125          ALTERNATING BITS IN ONE BYTE COMP IN NEXT
;    6          PAT333          ALTERNATING 1'S PAIR & 0 IN ONE BYTE COMP IN NEX
;    7          RANDAT          RANDOM
;
;NOTE.  DATA PATTERNS WILL BE MODIFIED SO BYTE #0 WILL CONTAIN TRACK ADDRESS
;       AND  BYTE #1 THE SECTOR ADDRESS IN WHICH THE DATA IS WRITTEN.
;       THE LAST TWO BYTES CONTAIN THE CHECK SUM NUMBERS.
;-------------------------------------------------------------------------
;-------------------------------------------------------------------------
;-------------------------------------------------------------------------
;-------------------------------------------------------------------------
```

```
2819  017574  001442                          BEQ     END131          ;NOT ZERO THEN
2820  017576  000241                          CLC
2821  017600  005702                          TST     R2              ;IS R2 NONZERO
2822  017602  001401                          BEQ     3$
2823  017604  000261                          SEC                     ;YES, SET THE "C" BIT
2824  017606  106137  017746          3$:     ROLB    DATBYT
2825  017612  000761                          BR      1$
2826                          ;-----------------------------------------------------------------
2827  017614  005037  017746          FLOAT1: CLR     DATBYT
2828  017620  000755                          BR      XPG
2829                          ;-----------------------------------------------------------------
2830  017622  112737  000125  017746  PAT125: MOVB    #125,DATBYT
2831  017630  004737  017704  XXPG:   JSR     PC,LOAD
2832  017634  005705                          TST     R5              ;IF R5
2833  017636  001421                          BEQ     END131          ;NOT ZERO THEN
2834  017640  105137  017746                  COMB    DATBYT
2835  017644  000771                          BR      XXPG
2836                          ;-----------------------------------------------------------------
2837  017646  112737  000333  017746  PAT333: MOVB    #333,DATBYT
2838  017654  000765                          BR      XXPG
2839                          ;-----------------------------------------------------------------
2840  017656  004737  004560  RANDAT: JSR     PC,RANGEN       ;GET RANDOM NUMBER
2841  017662  113737  004652  017746          MOVB    RANUM,DATBYT
2842  017670  004737  017704                  JSR     PC,LOAD
2843  017674  005705                          TST     R5              ;IF R5
2844  017676  001401                          BEQ     END131          ;NOT ZERO THEN
2845  017700  000766                          BR      RANDAT
2846                          ;-----------------------------------------------------------------
2847  017702  000207          END131: RTS     PC              ;RETURN.
2848                          ;-----------------------------------------------------------------
2849
2850                          ;-----------------------------------------------------------------
2851  017704  063737  017746  017744  LOAD:   ADD     DATBYT,SUM      ;ACCUMULATE THE PATTERN CHECK SUM
2852  017712  113724  017746          MOVB    DATBYT,(R4)+    ;LOAD THE DATA BUFFER
2853  017716  020504                  CMP     R5,R4           ;HAVE 124 BYTES BEEN GENERATED
2854  017720  001401                  BEQ     1$              ;IF YES, RETURN
2855  017722  000407                  BR      ENDLD           ;IF NO, RETURN TO PATTERN GENERATOR
2856  017724  113724  017744  1$:     MOVB    SUM,(R4)+       ;PUT CHECKSUM INTO TABLE
2857  017730  005137  017744          COM     SUM             ;COMPLIMENT CHECKSUM
2858  017734  113714  017744          MOVB    SUM,(R4)        ;PUT COMP CHECK SUM INTO TABLE
2859  017740  005005                  CLR     R5              ;CLEAR TEMP #5 - FLAG DONE MODULE
2860  017742  000207          ENDLD:  RTS     PC              ;RETURN
2861                          ;-----------------------------------------------------------------
2862  017744  000000          SUM:    0
2863  017746  000000          DATBYT: 0
2864  017750  000000          PAT:    0
2865                          ;MOD 1.3.1 ----- END MODULE ---------------------------------------
```

```
2868
2869                                            .SBTTL  MOD 1.3.2 - SET TRACK SEQUENCE
2870                                            ;-------------------------------------------------------------------
2871                                            ;   SEQ #      SEQUENCE
2872                                            ;   -----      --------
2873                                            ;     0        NO SEQUENCE SPECIFIED (DEFAULT TO SEQ 7)
2874                                            ;     1        INCREMENT FROM OD TO ID
2875                                            ;     2        DECREMENT FROM ID TO OD
2876                                            ;     3        INCREMENT THEN DECREMENT TRACKS
2877                                            ;     4        BOUNCE BETWEEN ID AND OD
2878                                            ;     5        BOUNCE BETWEEN DECREASING ID & INCREASING OD
2879                                            ;     6        STROBE BETWEEN OD AND DECREMENTING ID
2880                                            ;     7        RANDOM TRACK SELECTION
2881                                            ;-------------------------------------------------------------------
2882  017752  005037  020634                  STKSEQ: CLR     TKTBPT          ;CLEAR TRK TBL PTR
2883  017756  005037  020642                          CLR     PRESTK          ;CLEAR PRESENT TRK
2884  017762  005037  020640                          CLR     TARGET          ;CLEAR TARGET TRK
2885  017766  112737  000177  020642                  MOVB    #177,PRESTK     ;INIT PRESENT TRK TO HANDLE TRK #0
2886  017774  113737  020650  020640                  MOVB    OD,TARGET       ;INIT OD AS TARGET TRACK
2887  020002  005037  020646                          CLR     XID             ;INIT WORDING ID AND OD LOCATIONS
2888  020006  113737  020652  020646                  MOVB    ID,XID          ;SAVE INSIDE DIA. IN TEMP INSIDE DIA.
2889  020014  005037  020644                          CLR     XOD             ;CLEAR TEMP OUTSIDE DIA
2890  020020  113737  020650  020644                  MOVB    OD,XOD          ;SAVE OUTSIDE DIA. IN TEMP OUTSIDE DIA.
2891  020026  013737  020646  020636                  MOV     XID,TRKCNT      ;SET UP NUMBER OF TRACK MOVEMENTS
2892  020034  163737  020644  020636                  SUB     XOD,TRKCNT      ;
2893  020042  005237  020636                          INC     TRKCNT          ;INCREMENT # OF TRACKS
2894  020046  002005                                  BGE     GTTK            ;IF # OF TRACKS IS NEGATIVE, THEN
2895  020050  012737  100000  002274                  MOV     #100000,ERRSY   ;SET SYSTEM ERROR
2896  020056  000137  020632                          JMP     ENDTKS          ;EXIT
2897  020062  013737  002202  020654          GTTK:   MOV     TRKSEQ,SEQUEN   ;GET TRACK SEQUENCE #
2898  020070  042737  000377  020126                  BICB    #377,@#BRONTK   ;CLEAR OUT BRANCH OFFSET
2899  020076  005737  020654                          TST     SEQUEN          ;IF TRACK SEQUENCE
2900  020102  001003                                  BNE     1$              ;EQUALS ZERO, THEN
2901  020104  012737  000007  020654                  MOV     #7,SEQUEN       ;FORCE SEQ #7-RANDOM
2902  020112  013704  020654                  1$:     MOV     SEQUEN,R4       ;GET SEQUENCE BITS
2903  020116  005304                                  DEC     R4              ;ADJUST FOR CORRECT OFFSET
2904  020120  006304                                  ASL     R4              ;
2905  020122  150437  020126                          BISB    R4,@#BRONTK     ;THIS BR INST. IS MODIFIED SELECTED TRACK SEQUEN
2906  020126  000777                          BRONTK: BR      .               ;BRANCH TO SELECTED TRACK SEQUENCE
2907  020130  000137  020164                          JMP     SEQ1            ;
2908  020134  000137  020220                          JMP     SEQ2            ;
2909  020140  000137  020254                          JMP     SEQ3            ;
2910  020144  000137  020272                          JMP     SEQ4            ;BOUNCE ID TO OD
2911  020150  000137  020340                          JMP     SEQ5            ;DECREASING BOUNCE
2912  020154  000137  020422                          JMP     SEQ6            ;STROBE
2913  020160  000137  020476                          JMP     SEQ7            ;RANDOM
2914                                            ;-------------------------------------------------------------------
2915  020164  123737  020646  020642          SEQ1:   CMPB    XID,PRESTK      ;IF PRESENT TRACK=ID
2916  020172  001004                                  BNE     1$              ;THEN
2917  020174  012737  177777  020640                  MOV     #-1,TARGET      ;TERMINATE TABLE
2918  020202  000405                                  BR      2$              ;END SEQ1
2919  020204  113737  020644  020640          1$:     MOVB    XOD,TARGET      ;ELSE SET NEW TRACK-OUTSIDE DIA
2920  020212  005237  020644                          INC     XOD             ;INCREMENT OUTSIDE DIA
2921  020216  000565                          2$:     BR      NEWTRK          ;END SEQ1
2922                                            ;-------------------------------------------------------------------
2923  020220  123737  020644  020642          SEQ2:   CMPB    XOD,PRESTK      ;
```

```
2924  020226  001004                        BNE     1$
2925  020230  012737  177777  020640        MOV     #-1,TARGET      ;TERMINATE TABLE
2926  020236  000405                        BR      2$              ;END SEQ2
2927  020240  013737  020646  020640  1$:   MOV     XID,TARGET      ;SET NEXT TRACK=INSIDIA
2928  020246  005337  020646                DEC     XID             ;DECREMENT INSIDE DIA
2929  020252  000547                  2$:   BR      NEWTRK
2930                                        ;-----------------------------------------------------------------------
2931  020254  005701                  SEQ3: TST     R1              ;IF MODE
2932  020256  001402                        BEQ     1$              ;NOT EQUAL TO ZERO
2933  020260  005001                        CLR     R1              ;THEN CHANGE MODE
2934  020262  000756                        BR      SEQ2            ;DO SEQ2
2935  020264  012701  000001        1$:   MOV     #1,R1           ;ELSE CHANGE MODE
2936  020270  000735                        BR      SEQ1            ;DO SEQ1
2937                                        ;-----------------------------------------------------------------------
2938  020272  005701                  SEQ4: TST     R1              ;IF MODE
2939  020274  001405                        BEQ     1$              ;NOT EQUAL TO ZERO
2940  020276  113737  020644  020640        MOVB    XOD,TARGET      ;THEN SET NEXT TRACK=OUTSIDE DIA
2941  020304  005001                        CLR     R1              ;CHANGE MODE
2942  020306  000405                        BR      2$              ;BR
2943  020310  113737  020646  020640  1$:   MOVB    XID,TARGET      ;ELSE SET NEXT TRACK=INSIDE DIA
2944  020316  012701  000001                MOV     #1,R1           ;TERMINATE TABLE
2945  020322  005337  020636            2$: DEC     TRKCNT          ;
2946  020326  001003                        BNE     3$              ;
2947  020330  012737  177777  020640        MOV     #-1,TARGET      ;TERMINATE TABLE
2948  020336  000515                  3$:   BR      NEWTRK          ;
2949                                        ;-----------------------------------------------------------------------
2950  020340  123737  020646  020644  SEQ5: CMPB    XID,XOD         ;IF INSIDE & OUTSIDE DIA
2951  020346  001421                        BEQ     2$              ;NOT EQUAL
2952  020350  005701                        TST     R1              ;THEN, IF MODE
2953  020352  001407                        BEQ     1$              ;
2954  020354  005001                        CLR     R1              ;CHANGE MODE
2955  020356  013737  020644  020640        MOV     XOD,TARGET      ;SET NEXT TRACK=OUTSIDE DIA
2956  020364  005237  020644                INC     XOD             ;INCREMENT OUTSIDE DIA
2957  020370  000413                        BR      3$              ;END SEQ5
2958  020372  012701  000001        1$:   MOV     #1,R1           ;CHANGE MODE
2959  020376  013737  020646  020640        MOV     XID,TARGET      ;SET NEXT TRACK=INSIDE DIA
2960  020404  005337  020646                DEC     XID             ;DECREMENT INSIDE DIA
2961  020410  000403                        BR      3$              ;END SET5
2962  020412  012737  177777  020640  2$:   MOV     #-1,TARGET      ;TERMINATE TABLE
2963  020420  000464                  3$:   BR      NEWTRK          ;
2964                                        ;-----------------------------------------------------------------------
2965  020422  123737  020646  020644  SEQ6: CMPB    XID,XOD
2966  020430  001416                        BEQ     1$
2967  020432  123737  020642  020644        CMPB    PRESTK,XOD      ;IF O.D. JUST DONE
2968  020440  001006                        BNE     3$              ;THEN
2969  020442  113737  020646  020640        MOVB    XID,TARGET      ;SET TO DO I.D.
2970  020450  005337  020646                DEC     XID             ;DECREMENT I.D. FOR NEXT
2971  020454  000407                        BR      2$              ;
2972  020456  113737  020644  020640  3$:   MOVB    XOD,TARGET      ;ELSE SET TO DO O.D.
2973  020464  000403                        BR      2$
2974  020466  012737  177777  020640  1$:   MOV     #-1,TARGET
2975  020474  000436                  2$:   BR      NEWTRK
2976                                        ;-----------------------------------------------------------------------
2977  020476  000240                  SEQ7: NOP
2978  020500  004737  004560                JSR     PC,RANGEN       ;GET A RANDOM NUMBER
2979  020504  042737  177600  004652        BIC     #177600,RANUM   ;CLEAR ALL BUT LOW 7 BITS
```

```
2980  020512  123737  004652  020646          IDCOMP: CMPB    RANUM,XID       ;IF RANUM LARGER THAN ID ADDRESS
2981  020520  003401                                  BLE     ODCOMP          ;THEN
2982  020522  000765                                  BR      SEQ7            ;BR TO GET ANOTHER RANDOM NUMBER
2983  020524  123737  004652  020644          ODCOMP: CMPB    RANUM,XOD       ;IF RANUM SMALLER THAN OD ADDRESS
2984  020532  002001                                  BGE     PRESCK          ;THEN
2985  020534  000760                                  BR      SEQ7            ;BR TO GET ANOTHER RANDOM NUMBER
2986  020536  123737  004652  020642          PRESCK: CMPB    RANUM,PRESTK    ;IF RANUM EQUALS PRESENT TRACK
2987  020544  001754                                  BEQ     SEQ7            ;GET ANOTHER RANDOM NUMBER
2988  020546  013737  004652  020640                  MOV     RANUM,TARGET    ;RANUM OK PUT IT IN TARGET TRACK
2989  020554  005337  020636                          DEC     TRKCNT
2990  020560  001003                                  BNE     1$
2991  020562  012737  177777  020640                  MOV     #-1,TARGET      ;TERMINATE TABLE
2992  020570  000400                          1$:     BR      NEWTRK
2993                                          ;-----------------------------------------------------------------------
2994  020572  012702  033553                  NEWTRK: MOV     #TRKTBL-1,R2
2995  020576  005237  020634                          INC     TKTBPT
2996  020602  063702  020634                          ADD     TKTBPT,R2
2997  020606  113712  020640                          MOVB    TARGET,(R2)
2998  020612  005737  020640                          TST     TARGET
2999  020616  100405                                  BMI     ENDTKS
3000  020620  113737  020640  020642                  MOVB    TARGET,PRESTK
3001  020626  000137  020126                          JMP     BRONTK
3002  020632  000207                          ENDTKS: RTS     PC
3003                                          ;-----------------------------------------------------------------------
3004  020634  000000                          TKTBPT: 0                       ;TRACK TABLE POINTER
3005  020636  000000                          TRKCNT: 0                       ;TRACK COUNT
3006  020640  000000                          TARGET: 0                       ;TARGET TRACK
3007  020642  000000                          PRESTK: 0                       ;PRESENT TRACK
3008  020644  000000                          XOD:    0                       ;X OUTSIDE DIA.
3009  020646  000000                          XID:    0                       ;X INSIDE DIA.
3010  020650  000000                          OD:     0                       ;OUTSIDE DIA.
3011  020652  000000                          ID:     0                       ;INSIDE DIA.
3012  020654  000000                          SEQUEN: 0                       ;SEQUENCE #
3013                                          ;MOD 1.3.2 ----- END MODULE ------------------------------------------
3014
3015
3016
3017
3018                                          .SBTTL  MOD 1.3.3 - CLEAR STATISTICAL TABLES
3019                                          ;-----------------------------------------------------------------------
3020
3021  020656  012701  007314                  CLRSTA: MOV     #READSC,R1      ;SET UP BEGINNING ADDRESS
3022  020662  012702  011240                          MOV     #ENDST,R2       ;SET UP TABLE LENGTH
3023  020666  005021                          BDA133: CLR     (R1)+           ;CLEAR ADDRESSED LOCATION
3024  020670  020102                                  CMP     R1,R2           ;
3025  020672  001375                                  BNE     BDA133          ;DO UNTIL LAST ADDRESS DONE
3026  020674  000207                          END133: RTS     PC              ;RETURN
3027                                          ;MOD 1.3.3 ----- END MODULE ------------------------------------------
```

```
3030
3031
3032                                        .SBTTL  MOD 2.0 - SCHEDULE SYSTEM EXERCISE
3033                                        ;-----------------------------------------------------------------
3034
3035  020676  000240                      SCSYEX: NOP                     ;
3036  020700  005737  014016                IFK20:  TST     INITL           ;IF INITIALIZE
3037  020704  001417                              BEQ     ELK20           ;THEN
3038  020706  012737  000001  024252               MOV     #1,INITTK       ;SET INITIALIZE TRK FLG
3039  020714  005037  021430                      CLR     EXHCP           ;CLEAR EX HALF COMPL
3040  020720  005037  021432                      CLR     BTHDRV          ;CLEAR BOTH DRV DONE FLG
3041  020724  005037  021434                      CLR     BDVSCD          ;CLEAR BOTH DRV SEC DONE FLG
3042  020730  005037  021442                      CLR     DVDNCK          ;CLEAR DRV DONE CK FLG
3043  020734  005037  021444                      CLR     DRVDN           ;CLEAR DRV DONE
3044  020740  005037  021452                      CLR     ERTSAV          ;CLEAR ERR TYP SAVE
3045  020744  005037  021446                ELK20:  CLR     SFERR           ;CLEAR SFT ERR
3046  020750  033737  021426  002232          IFA20:  BIT     SUTPTR,SUT      ;IF SYSTEM UNDER TEST BIT
3047  020756  001406                              BEQ     ELA20           ;IS SET
3048  020760  004737  004756                      CALL    CVSTUT          ;CALL MOD U.A.2 - CONVERT SUTPTR-->UUT
3049  020764  013737  005024  002234               MOV     UNITST,UUT      ;SET UNIT UNDER TEST
3050  020772  000410                              BR      BDB20           ;BR TO BEGIN 'B'
3051  020774  006337  021426                ELA20:  ASL     SUTPTR          ;SHIFT SUT POINTER TO TEST
3052  021000  022737  000020  021426          DUC20:  CMP     #20,SUTPTR      ;DO UNTIL SUT POINTER
3053  021006  003360                              BGT     IFA20           ;EQUALS 10000 BIN
3054  021010  000137  021404                      JMP     EDC20           ;BR TO END DO 'C'
3055  021014                                BDB20:  BGNSEG                  ;BEGIN SEGMENT FOR ERROR LOOPS
3056  021016  013737  002176  021424               MOV     TSTN,EXN        ;GET TEST # = EXERCISE #
3057  021024  004737  021454                      CALL    GETTST          ;CALL MOD 2.1 - GET A TEST
3058  021030  013737  022156  021422               MOV     TSTWD,TST       ;SAVE TEST WORD
3059  021036  032737  000400  021422          IFB20:  BIT     #400,TST        ;IF NEXT UNIT BIT
3060  021044  001514                              BEQ     ELB20           ;IS SET THEN
3061  021046  004737  032352                      CALL    STDVDN          ;CALL MOD 2.6 -SET DRIVES DONE
3062  021052  032737  004000  021422          IFC20:  BIT     #4000,TST       ;IF ADV TRK BIT
3063  021060  001001                              BNE     IFI20           ;IS NOT SET THEN
3064  021062  000411                              BR      EIC20           ;BR TO END IF 'C'
3065  021064  023727  021432  000003          IFI20:  CMP     BTHDRV,#3       ;IF BOTH DRIVES DONE
3066  021072  001065                              BNE     IFL20           ;THEN
3067  021074  013737  021432  021444               MOV     BTHDRV,DRVDN    ;SET BOTH DRVS DONE TEST
3068  021102  005037  021432                      CLR     BTHDRV          ;CLEAR BOTH DRIVES DONE FLAG & THEN
3069  021106  013737  002234  021450          EIC20:  MOV     UUT,RESTK       ;SET UUT TO RESET TRK
3070  021114  052737  002000  021450                  BIS     #2000,RESTK     ;SET INC TRK ONTO RESET TRK
3071  021122  032737  001000  021422          IFF20:  BIT     #1000,TST       ;IF DEL DATA CK BIT
3072  021130  001001                              BNE     ELF20           ;IS SET THEN
3073  021132  000410                              BR      EIF20           ;BR TO IF 'F'
3074  021134  012737  002000  021440          ELF20:  MOV     #2000,ADVTRK    ;SET ADV TRK = INCR TRK
3075  021142  005737  021430                IFG20:  TST     EXHCP           ;IF EXERCISE 1/2 COMPLETE
3076  021146  001420                              BEQ     IFH20           ;IS SET, THEN
3077  021150  005037  021430                      CLR     EXHCP           ;CLEAR EX HALF COMPLETE
3078  021154  053737  021444  002230          EIF20:  BIS     DRVDN,SDD       ;SET THIS DRV DONE
3079  021162  006337  021426                      ASL     SUTPTR          ;SETUP PTR TO CK NXT UNIT
3080  021166  013737  002234  021450               MOV     UUT,RESTK       ;GET UUT
3081  021174  052737  002000  021450               BIS     #2000,RESTK     ;SET INCTRK ON RESET TRK FLAG
3082  021202  005037  021432                      CLR     BTHDRV          ;CLEAR BOTH DRV DN FLAG
3083  021206  000504                              BR      END20           ;BR TO END
3084  021210  005737  002244                IFH20:  TST     DELDAT          ;IF DEL DATA MODE
3085  021214  001403                              BEQ     ELH20           ;IS SET
```

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3086  021216  005037  002244                          CLR     DELDAT          ;CLEAR DEL DATA MODE
3087  021222  000403                                  BR      EIH20           ;BR TO END IF 'H'
3088  021224  012737  000010  002244          ELH20:  MOV     #10,DELDAT      ;SET DEC DATA MODE
3089  021232  005037  021444                  EIH20:  CLR     DRVDN           ;CLEAR DRV DONE
3090  021236  012737  000001  021430                  MOV     #1,EXHCP        ;SET EX 1/2 COMPLETE
3091  021244  000443                                  BR      EIB20           ;BR TO END IF 'B'
3092  021246  032737  000003  021434          IFL20:  BIT     #3,BDVSCD       ;IF BOTH DRV SEC DONE
3093  021254  001405                                  BEQ     ELL20           ;THEN
3094  021256  005037  021434                          CLR     BDVSCD          ;CLEAR DRV SEC DONE FLAGS
3095  021262  012737  004000  021440                  MOV     #4000,ADVTRK    ;ALLOW TRACK ADVANCE
3096  021270  004737  022320          ELL20:  CALL    GTDRV           ;CALL MOD 2.2 - GET A DRIVE
3097  021274  000427                                  BR      EIB20           ;BR TO END IF 'B'
3098  021276  053737  021440  021436  ELB20:  BIS     ADVTRK,INCTRK   ;SET ADV TRK  (IF SET BY PREV OP)
3099  021304  013737  021422  023324                  MOV     TST,DRVTST      ;PASS DRIVE TEST
3100  021312  004737  022504                          CALL    XDVTST          ;CALL MOD 2.3. - EXECUTE DRIVE TEST
3101  021316  013737  023324  025410                  MOV     DRVTST,TSTEV    ;PASS DRIVE TEST FOR EVAL
3102  021324  004737  025334                          CALL    EVTSTR          ;CALL MOD 2.4 - EVAL. TEST RESULTS
3103  021330  013701  021422                          MOV     TST,R1          ;GET DRV TST
3104  021334  042701  171777                          BIC     #171777,R1      ;SAVE TRK BITS
3105  021340  010137  021436                          MOV     R1,INCTRK       ;SET TRK BITS
3106  021344  005037  021440                          CLR     ADVTRK          ;CLEAR ADV TRK FLAG
3107  021350  005037  014016                          CLR     INITL           ;CLEAR INITIALIZE FLAG
3108  021354  000240                          EIB20:  NOP                     ;
3109  021356  005737  002276                  IFM20:  TST     ERRTY           ;IF ERR TYPE
3110  021362  001402                                  BEQ     DUB20           ;NOT=0
3111  021364  004737  030702                          CALL    OTERTP          ;CALL MOD 2.5 - O/P ERR TYPE
3112  021370  005737  002274                  DUB20:  TST     ERRSY           ;DO UNLESS SYSTEM ERROR
3113  021374  001011                                  BNE     END20           ;NOT=0 THEN
3114  021376                                          ENDSEG                  ;END SEGMENT FOR ERROR LOOPS
3115  021400  000137  021014                          JMP     BDB20           ;BR TO END MOD
3116  021404  012737  000001  021426          EDC20:  MOV     #1,SUTPTR       ;SET SYS UNDER TEST PTR
3117  021412  052737  000001  021446                  BIS     #1,SFERR        ;SET SFT ERR
3118  021420  000207                          END20:  RTS     PC              ;END MODULE
3119                                          ;-----------------------------------------------------------------------
3120  021422  000000                          TST:    0                       ;TEST FOR EXECUTION
3121  021424  000000                          EXN:    0                       ;EXERCISE #
3122  021426  000001                          SUTPTR: 1                       ;SYSTEM UNDER TEST POINTER
3123  021430  000000                          EXHCP:  0                       ;EXERCISE HALF COMPLETE (EX#7) DEL DATA PASS
3124  021432  000000                          BTHDRV: 0                       ;BOTH DRIVES DONE FLAG
3125  021434  000000                          BDVSCD: 0                       ;BOTH DRIVE SECTORS DONE FLAG
3126  021436  000000                          INCTRK: 0                       ;INCREMENT TRACK FLAGS
3127  021440  000000                          ADVTRK: 0                       ;ADVANCE TRACK FLAG
3128  021442  000000                          DVDNCK: 0                       ;DRV DONE CK FLAG
3129  021444  000000                          DRVDN:  0                       ;DRIVE DONE
3130  021446  000000                          SFERR:  0                       ;SOFTWARE ERR
3131  021450  000000                          RESTK:  0                       ;RESET TRK FLAG
3132  021452  000000                          ERTSAV: 0                       ;ERR TYP SAVE REG
3133                                          ;MOD 2.0 ----- END MODULE ---------------------------------------------
```

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3136
3137                                    .SBTTL  MOD 2.1 - GET A TEST
3138                                    ;-----------------------------------------------------------------
3139  021454  000240                    GETTST: NOP                     ;
3140  021456  013701  021424                    MOV     EXN,R1          ;GET EXERCISE NUMBER
3141  021462  006301                            ASL     R1              ;DOUBLE EXERCISE NUMBER
3142  021464  012702  022164                    MOV     #EXADTB,R2      ;GET EXERCISE ADDRESS TABLE
3143  021470  060102                            ADD     R1,R2           ;CAL EXERCISE TO BE USED
3144  021472  011237  022154                    MOV     (R2),EXADR      ;GET BEGIN ADR EXERCISE
3145  021476  005737  014016          IFL21:    TST     INITL           ;IF INITIALIZE
3146  021502  001406                            BEQ     IFA21           ;IS SET, THEN
3147  021504  005037  022152                    CLR     TSTPTR          ;CLEAR TST PTR
3148  021510                          IFF21:    INLOOP                  ;IF IN LOOP
3149  021512                                    BNCOMPLETE IFA21        ;SET, THEN
3150  021514  000137  022122                    JMP     EIF21           ;BR TO END IF 'F'
3151  021520  005737  002304          IFA21:    TST     RETRY           ;IF RETRY
3152  021524  001410                            BEQ     IFB21           ;NOT=0, AND
3153  021526  032737  000004  002204            BIT     #BIT02,SWREG    ;IF RETRY ON ERROR
3154  021534  001106                            BNE     IFH21           ;IS NOT SET, THEN
3155  021536  032737  000004  002264            BIT     #EVL,FLGDRS     ;IF DRS "EVL" FLAG
3156  021544  001102                            BNE     IFH21           ;IS NOT SET, THEN
3157  021546  005737  022152          IFB21:    TST     TSTPTR          ;IF TST PTR
3158  021552  001006                            BNE     IFC21           ;EQUALS ZERO
3159  021554  012737  000002  022152            MOV     #2,TSTPTR       ;ADV. TST PTR 1 CMD
3160  021562  005037  022160                    CLR     TBPRCT          ;CLEAR TABLE PAIR COUNT
3161  021566  000555                            BR      EIF21           ;BR TO END IF 'F'
3162  021570  005737  002262          IFC21:    TST     SECDN           ;IF SECTOR DONE IS
3163  021574  001447                            BEQ     IFG21           ;SET THEN
3164  021576  005737  022160          IFK21:    TST     TBPRCT          ;IF TABLE PAIR CNT=1,
3165  021602  001444                            BEQ     IFG21           ;THEN
3166  021604  062737  000002  022152            ADD     #2,TSTPTR       ;ADVANCE ONE TEST CMD
3167  021612  005037  022160                    CLR     TBPRCT          ;CLEAR TABLE PAIR  COUNT
3168  021616  005037  021442                    CLR     DVDNCK          ;CLEAR DRV DONE CK FLAG
3169  021622  032737  040000  022156  IFD21:    BIT     #40000,TSTWD    ;IF DONE CK
3170  021630  001411                            BEQ     IFM21           ;IS SET, THEN
3171  021632  005737  002260                    TST     TRKDN           ;IF TRACK DONE IS
3172  021636  001406                            BEQ     IFM21           ;SET, THEN
3173  021640  005037  002260                    CLR     TRKDN           ;CLEAR TRK DONE
3174  021644  012737  000001  021442            MOV     #1,DVDNCK       ;SET DRV DONE CK
3175  021652  000523                            BR      EIF21           ;BR TO END IF 'F'
3176  021654  032737  006000  022156  IFM21:    BIT     #6000,TSTWD     ;IF ADV OR INCR TRK
3177  021662  001517                            BEQ     EIF21           ;IS SET, THEN
3178  021664  032737  100000  022156  IFN21:    BIT     #100000,TSTWD   ;IF '4 CMD SEQ'
3179  021672  001404                            BEQ     ELN21           ;IS SET, THEN
3180  021674  162737  000010  022152            SUB     #10,TSTPTR      ;BACK UP 4 CMDS
3181  021702  000507                            BR      EIF21           ;BR TO END IF 'F'
3182  021704  162737  000004  022152  ELN21:    SUB     #4,TSTPTR       ;BACK UP TWO TEST CMDS
3183  021712  000503                            BR      EIF21           ;BR TO END IF 'F'
3184  021714  005737  022160          IFG21:    TST     TBPRCT          ;IF TABLE PAIR COUNT
3185  021720  001406                            BEQ     ELG21           ;EQUALS 1 THEN
3186  021722  005037  022160                    CLR     TBPRCT          ;CLEAR TABLE PAIR COUNT
3187  021726  162737  000002  022152            SUB     #2,TSTPTR       ;BACK UP ONE CMD
3188  021734  000472                            BR      EIF21           ;BR END IF 'F'
3189  021736  005237  022160          ELG21:    INC     TBPRCT          ;INCREMENT TABLE PAIR COUNT
3190  021742  062737  000002  022152            ADD     #2,TSTPTR       ;ADVANCE ONE CMD
3191  021750  000464                            BR      EIF21           ;BR END IF 'F'
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3192  021752  032737  000010  002304          IFH21:  BIT     #10,RETRY       ;IF NO DATA RETRY IS
3193  021760  001005                                  BNE     IFI21           ;SET, OR
3194  021762  032737  000020  002304                  BIT     #20,RETRY       ;IF NO CRC RETRY IS
3195  021770  001C01                                  BNE     IFI21           ;SET, THEN
3196  021772  000453                                  BR      EIF21           ;BR END IF 'F'
3197  021774  032737  000002  002304          IFI21:  BIT     #2,RETRY        ;IF WRITE RETRY IS
3198  022002  001412                                  BEQ     IFJ21           ;SET, THEN
3199  022004  162737  000006  022152                  SUB     #6,TSTPTR       ;BACK UP 3 CMDS
3200  022012  042737  000002  002304                  BIC     #2,RETRY        ;CLEAR WRITE RETRY
3201  022020  012737  000003  022162                  MOV     #3,TSAVCT       ;SET TEST ADV COUNT=3
3202  022026  000433                                  BR      EII21           ;BR TO END IF 'I'
3203  022030  032737  000004  002304          IFJ21:  BIT     #4,RETRY        ;IF READ RETRY IS
3204  022036  001412                                  BEQ     ELJ21           ;SET THEN
3205  022040  162737  000002  022152                  SUB     #2,TSTPTR       ;BACK UP 1 CMD
3206  022046  042737  000004  002304                  BIC     #4,RETRY        ;CLEAR READ RETRY
3207  022054  012737  000001  022162                  MOV     #1,TSAVCT       ;SET TEST ADV COUNT=1
3208  022062  000415                                  BR      EII21           ;BR TO END IF 'I'
3209  022064  005337  022162          ELJ21:  DEC     TSAVCT          ;DECREMENT TEST ADV COUNT
3210  022070  062737  000002  022152                  ADD     #2,TSTPTR       ;ADV TEST POINTER 1 CMD
3211  022076  005737  022162          IFO21:  TST     TSAVCT          ;IF TEST ADV COUNTER
3212  022102  001007                                  BNE     EIF21           ;EQUALS ZERO, THEN
3213  022104  005037  002304                  CLR     RETRY           ;CLEAR RETRY
3214  022110  005237  022160                  INC     TBPRCT          ;SET TABLE PAIR COUNT
3215  022114  000402                                  BR      EIF21           ;BR TO END IF 'F'
3216  022116  005037  022160          EII21:  CLR     TBPRCT          ;CLEAR TABLE PAIR CNT
3217  022122  013703  022152          EIF21:  MOV     TSTPTR,R3       ;GET TEST POINTER
3218  022126  063703  022154                  ADD     EXADR,R3        ;CAL. CUR. TEST OF THIS EXERCISE
3219  022132  011337  022156                  MOV     (R3),TSTWD      ;PASS UP TEST WORD
3220  022136  105713                  IFE21:  TSTB    (R3)            ;IF CMD LOWER BYTE
3221  022140  002002                          BGE     EIE21           ;EQUALS -1, THEN
3222  022142  005037  022152                  CLR     TSTPTR          ;RESET TEST PTR
3223  022146  000240                  EIE21:  NOP                     ;
3224  022150  000207                          RTS     PC              ;RETURN
3225                                  ;-----------------------------------------------------------------------
3226  022152  000000                  TSTPTR: .WORD   0               ;TEST POINTER
3227  022154  000000                  EXADR:  .WORD   0               ;CURRENT EXERCISE TABLE BASE ADDRESS
3228  022156  000000                  TSTWD:  .WORD   0               ;TEST WORD TO PASS UP
3229  022160  000000                  TBPRCT: .WORD   0               ;TABLE PAIR COUNT
3230  022162  000000                  TSAVCT: .WORD   0               ;TEST ADVANCE COUNTER
3231
3232  022164  022300                  EXADTB: .WORD   EX7             ;EXERCISE ADDRESS TABLE
3233  022166  022204                          .WORD   EX1
3234  022170  022214                          .WORD   EX2
3235  022172  022230                          .WORD   EX3
3236  022174  022244                          .WORD   EX4
3237  022176  022254                          .WORD   EX5
3238  022200  022264                          .WORD   EX6
3239  022202  022300                          .WORD   EX7
3240                                  ;-----------------------------------------------------------------------
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3243
3244
3245  022204  177777
3246  022206  000000
3247  022210  044002
3248  022212  000777
3249  022214  177777
3250  022216  000000
3251  022220  000002
3252  022222  000003
3253  022224  154001
3254  022226  000777
3255  022230  177777
3256  022232  000000
3257  022234  000002
3258  022236  000003
3259  022240  174001
3260  022242  000777
3261  022244  177777
3262  022246  000003
3263  022250  064001
3264  022252  000777
3265  022254  177777
3266  022256  000003
3267  022260  044001
3268  022262  000777
3269  022264  177777
3270  022266  000000
3271  022270  000002
3272  022272  000003
3273  022274  170001
3274  022276  004777
3275  022300  177777
3276  022302  000000
3277  022304  000002
3278  022306  000003
3279  022310  172001
3280  022312  000003
3281  022314  064001
3282  022316  001777
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```
 SBTTL -    EXERCISE/TEST TABLE
;-------------------------------------------------------------------------
EX1:    .WORD   -1
        .WORD   0               ;-,                             / FILL BUFFER
        .WORD   44002           ;DCK,ADVTRK                     / WRITE SECTOR
        .WORD   777             ;NXTUNT,                        / -1
EX2:    .WORD   -1
        .WORD   0               ;-,                             / FILL BUFFER
        .WORD   2               ;-,                             / WRITE SECTOR
        .WORD   3               ;-,                             / READ SECTOR
        .WORD   154001          ;4CMD,DCK,ADVTRK,RAW,           / EMPTY BUFFER
        .WORD   777             ;NXTUNT,                        / -1
EX3:    .WORD   -1
        .WORD   0               ;-,                             / FILL BUFFER
        .WORD   2               ;-,                             / WRITE SECTOR
        .WORD   3               ;-,                             / READ SECTOR
        .WORD   174001          ;4CMD,DCK,ADVTK,DACK,RAW/       / EMPTY BUFFER
        .WORD   777             ;NXTUNT,                        / -1
EX4:    .WORD   -1
        .WORD   3               ;-,                             / READ SECTOR
        .WORD   64001           ;DCK,ADVTRK,DATACK,             / EMPTY BUFFER
        .WORD   777             ;NXTUNT,                        / -1
EX5:    .WORD   -1
        .WORD   3               ;-,                             / READ SECTOR
        .WORD   44001           ;DCK,ADVTRK,                    / EMPTY BUFFER
        .WORD   777             ;NXTUNT,                        / -1
EX6:    .WORD   -1
        .WORD   0               ;-,                             / FILL BUFFER
        .WORD   2               ;-,                             / WRITE SECTOR
        .WORD   3               ;-,                             / READ SECTOR
        .WORD   170001          ;4CMD,DCK,DATACK, RAW,          / EMPTY BUFFER
        .WORD   4777            ;ADVTRK, NXTUNT,                / -1
EX7:    .WORD   -1
        .WORD   0               ;-,                             / FILL BUFFER
        .WORD   2               ;-,                             / WRITE SECTOR
        .WORD   3               ;-,                             / READ SECTOR
        .WORD   172001          ;4CMD,DCK,DACK,RAW,INCTK/       / EMPTY BUFFER
        .WORD   3               ;-,                             / READ SECTOR
        .WORD   64001           ;DCK,DATACK,ADVTRK,             / EMPTY BUFFER
        .WORD   1777            ;DDCHK, NXTUNT,                 / -1
;-------------------------------------------------------------------------
;       BIT#            NUMONIC         FUNCTION
;       ----            -------         --------
;
;        15             4CMD            4 COMMAND SEQUENCE
;        14             DCK             DONE CHECK
;        13             DATACK          DO DATA CHECK
;        12             RAW             READ AFTER WRITE FLAG
;        11             ADVTRK          ADVANCE TRACK MODE
;        10             INCTK           INCREMENT TRACK MODE
;        09             DDCHK           DEL. DATA CHECK
;        08             NXTUNT          GET NEXT UNIT, IF DONE LAST UNIT

;MOD 2.1 ----- END MODULE ----------------------------------------------
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3299
3300
3301                                            .SBTTL  MOD 2.2 - GET A DRIVE
3302                                            ;-------------------------------------------------------------------
3303
3304  022320  000240                            GTDRV:  NOP                     ;
3305  022322  032737  000001  002234            IFA22:  BIT     #1,UUT          ;IF UUT=DRIVE 0
3306  022330  001024                                    BNE     IFD22           ;THEN
3307  022332  032737  000002  002234            IFB22:  BIT     #2,UUT          ;IF UNIT/SIDE UNDER TEST (UUT)
3308  022340  001404                                    BEQ     ELB22           ;EQUALS 1
3309  022342  012737  000010  022502                    MOV     #10,TSTSUT      ;SET TEST OF SYS. UNDER TEST UNIT/SIDE=1
3310  022350  000403                                    BR      IFC22           ;BR TO IF 'C'
3311  022352  012737  000002  022502            ELB22:  MOV     #2,TSTSUT       ;SET TEST OF SYS. UNDER TEST UNIT/SIDE=0
3312  022360  033737  022502  002232            IFC22:  BIT     TSTSUT,SUT      ;IF DRIVE 1 SELECTED FOR TEST
3313  022366  001404                                    BEQ     ELC22           ;THEN
3314  022370  052737  000001  002234                    BIS     #1,UUT          ;SET UNIT UNDER TEST TO DRV #1
3315  022376  000427                                    BR      EIE22           ;BR TO END IF 'E'
3316  022400  000417                            ELC22:  BR      THE22           ;BR TO THEN 'E'
3317  022402  032737  000002  002234            IFD22:  BIT     #2,UUT          ;IF UNIT/SIDE UNDER TEST (UUT)
3318  022410  001404                                    BEQ     ELD22           ;EQUALS 1
3319  022412  012737  000004  022502                    MOV     #4,TSTSUT       ;SET TEST OF SYS. UNDER TEST UNIT/SIDE 1
3320  022420  000403                                    BR      IFE22           ;BR TO IF 'E'
3321  022422  012737  000001  022502            ELD22:  MOV     #1,TSTSUT       ;SET TEST OF SYS. UNDER TEST UNIT/SIDE 0
3322  022430  033737  022502  002232            IFE22:  BIT     TSTSUT,SUT      ;IF DRIVE 0 SELECTED FOR TEST
3323  022436  001404                                    BEQ     ELE22           ;THEN
3324  022440  042737  000001  002234            THE22:  BIC     #1,UUT          ;SET UNIT UNDER TEST TO DRV#0
3325  022446  000403                                    BR      EIE22           ;BR TO END IF 'E'
3326  022450  052737  000001  002234            ELE22:  BIS     #1,UUT          ;SET UNIT UNDER TEST TO DRV#1
3327  022456  013704  002234                    EIE22:  MOV     UUT,R4          ;GET UNIT UNDER TEST
3328  022462  006304                                    ASL     R4              ;DOUBLE IT
3329  022464  010437  002240                            MOV     R4,UUTOFF       ;SET UUT OFFSET
3330  022470  062704  002336                            ADD     #UT00,R4        ;GET UUT UNIT # FOR PRINT
3331  022474  011437  002334                            MOV     (R4),UNIT       ;SET UNIT=PRINT UNIT #
3332  022500  000207                            END22:  RTS     PC              ;RETURN
3333                                            ;-------------------------------------------------------------------
3334  022502  000000                            TSTSUT: 0
3335                                            ;MOD 2.2 ----- END MODULE -----------------------------------------
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3338
3339
3340                                        .SBTTL  MOD 2.3 - EXECUTE DRIVE TEST
3341                                        ;---------------------- ----------------------------------------
3342
3343  022504  013737  002252  023326        XDVTST: MOV     WDCNT,WDCT      ;SET DRIVE WORD CNT
3344  022512  013702  002240                        MOV     UUTOFF,R2       ;GET UUT OFFSET
3345  022516  005737  002172                IFA23:  TST     RXXX            ;IF DEVICE IS AN
3346  022522  001010                                BNE     1$              ;RX02 THEN
3347  022524  032737  000002  002234                BIT     #2,UUT          ;IF UNIT UNDER TEST IS
3348  022532  001404                                BEQ     1$              ;#1 THEN
3349  022534  013737  002222  002236                MOV     U1ADR,UUTADR    ;GET UNIT #1 UNIBUS ADR
3350  022542  000403                                BR      IFI23           ;BR TO END IF 'A'
3351  022544  013737  002220  002236        1$:     MOV     U0ADR,UUTADR    ;GET UNIT #0 UNIBUS ADR
3352  022552  005737  021450                IFI23:  TST     RESTK           ;IF RESET TRK
3353  022556  001413                                BEQ     IFB23           ;IF SET, THEN
3354  022560  113705  021450                        MOVB    RESTK,R5        ;GET UUT OFFSET
3355  022564  006305                                ASL     R5              ;DOUBLE OFFSET
3356  022566  062705  023306                        ADD     #CTRK,R5        ;ADD TRK TABLE ADR
3357  022572  013715  002206                        MOV     OTDITK,(R5)     ;RESET TO MIN TRK
3358  022576  005037  002262                        CLR     SECDN           ;CLEAR SEC DONE FLAG
3359  022602  005037  021450                        CLR     RESTK           ;CLEAR RESET TRK FLAG
3360  022606  005737  014016                IFB23:  TST     INITL           ;IF INITIALIZE IS
3361  022612  001415                                BEQ     EIB23           ;SET, THEN
3362  022614  012705  023276                        MOV     #CSEC,R5        ;GET START OF CUR TRK &SEC TBL
3363  022620  012704  000004                        MOV     #4,R4           ;SET TBL LENGTH
3364  022624  005025                        1$:     CLR     (R5)+           ;CLEAR TABLES
3365  022626  005304                                DEC     R4              ;DECR TBL LENTGH
3366  022630  001375                                BNE     1$              ;DO UNTIL LENGHT=0
3367  022632  012704  000004                        MOV     #4,R4           ;SET TBL LENGTH
3368  022636  013725  002206                2$:     MOV     OTDITK,(R5)+    ;SET STARTING TRACKS
3369  022642  005304                                DEC     R4              ;DECREMENT TBL LENGTH
3370  022644  001374                                BNE     2$              ;DO UNTIL LENGTH=0
3371  022646  012701  023306                EIB23:  MOV     #CTRK,R1        ;GET BEGIN ADR DRIVE CURRENT TRK.
3372  022652  060201                                ADD     R2,R1           ;CAL. DRIVE CUR. TRK. LOCATOR
3373  022654  010137  023320                        MOV     R1,CNTKLC       ;SAVE DRV. CUR. TRK.
3374  022660  017737  000434  024240                MOV     @CNTKLC,CURTRK  ;GET DRIVE CUR. TRK.
3375  022666  012701  023276                        MOV     #CSEC,R1        ;GET BEGIN ADR DRIVE CUR. SEC.
3376  022672  060201                                ADD     P2,R1           ;CAL. DRIVE CUR. SEC. LOCATOR
3377  022674  010137  023316                        MOV     R1,CNSCLC       ;SAVE DRV CUR SEC LOC.
3378  022700  017737  000412  023710                MOV     @CNSCLC,CURSEC  ;GET DRIVE CUR SEC.
3379  022706                                IFJ23:  INLOOP                  ;IF IN LOOP
3380  022710                                        BNCOMPLETE IFC23        ;THEN
3381  022712  000532                                BR      EIJ23           ;BR TO END IF 'I'
3382  022714  005737  002304                IFC23:  TST     RETRY           ;IF RETRY IS
3383  022720  001447                                BEQ     IFG23           ;NOT=0, AND
3384  022722  032737  000004  002204                BIT     #BIT02,SWREG    ;IF RETRY ON ERR
3385  022730  001004                                BNE     IFD23           ;SET OR
3386  022732  032737  000004  002264                BIT     #EVL,FLGDRS     ;DRS "EVL" FLAG
3387  022740  001437                                BEQ     IFG23           ;IS SET, THEN
3388  022742  032737  000001  002304        IFD23:  BIT     #1,RETRY        ;IF SEEK RETRY
3389  022750  001001                                BNE     1$              ;IS = 0
3390  022752  000404                                BR      2$              ;THEN BR TO 2$
3391  022754  032737  000010  002204        1$:     BIT     #BIT03,SWREG    ;ELSE IF RECAL SWITCH
3392  022762  001003                                BNE     THD23           ;IS NOT SET
3393  022764  005037  023322                2$:     CLR     SEEK            ;THEN CLEAR SEEK FUNCTION FLAG
```

```
3394  022770  000420                          BR      EID23           ;BR TO END IF 'D'
3395  022772  012737  040000  024404  THD23:  MOV     #40000,DVTST    ;PASS PROGRAM INITIALIZE TO DRIVE TEST
3396  023000  004737  024254                  CALL    GTDVFN          ;CALL MOD 2.3.3 GET DRIVE FUNCTION
3397  023004  013737  023332  023330          MOV     DRVFN,WDOT      ;PASS DRIVE FUNCTION
3398  023012  013737  002236  025034          MOV     UUTADR,CSADR    ;SET ADR FOR DRIVE FUNCTION
3399  023020  004737  024406                  CALL    OTDVFN          ;CALL MOD 2.3.4 O/P DRIVE FUNCTION
3400  023024  012737  000001  023322          MOV     #1,SEEK         ;SET SEEK FLAG
3401  023032  005037  002304          EID23:  CLR     RETRY           ;CLEAR RETRY FLAGS
3402  023036  000460                          BR      EIJ23           ;BR TO END IF 'C'
3403  023040  013705  023324          IFG23:  MOV     DRVTST,R5       ;SETUP DRIVE TST
3404  023044  042705  177770                  BIC     #177770,R5      ;FOR TYPE CK
3405  023050  005705                          TST     R5              ;IF DRIVE TST
3406  023052  001404                          BEQ     IFE23           ;IS NOT 'FILL BUFF'
3407  023054  022705  000003                  CMP     #3,R5           ;OR
3408  023060  001401                          BEQ     IFE23           ;NOT 'READ SEC' , THEN
3409  023062  000434                          BR      IFH23           ;BR TO IF 'H'
3410  023064  005737  002262          IFE23:  TST     SECDN           ;IF SEC DONE
3411  023070  001417                          BEQ     ELE23           ;IS = 1
3412  023072  005737  021436          IFF23:  TST     INCTRK          ;IF INCR TRK FLAGS
3413  023076  001414                          BEQ     ELE23           ;ARE SET ,THEN
3414  023100  013737  021436  024236          MOV     INCTRK,TRKINC   ;PASS TRK FLAGS
3415  023106  004737  023742                  CALL    GETTRK          ;CALL MOD 2.3.2 GET TRACK
3416  023112  013777  024240  000200          MOV     CURTRK,@CNTKLC  ;SAVE CURRENT TRACK
3417  023120  012737  000001  023322          MOV     #1,SEEK         ;SET SEEK FLAG
3418  023126  000402                          BR      EIE23           ;BR TO END IF 'E'
3419  023130  005037  023322          ELE23:  CLR     SEEK            ;RESET SEEK
3420  023134  017737  000156  023710  EIE23:  MOV     @CNSCLC,CURSEC  ;PASS CURRENT SECTOR
3421  023142  004737  023334                  CALL    GETSEC          ;CALL MOD 2.3.1 GET A SECTOR
3422  023146  013777  023710  000142          MOV     CURSEC,@CNSCLC  ;SAVE UPDATED CURRENT SECTOR
3423  023154  032737  000006  023324  IFH23:  BIT     #6,DRVTST       ;IF DRIVE TST
3424  023162  001006                          BNE     EIJ23           ;IS 'FILL BUFF' ,THEN
3425  023164  012701  034006                  MOV     #DATPAT,R1      ;SET UP DATA PATTERN ADR
3426  023170  117721  000124                  MOVB    @CNTKLC,(R1)+   ;SET TRK ADR IN DATA BUF BYTE #0
3427  023174  117711  000116                  MOVB    @CNSCLC,(R1)    ;SET SEC ADR IN DATA BUF BYTE#1
3428  023200  005037  024404          EIJ23:  CLR     DVTST           ;CLEAR DRIVE TEST
3429  023204  113737  023324  024404          MOVB    DRVTST,DVTST    ;PASS DRIVE TEST
3430  023212  004737  024254                  CALL    GTDVFN          ;CALL MOD 2.3.3 GET DRIVE FUNCTION
3431  023216  013737  023332  002332          MOV     DRVFN,CMD       ;SET COMMAND FOR PRINT
3432  023224  013737  023332  023330          MOV     DRVFN,WDOT      ;PASS FUNCTION WORD     (PASS TO 2.3.4)
3433  023232  017737  000062  025036          MOV     @CNTKLC,TRKADR  ;PASS CURRENT TRACK     (PASS TO 2.3.4)
3434  023240  017737  000052  025040          MOV     @CNSCLC,SECADR  ;PASS CURRENT SECTOR    (PASS TO 2.3.4)
3435  023246  013737  002236  025034          MOV     UUTADR,CSADR    ;PASS UUT C&S ADR       (PASS TO 2.3.4)
3436  023254  004737  024406                  CALL    OTDVFN          ;CALL MOD 2.3.4 O/P DRIVE FUNCTION
3437  023260  013737  025036  002254          MOV     TRKADR,TRACK    ;SAVE TRACK ADDR IN GLOBAL
3438  023266  013737  025040  002256          MOV     SECADR,SECTOR   ;SAVE SECTOR ADDR IN GLOBAL
3439  023274  000207                          RTS     PC              ;RETURN
3440                          ;-----------------------------------------------------------------------
```

```


                            ;------------------------------------------------------------------------
023276  000000              CSEC:   .WORD   0               ;CURRENT DRV SECTOR TABLE
023300  000000                      .WORD   0
023302  000000                      .WORD   0
023304  000000                      .WORD   0
023306  000000              CTRK:   .WORD   0               ;CURRENT DRV TRK TABLE
023310  000000                      .WORD   0
023312  000000                      .WORD   0
023314  000000                      .WORD   0

023316  000000              CNSCLC: .WORD   0               ;CURRENT SECTOR LOCATOR
023320  000000              CNTKLC: .WORD   0               ;CURRENT TRACK LOCATOR
023322  000000              SEEK:   .WORD   0               ;SEEK FLAG
023324  000000              DRV1ST: .WORD   0               ;DRIVE TEST
023326  000000              WDCT:   .WORD   0               ;WORD COUNT
023330  000000              WDOT:   .WORD   0               ;FUNCTION WORD TO SEND OUT
023332  000000              DRVFN:  .WORD   0               ;DRIVE FUNCTION WORD
                            ;MOD 2.3 ----- END MODULE --------------------------------------------
```

```
3464                                    .SBTTL  MOD 2.3.1 - GET A SECTOR
3465                                    ;---------------------------------------------------------------------
3466
3467  023334  005037  023704            GETSEC: CLR     UTSCDN          ;CLEAR UUT SECTOR DONE
3468  023340  013705  002234                    MOV     UUT,R5          ;GET UNIT UNDER TST
3469  023344  006305                            ASL     R5              ;DOUBLE FOR WRD ADR
3470  023346  005737  014016            IFI231: TST     INITL           ;IF INITIALIZE IS
3471  023352  001406                            BEQ     EII231          ;SET, THEN
3472  023354  012701  023664                    MOV     #SSEC,R1        ;GET STARTING SEC ADR
3473  023360  005021                            CLR     (R1)+           ;CLEAR UNT00 SSEC
3474  023362  005021                            CLR     (R1)+           ;CLEAR UNT01 SSEC
3475  023364  005021                            CLR     (R1)+           ;CLEAR UNT10 SSEC
3476  023366  005011                            CLR     (R1)            ;CLEAR UNT11 SSEC
3477  023370  012701  023664            EII231: MOV     #SSEC,R1        ;GET START SECTOR BASE ADR
3478  023374  060501                            ADD     R5,R1           ;FIND ADR UUT START SECTOR (TEMP 1)
3479  023376  011102                            MOV     (R1),R2         ;SAVE UUT STARTING SECTOR (TEMP 2)
3480  023400  012703  023674                    MOV     #NSEC,R3        ;GET NEXT SECTOR BASE ADR
3481  023404  060503                            ADD     R5,R3           ;FIND ADR UUT NEXT SECTOR (TEMP 3)
3482  023406  011304                            MOV     (R3),R4         ;SAVE UUT NEXT SECTOR (TEMP 4)
3483  023410  020237  002212            IFA231: CMP     R2,MINSEC       ;IF STARTING SECTOR < MIN. SECTOR
3484  023414  103422                            BLO     ELA231          ;THEN
3485  023416  010437  023710                    MOV     R4,CURSEC       ;SET CURRENT SECTOR=UUT NEXT SECTOR
3486  023422  023737  023660  023706    IFG231: CMP     SCPSCT,INTLV    ;IF SECTOR PASS CNT< INTERLV
3487  023430  103053                            BHIS    THF231          ;THEN BR TO THEN 'F',ELSE
3488  023432  005737  023662            IFH231: TST     STSCFG          ;IF START SEC FLAG
3489  023436  001405                            BEQ     ELH231          ;IS SET, THEN
3490  023440  005037  023662                    CLR     STSCFG          ;CLEAR FLAG
3491  023444  010204                            MOV     R2,R4           ;SET DRV NXT SEC= DRV START SEC
3492  023446  010213                            MOV     R2,(R3)         ;SAVE DRV NXT SEC
3493  023450  000426                            BR      IFC231          ;BR TO IF 'C'
3494  023452  063704  023706            ELH231: ADD     INTLV,R4        ;NSEC=NSEC+INTERLV
3495  023456  010413                            MOV     R4,(R3)         ;SAVE NEXT SEC
3496  023460  000422                            BR      IFC231          ;BR TO IF 'C'
3497  023462  013737  002212  023710    ELA231: MOV     MINSEC,CURSEC   ;SET CURRENT SECTOR = MIN. SECTOR
3498  023470  013711  002212                    MOV     MINSEC,(R1)     ;SET UUT START SECTOR = MIN. SECTOR
3499  023474  013702  002212                    MOV     MINSEC,R2       ;SET R2=MINSEC
3500  023500  005037  023660                    CLR     SCPSCT          ;CLEAR SECTOR PASS COUNT
3501  023504  023737  002212  002214    IFB231: CMP     MINSEC,MAXSEC   ;IF MAX. SECTOR NOT=MIN. SECTOR
3502  023512  001443                            BEQ     ELB231          ;THEN
3503  023514  010205                    THB231: MOV     R2,R5           ;GET UUT STARTING SECTOR
3504  023516  063705  023706                    ADD     INTLV,R5        ;ADD SECTOR INTERLEAVE
3505  023522  010513                            MOV     R5,(R3)         ;SAVE NEXT UUT NEXT SEC (TEMP 5)
3506  023524  010504                            MOV     R5,R4           ;SAVE NEXT UUT NEXT SEC (TEMP 4)
3507  023526  020437  002214            IFC231: CMP     R4,MAXSEC       ;IF NEXT SECTOR > MAX. SECTOR
3508  023532  103432                            BLO     ELC231          ;THEN
3509  023534  005211                            INC     (R1)            ;INCREMENT UUT STARTING SECTOR
3510  023536  011102                            MOV     (R1),R2         ;SET UP NEW START SEC
3511  023540  005237  023660                    INC     SCPSCT          ;INCR SECTOR PASS CNT
3512  023544  020437  002214            IFD231: CMP     R4,MAXSEC       ;IF NXT SEC NOT = MAX SEC
3513  023550  001417                            BEQ     ELD231          ;THEN
3514  023552  020237  002214            IFF231: CMP     R2,MAXSEC       ;IF DRV START SEC > MAX SEC
3515  023556  101411                            BLOS    ELF231          ;THEN
3516  023560  012737  000001  023704    THF231: MOV     #1,UTSCDN       ;SET UUT SECTOR DONE
3517  023566  004737  023712                    CALL    STSCDN          ;CALL MOD 2.3.1.A - SET DRIVE SECTOR DONE FLAG
3518  023572  005011                            CLR     (R1)            ;CLEAR UUT STARTING SECTOR
3519  023574  005037  023660                    CLR     SCPSCT          ;CLEAR SEC PASS CNT
```

```
3520  023600  000420                          BR      END231          ;BRANCH TO END GET SECTOR
3521  023602  010213                  ELF231: MOV     R2,(R3)         ;SET DRV NXT SEC = DRV START SEC
3522  023604  010204                          MOV     R2,R4           ;SAVE  DRV NXT SEC
3523  023606  000415                          BR      END231          ;BR TO END
3524  023610  012737  000001  023662  ELD231: MOV     #1,STSCFG       ;SET START SEC FLAG
3525  023616  000411                          BR      END231          ;BR TO END
3526  023620  000410                  ELC231: BR      END231          ;BRANCH TO END GET SECTOR
3527  023622  012737  000001  023704  ELB231: MOV     #1 UTSCDN       ;SET DRIVE SECTOR DONE FLAG
3528  023630  004737  023712                  CALL    STSCDN          ;CALL MOD 2.3.1.A - SET DRIVE SECTOR DONE FLAG
3529  023634  005037  023660                  CLR     SCPSCT          ;CLEAR SEC PASS CNT
3530  023640  005011                          CLR     (R1)            ;CLEAR UUT STARTING SECTOR
3531  023642  013737  023704  002262  END231: MOV     UTSCDN,SECDN    ;PASSUP UNIT SECTOR DONE
3532  023650  010437  023656                  MOV     R4,NXSCSA       ;
3533  023654  000207                          RTS     PC              ;RETURN TO MOD 2.3
3534                                  ;MOD 2.3.1 ----- REGISTERS & TABLES ----------
3535  023656  000000                  NXSCSA: 0
3536  023660  000000                  SCPSCT: 0                       ;SEC PASS COUNT
3537  023662  000000                  STSCFG: 0                       ;GET NEW STARTING SEC FLAG
3538  023664  000000                  SSEC:   0                       ;UUT STARTING SECTOR
3539  023666  000000                          0                       ;
3540  023670  000000                          0                       ;
3541  023672  000000                          0                       ;
3542  023674  000000                  NSEC:   0                       ;UUT NEXT SECTOR
3543  023676  000000                          0                       ;
3544  023700  000000                          0                       ;
3545  023702  000000                          0                       ;
3546  023704  000000                  UTSCDN: 0                       ;UUT SECTOR DONE FLAG
3547  023706  000003                  INTLV:  3                       ;SECTOR INTERLEAVE
3548  023710  000000                  CURSEC: 0                       ;CURRENT SECTOR UUT
3549                                  ;MOD 2.3.1 ----- END MODULE ----------
3550
3551
3552
3553                                  .SBTTL  MOD 2.3.1.A - SET SECTOR DONE
3554                                  ;----------
3555
3556  023712  032737  000001  002234  STSCDN: BIT     #1,UUT          ;IF DRIVE #1 DONE
3557  023720  001404                          BEQ     1$              ;THEN
3558  023722  052737  000002  021434          BIS     #2,BDVSCD       ;SET DRIVE #1 SEC DONE FLAG
3559  023730  000403                          BR      2$              ;BR TO END
3560  023732  052737  000001  021434  1$:     BIS     #1,BDVSCD       ;SET DRIVE #0 SEC DONE FLAG
3561  023740  000207                  2$:     RTS     PC              ;RETURN
3562                                  ;MOD 2.3.1.A ----- END MODULE ----------
```

```
3565                                            .SBTTL  MOD 2.3.2 - GET A TRACK
3566                                            ;-------------------------------------------------------------
3567
3568  023742  013737  002210  024234  GETTRK: MOV     INDITK,MAXTRK   ;GET INSIDE DIA AS SET BY OP
3569  023750  013737  002206  024232          MOV     OTDITK,MINTRK   ;GET OUTSIDE DIA AS SET BY OP
3570  023756  005737  024252          IFH232: TST     INITTK          ;IF INITIALIZE TRK IS
3571  023762  001413                          BEQ     EIH232          ;SET, THEN
3572  023764  005037  024252                  CLR     INITTK          ;RESET INITIALIZE TRK FLG
3573  023770  012701  024242                  MOV     #TKTL,R1        ;GET START OF TRK TBL
3574  023774  005021                          CLR     (R1)+           ;SET  UNT00
3575  023776  005021                          CLR     (R1)+           ;SET  UNT01
3576  024000  005021                          CLR     (R1)+           ;SET  UNT10
3577  024002  005011                          CLR     (R1)            ;SET  UNT11
3578  024004  013737  024232  024240          MOV     MINTRK,CURTRK   ;SET MIN CURRENT TRK
3579  024012  013702  002234          EIH232: MOV     UUT,R2          ;GET UNIT UNDER TEST INDICATOR
3580  024016  006302                          ASL     R2              ;DOUBLE FOR ADDRESSING WORDS
3581  024020  005037  024230                  CLR     TRKDNF          ;CLEAR TRACK DONE FLAG
3582  024024  032737  002000  024236  IFA232: BIT     #2000,TRKINC    ;IF INCREMENT TRACK FLAG
3583  024032  001023                          BNE     IFG232          ;NOT SET, THEN (USE SELECTED TRK SEQ)
3584  024034  012701  024242                  MOV     #TKTL,R1        ;GET DRIVE TRACK TABLE LOCATOR BASE ADR
3585  024040  060201                          ADD     R2,R1           ;CAL. DRV. TRK. TAB. LOCATOR ADR
3586  024042  011102                          MOV     (R1),R2         ;GET DRV.TRK. TAB. LOCATOR
3587  024044  012703  033554                  MOV     #TRKTBL,R3      ;GET BEGIN TRACK TABLE ADR
3588  024050  060203                          ADD     R2,R3           ;CAL. TRACK TAB. ADR. THIS DRIVE
3589  024052  005202                          INC     R2              ;INCREMENT DRV. TRK. TAB. LOCATOR
3590  024054  010211                          MOV     R2,(R1)         ;SAVE DRV. TRK. TAB. LOCATOR
3591  024056  111337  024240                  MOVB    (R3),CURTRK     ;SAVE CURRENT TRACK
3592  024062  005203                          INC     R3              ;INCREMENT TRACK TAB. POINTER
3593  024064  105713                  IFF232: TSTB    (R3)            ;IF NEXT TRACK
3594  024066  002004                          BGE     ELF232          ;EQUALS -1
3595  024070  012[illegible]  000001  024230          MOV     #1,TRKDNF       ;THEN SET TRACK DONE FLAG
3596  024076  005[illegible]                  CLR     (R1)            ;RESET DRV. TRK. TAB. LOCATOR ADR.
3597  024100  00[illegible]           ELF232: BR      END232          ;BR TO END MOD.
3598  024102  123[illegible]  24240  024234  IFG232: CMPB    CURTRK,MAXTRK   ;IF CURRENT TRK > OR = MAX TRK (O. D.)
3599  024110  103[illegible]                  BLO     IFB232          ;THEN
3600  024112  013737  024232  024240          MOV     MINTRK,CURTRK   ;SET CURRENT TRK = MIN TRK
3601  024120  123737  024240  024232  IFB232: CMPB    CURTRK,MINTRK   ;IF CURRENT TRK > OR = MIN TRK (O.D.)
3602  024126  103427                          BLO     ELB232          ;THEN
3603  024130  013701  024240                  MOV     CURTRK,R1       ;GET CURRENT TRACK
3604  024134  005201                          INC     R1              ;INCREMENT CURRENT TRACK
3605  024136  120137  024234          IFC232: CMPB    R1,MAXTRK       ;IF CURRENT TRK +1 < MAX TRK (I.D.)
3606  024142  103001                          BHIS    IFD232          ;THEN
3607  024144  000406                          BR      EID232          ;BRANCH TO END IF 'D'
3608  024146  120137  024234  IFD232: CMPB    R1,MAXTRK       ;IF CURRENT TRK +1 = MAX TRK
3609  024152  001006                          BNE     IFE232          ;THEN
3610  024154  012737  000001  024230          MOV     #1,TRKDNF       ;SET TRK DONE FLAG
3611  024162  010137  024240  EID232: MOV     R1,CURTRK       ;SAVE CURRENT TRK +1 = CURRENT TRK
3612  024166  000412                          BR      END232          ;BR END OF MOD.
3613  024170  123737  024234  024232  IFE232: CMPB    MAXTRK,MINTRK   ;IF TRK MAX = TRK MIN
3614  024176  001003                          BNE     ELB232          ;THEN
3615  024200  012737  000001  024230          MOV     #1,TRKDNF       ;SET TRK DONE FLAG
3616  024206  013737  024232  024240  ELB232: MOV     MINTRK,CURTRK   ;SET CURRENT TRK = MIN. TRK (O.D.)
3617  024214  013737  024230  002260  END232: MOV     TRKDNF,TRKDN    ;SAVE TRACK DONE FLAG
3618  024222  005037  024236                  CLR     TRKINC          ;CLEAR TRK INCR FLAG
3619  024226  000207                          RTS     PC              ;
3620                                          ;-------------------------------------------------------------
```

```
3623                                       ;-----------------------------------------------------------------------
3624 024230 000000              TRKDNF: .WORD   0               ;TRACK DONE FLAG
3625 024232 000000              MINTRK: .WORD   0               ;MINIMUM TRACK - O.D.
3626 024234 000000              MAXTRK: .WORD   0               ;MAXIMUM TRACK - I.D.
3627 024236 000000              TRKINC: .WORD   0               ;INCREMENT TRK FLAG
3628 024240 000000              CURTRK: .WORD   0               ;CURRENT TRACK
3629 024242 000000              TKTI    .WORD   0               ;DRV TRK TABLE LOCATOR
3630 024244 000000                      .WORD   0
3631 024246 000000                      .WORD   0
3632 024250 000000                      .WORD   0
3633 024252 000000              INITTK: .WORD   0               ;INITIALIZE TRK FLAG
3634                            ;MOD 2.3.2 ----- END MODULE ------------------------------------------
```

```
3637                                        .SBTTL  MOD 2.3.3 - GET A DRIVE FUNCTION
3638                                        ;---------------------------------------------------------------
3639
3640  024254  005001                        GTDVFN: CLR     R1              ;CLEAR REG #1
3641  024256  013701  024404                        MOV     DVTST,R1        ;GET DRIVE TEST
3642  024262  032701  040000                IFA233: BIT     #40000,R1       ;IF NOT INITIALIZE
3643  024266  001012                                BNE     IFB233          ;THEN
3644  024270  042701  177700                        BIC     #177700,R1      ;CLEAR TOP BYTE OF R1
3645  024274  006301                                ASL     R1              ;FORMAT FUNCTION
3646  024276  052701  000001                        BIS     #1,R1           ;SET GO BIT
3647  024302  020127  000005                IFE233: CMP     R1,#5           ;IF WRT FUNCT
3648  024306  001002                                BNE     IFB233          ;THEN
3649  024310  053701  002244                        BIS     DELDAT,R1       ;SET DEL DAT WRT (IF SET)
3650  024314  005737  002172                IFB233: TST     RXXX            ;IF DRIVE IS RXXX
3651  024320  001411                                BEQ     IFD233          ;THEN
3652  024322  032737  000002  002234        IFC233: BIT     #2,UUT          ;IF SIDE #1 IS SELECTED
3653  024330  001403                                BEQ     ELC233          ;THEN
3654  024332  052701  001000                        BIS     #1000,R1        ;SET SIDE #1 BIT
3655  024336  000402                                BR      IFD233          ;BRANCH TO IF 'D'
3656  024340  042701  001000                ELC233: BIC     #1000,R1        ;SET FOR SIDE #0
3657  024344  032737  000001  002234        IFD233: BIT     #1,UUT          ;IF UNIT UNDER TEST IS
3658  024352  001403                                BEQ     ELD233          ;DRIVE #1
3659  024354  052701  000020                        BIS     #20,R1          ;THEN SET DRIVE #1 SELECT BIT
3660  024360  000402                                BR      EID233          ;BRANCH TO IF 'D'
3661  024362  042701  000020                ELD233: BIC     #20,R1          ;ELSE CLEAR DRIVE #1 SELECT BIT
3662  024366  053701  002242                EID233: BIS     DEN,R1          ;SET DENSITY BIT
3663  024372  052701  000100                        BIS     #100,R1         ;SET INTERRUPT BIT
3664  024376  010137  023332                        MOV     R1,DRVFN        ;PASS UP FUNCTION WORD
3665  024402  000207                        END233: RTS     PC              ;RETURN
3666                                        ;---------------------------------------------------------------
3667  024404  000000                        DVTST:  0                       ;DRIVE TEST WORD
3668                                        ;MOD 2.3.3 ----- END MODULE -----------------------------------
```

```
3671                                            .SBTTL  MOD 2.3.4 - OUTPUT DRIVE FUNCTION
3672                                            ;---------------------------------------------------------------
3673
3674  024406  013701  025034          OTDVFN: MOV     CSADR,R1        ;GET STATUS REG ADR
3675  024412  062701  000002                  ADD     #2,R1           ;ADD 2 TO ADR
3676  024416  010137  025032                  MOV     R1,DBADR        ;SAVE AS DATA ADDRESS
3677  024422  012737  000040  025330          MOV     #DNBIT,RDYWD    ;READY TEST WD          (PASS TO 2.3.4.1)
3678  024430  013737  023330  025022          MOV     WDOT,WRDS       ;WORD FOR OUTPUT        (PASS TO 2.3.4.1)
3679  024436  013737  025034  025024          MOV     CSADR,ADRS      ;ADDRESS OF OUTPUT      (PASS TO 2.3.4.1)
3680  024444  004737  025042                  JSR     PC,OUTSWD       ;OUTPUT FUNCTION WD (FW) DO 2.3.4.1)
3681  024450  032737  040000  023330  IFA234: BIT     #40000,WDOT     ;IF FUNCTION IS
3682  024456  001402                          BEQ     THA234          ;NOT AN ''INITIALIZE'' (FW BIT#14=0)
3683  024460  000137  025016                  JMP     END234          ;THEN,
3684  024464  032737  000010  023330  THA234: BIT     #10,WDOT        ;IF FUNCTION IS
3685  024472  001043                          BNE     IFC234          ;''READ, WRITE, FILL, EMPTY'' (FW BIT#3=0)
3686  024474  032737  000004  023330  IFH234: BIT     #4,WDOT         ;AND THEN IF FUNCTION IS
3687  024502  001047                          BNE     ELH234          ;''EMPTY, FILL'' (FW BIT#2=0)
3688  024504  012737  000200  025330          MOV     #TRBIT,RDYWD    ;THEN SET OUTPUT READY TEST WORD (PASS TO 2.3.4.
3689  024512  013737  023326  025022          MOV     WDCT,WRDS       ;AND SET WORD FOR OUTPUT        (PASS TO 2.3.4.1
3690  024520  013737  025032  025024          MOV     DBADR,ADRS      ;AND SET ADDRESS OF OUTPUT      (PASS TO 2.3.4.1
3691  024526  004737  025042                  JSR     PC,OUTSWD       ;OUTPUT BASE ADDRESS WORD       DO 2.3.4.1
3692  024532  032737  000002  023330  IFK234: BIT     #2,WDOT         ;IF ''FILL'' (FW BIT#1=0)
3693  024540  001004                          BNE     ELK234          ;THEN
3694  024542  012737  034006  025022          MOV     #DATPAT,WRDS    ;SET DATA PATTERN ADR           (PASS TO 2.3.4.1
3695  024550  000403                          BR      EIK234          ;BR TO END IF 'K'
3696  024552  012737  034406  025022  ELK234: MOV     #DATBUF,WRDS    ;SET DATA BUFFER ADR            (PASS TO 2.3.4.1
3697  024560  012737  000200  025330  EIK234: MOV     #TRBIT,RDYWD    ;SET OUTPUT READY TEST WORD     (PASS TO 2.3.4.1
3698  024566  013737  025032  025024          MOV     DBADR,ADRS      ;ADDRESS OF OUTPUT              (PASS TO 2.3.4.1
3699  024574  004737  025042                  JSR     PC,OUTSWD       ;OUTPUT WORD COUNT WORD         DO 2.3.4.1
3700  024600  000444                          BR      EIH234          ;BRANCH TO END IF 'H'
3701  024602  032737  000004  023330  IFC234: BIT     #4,WDOT         ;IF FUNCTION WORD IS
3702  024610  001455                          BEQ     IFE234          ;''WRITE D.D'' OR ''READ E.C'' (FW BIT #2=1)
3703  024612  032737  000002  023330  IFD234: BIT     #2,WDOT         ;THEN, IF FUNCTION IS
3704  024620  001035                          BNE     ELD234          ;''WRITE D.D'', THEN (FW BIT#1=0)
3705  024622  012737  000200  025330  ELH234: MOV     #TRBIT,RDYWD    ;SET OUTPUT READY TEST WORD
3706  024630  013737  025040  025022          MOV     SECADR,WRDS     ;MOVE TRACK AND SECTOR ADDRESS
3707  024636  042737  177700  025022          BIC     #177700,WRDS    ;FORMAT TO SECTOR ADDRESS
3708  024644  013737  025032  025024          MOV     DBADR,ADRS      ;ADDRESS OF OUTPUT
3709  024652  004737  025042                  JSR     PC,OUTSWD       ;OUTPUT SECTOR ADDRESS
3710  024656  013737  025036  025022          MOV     TRKADR,WRDS     ;MOVE TRACK AND SECTOR ADDRESS
3711  024664  042737  177600  025022          BIC     #177600,WRDS    ;FORMAT TRACK ADDRESS
3712  024672  012737  000200  025330          MOV     #TRBIT,RDYWD    ;SET OUTPUT READY TEST WORD
3713  024700  013737  025032  025024          MOV     DBADR,ADRS      ;ADDRESS OF OUTPUT
3714  024706  004737  025042                  JSR     PC,OUTSWD       ;OUTPUT TRACK ADDRESS
3715  024712  000437                  EIH234: BR      EIB234          ;ENDIF H -DONE
3716  024714  012737  000200  025330  ELD234: MOV     #TRBIT,RDYWD    ;SET READY WD TO TR MODE
3717  024722  012737  033544  025022          MOV     #XERUUT,WRDS    ;EXT ERR. CODE TABLE ADD
3718  024730  013737  025032  025024          MOV     DBADR,ADRS      ;ADDRESS OF OUTPUT, RXDB
3719  024736  004737  025042                  JSR     PC,OUTSWD       ;O/P BASE ADD FOR ERR. CODE
3720  024742  000423                          BR      EIB234          ;DONE
3721  024744  032737  000002  023330  IFE234: BIT     #2,WDOT         ;IF FUNCTION IS
3722  024752  001404                          BEQ     ELE234          ;''READ STATUS'' (FW BIT#1=1)
3723  024754  012737  000001  025026  THE234: MOV     #1,ERSTAT       ;THEN-SET ERR STATUS FLAG
3724  024762  000413                          BR      EIB234          ;DONE
3725  024764  012737  000200  025330  ELE234: MOV     #TRBIT,RDYWD    ;SET OUTPUT READY TEST WD
3726  024772  013737  025030  025022          MOV     VALWD,WRDS      ;VALIDATION WORD
```

```
3727  025000  013737  025032  025024          MOV     DBADR,ADRS      ;ADDRESS OF OUTPUT, RXDB
3728  025006  004737  025042                  JSR     PC,OUTSWD       ;OUTPUT VALIDATION WORD
3729  025012  004737  025104          EIB234: CALL    WATCH           ;CALL MOD U.2  -WATCH DOG
3730  025016  000240                  END234: NOP                     ;
3731  025020  000207                          RTS     PC              ;RETURN TO MOD 2.3
3732                                  ;-----------------------------------------------------------------
3733  025022  000000                  WRDS:   0                       ;MODULE 2.3.4.1 OUTPUT WORD
3734  025024  000000                  ADRS:   0                       ;MODULE 2.3.4.1 OUTPUT ADDRESS
3735  025026  000000                  ERSTAT: 0                       ;MODULE 0.0 ERR STATUS READ FLAG
3736  025030  000111                  VALWD:  111                     ;EXTERNAL, VALIDATION WD (SET DENS-ASCII "I")
3737  025032  000000                  DBADR:  0                       ;RX DATA BUFFER ADDRESS
3738  025034  000000                  CSADR:  0                       ;RX CONT/STATUS ADDRESS
3739  025036  000000                  TRKADR: 0                       ;TRACK ADDRESS
3740  025040  000000                  SECADR: 0                       ;SECTOR ADDRESS
3741                                  ;MOD 2.3.4 ----- END MODULE ----------
3742
3743
3744
3745
3746                                  .SBTTL  MOD 2.3.4.1 - OUTPUT SINGLE WORD
3747                                  ;-----------------------------------------------------------------
3748
3749  025042  000240                  OUTSWD: NOP                     ;
3750  025044  013737  025034  025332          MOV     CSADR,CSRADR    ;SET C&S REG ADR
3751  025052  013737  025330  025330          MOV     RDYWD,RDYWD     ;OUTPUT READY WORD (PASS TO DELAY)
3752  025060  004737  025230                  JSR     PC,DELAY        ;DELAY FOR READY  DO DELAY
3753  025064  033777  025330  177742          BIT     RDYWD,@CSADR    ;IF READY,
3754  025072  001403                          BEQ     ED2341          ;THEN
3755  025074  013777  025022  177722          MOV     WRDS,@ADRS      ;MOV WORD TO ADDRESS
3756  025102  000207                  ED2341: RTS     PC              ;RETURN TO MOD 2.3.4
3757                                  ;MOD  2.3.4.1 ------- END MODULE -----------------------------------
```

```
3760                                        .SBTTL  MOD U.2.3.4  - WATCH DOG TIMER
3761                                        ;-------------------------------------------------------------------
3762
3763  025104  005037  025226                WATCH:  CLR     DNFLAG          ;CLEAR DONE FLAG
3764  025110                                        SETPRI  #PRI00          ;SET PROCESSOR PRI=0 - ALLOW INTERRUPTS
3765  025116  013704  025222                        MOV     DX,R4           ;SET DELAY MULT
3766  025122  013703  025224                BAU234: MOV     DLY,R3          ;SET DELAY
3767  025126  005737  025226                IBU234: TST     DNFLAG          ;IF INTERRUPTS DONE FLAG
3768  025132  001410                                BEQ     LBU234          ;IS SET, THEN
3769  025134  032777  000040  177672        ICU234: BIT     #DNBIT,@CSADR   ;IF DONT BIT
3770  025142  001023                                BNE     XU234           ;IS NOT SET, THEN
3771  025144  012737  010000  002276                MOV     #BIT12,ERRTY    ;SET INTERR, BUT NO DONE ERROR
3772  025152  000417                                BR      XU234           ;BR TO MOD 'EXIT'
3773  025154  005303                LBU234: DEC     R3              ;DECREMENT DELAY COUNT
3774  025156  001363                UDU234: BNE     IBU234          ;DO UNIT DELAY COUNT=0
3775  025160  005304                        DEC     R4              ;DECREMENT DELAY MULT
3776  025162  001357                UAU234: BNE     BAU234          ;DO UNTIL DELAY MULT=0
3777  025164  032777  000040  177642        IEU234: BIT     #DNBIT,@CSADR   ;IF DONE BIT IS
3778  025172  001404                                BEQ     LEU234          ;SET, THEN
3779  025174  052737  020000  002276                BIS     #BIT13,ERRTY    ;SET DONE, BUT NO INTERRUPT ERROR
3780  025202  000403                                BR      XU234           ;BR TO MOD 'EXIT'
3781  025204  052737  040000  002274        LEU234: BIS     #BIT14,ERRSY    ;SET T.O. ERROR
3782  025212                                XU234:  SETPRI  #PRI07          ;SET PROCESSOR PRI=7 - NO INTERRUPTS
3783  025220  000207                                RTS     PC              ;RETURN TO MOD 2.3.4
3784                                      ;-------------------------------------------------------------------
3785  025222  000040                      DX:     40                      ;DELAY MULT
3786  025224  100000                      DLY:    100000                  ;DELAY
3787  025226  000000                      DNFLAG: 0                       ;DONE FLAG
3788                                      ;MOD U.2.3.4 ---- END MODULE ----------------------------------------
3789
3790                                      .SBTTL  MOD U.2.3/4 DELAY
3791                                      ;-------------------------------------------------------------------
3792
3793  025230  000240                      DELAY:  NOP                     ;
3794  025232  023727  025330  000000        IFAU23: CMP     RDYWD,#0        ;IF READY WORD
3795  025240  001430                                BEQ     XU23            ;EQUALS ZERO, THEN BR TO END IF 'A'
3796  025242  013704  025324                        MOV     RYDX,R4         ;SET READY DELAY MULT
3797  025246  013703  025326                BDAU23: MOV     RYDLY,R3        ;SET READY DELAY
3798  025252  033777  025330  000052        BDBU23: BIT     RDYWD,@CSRADR   ;IF READY
3799  025260  001020                                BNE     XU23            ;EQUAL TO "1" ,THEN BR TO END IF 'B'
3800  025262  005303                                DEC     R3              ;ELSE DECREMENT DELAY
3801  025264  001372                                BNE     BDBU23          ;DO UNTIL R3=0
3802  025266  005304                                DEC     R4              ;DECREMENT DELAY MULT.
3803  025270  001366                                BNE     BDAU23          ;DO UNTIL R4=0
3804  025272  052737  040000  002274                BIS     #40000,ERRSY    ;SET TIME OUT ERR
3805  025300  017737  000026  002246                MOV     @CSRADR,CSRUUT  ;GET UUT C&S REG
3806  025306  062737  000002  025332                ADD     #2,CSRADR       ;SET CSRADR TO DB REG
3807  025314  017737  000012  002250                MOV     @CSRADR,ESRUUT  ;GET UUT E&S REG
3808  025322  000207                        XU23:   RTS     PC              ;RETURN TO CALLING MOD
3809                                      ;-------------------------------------------------------------------
3810  025324  000040                      RYDX:   40                      ;READY MULTIPLIER
3811  025326  100000                      RYDLY:  100000                  ;READY DELAY
3812  025330  000000                      RDYWD:  0                       ;READY WORD - TEST FOR DEVICE READY
3813  025332  000000                      CSRADR: 0                       ;C&S REG OF UNIT- WAITING FOR
3814                                      ;MOD U.2.3.4 ----- END MODULE ---------------------------------------
```

```
3817
3818                                        .SBTTL  MOD 2.4 - EVALUATE TEST RESULTS
3819                                        ;-------------------------------------------------------------------
3820
3821  025334  013737  025410  027070    EVTSTR: MOV     TSTEV,FUNEV     ;PASS TEST FUNCTION
3822  025342  004737  026206                    CALL    EVDVST          ;CALL MOD 2.4.2 - EVALUATE DRIVE STATE
3823  025346  013737  025410  030622            MOV     TSTEV,FNEV4     ;PASS TEST FUNCTION
3824  025354  004737  030476                    CALL    EVUTEC          ;CALL MOD 2.4.4 - EVAL UNIT ERR CODE
3825  025360  032737  020000  025410    IFA24:  BIT     #20000,TSTEV    ;IF DATA CK BIT
3826  025366  001402                            BEQ     EIA24           ;IS SET, THEN
3827  025370  004737  025412                    CALL    EVDATA          ;CALL MOD 2.4.1 - EVALUATE DATA
3828  025374  013737  025410  027626    EIA24:  MOV     TSTEV,TSTCK     ;PASS DRIVE TEST
3829  025402  004737  027230                    CALL    UPDVST          ;CALL MOD 2.4.3 UPDATE DRIVE STATISTICS
3830  025406  000207                            RTS     PC              ;
3831                                      ;-------------------------------------------------------------------
3832  025410  000000                    TSTEV:  0
3833                                      ;MOD 2.4 -----  END MODULE ----------------------------------------
```

```
3836                                        .SBTTL  MOD 2.4.1 - EVALUATE DATA
3837                                        ;-----------------------------------------------------------------------
3838
3839  025412  005037  026054          EVDATA: CLR     DAERCT          ;CLEAR DATA ERR COUNT
3840  025416  005037  026046                  CLR     SEEKCK          ;CLEAR SEEK CK
3841  025422  012737  000001  026062          MOV     #1,PTHEAD       ;SET PRINT HEADER FLAG
3842  025430  013701  002252                  MOV     WDCNT,R1        ;SAVE WORD COUNT
3843  025434  006301                          ASL     R1              ;
3844  025436  162701  000001                  SUB     #1,R1           ;SUBTRACT 2 TO GET CHECKSUM
3845  025442  012702  034006                  MOV     #DATPAT,R2      ;GET ADDRESS DATA SOURCE
3846  025446  012703  034406                  MOV     #DATBUF,R3      ;GET ADDRESS DATA BUFFER
3847  025452  060102                          ADD     R1,R2           ;CAL. ADDR SOURCE CHECKSUM
3848  025454  060103                          ADD     R1,R3           ;CAL. ADDR BUFFER CHECKSUM
3849  025456  121213          IFA241: CMPB    (R2),(R3)       ;IF CHECK SUMS
3850  025460  001407                  BEQ     ELA241          ;NOT= THEN
3851  025462  032737  000002  021452  IF!241: BIT     #2,ERTSAV       ;IF CRC ERR
3852  025470  001003                  BNE     ELA241          ;NOT SET,THEN
3853  025472  052737  000004  002276          BIS     #4,ERRTY        ;SET CHECKSUM ERR
3854  025500  005037  026052          ELA241: CLR     BYTNUM          ;CLEAR BYTE NUMBER
3855  025504  162701  000001                  SUB     #1,R1           ;CAL. TOTAL BYTE COUNT-LAST TWO
3856  025510  010137  026050                  MOV     R1,BYTCNT       ;SAVE BYTE COUNT
3857  025514  012701  034006          BDA241: MOV     #DATPAT,R1      ;SET TEMP#1=DATA SOURCE BEGIN ADR
3858  025520  012702  034406                  MOV     #DATBUF,R2      ;SET TEMP#2=DATA BUFFER BEGIN ADR
3859  025524  063701  026052                  ADD     BYTNUM,R1       ;CAL CURRENT BYTE ADDR (SOURCE)
3860  025530  063702  026052                  ADD     BYTNUM,R2       ;CAL CURRENT BYTE ADDR (BUFFER)
3861  025534  121112                          CMPB    (R1),(R2)       ;IF SOURCE BYTE & BUFFER BYTE
3862  025536  001502                          BEQ     ELB241          ;NOT EQUAL
3863  025540  005237  026054                  INC     DAERCT          ;INCREMENT DATA ERR COUNT
3864  025544  052737  000010  002276          BIS     #10,ERRTY       ;SET DATA ERR-ERR TYPE
3865  025552  042737  000004  002276          BIC     #4,ERRTY        ;CLR CK SUM ERR-ERR TYPE
3866  025560  023727  026052  000002  IFC241: CMP     BYTNUM,#2       ;IF BYTE #0 OR #1
3867  025566  002006                  BGE     IFE241          ;THEN
3868  025570  005737  026052          IFD241: TST     BYTNUM          ;IF BYTE #0
3869  025574  001003                  BNE     IFE241          ;THEN
3870  025576  052737  000001  026046          BIS     #1,SEEKCK       ;SET SEEK ERR-ERR TYPE
3871  025604  023727  026054  000012  IFE241: CMP     DAERCT,#12      ;IF OVER 10 DATA ERRORS
3872  025612  103404                  BLO     THF241          ;THEN
3873  025614  032737  000020  002204  IFF241: BIT     #20,SWREG       ;IF PRINT ONLY 10 DATA ERROR FLAG
3874  025622  001047                  BNE     EIF241          ;IS NOT SET, THEN
3875  025624  111137  026056  THF241: MOVB    (R1),DATASB
3876  025630  111237  026060          MOVB    (R2),DATAWS
3877  025634  005737  026062  IFM241: TST     PTHEAD          ;IF PRINT HEADER
3878  025640  001420                  BEQ     EIM241          ;OK, THEN
3879  025642  005037  026062          CLR     PTHEAD          ;CLEAR PRINT HEADER
3880  025646                          PRINTB  #DMSG1,UNIT,TRACK,SECTOR
3881  025702                  EIM241: PRINTB  #DMSG2,BYTNUM,<B,DATASB>,<B,DATAWS>
3882  025742  000240          EIF241: NOP             ;
3883  025744  005237  026052  ELB241: INC     BYTNUM          ;INCREMENT BYTE #
3884  025750  005337  026050          DEC     BYTCNT          ;DECREMENT BYTE COUNT
3885  025754  005737  026050          TST     BYTCNT          ;DO UNTIL BYTE COUNT
3886  025760  003255                  BGT     BDA241          ;EQUALS 0
3887  025762  005737  026046  IFJ241: TST     SEEKCK          ;IF DISK SEEK ERR
3888  025766  001413                  BEQ     END241          ;IS SET AND
3889  025770  032737  000010  002276  IFK241: BIT     #10,ERRTY       ;IF DATA ERR
3890  025776  001007                  BNE     END241          ;NOT SET AND
3891  026000  032737  000002  021452  IFL241: BIT     #2,ERTSAV       ;IF CRC ERR
```

```
3892  026006  001003                          BNE     END241          ;NOT SET
3893  026010  052737  000001  002276          BIS     #1,ERRTY        ;THEN SET SEEK ERR
3894  026016  000240                  END241: NOP                     ;
3895  026020  005037  021452                  CLR     ERTSAV          ;CLEAR EPR TYP SAV
3896  026024  012705  034406                  MOV     #DATBUF,R5      ;GET BEGIN OF DATA BUFFER
3897  026030  012704  000200                  MOV     #128.,R4        ;SET WORD LENGTH OF TABLE
3898  026034  005025                  BDB241: CLR     (R5)+           ;CLEAR WORD IN DATA BUFFER TABLE
3899  026036  005304                          DEC     R4              ;DECREMENT WORD COUNT
3900  026040  005704                          TST     R4              ;DO UNTIL
3901  026042  001374                  EDB241: BNE     BDB241          ;ALL TABLE WORDS ZEROED
3902  026044  000207                          RTS     PC              ;RETURN
3903                                  ;-------------------------------------------------------------------
3904  026046  000000                  SEEKCK: 0                       ;SEEK CECK FLAG
3905  026050  000000                  BYTCNT: 0                       ;BYTE COUNT
3906  026052  000000                  BYTNUM: 0                       ;BYTE NUMBER
3907  026054  000000                  DAERCT: 0                       ;DATA ERR COUNT
3908  026056  000000                  DATASB: 0                       ;DATA SHOULD BE
3909  026060  000000                  DATAWS: 0                       ;DATA WAS
3910  026062  000000                  PTHEAD: 0                       ;PRINT HEADER FLAG
3911                                  ;-------------------------------------------------------------------
3912  026064  047045  040445  052440  DMSG1:  .ASCIZ  /%N%A UNIT#%O1%A TRK#%D3%A SEC#%D2%N%A BYTE#%S2%AGOOD%S6%ABAD/
3913  026161     045  022516  031523  DMSG2:  .ASCIZ  /%N%S3%D3%S2%B8%S2%B8/
3914                                          .EVEN
3915                                  ;MOD 2.4.1 ----- END MODULE ----------------------------------------
```

```
3918                                            .SBTTL  MOD 2.4.2 - EVALUATE DRIVE STATE
3919                                            ;-----------------------------------------------------------------
3920  026206  013705  002236                    EVDVST: MOV     UUTADR,R5
3921  026212  013737  002246  027072                    MOV     CSRUUT,CSREV    ;GET COMMAND & STATUS  LAST OP UUT
3922  026220  013737  002250  027074                    MOV     ESRUUT,ESREV    ;GET ERROR STATUS LAST OP UUT
3923  026226  005037  033544                          CLR     XERUUT          ;CLEAR EXTENDED ERROR CODE LOCATION
3924  026232  032737  000040  027072            IFA242: BIT     #40,CSREV       ;IF DONE NOT
3925  026240  001032                                    BNE     IFB242          ;SET THEN
3926  026242  012715  040000                          MOV     #40000,(R5)     ;ISSUE PROG INIT TO UUT
3927  026246  013737  002236  025332                    MOV     UUTADR,CSRADR   ;SET CSR ADR
3928  026254  012737  000040  025330                    MOV     #DNBIT,RDYWD    ;SET DONE TEST
3929  026262  004737  025230                          CALL    DELAY           ;WAIT FOR TR
3930  026266  032715  000040            IFC242: BIT     #40,(R5)        ;IF DONE NOT
3931  026272  001005                                    BNE     ELC242          ;SET THEN
3932  026274  052737  000010  002274                    BIS     #10,ERRSY       ;SET NO DONE ON INT-SYS ERR
3933  026302  000137  027064                          JMP     END242          ;BR TO END MOD
3934  026306  113701  027070            ELC242: MOVB    FUNEV,R1        ;GET DRIVE FUNCTION
3935  026312  042701  177770                          BIC     #177770,R1      ;CLEAR ALL BUT FUNCTION
3936  026316  050137  002274                          BIS     R1,ERRSY        ;SET NO DONE ON FUNCTION-SYS ERR
3937  026322  000137  027064                          JMP     END242          ;BR TO END MOD
3938  026326  004737  027076            IFB242: CALL    EVDVRE          ;CALL MOD 2.4.2.1 EVALUATE DRIVE RESPONSE
3939  026332  005737  002274                          TST     ERRSY           ;IF SYS ERR
3940  026336  001463                                    BEQ     IFG242          ;NOT=0 THEN
3941  026340  032737  000001  002234                    BIT     #1,UUT          ;IFDRV#1 UNDER TST
3942  026346  001404                                    BEQ     1$              ;THEN
3943  026350  012737  000020  027066                    MOV     #20,EVCMD       ;SET CMD TO DRV#1
3944  026356  000402                                    BR      2$              ;BR
3945  026360  005037  027066            1$:     CLR     EVCMD           ;SET CMD TO DRV#0
3946  026364  052737  000013  027066    2$:     BIS     #13,EVCMD       ;SET READ UUT ESR IN CMD
3947  026372  053737  002242  027066            BIS     DEN,EVCMD       ;SET DEN FOR CMD
3948  026400  013715  027066                    MOV     EVCMD,(R5)      ;READ UUT ESR
3949  026404  013737  002236  025332            MOV     UUTADR,CSRADR   ;SET CSR ADR
3950  026412  012737  000040  025330            MOV     #DNBIT,RDYWD    ;SET DONE BIT
3951  026420  004737  025230                    CALL    DELAY           ;CALL
3952  026424  032715  000040            IFX242: BIT     #40,(R5)        ;IF DONE BIT
3953  026430  001005                                    BNE     IFD242          ;NOT SET THEN
3954  026432  052737  000200  002274                    BIS     #200,ERRSY      ;SET NO DONE BIT (SECONDARY PROBLEM)
3955  026440  000137  027064                          JMP     END242          ;BK TO END
3956  026444  032715  100000            IFD242: BIT     #100000,(R5)    ;IF ERR BIT
3957  026450  001403                                    BEQ     IFE242          ;SET
3958  026452  052737  100000  002276                    BIS     #100000,ERRTY   ;ERR BIT - ERR TYPE
3959  026460  013701  002236            IFE242: MOV     UUTADR,R1       ;GET UUT ADR
3960  026464  062701  000002                          ADD     #2,R1           ;CAL DBR ADR
3961  026470  032711  000200                          BIT     #200,(R1)       ;IF DRV RDY BIT
3962  026474  001102                                    BNE     IFN242          ;EQUALS 0
3963  026476  052737  000040  002274                    BIS     #40,ERRSY       ;SET DRIVE NOT RDY-SYS ERR
3964  026504  000561                                    BR      IFS242          ;BR TO END IF 'E'
3965  026506  032737  002021  027074            IFG242: BIT     #2021,ESREV     ;IF ANY ESR ERR BIT SET
3966  026514  001410                                    BEQ     IFH242          ;THEN
3967  026516  032737  100000  027072            IFI242: BIT     #100000,CSREV   ;IF UUT ERR BIT
3968  026524  001010                                    BNE     IFJ242          ;NOT=1 THEN
3969  026526  052737  040000  002276                    BIS     #40000,ERRTY    ;SET MISSING ERR BIT
3970  026534  000450                                    BR      IFL242          ;BR TO IF 'L'
3971  026536  032737  100000  027072            IFH242: BIT     #100000,CSREV   ;IF UUT CSR ERR BIT
3972  026544  001456                                    BEQ     IFN242          ;EQUALS 1 THEN
3973  026546  013701  025410            IFJ242: MOV     TSTEV,R1        ;GET TEST FUNCTION
```

```
3974  026552  042701  177774                      BIC     #177774,R1      ;CLEAR ALL BUT TWO BOTTOM BITS
3975  026556  022701  000002                      CMP     #2,R1           ;IF WRITE FUNCTION
3976  026562  001004                              BNE     IFK242          ;THEN
3977  026564  052737  004000  002276              BIS     #4000,ERRTY     ;SET WRITE ERR - ERR TYPE
3978  026572  000431                              BR      IFL242          ;BR TO IF 'L'
3979  026574  013701  025410              IFK242: MOV     TSTEV,R1        ;GET TEST FUNCTION
3980  026600  042701  177770                      BIC     #177770,R1      ;CLEAR ALL BUT FUNCTION
3981  026604  022701  000003                      CMP     #3,R1           ;IF READ FUNCTION
3982  026610  001004                              BNE     IFM242          ;THEN
3983  026612  052737  002000  002276              BIS     #2000,ERRTY     ;SET READ ERR-ERR TYPE
3984  026620  000416                              BR      IFL242          ;BR TO IF 'L'
3985  026622  013701  025410              IFM242: MOV     TSTEV,R1        ;GET TEST FUNCTION
3986  026626  042701  177771                      BIC     #177771,R1      ;CLEAR BITS
3987  026632  032701  000006                      BIT     #6,R1           ;IF. FILL/EMPTY BUFFER
3988  026636  001004                              BNE     ELM242          ;THEN
3989  026640  052737  001000  002276              BIS     #1000,ERRTY     ;SET FILL/EMPTY ERR-ERR TYP
3990  026646  000403                              BR      IFL242          ;BR TO IF 'L'
3991  026650  052737  000400  002276      ELM242: BIS     #400,ERRTY      ;ELSE SET UNK ERR
3992  026656  032737  000001  027074      IFL242: BIT     #1,ESREV        ;IF CRC ERR (ESR)
3993  026664  001406                              BEQ     IFN242          ;THEN
3994  026666  042737  000001  002276              BIC     #1,ERRTY        ;CLEAR ANY SEEK ERR
3995  026674  052737  000002  002276              BIS     #2,ERRTY        ;SET CRC ERR
3996  026702  032737  006010  027074      IFN242: BIT     #6010,ESREV     ;IF ESR BIT#3,10,11 ARE
3997  026710  001404                              BEQ     IFF242          ;SET, THEN
3998  026712  052737  100000  002274              BIS     #100000,ERRSY   ;SET UNKNOWN ERR-SYS ERR
3999  026720  000453                              BR      IFS242          ;BR TO IF 'S'
4000  026722  013701  025410              IFF242: MOV     TSTEV,R1        ;GET TEST FUNCTION
4001  026726  032701  000002                      BIT     #2,R1           ;IF FUNCTION WAS
4002  026732  001446                              BEQ     IFS242          ;POSSIBLE READ OR WRITE
4003  026734  032701  000005                      BIT     #5,R1           ;BUT REALLY
4004  026740  001043                              BNE     IFS242          ;IS READ OR WRITE, THEN
4005  026742  005737  002244              IFD242: TST     DELDAT          ;IF DELETED DATA FLAG IS
4006  026746  001410                              BEQ     IFQ242          ;SET THEN
4007  026750  032737  000100  027074      IFP242: BIT     #100,ESREV      ;IF UUT ESR DD BIT
4008  026756  001013                              BNE     IFR242          ;NOT SET THEN
4009  026760  052737  000100  002276              BIS     #100,ERRTY      ;SET MISSING DP MARK-ERR TYP
4010  026766  000407                              BR      IFR242          ;BR TO IF 'R'
4011  026770  032737  000100  027074      IFQ242: BIT     #100,ESREV      ;IF D.D. BIT IS
4012  026776  001403                              BEQ     IFR242          ;SET THEN
4013  027000  052737  000040  002276              BIS     #40,ERRTY       ;SET UNEX DD BIT
4014  027006  032737  000020  027074      IFR242: BIT     #20,ESREV       ;IF DEN. ERR. (ESR)
4015  027014  001403                              BEQ     IFU242          ;THEN
4016  027016  052737  020000  002274              BIS     #20000,ERRSY    ;SET DEN. ERR-SYS ERR
4017  027024  005737  002242              IFU242: TST     DEN             ;IF DOUBLE DEN MODE IS
4018  027030  001407                              BEQ     IFS242          ;SET AND THEN
4019  027032  032737  000040  027074      IFV242: BIT     #40,ESREV       ;IF. UUT RESPONDS IN
4020  027040  001003                              BNE     IFS242          ;SINGLE DENSITY, THEN
4021  027042  052737  010000  002274              BIS     #10000,ERRSY    ;SET DRIVE DENSITY ERR-SYS ERR
4022  027050  032737  100000  027072      IFS242: BIT     #100000,CSREV   ;IF UUT ERR BIT
4023  027056  001402                              BEQ     END242          ;NOT=0 THEN
4024  027060  004737  005026                      CALL    RDERCD          ;CALL UUT - READ ERROR CODE
4025  027064  000207              END242: RTS     PC
4026                                  ;-------------------------------------------------------------------------
4027  027066  000000              EVCMD:  0                               ;CMD WORD USED IN THIS MOD
4028  027070  000000              FUNEV:  0
4029  027072  000000              CSREV:  0
```

```
4030  027074  000000                    ESREV:  0
4031                                    ;MOD 2.4.2 ----- END MODULE ----------------------------------------
```

```
 4034
 4035                                          .SBTTL  MOD 2.4.2.1 - EVALUATE DRIVE RESPONSE
 4036                                          ;-------------------------------------------------------------
 4037
 4038  027076  013701  025410                 EVDVRE: MOV     TSTEV,R1        ;GET TEST FUNCTION
 4039  027102  042701  177771                         BIC     #177771,R1      ;CLEAR BITS
 4040  027106  032701  000006                         BIT     #6,R1           ;IF NOT FILL/EMPTY BUFFER
 4041  027112  001445                                 BEQ     6$              ;THEN
 4042  027114  005737  002172                         TST     RXXX            ;IF RXXX
 4043  027120  001421                                 BEQ     1$              ;AND
 4044  027122  032737  000002  002234                 BIT     #2,UUT          ;SIDE # SELECTED
 4045  027130  001403                                 BEQ     2$              ;THEN
 4046  027132  012701  001000                         MOV     #1000,R1        ;SET R1 TO TEST SIDE #1 SELECT
 4047  027136  000401                                 BR      3$              ;BR TO TEST RESPONSE
 4048  027140  005001                         2$:     CLR     R1              ;SET R1 TO TEST SIDE #0 SELECT
 4049  027142  013702  002250                 3$:     MOV     ESRUUT,R2       ;GET ESR UNIT UNDER TEST
 4050  027146  042702  176777                         BIC     #176777,R2      ;CLEAR ALL BITS BUT SIDE SELECT
 4051  027152  020102                                 CMP     R1,R2           ;IF SIDE SELECT
 4052  027154  001403                                 BEQ     1$              ;NOT=SIDE RESPONDING THEN
 4053  027156  052737  001000  002274                 BIS     #1000,ERRSY     ;SET WRONG SIDE RESPONDING SYS ERR
 4054  027164  032737  000001  002234         1$:     BIT     #1,UUT          ;IF DRIVE #1 SELECTED
 4055  027172  001403                                 BEQ     4$              ;THEN
 4056  027174  012701  000400                         MOV     #400,R1         ;SET R1 TO TEST DRIVE #1 SEL
 4057  027200  000401                                 BR      5$              ;BR TO TEST RESPONSE
 4058  027202  005001                         4$:     CLR     R1              ;SET R1 TO TEST DRIVE #0 SEL
 4059  027204  013702  002250                 5$:     MOV     ESRUUT,R2       ;GET ESR UNIT UNDER TEST
 4060  027210  042702  177377                         BIC     #177377,R2      ;CLEAR ALL BITS BUT DRIVE RESPONDING
 4061  027214  020102                                 CMP     R1,R2           ;
 4062  027216  001403                                 BEQ     6$              ;
 4063  027220  052737  000400  002274                 BIS     #400,ERRSY      ;SET WRONG DRIVE RESPONDING SYS ERR
 4064  027226  000207                         6$:     RTS     PC              ;
 4065                                          ;MOD 2.4.2.1 ----- END MODULE ----------------------------------------
```

```
4068                                        .SBTTL  MOD 2.4.3 - UPDATE DRIVE STATISTICS
4069                                        ;-------------------------------------------------------------------
4070
4071  027230  013737  027626  030342  UPDVST: MOV     ISTCK,FUNTY     ;PASS TEST FUNCTION TO UPDATE SEC CTR
4072  027236  004737  030216                  CALL    UPSECT          ;CALL UP DATE SECTOR CONTENTS
4073  027242  032737  000002  027606  IA243:  BIT     #2,ETSAV        ;IF ERRTY SAVE
4074  027250  001405                          BEQ     EA243           ;HAS CRC ERR BIT SET, THEN
4075  027252  004737  027722                  CALL    UDCRST          ;CALL UPDATE CRC STATISTICS
4076  027256  005037  027606                  CLR     ETSAV           ;CLEAR ERR TYPE SAVE
4077  027262  000457                          BR      IG243           ;BR TO IF 'G'
4078  027264  013737  002276  027606  EA243:  MOV     ERRTY,ETSAV     ;SAVE ERR TYP --> ETSAV
4079  027272  013737  002276  027614          MOV     ERRTY,STERRG    ;GET ERR TYP --> STAT ERR REG
4080  027300  005037  027616                  CLR     STCNTR          ;ZERO STAT COUNTER
4081  027304  032737  000002  027614  ID243:  BIT     #2,STERRG       ;IF ERR IS
4082  027312  001403                          BEQ     BF243           ;CRC, THEN
4083  027314  042737  006002  027614          BIC     #6002,STERRG    ;CLEAR CRC, RD, & WRT ERR BITS OF STAT ERR REG
4084  027322  000241          BF243:  CLC             ;CLEAR CARRY BIT
4085  027324  006037  027614                  ROR     STERRG          ;ROTATE RIGHT STAT ERROR REG
4086  027330  103026          IB243:  BCC     EB243           ;IF CARRY BIT SET, THEN
4087  027332  013701  027616                  MOV     STCNTR,R1       ;GET STAT COUNTER
4088  027336  006301                          ASL     R1              ;& DOUBLE FOR WORD ADDRESSING
4089  027340  062701  027630                  ADD     #ETTAB,R1       ;CAL. CLASSIFICATION WORD-ADDRESS
4090  027344  011137  027620                  MOV     (R1),CLASWD     ;GET CLASSIFICATION WORD
4091  027350  011102                          MOV     (R1),R2         ;GET CLASSIFICATION WORD-TO FIND LOG OFFSET
4092  027352  000302                          SWAB    R2              ;GET CLASSIFICATION WORD UPPER BYTE
4093  027354  006302                          ASL     R2              ;--SHIFT LEFT TO GET LOG REG OFFSET (LAST 6 BITS
4094  027356  006302                          ASL     R2              ;--SHIFT LEFT AGAIN
4095  027360  042702  177004                  BIC     #177004,R2      ;CLEAR UNWANTED BITS
4096  027364  010237  027622                  MOV     R2,LOGOFF       ;SAVE ERROR LOG OFFSET
4097  027370  005711          IC243:  TST     (R1)            ;IF ERR TYP CLASSIFICATION WORD
4098  027372  100403                          BMI     LC243           ;TYPE=SOFT, THEN
4099  027374  004737  030072                  CALL    UDSFST          ;CALL UPDATE SOFT ERROR STATISTICS
4100  027400  000402                          BR      EB243           ;BR TO END 'B'
4101  027402  004737  027670  LC243:  CALL    UDHDST          ;CALL UPDATE HARD ERROR STATISTICS
4102  027406  005237  027616  EB243:  INC     STCNTR          ;INCREMENT STAT COUNTER
4103  027412  022737  000020  027616  UF243:  CMP     #16.,STCNTR     ;DO UNTIL ALL 16
4104  027420  101340                          BHI     BF243           ;BITS ARE DONE
4105  027422  013703  033544  IG243:  MOV     XERUUT,R3       ;GET EXTENDED ERROR CODE
4106  027426  042703  177400                  BIC     #177400,R3      ;CLEAR UPPER BYTE
4107  027432  005703                          TST     R3              ;IF EXTENDED ERROR CODE
4108  027434  001410                          BEQ     IH243           ;NOT=0, THEN
4109  027436  162703  000010                  SUB     #10,R3          ;ADJ ERROR CODE # FOR LOGGING
4110  027442  012702  007604                  MOV     #ECLOG,R2       ;GET LOC OF ERR CODE LOG
4111  027446  060302                          ADD     R3,R2           ;ADD ERR CODE TO LOC ERR CODE LOG
4112  027450  063702  002240                  ADD     UUTOFF,R2       ;FIND LOC ERR REG THIS UNIT
4113  027454  005212                          INC     (R2)            ;INCREMENT UNIT ERR REG
4114  027456  013703  002276  IH243:  MOV     ERRTY,R3        ;GET ERR TYPE
4115  027462  042703  171774                  BIC     #171774,R3      ;CLEAR ALL ERRS BUT RD, WT, CRC, SEEK
4116  027466  005703                          TST     R3              ;IF ONE OF THESE ERRORS
4117  027470  001412                          BEQ     II243           ;THEN
4118  027472  013702  002254                  MOV     TRACK,R2        ;GET TRACK ADR
4119  027476  006302                          ASL     R2              ;DOUBLE TRACK ADR FOR WORD ADDRESSING
4120  027500  006302                          ASL     R2              ;ADJ TRK
4121  027502  006302                          ASL     R2              ; FOR ADR.
4122  027504  062702  010070                  ADD     #TKXX,R2        ;ADD TRACK LOG LOCATION
4123  027510  063702  002240                  ADD     UUTOFF,R2       ;FIND LOC ERR REG THIS UNIT
```

```
4124  027514  005212                          INC     (R2)            ;INCREMENT UNIT ERR REG
4125  027516  005737  027610            II243: TST     ERRSAV          ;IF ERR SAVE HAS
4126  027522  001023                          BNE     LI243           ;NO ERROR SET, THEN
4127  027524  005237  027612                  INC     ERSVCT          ;INCREMENT ERROR SAVE COUNTER
4128  027530  022737  000004  027612    IJ243: CMP     #4,ERSVCT       ;IF ERROR SAVE COUNTER
4129  027536  101017                          BHI     EI243           ;NOT=4, THEN
4130  027540  012701  002306                  MOV     #SEEKRT,R1      ;SET BEGIN ADDRESS OF RETRY COUNTERS
4131  027544  012702  000011                  MOV     #11,R2          ;SET # OF RETRY COUNTERS
4132  027550  005021                    BK243: CLR     (R1)+           ;CLEAR RETRY COUNTER
4133  027552  005302                          DEC     R2              ;DECREMENT RETRY COUNTER #
4134  027554  005702                    UK243: TST     R2              ;DO UNTIL
4135  027556  001374                          BNE     BK243           ;ALL COUNTERS CLEARED
4136  027560  005037  027612                  CLR     ERSVCT          ;CLEAR ERROR SAVE COUNTER
4137  027564  005037  002304                  CLR     RETRY           ;CLEAR RETRY COUNTER
4138  027570  000402                          BR      EI243           ;BR TO END 'I'
4139  027572  005037  027612            LI243: CLR     ERSVCT          ;CLEAR ERROR SAVE COUNT
4140  027576  013737  002276  027610    EI243: MOV     ERRTY,ERRSAV    ;SAVE ERROR TYPE FOR NEXT ERROR CHECK
4141  027604  000207                    END243: RTS     PC              ;RETURN
4142                                    ;-------------------------------------------------------------------
4143  027606  000000                    ETSAV:  0                       ;ERR TYPE SAVE
4144  027610  000000                    ERRSAV: 0                       ;ERR TYPE SAVE REG
4145  027612  000000                    ERSVCT: 0                       ;ERROR SAVE COUNTER-COUNTS # OF NO ERROR PASSES
4146  027614  000000                    STERRG: 0                       ;STAT ERR REG
4147  027616  000000                    STCNTR: 0                       ;STAT COUNTER
4148  027620  000000                    CLASWD: 0                       ;ERROR CLASSIFICATION WORD-FROM TABLE
4149  027622  000000                    LOGOFF: 0                       ;ERROR LOG OFFSET FROM #CKSML
4150  027624  000000                    RTOFF:  0                       ;RETRY COUNTER OFFSET FROM # SEEKRT
4151  027626  000000                    TSTCK:  0                       ;TEST WORD-USED TO CHECK TEST DONE
4152                                    ;MOD 2.4.3 ----- END MODULE ----------------------------------------
4153
4154                                    ;----- ERROR TYPE CLASSIFICATION & OFFSETS TABLE ----------------------
4155                                                                    ;TYPE/LOG-OFF/RT-OFF/CLASS   /BIT#
4156                                                                    ;----/-------/------/--------/----------
4157  027630  005001                    ETTAB:  .WORD   005001          ;SFT /SEEK    /SEEK  /SK-RTMSK/  0
4158  027632  006005                            .WORD   006005          ;SFT /CRC     /CRC   /CRC      /  1
4159  027634  100407                            .WORD   100407          ;HRD /CKSML   /  -   /HD       /  2
4160  027636  012106                            .WORD   012106          ;SFT /DATA    /DATA  /DT-RTMSK/  3
4161  027640  154400                            .WORD   154400          ;HRD /  -     /  -   /   -    /  4
4162  027642  113227                            .WORD   113227          ;HRD /DDUNX   /DD    /HD       /  5
4163  027644  113227                            .WORD   113227          ;HRD /DDMIS   /DD    /HD       /  6
4164  027646  154400                            .WORD   154400          ;HRD /  -     /  -   /   -    /  7
4165  027650  154400                            .WORD   154400          ;HRD /UNK     /  -   /   -    /  8
4166  027652  101407                            .WORD   101407          ;HRD /FIL-EMP/  -    /HD       /  9
4167  027654  010164                            .WORD   010164          ;SFT /RD      /RD    /RD-RTMSK/ 10
4168  027656  011202                            .WORD   011202          ;SFT /WRT     /WT    /WT-RTMSK/ 11
4169  027660  103407                            .WORD   103407          ;HRD /INTR-ND/  -    /HD       / 12
4170  027662  104407                            .WORD   104407          ;HRD /D-NINTR/  -    /HD       / 13
4171  027664  102407                            .WORD   102407          ;HRD /ER-NSET/  -    /HD       / 14
4172  027666  154407                            .WORD   154407          ;HRD /ERR BIT/  -    /HD       /  15
4173                                                    !!!!!!
4174                                    ;               !!!!!!---<CLASSIFICATION (SEEK=1/CRC=5/DATA=6/WRITE=2/READ=4)
4175                                    ;               !!!!!----<RETRY COUNTER OFFSET
4176                                    ;               !!!------<LOG REGISTER OFFSET-(FROM CKSML ADDRESS)
4177                                    ;               !--------<TYPE (SOFT=0/HARD=1)
4178                                    ;-------------------------------------------------------------------
```

```
4181                                            .SBTTL  MOD 2.4.3.1 - UPDATE HARD ERROR STATISTICS
4182                                            ;---------------------------------------------------------------
4183
4184  027670  000240                  UDHDST: NOP                     ;
4185  027672  032737  000007  027620  IA2431: BIT     #7,CLASWD       ;IF ERROR CLASS WORD-
4186  027700  001007                          BNE     X2431           ;CLASS=HD(7), THEN
4187  027702  013701  027622                  MOV     LOGOFF,R1       ;GET ERROR LOG OFFSET
4188  027706  062701  007354                  ADD     #CKSML,R1       ;ERR LOG ADR=ERR LOG OFF + CKSML ADR
4189  027712  063701  002240                  ADD     UUTOFF,R1       ;UUT ERR LOG ADR=UUT OFFSET + ERR LOG ADR
4190  027716  005211                          INC     (R1)            ;INCREMENT THE ERROR LOG
4191  027720  000207                  X2431:  RTS     PC              ;RETURN
4192                                            ;MOD 2.4.3.1 ----- END MODULE ----------------------------------------
4193
4194
4195
4196                                            .SBTTL  MOD 2.4.3.2 - UPDATE CRC STATISTICS
4197                                            ;---------------------------------------------------------------
4198
4199  027722  000240                  UDCRST: NOP                     ;
4200  027724  032737  020000  027626  IA2432: BIT     #BIT13,TSTCK    ;IF TEST=DATA CHECK
4201  027732  001425                          BEQ     LA2432          ;BIT SET, THEN
4202  027734  032737  000010  002276  IB2432: BIT     #BIT03,ERRTY    ;IF ERR TYPE=DATA ERR
4203  027742  001007                          BNE     LB2432          ;NOT SET, THEN
4204  027744  012737  000020  027622          MOV     #20,LOGOFF      ;SET LOG OFFSET=CRC BAD LOG
4205  027752  012737  000006  027624          MOV     #6,RTOFF        ;SET RETRY OFFSET=CRC ERR
4206  027760  000420                          BR      IC2432          ;BR TO 'C'
4207  027762  012737  000050  027622  LB2432: MOV     #50,LOGOFF      ;SET DATA LOG OFFSET
4208  027770  005037  030474                  CLR     RTMASK          ;CLEAR RETRY MASK
4209  027774  012737  000012  027624          MOV     #12,RTOFF       ;SET DUMMY DATA RETRY COUNTER OFFSET
4210  030002  004737  030344                  CALL    SFERLG          ;CALL SOFT ERROR LOGGER
4211  030006  012737  000010  027622  LA2432: MOV     #10,LOGOFF      ;SET LOG OFFSET=CRC ERR LOG
4212  030014  012737  000006  027624          MOV     #6,RTOFF        ;SET RETRY OFFSET=CRC ERR
4213  030022  032737  010000  027626  IC2432: BIT     #BIT12,TSTCK    ;IF READ AFTER WRITE (RAW)
4214  030030  001407                          BEQ     LC2432          ;BIT SET, THEN
4215  030032  012737  000020  030474          MOV     #BIT04,RTMASK   ;SET RETRY MASK=CRC
4216  030040  052737  000002  030474          BIS     #BIT1,RTMASK    ;SET RETRY MASK=WRITE
4217  030046  000406                          BR      EC2432          ;BR TO END 'C'
4218  030050  012737  000020  030474  LC2432: MOV     #BIT04,RTMASK   ;SET RETRY MASK=CRC
4219  030056  052737  000004  030474          BIS     #BIT02,RTMASK   ;SET RETRY MASK=READ
4220  030064  004737  030344          EC2432: CALL    SFERLG          ;CALL SOFT ERROR LOGGER
4221  030070  000207                          RETURN                  ;RETURN
4222                                            ;MOD 2.4.3.2 ----- END MODULE ----------------------------------------
```

```
                                       .SBTTL  MOD 2.4.3.3 - UPDATE SOFT ERROR STATISTICS
                                       ;-----------------------------------------------------------------------

030072  013702  027620                 UDSFST: MOV     CLASWD,R2       ;PUT CLASSIFICATION WORD IN R1
030076  006202                                 ASR     R2              ;  SHIFT WORD RIGHT
030100  006202                                 ASR     R2              ;    3 TIMES TO GET
030102  006202                                 ASR     R2              ;      RETRY COUNTER OFFSET (LAST 6 BITS)
030104  042702  177700                         BIC     #177700,R2      ;CLEAR TOP 10 BITS
030110  010237  027624                         MOV     R2,RTOFF        ;SET RETRY COUNTER OFFSET
030114  013702  027620                 IA2433: MOV     CLASWD,R2       ;GET CLASSIFICATION WORD
030120  042702  177770                         BIC     #177770,R2      ;CLEAR ALL BIT ERROR CLASSIFICATION
030124  022702  000006                         CMP     #6,R2           ;IF ERROR
030130  001022                                 BNE     LA2433          ;CLASS=DATA, THEN
030132  032737  010000  027626         IB2433: BIT     #BIT12,TSTCK    ;IF TEST HAS
030140  001404                                 BEQ     LB2433          ;READ AFTER WRITE (RAW) BIT SET, THEN
030142  012737  000012  030474                 MOV     #12,RTMASK      ;SET DATA & WRITE RETRY
030150  000403                                 BR      EB2433          ;BR TO END IF 'B'
030152  012737  000014  030474         LB2433: MOV     #14,RTMASK      ;SET DATA & READ RETRY
030160  012737  000010  027624         EB2433: MOV     #10,RTOFF       ;SET DATA RT COUNTER OFFSET
030166  012737  000050  027622                 MOV     #50,LOGOFF      ;SET DATA LOG OFFSET
030174  000405                                 BR      EA2433          ;BR TO END 'A'
030176  010237  030474                 LA2433: MOV     R2,RTMASK       ;ELSE-PUT CLASS INTO RETRY MASK
030202  162737  000050  027622                 SUB     #50,LOGOFF      ;ADJ. LOG OFFSET SO THAT 'SEK' IS LOG BEGIN
030210  004737  030344                 EA2433: CALL    SFERLG          ;CALL SOFT ERROR LOGGER
030214  000207                         X2433:  RTS     PC              ;RETURN
                                       ;MOD 2.4.3.3 ----- END MODULE ------------------------------------------
```

```
4253
4254                                        .SBTTL  MOD 2.4.3.4 - UPDATE SECTOR WRITTEN/READ COUNTERS
4255                                        ;---------------------------------------------------------
4256
4257  030216  013701  002234              UPSECT: MOV     UUT,R1          ;GET UNIT UNDER TEST
4258  030222  006301                              ASL     R1              ;DOUBLE FOR WORD ADDRESSING
4259  030224  006301                              ASL     R1              ;DOUBLE FOR 2 WORD ADDRESSING
4260  030226  042737  177770  030342              BIC     #177770,FUNTY   ;CLEAR ALL BUT FUNCTION
4261  030234  022737  000003  030342      IA2434: CMP     #3,FUNTY        ;IF FUNCTION TYPE
4262  030242  001002                              BNE     IB2434          ;IS READ, THEN
4263  030244  005002                              CLR     R2              ;CLEAR R2
4264  030246  000412                              BR      EA2434          ;BR TO END 'A'
4265  030250  022737  000002  030342      IB2434: CMP     #2,FUNTY        ;IF FUNCTION TYPE
4266  030256  001404                              BEQ     LB2434          ;IS NOT WRITE #1, THEN
4267  030260  022737  000006  030342      IC2434: CMP     #6,FUNTY        ;IF FUNCTION TYPE
4268  030266  001024                              BNE     XUPSCT          ;IS WRITE #2, THEN
4269  030270  012702  000020              LB2434: MOV     #20,R2          ;SET R2 OFFSET=WRITE
4270  030274  000241                      EA2434: CLC                     ;CLEAR CARRY BIT
4271  030276  060102                              ADD     R1,R2           ;SETUP OFFSET
4272  030300  005262  007314                      INC     READSC(R2)      ;INCREMENT SECTOR COUNTER
4273  030304  100015                              BPL     XUPSCT          ;IF BIT#15 SET, THEN
4274  030306  005062  007314                      CLR     READSC(R2)      ;CLEAR SECTOR COUNTER
4275  030312  062702  000002                      ADD     #2,R2           ;SETUP TO INCREMENT DOUBLE PRECISION WORD
4276  030316  005262  007314                      INC     READSC(R2)      ;INCREMENT DOUBLE PRECISION WORD
4277  030322  103006                              BCC     XUPSCT          ;IF CARRY BIT SET, THEN
4278  030324  005062  007314                      CLR     READSC(R2)      ;CLEAR DOUBLE PRECISION CTR
4279  030330  162702  000002                      SUB     #2,R2           ;
4280  030334  005062  007314                      CLR     READSC(R2)      ;CLEAR DOUBLE PRECISION CTR
4281  030340  000207                      XUPSCT: RETURN                  ;RETURN
4282                                        ;---------------------------------------------------------------------
4283  030342  000000                      FUNTY:  0                       ;STATISTICS FUNCTION CK
4284                                        ;---------------------------------------------------------------------
```

```
4287                                        .SBTTL  -    MOD 2.4.U.1 - SOFT ERROR LOGGER
4288                                        ;-------------------------------------------------------------------
4289
4290  030344  013701  027622                SFERLG: MOV     LOGOFF,R1       ;GET ERR LOG OFFSET
4291  030350  013702  027624                        MOV     RTOFF,R2        ;GET RETRY COUNTER OFFSET
4292  030354  062702  002306                        ADD     #SEEKRT,R2      ;CAL. RETRY COUNTER ADR
4293  030360  032737  000004  002204        IA24U1: BIT     #BIT02,SWREG    ;IF (SFT SW REG) RETRY ON ERROR, LOG SOFT OR HD
4294  030366  001004                                BNE     IB24U1          ;SET OR
4295  030370  032737  000004  002264                BIT     #EVL,FLGDRS     ;DRS "EVL" FLAG
4296  030376  001412                                BEQ     LB24U1          ;SET, THEN
4297  030400  021227  000012                IB24U1: CMP     (R2),#12        ;IF RETRY COUNTER
4298  030404  103007                                BHIS    LB24U1          ;EQUALS < 10 ERRORS, THEN
4299  030406  005212                                INC     (R2)            ;INCREMENT RETRY COUNTER
4300  030410  053737  030474  002304                BIS     RTMASK,RETRY    ;SET RT FLAGS PER RT MASK
4301  030416  005037  002300                        CLR     HARDER          ;CLEAR HARD ERROR
4302  030422  000413                                BR      EB24U1          ;BR TO END 'B'
4303  030424  062701  007514                LB24U1: ADD     #HSEK,R1        ;HD ERR LOG ADR=HARD SEEK ADR+LOG OFFSET
4304  030430  063701  002240                        ADD     UUTOFF,R1       ;UUT ERR LOG ADR=UUT OFFSET+LOG ADR
4305  030434  005211                                INC     (R1)            ;INCREMENT UUT HARD ERROR LOG
4306  030436  043737  030474  002304                BIC     RTMASK,RETRY    ;CLEAR RETRY FALGS USING RT MASK
4307  030444  005012                                CLR     (R2)            ;CLEAR RETRY COUNTER
4308  030446  005237  002300                        INC     HARDER          ;SET HARD ERROR FLAG
4309  030452  013701  027622                EB24U1: MOV     LOGOFF,R1       ;GET ERR LOG OFFSET
4310  030456  062701  007424                        ADD     #SEK,R1         ;ERR LOG ADR=SEK LOG ADR+LOG OFFSET
4311  030462  063701  002240                        ADD     UUTOFF,R1       ;UUT ERR LOG ADR=UUT OFFSET+LOG ADR
4312  030466  005211                                INC     (R1)            ;INCREMENT UUT ERROR LOG
4313  030470  000240                        X24U1:  NOP                     ;
4314  030472  000207                                RTS     PC              ;RETURN
4315                                        ;-------------------------------------------------------------------
4316  030474  000000                        RTMASK: 0                       ;RETRY MASK
4317                                        ;MOD 2.4.U1 ----- END MODULE ----------------------------------------
```

```
4320
4321
4322
4323  030476  013701  033544                .SBTTL  MOD 2.4.4 - EVALUATE UNIT ERROR CODE
4324  030502  042701  177400                ;-----------------------------------------------------------------
4325  030506  005701                EVUTEC: MOV     XERUUT,R1       ;GET FRR CODE & SAVE
4326  030510  001443                        BIC     #177400,R1      ;CLEAR TOP BYTE
4327  030512  006201                IFA244: TST     R1              ;IF ERRCODE
4328  030514  006201                        BEQ     END244          ;NOT=0, THEN
4329  030516  062701  030624                ASR     R1              ;SHIFT ERR CODE FOR LOOK UP
4330  030522  011102                        ASR     R1              ;WD ADDRESSING
4331  030524  105702                        ADD     #ECCLAS,R1      ;CAL ERR TABLE CLASSIFICATION ADR
4332  030526  001003                        MOV     (R1),R2         ;GET ERR CODE CLASSIFICATION WORD
4333  030530  050237  002274        IFB244: TSTB    R2              ;IF LOWER BYTE
4334  030534  000431                        BNE     IFC244          ;EQUALS 0, THEN
4335  030536  122702  000300                BIS     R2,ERRSY        ;SET ERR ONTO ERRSY
4336  030542  001024                        BR      END244          ;BR TO END IF 'B'
4337  030544  022737  000003  030622  IFC244: CMPB    #300,R2         ;IF LOW BYTE
4338  030552  001004                        BNE     ELC244          ;EQUALS 300, THEN
4339  030554  052737  002000  002276  IFD244: CMP     #3,FNEV4        ;IF FUNCTION WAS
4340  030562  000416                        BNE     IFE244          ;A READ, THEN
4341  030564  022737  000002  030622        BIS     #2000,ERRTY     ;SET READ ERR
4342  030572  001004                        BR      END244          ;BR TO END IF 'B'
4343  030574  052737  004000  002276  IFE244: CMP     #2,FNEV4        ;IF FUNCTION WAS
4344  030602  000406                        BNE     ELE244          ;A WRITE, THEN
4345  030604  052737  040000  002276        BIS     #4000,ERRTY     ;SET WRITE ERROR
4346  030612  000402                        BR      END244          ;BR TO END IF 'B'
4347  030614  050237  002276        ELE244: BIS     #40000,ERRTY    ;SET UNK ERROR
4348  030620  000207                        BR      END244          ;BR TO END IF 'B'
4349                                ELC244: BIS     R2,ERRTY        ;SET CLASSIFIED ERROR ONTO ERRTY
4350  030622  000000                END244: RTS     PC              ;RETURN
4351                                ;-----------------------------------------------------------------
4352  030624  000000                FNEV4:  0                       ;FUNCTION FOR EVALUATION
4353  030626  000001                ;-----------------------------------------------------------------
4354  030630  000001                ECCLAS: .WORD   0               ;ERR CODE # 00  ---> NOT USED (NO ERROR)
4355  030632  000000                        .WORD   1               ;ERR CODE # 10  ---> SEEK
4356  030634  004000                        .WORD   1               ;ERR CODE # 20  ---> SEEK
4357  030636  000001                        .WORD   0               ;ERR CODE # 30  ---> NOT ASSIGNED
4358  030640  002000                        .WORD   4000            ;ERR CODE # 40  ---> SYS ERR
4359  030642  000300                        .WORD   1               ;ERR CODE # 50  ---> SEEK
4360  030644  004000                        .WORD   2000            ;ERR CODE # 60  ---> SELF DIAG ERR
4361  030646  000300                        .WORD   300             ;ERR CODE # 70  ---> READ OR WRITE ERR
4362  030650  000300                        .WORD   4000            ;ERR CODE # 100 ---> SYS ERR
4363  030652  000300                        .WORD   300             ;ERR CODE # 110 ---> READ OR WRITE ERR
4364  030654  000002                        .WORD   300             ;ERR CODE # 120 ---> READ OR WRITE ERR
4365  030656  000001                        .WORD   300             ;ERR CODE # 130 ---> READ OR WRITE ERR
4366  030660  000300                        .WORD   2               ;ERR CODE # 140 ---> CRC ERR
4367  030662  000300                        .WORD   1               ;ERR CODE # 150 ---> SEEK ERR
4368  030664  000002                        .WORD   300             ;ERR CODE # 160 ---> READ OR WRITE ERR
4369  030666  000000                        .WORD   300             ;ERR CODE # 170 ---> READ OR WRITE ERR
4370  030670  002000                        .WORD   2               ;ERR CODE # 200 ---> CRC ERR
4371  030672  004000                        .WORD   0               ;ERR CODE # 210 ---> NOT ASSIGNED
4372  030674  020000                        .WORD   2000            ;ERR CODE # 220 ---> SELF DIAG ERR
4373  030676  020000                        .WORD   4000            ;ERR CODE # 230 ---> SYS ERR
4374  030700  000000                        .WORD   20000           ;ERR CODE # 240 ---> DENSITY ERR
4375                                        .WORD   20000           ;ERR CODE # 250 ---> DENSITY ERR
                                            .WORD   0               ;ERR CODE # 260 ---> NOT ASSIGNED
                                ;MOD 2.4.4 ----- END MODULE ----------------------------------------
```

```
4378                                        .SBTTL  MOD 2.5 - OUTPUT ERROR TYPE
4379                                        ;-------------------------------------------------------------------
4380  030702  013737  002276  002604  OTERTP: MOV     ERRTY,ERRREG    ;SET ERROR TYPE FOR PRINT OUT
4381  030710  013701  002276                  MOV     ERRTY,R1        ;GET ERROR TYPE
4382  030714  005002                          CLR     R2              ;CLEAR ERROR # COUNT
4383  030716  000240                  BDA25:  NOP                     ;
4384  030720  032701  000001          IFA25:  BIT     #1,R1           ;IF BIT #1
4385  030724  001405                          BEQ     ELA25           ;EQUALS 1, THEN
4386  030726  010204                          MOV     R2,R4           ;SAVE ERROR # COUNT
4387  030730  006304                          ASL     R4              ;DOUBLE ERR # COUNT FOR ADDRESSING
4388  030732  062704  031616                  ADD     #ET1,R4         ;SET ADDR FOR ERR MSG PRINT
4389  030736  000407                          BR      THA25           ;BR TO THEN 'A'
4390  030740  000241                  ELA25:  CLC                     ;CLEAR CARRY BIT
4391  030742  006201                          ASR     R1              ;SHIFT ERR TYPE RIGHT
4392  030744  005202                          INC     R2              ;INCREMENT ERROR # COUNT
4393  030746  022702  000017                  CMP     #17,R2          ;DO UNTIL ERROR # COUNT
4394  030752  001361                          BNE     BDA25           ;EQUALS 15, THEN
4395  030754  000507                          BR      EIA25           ;BR TO END IF 'A'
4396  030756  005003                  THA25:  CLR     R3              ;CLEAR R3
4397  030760  010205                          MOV     R2,R5           ;GET ERR#
4398  030762  062705  031656                  ADD     #ETCLAS,R5      ;CAL. ERR# CLASSIFICATION ADR
4399  030766  111503                          MOVB    (R5),R3         ;GET ERR# CLASSIFICATION
4400  030770  032703  000001          IFB25:  BIT     #1,R3           ;IF SOFT ERR
4401  030774  001415                          BEQ     IFC25           ;CLASS, THEN
4402  030776  005737  002300                  TST     HARDER          ;IF HARD ERR
4403  031002  001015                          BNE     ELB25           ;NOT SET, THEN
4404  031004  010237  002376                  MOV     R2,ERRNBR       ;SET ERR #
4405  031010  011437  002400                  MOV     (R4),ERRMSG     ;SET ERR MSG
4406  031014  012737  000003  002374          MOV     #SOFT,ERRTYP    ;SET ERRTYP=SOFT
4407  031022  004737  002354                  CALL    ERROR           ;CALL ERROR
4408  031026  000437                          BR      EIC25           ;
4409  031030  032703  000002          IFC25:  BIT     #2,R3           ;IF HARD ERR
4410  031034  001434                          BEQ     EIC25           ;CLASS, THEN
4411  031036  052702  000040          ELB25:  BIS     #40,R2          ;SET HARD ERROR #
4412  031042  010237  002376                  MOV     R2,ERRNBR       ;SET ERR #
4413  031046  011437  002400                  MOV     (R4),ERRMSG     ;SET ERR MSG
4414  031052  012737  000002  002374          MOV     #HARD,ERRTYP    ;PRESET ERRTYP=HARD ERR
4415  031060  032737  000004  002264  IFF25:  BIT     #EVL,FLGDRS     ;IF DRS "EVL" FLAG
4416  031066  001413                          BEQ     EIF25           ;IS SET, THEN
4417  031070  005237  002302                  INC     HDERCT          ;INCREMENT HARD ERROR CTR
4418  031074  023737  002302  002216  IFE25:  CMP     HDERCT,DFTL     ;IF DEVICE FATAL THRESHOLD
4419  031102  101005                          BHI     EIF25           ;REACHED, THEN
4420  031104  012737  000001  002374          MOV     #DVFT,ERRTYP    ;RESET ERRTYP=DEVICE FATAL
4421  031112  005037  002302                  CLR     HDERCT          ;CLEAR HARD ERROR CTR
4422  031116  004737  002354          EIF25:  CALL    ERROR           ;CALL ERROR
4423  031122  005237  002300                  INC     HARDER          ;SET HARD ERROR FLAG
4424  031126  013737  002276  002604  EIC25:  MOV     ERRTY,ERRREG    ;SET ERR TYPE FOR PRINT OUT
4425  031134  004737  002404                  CALL    PRTERR          ;CALL U.P.ERR - PRINT ERR INFO
4426  031140  013737  002276  021452          MOV     ERRTY,ERTSAV    ;SAVE ERR TYP FOR DATA CK
4427  031146  005037  002276                  CLR     ERRTY           ;CLEAR DEVICE ERR
4428  031152  004737  003034                  CALL    XERPRT          ;CALL MOD U.PRT.B - PRINT ERR CODE
4429  031156  005737  002300          IFD25:  TST     HARDER          ;IF NOT A
4430  031162  001002                          BNE     ELD25           ;HARDER, THEN
4431  031164  004737  031676                  CALL    PTRTY           ;CALL 2.5.1 - PRINT RETRY #
4432  031170  005037  002300          ELD25:  CLR     HARDER          ;CLEAR HARD ERROR FLAG
4433  031174  000207                  EIA25:  RTS     PC              ;RETURN
```

```
                                                ;------------------------------------------------------------------
                                                ;------------------------------------------------------------------
031176  051440  042505  020113                  ERT1:   .ASCIZ  / SEEK ERR/
031210  041440  041522  042440                  ERT2:   .ASCIZ  / CRC ERR/
031221     040  045503  051440                  ERT3:   .ASCIZ  / CK SUM ERR/
031235     040  040504  040524                  ERT4:   .ASCIZ  / DATA ERR/
031247     040  047125  051501                  ERT5:   .ASCIZ  / UNASSG ERR/
031263     040  042504  027114                  ERT6:   .ASCIZ  / DEL. DATA UNEXPECTED ERR/
031315     040  042504  027114                  ERT7:   .ASCIZ  / DEL. DATA MISSING ERR/
031344  052440  040516  051523                  ERT8:   .ASCIZ  / UNASSG ERR/
031360  052440  045516  042440                  ERT9:   .ASCIZ  / UNK ERR/
031371     040  044506  046114                  ERT10:  .ASCIZ  / FILL OR EMPTY BUFFER ERR/
031423     040  042522  042101                  ERT11:  .ASCIZ  / READ ERR/
031435     040  051127  052111                  ERT12:  .ASCIZ  / WRITE ERR/
031450  044440  052116  051105                  ERT13:  .ASCIZ  / INTERRUPT BUT NO DONE BIT ERR/
031507     040  047504  042516                  ERT14:  .ASCIZ  / DONE BIT BUT NO INTERRUPT ERR/
031546  042440  051122  051117                  ERT15:  .ASCIZ  / ERROR, BUT NO ERR BIT SET/
031601     040  051105  020122                  ERT16:  .ASCIZ  / ERR BIT SET/
                                                        .EVEN
031616  031176                                  ET1:    .WORD   ERT1
031620  031210                                          .WORD   ERT2
031622  031221                                          .WORD   ERT3
031624  031235                                          .WORD   ERT4
031626  031247                                          .WORD   ERT5
031630  031263                                          .WORD   ERT6
031632  031315                                          .WORD   ERT7
031634  031344                                          .WORD   ERT8
031636  031360                                          .WORD   ERT9
031640  031371                                          .WORD   ERT10
031642  031423                                          .WORD   ERT11
031644  031435                                          .WORD   ERT12
031646  031450                                          .WORD   ERT13
031650  031507                                          .WORD   ERT14
031652  031546                                          .WORD   ERT15
031654  031601                                          .WORD   ERT16
                                                ;------------------------------------------------------------------
                                                                        ;ERROR                  - TYPE - ERR#
                                                                        ;-----                  -------------
031656     001                                  ETCLAS: .BYTE   1       ;SEEK                   - SOFT - 0 -32
031657     001                                          .BYTE   1       ;CRC                    - SOFT - 1 -33
031660     002                                          .BYTE   2       ;CKSUM                  - HARD -   -34
031661     001                                          .BYTE   1       ;DATA                   - SOFT - 3 -35
031662     000                                          .BYTE   0       ;UNASSIGNED             -
031663     002                                          .BYTE   2       ;DEL. DATA UNEX         - HARD -   -37
031664     002                                          .BYTE   2       ;DEL. DATA MISSING      - HARD -   -38
031665     000                                          .BYTE   0       ;UNASSIGNED             -
031666     002                                          .BYTE   2       ;UNK ERR                - HARD -   -40
031667     002                                          .BYTE   2       ;FILL/EMPTY BUFFER      - HARD -   -41
031670     001                                          .BYTE   1       ;READ                   - SOFT - 10-42
031671     001                                          .BYTE   1       ;WRITE                  - SOFT - 11-43
031672     002                                          .BYTE   2       ;INTER-BUT NO DONE      - HARD -   -44
031673     002                                          .BYTE   2       ;DONE-BUT NO INTER      - HARD -   -45
031674     002                                          .BYTE   2       ;ERR-BUT NO ERR BIT     - HARD -   -46
031675     002                                          .BYTE   2       ;ERR BIT SET            - HARD -   -47
                                                        .EVEN
                                                ;MOD 2.5 ----- END MODULE --------------------------------------
```

```
4492
4493                                            .SBTTL  MOD 2.5.1 - PRINT RETRY
4494                                            ;---------------------------------------------------------------
4495
4496  031676  000240                            PTRTY:  NOP                     ;
4497  031700  005737  002304                    IFA251: TST     RETRY           ;IF RETRY
4498  031704  001500                                    BEQ     END251          ;NOT=0, THEN
4499  031706  032737  000001  002304            IFB251: BIT     #1,RETRY        ;IF RETRY
4500  031714  001405                                    BEQ     IFC251          ;IS SEEK, THEN
4501  031716  013702  002306                            MOV     SEEKRT,R2       ;SET SEEK RT COUNT
4502  031722  012701  032110                            MOV     #MSKRT,R1       ;SET SEEK RT MSG
4503  031726  000465                                    BR      EIB251          ;BR TO END IF 'B'
4504  031730  032737  000002  002304            IFC251: BIT     #2,RETRY        ;IF RETRY
4505  031736  001427                                    BEQ     IFE251          ;IS WRT, THEN
4506  031740  032737  000030  002304            IFD251: BIT     #30,RETRY       ;IF RETRY
4507  031746  001416                                    BEQ     ELD251          ;IS DATA OR CRC , THEN
4508  031750  032737  000010  002304            IFG251: BIT     #10,RETRY       ;IF RETRY
4509  031756  001405                                    BEQ     ELG251          ;IS DATA, THEN
4510  031760  013702  002316                            MOV     DATART,R2       ;SET DATA RT COUNT
4511  031764  012701  032134                            MOV     #MDWTRT,R1      ;SET DATA WRT MSG
4512  031770  000444                                    BR      EIB251          ;BR TO END IF 'B'
4513  031772  013702  002314                    ELG251: MOV     CRCERT,R2       ;SET CRC RETRY COUNT
4514  031776  012701  032270                            MOV     #MCWTRT,R1      ;SET CRC WRT MSG
4515  032002  000437                                    BR      EIB251          ;BR TO END IF 'B'
4516  032004  013702  002326                    ELD251: MOV     WRTRT,R2        ;SET WRT RT COUNT
4517  032010  012701  032166                            MOV     #MWTRT,R1       ;SET WRT RT MSG
4518  032014  000432                                    BR      EIB251          ;BR TO END IF 'B'
4519  032016  032737  000004  002304            IFE251: BIT     #4,RETRY        ;IF RETRY
4520  032024  001430                                    BEQ     END251          ;IS READ, THEN
4521  032026  032737  000030  002304            IFF251: BIT     #30,RETRY       ;IF RETRY
4522  032034  001416                                    BEQ     ELF251          ;IS DATA OR CRC, THEN
4523  032036  032737  000010  002304            IFH251: BIT     #10,RETRY       ;IF RETRY
4524  032044  001405                                    BEQ     ELH251          ;IS DATA, THEN
4525  032046  013702  002316                            MOV     DATART,R2       ;SET DATA RT COUNT
4526  032052  012701  032213                            MOV     #MDRDRT,R1      ;SET DATA READ RT MSG
4527  032056  000411                                    BR      EIB251          ;BR TO END IF 'B'
4528  032060  013702  002314                    ELH251: MOV     CRCERT,R2       ;SET CRC RETRY COUNT
4529  032064  012701  032321                            MOV     #MCRDRT,R1      ;SET CRC READ MSG
4530  032070  000404                                    BR      EIB251          ;BR TO END IF 'B'
4531  032072  013702  002324                    ELF251: MOV     READRT,R2       ;SET READ RT COUNT
4532  032076  012701  032244                            MOV     #MRDRT,R1       ;SET READ RT MSG
4533  032102  004737  004536                    EIB251: CALL    PRTB1S          ;PRINT RETRY # & TYPE
4534  032106  000207                            END251: RTS     PC              ;RETURN
4535                                            ;---------------------------------------------------------------
4536  032110  040445  051440  042505            MSKRT:  .ASCIZ  /%A SEEK RETRY#%D2%N/
4537  032134  040445  042040  052101            MDWTRT: .ASCIZ  /%A DATA WRITE RETRY#%D2%N/
4538  032166  040445  053440  044522            MWTRT:  .ASCIZ  /%A WRITE RETRY#%D2%N/
4539  032213     045  020101  040504            MDRDRT: .ASCIZ  /%A DATA READ RETRY#%D2%N/
4540  032244  040445  051040  040505            MRDRT:  .ASCIZ  /%A READ RETRY#%D2%N/
4541  032270  040445  041440  041522            MCWTRT: .ASCIZ  /%A CRC WRITE RETRY#%D2%N/
4542  032321     045  020101  051103            MCRDRT: .ASCIZ  /%A CRC READ RETRY#%D2%N/
4543          032352                                    .EVEN
4544                                            ;MOD 2.5.1 ----- END MODULE -----------------------------------------
```

```
 4547                                           .SBTTL  MOD 2.6 - SET DRIVES DONE
 4548                                           ;---------------------------------------------------------------
 4549
 4550  032352  000240                           STDVDN: NOP                     ;
 4551  032354  005737  021442                   IFA26:  TST     DVDNCK          ;IF DRV DONE CK
 4552  032360  001430                                   BEQ     END26           ;IS SET, THEN
 4553  032362  000240                                   NOP                     ;
 4554  032364  005037  021442                           CLR     DVDNCK          ;CLEAR DRV DONE CK
 4555  032370  032737  000001  002234           IFB26:  BIT     #1,UUT          ;IF DRV#1 DONE
 4556  032376  001404                                   BEQ     ELB26           ;THEN
 4557  032400  052737  000002  021432                   BIS     #2,BTHDRV       ;SET DRV#1 DONE FLAG
 4558  032406  000403                                   BR      EIB26           ;BR TO END
 4559  032410  052737  000001  021432           ELB26:  BIS     #1,BTHDRV       ;SET DRV#0 DONE FLAG
 4560  032416  005001                           EIB26:  CLR     R1              ;CLEAR TEMP DRV DONE REG
 4561  032420  013703  002234                           MOV     UUT,R3          ;GET UNIT UNDER TEST
 4562  032424  000261                                   SEC                     ;SET CARRY BIT
 4563  032426  006101                           BDA26:  ROL     R1              ;MOVE DRV BIT
 4564  032430  005303                                   DEC     R3              ;DECREMENT UNIT UNDER TEST
 4565  032432  005703                                   TST     R3              ;DO UNTIL UNIT UNDER TST
 4566  032434  002374                           DUA26:  BGE     BDA26           ;EQUALS -1
 4567  032436  050137  021444                           BIS     R1,DRVDN        ;THEN SET THIS DRV DONE
 4568  032442  000207                           END26:  RTS     PC              ;RETURN
 4569                                           ;MOD 2.6 ---- END MODULE ----------------------------------------
```

```
 4572                                                .SBTTL  MOD 3.0 - OUTPUT EXERCISE COMPLETE
 4573                                                ;-------------------------------------------------------------
 4574  032444  000240                                OTEXCM: NOP
 4575  032446  023737  002232  002230                        CMP     SUT,SDD         ;IF ALL SCHEDULED
 4576  032454  001003                                      BNE     END30           ;DRIVE DONE
 4577  032456  012737  000001  014020                      MOV     #1,EXCMP        ;SET EXERCISE COMPLETE
 4578  032464  000207                                END30:  RTS     PC              ;RETURN
 4579                                                ;MOD 3.0 ----- END MODULE -----------------------------------------
```

```
4582                                            .SBTTL  MOD 4.0 - OUTPUT SYSTEM ERROR
4583                                            ;-------------------------------------------------------------------
4584  032466  013701  002274                    OTSYER: MOV     ERRSY,R1        ;GET SYSTEM ERR
4585  032472  000241                                    CLC                     ;CLEAR CARRY BIT
4586  032474  006201                                    ASR     R1              ;SHIFT
4587  032476  000241                                    CLC                     ;
4588  032500  006201                                    ASR     R1              ;       FUNCTION
4589  032502  006201                                    ASR     R1              ;                 OUT
4590  032504  005002                                    CLR     R2              ;CLEAR ERR #  COUNT
4591  032506  000240                            BDA40:  NOP                     ;
4592  032510  032701  000001                    IFA40:  BIT     #1,R1           ;IF BIT #1
4593  032514  001405                                    BEQ     ELA40           ;EQUALS 1, THEN
4594  032516  010204                                    MOV     R2,R4           ;SAVE ERROR # COUNT
4595  032520  006304                                    ASL     R4              ;DOUBLE ERR # COUNT FOR ADDRESSING
4596  032522  062704  033416                          ADD     #SE1,R4         ;SET ADDR FOR ERR MSG PRINT
4597  032526  000406                                    BR      THA40           ;BR TO THEN 'A'
4598  032530  006201                            ELA40:  ASR     R1              ;SHIFT ERR TYPE RIGHT
4599  032532  005202                                    INC     R2              ;INCREMENT ERROR # COUNT
4600  032534  022702  000017                          CMP     #17,R2          ;DO UNTIL ERR # COUNT
4601  032540  001362                                    BNE     BDA40           ;EQUALS 15, THEN
4602  032542  000452                                    BR      EIA40           ;BR TO END IF 'A'
4603  032544  010205                            THA40:  MOV     R2,R5           ;GET ERR#
4604  032546  062705  033450                          ADD     #ESCLAS,R5      ;CAL. ERR# CLASSIFICATION ADR
4605  032552  111503                                    MOVB    (R5),R3         ;GET ERR# CLASSIFICATION
4606  032554  032703  000002                    IFB40:  BIT     #2,R3           ;IF DEVICE FATAL
4607  032560  001415                                    BEQ     IFC40           ;ERROR, THEN
4608  032562  010205                                    MOV     R2,R5           ;GET ERR#
4609  032564  052705  000100                          BIS     #100,R5         ;SET ERR CLASS=SYS
4610  032570  010537  002376                          MOV     R5,ERRNBR       ;SET ERR#
4611  032574  011437  002400                          MOV     (R4),ERRMSG     ;SET ERR MSG
4612  032600  012737  000001  002374                  MOV     #DVFT,ERRTYP    ;SET DEVICE FATAL ERROR
4613  032606  004737  002354                          CALL    ERROR           ;CALL ERROR
4614  032612  000417                                    BR      EIC40           ;BR TO END IF 'C'
4615  032614  032703  000004                    IFC40:  BIT     #4,R3           ;IF SYSTEM FATAL
4616  032620  001414                                    BEQ     EIC40           ;ERROR, THEN
4617  032622  010205                                    MOV     R2,R5           ;GET ERR#
4618  032624  052705  000200                          BIS     #200,R5         ;SET ERR CLASS=SYS
4619  032630  010537  002376                          MOV     R5,ERRNBR       ;SET ERR#
4620  032634  011437  002400                          MOV     (R4),ERRMSG     ;SET ERR MSG
4621  032640  012737  000000  002374                  MOV     #SYFT,ERRTYP    ;SET ERR TYP=SYS FATAL
4622  032646  004737  002354                          CALL    ERROR           ;CALL ERROR
4623  032652  013737  002274  002604          EIC40:  MOV     ERRSY,ERRREG    ;SET SYS ERR FOR PRINT OUT
4624  032660  004737  002404                          CALL    PRTERR          ;CALL U.P.ERR - PRINT ERR INFO
4625  032664  004737  003034                          CALL    XERPRT          ;CALL MOD U.PRT.B - PRINT ERROR CODE
4626  032670  000240                            EIA40:  NOP                     ;
4627  032672  005037  002274                          CLR     ERRSY           ;CLEAR SYS ERRORS
4628  032676  000207                            END40:  RTS     PC
4629                                            ;-------------------------------------------------------------------
```

```
4632
4633                                    ;-------------------------------------------------------------------
4634  032700 047040 020117 047504      SYSE4:  .ASCIZ  / NO DONE BIT ON INITIALIZE/
4635  032733    040 047516 042040      SYSE5:  .ASCIZ  / NO DONE BIT ON FUNCTION/
4636  032764 047040 020117 051104      SYSE6:  .ASCIZ  / NO DRIVE READY BIT/
4637  033010 047040 020117 044523      SYSE7:  .ASCIZ  / NO SIDE READY BIT/
4638  033033    040 047516 042040      SYSE8:  .ASCIZ  / NO DONE BIT AFTER READ STATUS/
4639  033072 053440 047522 043516      SYSE9:  .ASCIZ  / WRONG DRIVE RESPONDING/
4640  033122 053440 047522 043516      SYSE10: .ASCIZ  / WRONG SIDE RESPONDING/
4641  033151    040 047125 051525      SYSE11: .ASCIZ  / UNUSED/
4642  033161    040 047125 051525      SYSE12: .ASCIZ  / UNUSED/
4643  033171    040 044504 045523      SYSE13: .ASCIZ  / DISKETTE WRONG DENSITY ERR/
4644  033225    040 042504 051516      SYSE14: .ASCIZ  / DENSITY ERR/
4645  033242 052040 046511 020105      SYSE15: .ASCIZ  / TIME OUT ON "TR" OR "DONE" BIT/
4646  033302 052440 041516 040514      SYSE16: .ASCIZ  / UNCLASSIFIED SYSTEM ERROR/
4647  033335    045 022516 043101      FUNCT:  .ASCIZ  /%N%AFUNCTION CODE:%03/
4648  033363    045 022516 051501      ERRORS: .ASCIZ  /%N%ASYSTEM ERROR REG=%B%N/
4649        033416                              .EVEN
4650  033416 032700                     SE1:    .WORD   SYSE4
4651  033420 032733                             .WORD   SYSE5
4652  033422 032764                             .WORD   SYSE6
4653  033424 033010                             .WORD   SYSE7
4654  033426 033033                             .WORD   SYSE8
4655  033430 033072                             .WORD   SYSE9
4656  033432 033122                             .WORD   SYSE10
4657  033434 033151                             .WORD   SYSE11
4658  033436 033161                             .WORD   SYSE12
4659  033440 033171                             .WORD   SYSE13
4660  033442 033225                             .WORD   SYSE14
4661  033444 033242                             .WORD   SYSE15
4662  033446 033302                             .WORD   SYSE16
4663                                    ;-------------------------------------------------------------------
4664                                                    ;ERROR                  - CLASS      -ERR#
4665                                                    ;-----                  -------      -----
4666  033450     004                    ESCLAS: .BYTE   4               ;NO DONE ON INIT        - SYS FATAL - 128
4667  033451     002                            .BYTE   2               ;NO DONE ON FUNCTION    - DEV FATAL -  65
4668  033452     002                            .BYTE   2               ;NO DRIVE RDY           - DEV FATAL -  66
4669  033453     002                            .BYTE   2               ;NO SIDE RDY            - DEV FATAL -  67
4670  033454     004                            .BYTE   4               ;NO DONE AFTER RD STA   - DEV FATAL -  68
4671  033455     004                            .BYTE   4               ;WRG DRV RESPOND        - SYS FATAL - 133
4672  033456     000                            .BYTE   0               ;WRG SIDE RESPOND       - SYS FATAL - 134
4673  033457     000                            .BYTE   0               ;UNUSED                 - 0
4674  033460     002                            .BYTE   2               ;UNUSED                 - 0
4675  033461     002                            .BYTE   2               ;DISKETT WRG DEN        - DEV FATAL -  73
4676  033462     004                            .BYTE   4               ;DENSITY ERR            - DEV FATAL -  74
4677  033463     004                            .BYTE   4               ;T.O. ON "TR" OR "DONE" - SYS FATAL - 139
4678  033464     004                            .BYTE   4               ;SYS ERR                - SYS FATAL - 140
4679        033466                              .EVEN
4680                                    ;MOD 4.0 ----- END MODULE ------------------------------------------
```

```
4683                                            .SBTTL  -    MOD INTR.1 - INTERRUPT HANDLER #0
4684                                            ;-------------------------------------------------------------
4685  033466  013737  002220  033542           INTH0:  MOV     U0ADR,INCSAD    ;SET UNIT #0 ADDRESS
4686  033474  004737  033516                           CALL    SVUTRG          ;CALL MOD U.INTR.U - SAVE UNIT REG
4687  033500  000002                                   RTI                     ;
4688                                            ;MOD U.INTR.1 ----- END MODULE -------------------------------
4689
4690                                            .SBTTL  -    MOD INTR.2 - INTERRUPT HANDLER #1
4691                                            ;-------------------------------------------------------------
4692  033502  013737  002222  033542           INTH1:  MOV     U1ADR,INCSAD    ;SET UNIT #1 ADDRESS
4693  033510  004737  033516                           CALL    SVUTRG          ;CALL MOD U.INTR.U - SAVE UNIT REG
4694  033514  000002                                   RTI                     ;
4695                                            ;MOD U.INTR.2 ----- END MODULE -------------------------------
4696
4697                                            .SBTTL  MOD U.INTR.U - SAVE UNIT REG
4698                                            ;-------------------------------------------------------------
4699  033516  012737  000001  025226           SVUTRG: MOV     #1,DNFLAG       ;SET DONE FLAG
4700  033524  013701  033542                           MOV     INCSAD,R1       ;SAVE UUT ADDRESS
4701  033530  012137  002246                           MOV     (R1)+,CSRUUT    ;SAVE UUT CSR
4702  033534  011137  002250                           MOV     (R1),ESRUUT     ;SAVE UUT ESR
4703  033540  000207                                   RTS     PC              ;RETURN
4704                                            ;-------------------------------------------------------------
4705  033542  000000                           INCSAD: 0                       ;INTERRUPTING UNIT CSR ADDRESS
4706                                            ;MOD U.I.U ----- END MODULE -----------------------------------
4707
4708                                            .SBTTL  -    READ ERROR CODE BUFFER
4709                                            ;-------------------------------------------------------------
4710  033544     000                           XERUUT: .BYTE   0               ;ERROR CODE UUT
4711  033545     000                           WC:     .BYTE   0               ;WORD COUNT UUT
4712  033546     000                           CTK0:   .BYTE   0               ;CUR TRK DRV#0
4713  033547     000                           CTK1:   .BYTE   0               ;CUR TRK DRV#1
4714  033550     000                           TTRK:   .BYTE   0               ;TARGET TRK
4715  033551     000                           TSEC:   .BYTE   0               ;TARGET SEC
4716  033552     000                           SFTSTS: .BYTE   0               ;MICRO CODE SOFT STATUS
4717  033553     000                           BTRK:   .BYTE   0               ;BAD TRK ADR
4718                                            ;-------------------------------------------------------------
4719
4720                                            .SBTTL  -    TRACK TABLE
4721                                            ;-------------------------------------------------------------
4722  033554  000232                           TRKTBL:
4725                                            ;-------------------------------------------------------------
4726
4727                                            .SBTTL  -    DATA BUFFERS
4728                                            ;-------------------------------------------------------------
4729  034006  000400                           DATPAT:
4732  034406  000400                           DATBUF:
4735                                            ;-------------------------------------------------------------
4736  035006                                            ENDTST
```

```
                                        .TITLE PARAMETER CODING
                                        .SBTTL  HARDWARE PARAMETER CODING SECTION
                                        ;++
                                        ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
                                        ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
                                        ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
                                        ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
                                        ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
                                        ; WITH THE OPERATOR.
                                        ;--

035010                                          BGNHRD

035012                                          GPRMA   MSG1,0,0,0,177777,YES
035022                                          GPRMA   MSG2,2,0,0,177777,YES
035032                                          GPRMD   MSG3,4,0,177777,0.,1.,YES
035044                                          GPRMD   MSG4,6,0,177777,0.,1.,YES

035056                                          EXIT    HRD

035060                                          ENDHRD
                                        ;-----------------------------------------------------------------------
035060  054122  041040  051525        MSG1:   .ASCIZ  /RX BUS ADR/
035073    126  041505  047524        MSG2:   .ASCIZ  /VECTOR ADR/
035106  051104  053111  020105        MSG3:   .ASCIZ  /DRIVE #   /
035121     105  050130  053440        MSG4:   .ASCIZ  /EXP WRD-CR/
                                        ;-----------------------------------------------------------------------
                                                .EVEN
```

```
4827                                    .SBTTL  SOFTWARE PARAMETER CODING SECTION
4828
4829                                    ;++
4830                                    ; THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS
4831                                    ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
4832                                    ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
4833                                    ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
4834                                    ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
4835                                    ; WITH THE OPERATOR.
4836                                    ;--
4837
4838  035134                                    BGNSFT
4839
4840  035136                                    GPRML   MSG6,2,1,YES
4841  035144                                    XFERF   1$
4842  035146                                    GPRML   MSG7,2,2,YES
4843  035154                            1$:     GPRMD   MSG8,4,0,177777,0,6,YES
4844  035166                                    GPRMD   MSG11,6,0,177777,0,6,YES
4845  035200                                    GPRMD   MSG14,10,0,177777,0,6,YES
4846  035212                                    GPRMD   MSG9,24,D,177777,1.,10000.,YES
4847  035224                                    GPRML   MSG15,12,1,YES
4848  035232                                    GPRML   MSG16,12,2,YES
4849  035240                                    GPRML   MSG17,2,100,YES
4850  035246                                    XFERF   4$
4851  035250                                    GPRML   MSG18,12,4,YES
4852  035256                                    GPRML   MSG19,12,10,YES
4853  035264                                    GPRML   MSG20,12,20,YES
4854  035272                                    GPRML   MSG21,12,40,YES
4855  035300                            4$:     GPRML   MSG22,2,200,YES
4856  035306                                    XFERF   5$
4857  035310                                    GPRMD   MSG23,14,D,177777,0.,76.,YES
4858  035322                                    GPRMD   MSG24,16,D,177777,0.,76.,YES
4859  035334                            5$:     GPRML   MSG25,2,400,YES
4860  035342                                    XFERF   6$
4861  035344                                    GPRMD   MSG26,20,D,177777,1.,26.,YES
4862  035356                                    GPRMD   MSG27,22,D,177777,1.,26.,YES
4863  035370                            6$:     GPRML   MSG5,0,177777,YES
4864  035376                                    EXIT    SFT
4865
4872
4873                                    .EVEN
4874
4875  035400                                    ENDSFT
```

```
4878
4879            000015                          ;----------------------------------------------------------------
4880            000012                                  CR==15                  ;CARRIAGE RETURN
4881  035400    054122    054130    042440             LF==12                  ;LINE FEED
4882  035432    042510    050114    052040     MSG5:    .ASCIZ  /RXXX EXPANSION TYPE <CR> /
4883  035453       105    042530    041522     MSG6:    .ASCIZ  /HELP TEST SETUP /
4884  035475       040    020040    020060     MSG7:    .ASCII  /EXERCISE OPTIONS/<CR><LF>
4885  035547       040    020040    020061              .ASCII  /   0 = WRITE-READ-DATA CK & READ-DATA CK/<CR><LF>
4886  035572    020040    031040    036440              .ASCII  /   1 = WRITE ONLY/<CR><LF>
4887  035615       040    020040    020063              .ASCII  /   2 = WRITE-READ/<CR><LF>
4888  035653       040    020040    020064              .ASCII  /   3 = WRITE-READ-DATA CHECK/<CR><LF>
4889  035710    020040    032440    036440              .ASCII  /   4 = READ-DATA CHECK ONLY/<CR><LF>
4890  035746    020040    033040    036440              .ASCII  /   5 = READ ONLY (CRC CHECK)/<CR><LF>
4891  036030    040504    040524    050040              .ASCII  /   6 = WRITE-READ-DATA CHECK ON ALTERNATE DRIVES/<CR><LF>
4892  036056    020040    030040    036440              .ASCII  /DATA PATTERN OPTIONS/<CR><LF>
4893  036075       040    020040    020061              .ASCII  /   0 = RANDOM/<CR><LF>
4894  036113       040    020040    020062              .ASCII  /   1 = ZEROS/<CR><LF>
4895  036130    020040    031440    036440              .ASCII  /   2 = ONES/<CR><LF>
4896  036156    020040    032040    036440              .ASCII  /   3 = FLOATING ZERO/<CR><LF>
4897  036203       040    020040    020065              .ASCII  /   4 = FLOATING ONE/<CR><LF>
4898  036217       040    020040    020066              .ASCII  /   5 = 125/<CR><LF>
4899  036233       124    040522    045503              .ASCII  /   6 = 333/<CR><LF>
4900  036263       040    020040    020060              .ASCII  /TRACK SEQUENCE OPTIONS/<CR><LF>
4901  036302    020040    030440    036440              .ASCII  /   0 = RANDOM/<CR><LF>
4902  036331       040    020040    020062              .ASCII  /   1 = INCREMENT O.D./<CR><LF>
4903  036360    020040    031440    036440              .ASCII  /   2 = DECREMENT I.D./<CR><LF>
4904  036426    020040    032040    036440              .ASCII  /   3 = INCREMENT O.D.-DECREMENT I.D./<CR><LF>
4905  036471       040    020040    020065              .ASCII  /   4 = BOUNCE BETWEEN I.D. & O.D./<CR><LF>
4906  036550    020040    033040    036440              .ASCII  /   5 = BOUNCE BETWEEN INCR. O.D. & DECR. I.D./<CR><LF>
4907  036621       040    020040    020040              .ASCII  /   6 = BOUNCE BETWEEN O.D. & DECR. I.D./<CR><LF>
4908  036703       055    042076    053105              .ASCII  /      (O.D. = OUTSIDE DIA. & I.D. = INSIDE DIA.)/<CR><LF>
4909  037016    020040    043111    042040              .ASCII  /->DEVICE FATAL THRESHOLD LVL=NO. OF HARD ERRS THAT CAUSE DEVICE
4910  037126    020040    044124    020105              .ASCII  /  IF DRS "EVL" FLAG IS SET, BUT HARD ERR WILL STILL LOG AS A HA
4911  037235       124    050131    020105              .ASCII  /  THE "EVL" FLAG WILL CAUSE 10 REPEATED SOFT ERRS TO BECOME A HA
4912  037263       105    042530    041522              .ASCIZ  /TYPE "CR" TO CONTINUE/
4913  037312    040504    040524    050040     MSG8:    .ASCIZ  /EXERCISE #       (0-6)/
4914  037341       124    040522    045503     MSG11:   .ASCIZ  /DATA PATTERN #   (0-6)/
4915  037370    042504    044526    042503     MSG14:   .ASCIZ  /TRACK SEQUENCE # (0-6)/
4916  037425       122    047125    052040     MSG9:    .ASCIZ  /DEVICE FATAL THRESHOLD LEVEL/
4917  037463       122    047125    052040     MSG15:   .ASCIZ  /RUN TEST IN DOUBLE DENSITY   /
4918  037521       101    054516    050040     MSG16:   .ASCIZ  /RUN TEST IN DELETED DATA MODE/
4919  037557       040    020040    042522     MSG17:   .ASCIZ  /ANY PROGRAM CONTROL FLAGS    /
4920  037627       040    020040    042522     MSG18:   .ASCIZ  /   RETRY ON ERROR, LOG SOFT & HARD ERRS/
4921  037677       040    020040    051120     MSG19:   .ASCIZ  /   RECALIBRATE ON SEEK ERRORS          /
4922  037747       040    020040    046103     MSG20:   .ASCIZ  /   PRINT ONLY 10 DATA ERRORS & CONTINUE/
4923  040017       115    042117    043111     MSG21:   .ASCIZ  /   CLEAR STATISTICAL TABLES NEXT PASS  /
4924  040055       040    020040    052517     MSG22:   .ASCIZ  /MODIFY TRACK ADDRESS LIMITS  /
4925  040105       040    020040    047111     MSG23:   .ASCIZ  /   OUTER DIAMETER ADR #/
4926  040135       115    042117    043111     MSG24:   .ASCIZ  /   INNER DIAMETER ADR #/
4927  040173       040    020040    044515     MSG25:   .ASCIZ  /MODIFY SECTOR ADDRESS LIMITS /
4928  040220    020040    046440    054101     MSG26:   .ASCIZ  /   MIN. SECTOR ADR #/
4929                                            MSG27:   .ASCIZ  /   MAX. SECTOR ADR #/
4930            040246                          ;----------------------------------------------------------------
                                                        .EVEN
```

```
 4933                                   .SBTTL  -    PATCH AREA
 4934                                   ;-------------------------------------------------------------------
 4935  040246  000000                   PATCH:  0                       ;PATCH AREA
 4936          040450                   .=.+200
 4937                                   ;-------------------------------------------------------------------
 4938
 4945
 4946
 4947  040450                                   LASTAD
  (3)  040454                           L$LAST::
 4948  040454                                   ENDMOD
 4949
 4950  040454                                   BGNSETUP        2
 4951  040454                                   BGNPTAB
 4952  040460  177170                           177170
 4953  040462  000264                           264
 4954  040464  000000                           0
 4955  040466  000000                           0
 4956  040470                                   ENDPTAB
 4957  040470                                   BGNPTAB
 4958  040474  177170                           177170
 4959  040476  000264                           264
 4960  040500  000001                           1
 4961  040502  000000                           0
 4962  040504                                   ENDPTAB
 4963  040504                                   ENDSETUP
 4964          000001                   .END
```

```
ABORT   002270          1114#  1912*  1927*  2095   2118   2129*  2152*  2156   2192*  2337*  2351   2361   2368
                        2374   2498*
ADR   = 000020 G         982#
ADRS    025024          3679*  3690*  3698*  3708*  3713*  3718*  3727*  3734#  3755*
ADRTST  012774          2094*  2117*  2151#
ADVTRK  021440          3074*  3095*  3098   3106*  3127#
ASSEMB= 000010           785
BAU234  025122          3766#  3776
BC00    013706          2356#  2371
BDAU23  025246          3797#  3803
BDA121  014756          2539#  2587
BDA133  020666          3023#  3025
BDA241  025514          3857#  3886
BDA25   030716          4383#  4394
BDA26   032426          4563#  4566
BDA40   032506          4591#  4601
BDBU23  025252          3798#  3801
BDB20   021014          3050   3055#  3115
BDB241  026034          3898#  3901
BDVSCD  021434          3041*  3092   3094*  3125#  3558*  3560*
BF243   027322          4082   4084#  4104
BG00    013566          2335#  2373
BIT0  = 000001 G         982#  1013#  1064   1992   2015
BIT00 = 000001 G         982#  1002#  1013
BIT01 = 000002 G         982#  1001#  1012
BIT02 = 000004 G         982#  1000#  1011   3153   3384   4219   4293
BIT03 = 000010 G         982#   999#  1010   3391   4202
BIT04 = 000020 G         982#   998#  1009   4215   4218
BIT05 = 000040 G         982#  1008
BIT06 = 000100 G         982#   996#  1007
BIT07 = 000200 G         982#   995#  1006
BIT08 = 000400 G         982#   994#  1005
BIT09 = 001000 G         982#   993#  1004
BIT1  = 000002 G         982#  1012#  1063   2001   2023   4216
BIT10 = 002000 G         982#   992#
BIT11 = 004000 G         982#   991#  1056   1065
BIT12 = 010000 G         982#   990#  3771   4213   4238
BIT13 = 020000 G         982#   989#  3779   4200
BIT14 = 040000 G         982#   988#  2398   3781
BIT15 = 000040 G         982#   987#   997#
BIT2  = 000004 G         982#  1011#  1995   2018
BIT3  = 000010 G         982#  1010#  2004   2026
BIT4  = 000020 G         982#  1009#  2637
BIT5  = 000040 G         982#  1008#
BIT6  = 000100 G         982#  1007#
BIT7  = 000200 G         982#  1006#
BIT8  = 000400 G         982#  1005#  2619
BIT9  = 001000 G         982#  1004#  2642
BK243   027550          4132#  4135
BOE   = 000400 G         982#
BRONPT  017462          2780*  2788*  2794#
BRONTK  020126          2898*  2905*  2906#  3001
BTHDRV  021432          3040*  3065   3067   3068*  3082*  3124#  4557*  4559*
BTRK    033553          1260   4717#
BTRP4 = 000004 G        1061#  2153   2155
BTRP6 = 000006 G        1062#
```

```
BUFERL  007364          1836#
BYTCNT  026050          3856*   3884*   3885    3905#
BYTNUM  026052          3854*   3859    3860    3866    3868    3881    3883*   3906#
CKDVAV  014742          2462*   2487*   2536#
CKSML   007354          1625    1835#   4188
CKSMRT  002310          1124#
CLASWD  027620          4090*   4148#   4185    4228    4234
CLRSTA  020656          2757*   3021#
CMD     002332          1137#   1256    2346*   2665*   3431*
CNSCLC  023316          3377*   3378    3420    3422*   3427    3434    3454#
CNTKLC  023320          3373*   3374    3416*   3426    3433    3455#
CONTRL  013564          2334#
CR    = 000015 G        4879#   4883    4884    4885    4886    4887    4888    4889    4890    4891    4892    4893    4894
                        4895    4896    4897    4898    4899    4900    4901    4902    4903    4904    4905    4906    4907
                        4908    4909    4910
CRC     007434          1841#
CRCBAD  007444          1842#
CRCBRT  002312          1125#
CRCERT  002314          1126#   4513    4528
CSADR   025034          3398*   3435*   3674    3679    3738#   3750    3753    3769    3777
CSEC    023276          3362    3375    3445#
CSRADR  025332          1539*   2442*   2451*   2479*   2555*   2644*   2653*   3750*   3798    3805    3806*   3807    3813#
                        3927*   3949*
CSREV   027072          3921*   3924    3967    3971    4022    4029#
CSRUUT  002246          1103#   1256    2343*   2659*   3805*   3921    4701*
CTK0    033546          1259    4712#
CTK1    033547          1259    4713#
CTRK    023306          3356    3371    3449#
CURSEC  023710          3378*   3420*   3422    3485*   3497*   3548#
CURTRK  024240          3374*   3416    3578*   3591*   3598    3600*   3601    3603    3611*   3616*   3628#
CVSTUT  004756          1510#   3048*
CVUNIT  004752          1488    1490    1496    1503#   2223*
CVUTST  004654          1486#   2224*
C$AU  = 000052           785#   2270
C$AUTO= 000061           785#   2130
C$BRK = 000022           785#
C$BSEG= 000004           785#   2542    2612    3055
C$BSUB= 000002           785#   2335    2356
C$CEFG= 000045           785#
C$CLCK= 000062           785#
C$CLEA= 000012           785#   2070
C$CLOS= 000035           785#
C$CLP1= 000006           785#   2366
C$CVEC= 000036           785#   2065    2068    2155
C$DCLN= 000044           785#   1928    2036    2128    2376
C$DODU= 000051           785#   2099    2102    2108    2111    2122    2125    2704
C$DRPT= 000024           785#   2378
C$DU  = 000053           785#   2230
C$EDIT= 000003           785#    828
C$ERDF= 000055           785#
C$ERHR= 000056           785#
C$ERRO= 000060           785#   1248    2168    2696
C$ERSF= 000054           785#
C$ERSO= 000057           785#
C$ESCA= 000010           785#
C$ESEG= 000005           785#   2578    2680    3114
```

```
C$ESUB= 000003          785#  2350   2367
C$ETST= 000001          785#  4736
C$EXIT= 000032          785#  2379
C$GETB= 000026          785#
C$GETW= 000027          785#
C$GMAN= 000043          785#  2630
C$GPHR= 000042          785#  1921
C$GPLO= 000030          785#
C$GPRI= 000040          785#
C$INIT= 000011          785#  1933
C$INLP= 000020          785#  3148   3379
C$MANI= 000050          785#  2628
C$MEM = 000031          785#
C$MSG = 000023          785#  1348   1368
C$OPEN= 000034          785#
C$PNTB= 000014          785#  1256   1370   1373   3880   3881
C$PNTF= 000017          785#  1926   2035   2038   2220   2228
C$PNTS= 000016          785#  1743   1755   1765
C$PNTX= 000015          785#  1259   1260   1288
C$QIO = 000377          785#
C$RDBU= 000007          785#
C$REFG= 000047          785#  1896   1900   1909
C$RESE= 000033          785#  2069   2439
C$REVI= 000003          785#   828
C$RFLA= 000021          785#  1895
C$RPT = 000025          785#  1649
C$SEFG= 000046          785#
C$SPRI= 000041          785#  3764   3782
C$SVEC= 000037          785#  1929   1932   2153
C$TPRI= 000013          785#
DAERCT  026054         3839*  3863*  3871   3907#
DARDRT  002320         1128#
DATA    007474         1845#
DATART  002316         1127#  4510   4525
DATASB  026056         3875*  3881   3908#
DATAWS  026060         3876*  3881   3909#
DATA0   017520         2795   2803#
DATA1   017536         2796   2809#
DATBUF  034406         3696   3846   3858   3896   4732#
DATBYT  017746         2803*  2809*  2812*  2824*  2827*  2830*  2834*  2837*  2841*  2851  2852  2863#
DATPAT  034006         2789   2792   3425   3694   3845   3857   4729#
DAWTRT  002322         1129#
DBADR   025032         3676*  3690   3698   3708   3713   3718   3727   3737#
DDERCT  002330         1132#
DELAY   025230         1541*  2443*  2452*  2480*  2557*  2646*  2657*  3752   3793#  3929*  3951*
DELDAT  002244         1102#  2421*  2423*  3084   3086*  3088*  3649   4005
DEN     002242         1101#  1535   2426*  2428*  3662   3947   4017
DFPTBL  002160 G        865#
DFTL    002216          902#  4418
DIAGMC= 000000          785
DLDTER  007504         1846#
DLY     025224         3766   3786#
DMSG1   026064         3880   3912#
DMSG2   026161         3881   3913#
DNBIT = 000040 G       1055#  2441   2444   2450   2453   2475   2478   2481   2556   2654   3677   3769   3777
                       3928   3950
```

```
DNFLAG  025226          3763*   3767    3787#   4699*
DRIVEN  015270          2550*   2553*   2596#
DRVDN   021444          3043*   3067*   3078    3089*   3129#   4567*
DRVFN   023332          3397    3431    3432    3460#   3664*
DRVTST  023324          3099*   3101    3403    3423    3429    3457#
DUA121  015246          2585#
DUA26   032434          4566#
DUB20   021370          3110    3112#
DUC20   021000          3052#
DUMSG1  013442          2228    2235#
DUMSG2  013503          2220    2236#
DVDNCK  021442          3042*   3128#   3168*   3174*   4551    4554*
DVFT  = 000001 G        1059#   4420    4612
DVTST   024404          3395*   3428*   3429*   3641    3667#
DX      025222          3765    3785#
EA1211  016004          2675    2680#
EA243   027264          4074    4078#
EA2433  030210          4245    4248#
EA2434  030274          4264    4270#
EB24U1  030452          4302    4309#
EB243   027406          4086    4100    4102#
EB2433  030160          4241    4243#
ECCLAS  030524          4329    4352#
ECLOG   007604          1635    1854#   4110
ECTAB   003116          1286    1296#
EC1     003170          1296    1321#
EC10    003555          1303    1328#
EC11    003603          1304    1329#
EC12    003660          1305    1330#
EC13    003714          1306    1331#
EC14    003773          1307    1332#
EC15    004021          1308    1333#
EC16    004107          1309    1334#
EC17    004153          1310    1335#
EC2     003236          1297    1322#
EC20    004207          1311    1336#
EC21    004254          1312    1337#
EC22    004311          1313    1338#
EC23    004360          1314    1339#
EC24    004413          1315    1340#
EC2432  030064          4217    4220#
EC25    004442          1316    1341#
EC3     003304          1298    1323#
EC4     003332          1299    1324#
EC5     003400          1300    1325#
EC6     003451          1301    1326#
EC7     003477          1302    1327#
EDB241  026042          3901#
EDC20   021404          3054    3116#
EDOO    013746          2362    2364    2366#
ED1211  016000          2677    2679#
ED2341  025102          3754    3756#
EF.CON= 000036 G         982#   1020#
EF.NEW= 000035 G         982#   1021#
EF.PWR= 000034 G         982#   1022#   1896
EF.RES= 000037 G         982#   1019#   1909
```

```
EF.STA= 000040 G   982#  1018#  1900
EF01  = 000001 G  1039#
EF02  = 000002 G  1038#
EF03  = 000003 G  1037#
EF04  = 000004 G  1036#
EF05  = 000005 G  1035#
EF06  = 000006 G  1034#
EF07  = 000007 G  1033#
EF08  = 000010 G  1032#
EF09  = 000011 G  1031#
EF10  = 000012 G  1030#
EF11  = 000013 G  1029#
EF12  = 000014 G  1028#
EF13  = 000015 G  1027#
EF14  = 000016 G  1026#
EF15  = 000017 G  1025#
EF16  = 000020 G  1024#
EG1211  015526    2639  2641  2643#
EH1211  015750    2669  2671  2673#
EIA11   014126    2415  2417#
EIA12   014374    2448  2457  2464#
EIA121  015232    2541  2580  2582#
EIA24   025374    3826  3828#
EIA25   031174    4395  4433#
EIA40   032670    4602  4626#
EIB121  015050    2551  2554#
EIB20   021354    3091  3097  3108#
EIB23   022646    3361  3371#
EIB234  025012    3715  3720  3724  3729#
EIB251  032102    4503  4512  4515  4518  4527  4530  4533#
EIB26   032416    4558  4560#
EIC11   011756    1980  1984#
EIC11   014212    2427  2429#
EIC121  015212    2561  2565  2569  2577#
EIC20   021106    3064  3069#
EIC25   031126    4408  4410  4424#
EIC40   032652    4614  4616  4623#
EID121  015226    2571  2573  2575  2581#
EID23   023032    3394  3401#
EID232  024162    3607  3611#
EID233  024366    3660  3662#
EIE12   014564    2490  2492#
EIE21   022146    3221  3223#
EIE22   022456    3315  3325  3327#
EIE23   023134    3418  3420#
EIF11   012224    1994  1997  2003  2006  2017  2020  2025  2028#
EIF20   021154    3073  3078#
EIF21   022122    3150  3161  3175  3177  3181  3183  3188  3191  3196  3212  3215  3217#
EIF241  025742    3874  3882#
EIF25   031116    4416  4419  4422#
EIH20   021232    3087  3089#
EIH232  024012    3571  3579#
EIH234  024712    3700  3715#
EII21   022116    3202  3208  3216#
EII231  023370    3471  3477#
EIJ23   023200    3381  3402  3424  3428#
```

```
PAR
CZR

O$EI
O$GI
O$PI
O$SI
PAR
PAT
PATI
PAT1
PAT2
PG
PLOI
PNT
POWE
PREF
PREF
PREF
PRES
PRES
PRI
PRID
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PRIO
PRNU
PRTB
PRTB
PRTB
PRTC
PRTD
PRTE
PRTE
PRTH
```

```
EIK234  024560          3695    3697#
EIM241  025702          3878    3881#
EI243   027576          4129    4138    4140#
ELA10   014054          2395    2397#
ELA11   014120          2413    2416#
ELA12   014270          2445    2449#
ELA20   020774          3047    3051#
ELA231  023462          3484    3497#
ELA241  025500          3850    3852    3854#
ELA25   030740          4385    4390#
ELA40   032530          4593    4598#
ELB11   014162          2420    2423#
ELB12   014342          2454    2458#
ELB121  015036          2548    2552#
ELB20   021276          3060    3098#
ELB22   022352          3308    3311#
ELB231  023622          3502    3527#
ELB232  024206          3602    3614    3616#
ELB241  025744          3862    3883#
ELB25   031036          4403    4411#
ELB26   032410          4556    4559#
ELC11   014206          2425    2428#
ELC22   022400          3313    3316#
ELC231  023620          3508    3526#
ELC233  024340          3653    3656#
ELC242  026306          3931    3934#
ELC244  030614          4336    4347#
ELDI1   012300          1982    2038#
ELD22   022422          3318    3321#
ELD231  023610          3513    3524#
ELD233  024362          3658    3661#
ELD234  024714          3704    3716#
ELD25   031170          4430    4432#
ELD251  032004          4507    4516#
ELE12   014556          2476    2491#
ELE22   022450          3323    3326#
ELE23   023130          3411    3413    3419#
ELE234  024764          3722    3725#
ELE244  030604          4342    4345#
ELF12   014546          2482    2489#
ELF20   021134          3072    3074#
ELF231  023602          3515    3521#
ELF232  024100          3594    3597#
ELF251  032072          4522    4531#
ELGI1   012022          1991    1995#
ELG12   014622          2495    2499#
ELG21   021736          3185    3189#
ELG251  031772          4509    4513#
ELHI1   012066          2000    2004#
ELH12   014412          2465    2468#
ELH20   021224          3085    3088#
ELH231  023452          3489    3494#
ELH234  024622          3687    3705#
ELH251  032060          4524    4528#
ELII1   012250          2009    2035#
ELJ21   022064          3204    3209#
```

```
ELKI1   012146          2014    2018#
ELK20   020744          3037    3045#
ELK234  024552          3693    3696#
ELLI1   012210          2022    2026#
ELL20   021270          3093    3096#
ELM242  026650          3988    3991#
ELN21   021704          3179    3182#
ENDCVT  004750          1493    1495    1499    1501#
ENDI1   012324          2034    2037    2039#
ENDLD   017742          2855    2860#
ENDRPT  005406          1649#
ENDST   011240          1857#   3022
ENDTKS  020632          2896    2999    3002#
ENDUP   002576          1258    1262#
ENDXER  003112          1281    1290#
END00   014012          2377    2379#
END121  015260          2586    2588#
END13   017374          2755    2759#
END131  017702          2806    2819    2833    2844    2847#
END133  020674          3026#
END20   021420          3083    3113    3118#
END22   022500          3332#
END231  023642          3520    3523    3525    3526    3531#
END232  024214          3597    3612    3617#
END233  024402          3665#
END234  025016          3683    3730#
END241  026016          3888    3890    3892    3894#
END242  027064          3933    3937    3955    4023    4025#
END243  027604          4141#
END244  030620          4326    4334    4340    4344    4346    4348#
END251  032106          4498    4520    4534#
END26   032442          4552    4568#
END30   032464          4576    4578#
END40   032676          4628#
ERRBLK  002402 G        1246*   1251#   2166*   2693*
ERRMSG  002400 G        1251#   2165*   2692*   4405*   4413*   4611*   4620*
ERRNBR  002376 G        1251#   2164*   2691*   4404*   4412*   4610*   4619*
ERROR   002354          1246#   4407*   4422*   4613*   4622*
ERRORS  033363          4648#
ERRREG  002604          1262*   1265#   4380*   4424*   4623*
ERRSAV  027610          4125    4140*   4144#
ERRSY   002274          1117#   1544*   2191*   2341*   2351    2358    2398*   2647    2895*   3112    3781*   3804*   3932*
                        3936*   3939    3954*   3963*   3998*   4016*   4021*   4053*   4063*   4333*   4584    4623    4627*
ERRTY   002276          1118#   2342*   3109    3771*   3779*   3853*   3864*   3865*   3889    3893*   3958*   3969*   3977*
                        3983*   3989*   3991*   3994*   3995*   4009*   4013*   4078    4079    4114    4140    4202    4339*
                        4343*   4345*   4347*   4380    4381    4424    4426    4427*
ERRTYP  002374 G        1251#   2167*   2694*   4406*   4414*   4420*   4612*   4621*
ERSTAT  025026          3723*   3735#
ERSVCT  027612          4127*   4128    4136*   4139*   4145#
ERTSAV  021452          3044*   3132#   3851    3891    3895*   4426*
ERT1    031175          4436#   4453
ERT10   031371          4445#   4462
ERT11   031423          4446#   4463
ERT12   031435          4447#   4464
ERT13   031450          4448#   4465
ERT14   031507          4449#   4466
```

```
ERT15   031546          4450#   4467
ERT16   031601          4451#   4468
ERT2    031210          4437#   4454
ERT3    031221          4438#   4455
ERT4    031235          4439#   4456
ERT5    031247          4440#   4457
ERT6    031263          4441#   4458
ERT7    031315          4442#   4459
ERT8    031344          4443#   4460
ERT9    031360          4444#   4461
ESCLAS  033450          4604    4666#
ESREV   027074          3922*   3965    3992    3996    4007    4011    4014    4019    4030#
ESRUUT  0C2250          1104#   1256    2344*   2660*   3807*   3922    4049    4059    4702*
ETCLAS  031656          4398    4472#
ETSAV   027606          4073    4076*   4078*   4143#
ETTAB   027630          4089    4157#
ET1     031616          4388    4453#
EVCMD   027066          3943*   3945*   3946*   3947*   3948    4027#
EVDATA  025412          3827*   3839#
EVDVRE  027076          3938*   4038#
EVDVST  026206          3822*   3920#
EVL     = 000004 G       982#   3155    3386    4295    4415
EVTSTR  025334          3102*   3821#
EVUTEC  030476          3824*   4323#
EXADR   022154          3144*   3218    3227#
EXADTB  022164          3142    3232#
EXCMP   014020          2336*   2370    2382#   4577*
EXHCP   021430          3039*   3075    3077*   3090*   3123#
EXMSG   003114          1287*   1288    1293#
EXN     021424          3056*   3121#   3140
EX1     022204          3233    3245#
EX2     022214          3234    3249#
EX3     022230          3235    3255#
EX4     022244          3236    3261#
EX5     022254          3237    3265#
EX6     022264          3238    3269#
EX7     022300          3232    3239    3275#
E$END   = 002100         785#
E$LOAD= 000035           785#    828
FCKMSG  017223          2630    2737#
FIN     011520          1899    1920    1929#
FIRST   014074          2399*   2402#   2752
FLAGS   002266          1113#   1890*   1898*   1911*   2391
FLGDRS  002264          1112#   1895*   3155    3386    4295    4415
FLOAT0  017546          2797    2812#
FLOAT1  017614          2798    2827#
FNEV4   030622          3823*   4337    4341    4350#
FORMCK  015304          2602#   2630    2631    2633*
FUNCT   033335          4647#
FUNEV   027070          3821*   3934    4028#
FUNTY   030342          4071*   4260*   4261    4265    4267    4283#
F$AU    = 000015         785#   2262    2270
F$AUTO= 000020           785#   2089    2130
F$BGN   = 000040         785#    811     913     975    1347    1366    1552    1605    1613    1875    1889    2057    2089
                        2210    2262    2333    2335    2350    2356    2367    2379    2542    2612    3055    4736    4797
                        4804    4838    4864    4948    4950    4951    4956    4957    4962    4963
```

```
F$CLEA= 000007   785#  2057  2070
F$DU  = 000016   785#  2210  2230
F$END = 000041   785#   811   913   975  1348  1368  1552  1605  1649  1933  2070  2130  2230
                2270  2333  2335  2350  2356  2367  2379  2578  2680  3114  4736  4804  4811
                4864  4875  4948  4950  4951  4956  4957  4962  4963
F$HARD= 000004   785#  4797  4804  4811  4841  4850  4856  4860  4864
F$HW  = 000013   785#   865   878
F$INIT= 000006   785#  1889  1933
F$JMP = 000050   785#  2379  4804  4864
F$MOD = 000000   785#   811   913   975  1552  1605  4948
F$MSG = 000011   785#  1347  1348  1366  1368
F$PROT= 000021   785#  1875  1879
F$PWR = 000017   785#
F$RPT = 000012   785#  1613  1649
F$SEG = 000003   785#  2542  2578  2612  2680  3055  3114
F$SOFT= 000005   785#  4838  4841  4850  4856  4860  4864  4875
F$SRV = 000010   785#
F$SUB = 000002   785#  2335  2350  2356  2367
F$SW  = 000014   785#   890   911
F$TEST= 000001   785#  2333  4736
GETSEC  023334  3421*  3467#
GETTRK  023742  3415*  3568#
GETTST  021454  3057*  3139#
GPSUN0  014626  2440*  2505#
GPSUN1  014702  2474*  2516*  2522#
GTDRV   022320  3096*  3304#
GTDVFN  024254  3396*  3430*  3640#
GTEX    017302  2397   2746#
GTEXCD  014076  2393   2411#
GTSYEX  014022  2349*  2390#
GTSYS   014216  2396   2439#
GTTK    020062  2894   2897#
G$CNTO= 000200   785#
G$DELM= 000372   785#
G$DISP= 000003   785#
G$EXCP= 000400   785#
G$HILI= 000002   785#
G$LOLI= 000001   785#
G$NO  = 000000   785#
G$OFFS= 000400   785#  2630  4799  4800  4801  4802  4840  4842  4843  4844  4845  4846  4847
                4848  4849  4851  4852  4853  4854  4855  4857  4858  4859  4861  4862  4863
G$OFSI= 000376   785#  2630  4799  4800  4801  4802  4840  4842  4843  4844  4845  4846  4847
                4848  4849  4851  4852  4853  4854  4855  4857  4858  4859  4861  4862  4863
G$PRMA= 000001   785#  4799  4800
G$PRMD= 000002   785#  4801  4802  4843  4844  4845  4846  4857  4858  4861  4862
G$PRML= 000000   785#  2630  4840  4842  4847  4848  4849  4851  4852  4853  4854  4855  4859
                4863
G$RADA= 000140   785#
G$RADB= 000000   785#
G$RADD= 000040   785#  4846  4857  4858  4861  4862
G$RADL= 000120   785#  2630  4840  4842  4847  4848  4849  4851  4852  4853  4854  4855  4859
                4863
G$RADO= 000020   785#  4799  4800  4801  4802  4843  4844  4845
G$XFER= 000004   785#  4804  4841  4850  4856  4860  4864
G$YES = 00001C   785#  2630  4799  4800  4801  4802  4840  4842  4843  4844  4845  4846  4847
                4848  4849  4851  4852  4853  4854  4855  4857  4858  4859  4861  4862  4863
```

```
HARD   = 000002 G   1058#  4414
HARDER    002300    1119#  4301*  4308*  4402   4423*  4429   4432*
HCRC      007524    1848#
HCRCBD    007534    1849#
HDATA     007564    1852#
HDD       007574    1853#
HDERCT    002302    1120#  4417*  4418   4421*
HELP   = 000000     763#   772    776    802    820    830    849    872    904    918#   965   1066   1182
                    1188   1209   1219   1227   1350   1355   1360   1388   1395   1401   1408   1414   1421
                    1430   1438   1445   1452   1558#  1859   1934   1943   2059   2072   2204   2239   2264
                    2272   4742#  4806   4819   4866   4939
HOE    = 100000 G    982#
HRD       007544    1850#
HSEK      007514    1847#  4303
HWRT      007554    1851#
IAATDP    012552    2090#
IAREC     005112    1542#
IA00      013666    2351#
IA1211    015324    2610   2613#
IA24U1    030360    4293#
IA243     027242    4073#
IA2431    027672    4185#
IA2432    027724    4200#
IA2433    030114    4234#
IA2434    030234    4261#
IBATDP    012574    2095#
IBE    = 010000 G    982#
IBU234    025126    3767#  3774
IB00      013700    2352   2354#
IB1211    015334    2615#
IB24U1    030400    4294   4297#
IB243     027330    4086#
IB2432    027734    4202#
IB2433    030132    4238#
IB2434    030250    4262   4265#
IC ATDP   012632    2101   2103#
ICU234    025134    3769#
IC1211    015372    2614   2622#
IC243     027370    4097#
IC2432    030022    4206   4213#
IC2434    030260    4267#
ID        020652    2418*  2750*  2888   3011#
IDATDP    012676    2091   2096   2104   2113#
IDCOMP    020512    2980#
IDENT1    002606    1256   1267#
IDU    = 000040 G    982#
ID00      013714    2358#
ID1211    015424    2620   2628#
ID243     027304    4081#
IEATDP    012720    2118#
IER    = 020000 G    982#
IEU234    025164    3777#
IE00      013726    2361#
IE1211    015444    2631#
IFAI1     011670    1967#
IFATDP    012756    2114   2124   2126#
```

```
IFAUP   002444          1257#
IFAU23  025232          3794#
IFA10   014040          2392    2394#
IFA11   014100          2412#
IFA12   014244          2444#
IFA121  014760          2540#
IFA20   020750          3046#   3053
IFA21   021520          3146    3149    3151#
IFA22   022322          3305#
IFA23   022516          3345#
IFA231  023410          3483#
IFA232  024024          3582#
IFA233  024262          3642#
IFA234  024450          3681#
IFA24   025360          3825#
IFA241  025456          3849#
IFA242  026232          3924#
IFA244  030506          4325#
IFA25   030720          4384#
IFA251  031700          4497#
IFA26   032354          4551#
IFA40   032510          4592#
IFBI1   011710          1968    1972#
IFB10   014024          2391#
IFB12   014316          2453#
IFB121  015010          2547#
IFB13   017342          2752#
IFB20   021036          3059#
IFB21   021546          3152    3157#
IFB22   022332          3307#
IFB23   022606          3353    3360#
IFB231  023504          3501#
IFB232  024120          3599    3601#
IFB233  024314          3643    3648    3650#
IFB242  026326          3925    3938#
IFB244  030524          4331#
IFB25   030770          4400#
IFB251  031706          4499#
IFB26   032370          4555#
IFB40   032554          4606#
IFCI1   011724          1973    1976#
IFC11   014166          2422    2424#
IFC12   014420          2463    2467    2469#
IFC121  015116          2559    2562#
IFC13   017350          2754#
IFC20   021052          3062#
IFC21   021570          3158    3162#
IFC22   022360          3310    3312#
IFC23   022714          3380    3382#
IFC231  023526          3493    3496    3507#
IFC232  024136          3605#
IFC233  024322          3652#
IFC234  024602          3685    3701#
IFC241  025560          3866#
IFC242  026266          3930#
IFC244  030536          4332    4335#
```

```
IFH20   021210          3076    3084#
IFH21   021752          3154    3156    3192#
IFH23   023154          3409    3423#
IFH231  023432          3488#
IFH232  023756          3570#
IFH234  024474          3686#
IFH242  026536          3966    3971#
IFH251  032036          4523#
IFI11   012104          1986    2007#
IFI121  015136          2563    2566#
IFI20   021064          3063    3065#
IFI21   021774          3193    3195    3197#
IFI23   022552          3350    3352#
IFI231  023346          3470#
IFI241  025462          3851#
IFI242  026516          3967#
IFJ11   012114          2010#
IFJ21   022030          3198    3203#
IFJ23   022706          3379#
IFJ241  025762          3887#
IFJ242  026546          3968    3973#
IFK11   012124          2013#
IFK20   020700          3036#
IFK21   021576          3164#
IFK234  024532          3692#
IFK241  025770          3889#
IFK242  026574          3976    3979#
IFL11   012164          2012    2021#
IFL20   021246          3066    3092#
IFL21   021476          3145#
IFL241  026000          3891#
IFL242  026656          3970    3978    3984    3990    3992#
IFM20   021356          3109#
IFM21   021654          3170    3172    3176#
IFM241  025634          3877#
IFM242  026622          3982    3985#
IFN21   021664          3178#
IFN242  026702          3962    3972    3993    3996#
IFO21   022076          3211#
IFO242  026742          4005#
IFP242  026750          4007#
IFQ242  026770          4006    4011#
IFR242  027006          4008    4010    4012    4014#
IFS242  027050          3964    3999    4002    4004    4018    4020    4022#
IFU242  027024          4015    4017#
IFV242  027032          4019#
IFX242  026424          3952#
IF00    013776          2369    2374#
IF1211  015464          2635#
IGATDP  012602          2097#
IG1211  015502          2636    2638#
IG243   027422          4077    4105#
IHATDP  012616          2098    2100#
IH1211  015554          2647#
IH243   027456          4108    4114#
IIATDP  012644          2106#
```

```
II1211  015662          2661#
II243   027516          4117    4125#
IJATDP  012660          2107    2109#
IJ1211  015672          2663#
IJ243   027530          4128#
IKATDP  012726          2120#
ILATDP  012742          2121    2123#
INCSAD  033542          4685*   4692*   4700    4705#
INCTRK  021436          3098*   3105*   3126#   3412    3414
INDITK  002210           899#   2418    2750    3568
INIT    011250          1890#
INITER  011470          1908    1926#
INITL   014016          2338*   2381#   3036    3107*   3145    3360    3470
INITTK  024252          3038*   3570    3572*   3633#
INMSG2  012332          2035    2044#
INMSG3  012432          2038    2045#
INTCMD  015266          2549*   2552*   2554    2595#
INTER   007414          1839#
INTER1  011606          1926    1956#
INTER2  016167          2446    2491    2722#
INTER3  016235          2455    2489    2723#
INTER4  016305          2496    2724#
INTH0   033466          1929    4685#
INTH1   033502          1932    4692#
INTLV   023706          3486    3494    3504    3547#
ISR     = 000100 G       982#
ITCSAD  015272          2536*   2554*   2555    2566    2597#   2643*   2644    2653    2659    2661    2663    2666
ITDBAD  015274          2538*   2558    2562    2574    2598#   2615    2622    2649*   2660
ITDROP  016064          2579*   2681*   2703#
ITERMG  016132          2692    2720#
ITERR   016016          2447*   2456*   2492*   2577*   2673*   2679*   2691#
ITERUT  016153          2712    2721#
ITER1   017032          2668    2734#
ITER2   017116          2670    2735#
ITER3   017200          2560    2736#
ITMSG   016130          2446*   2455*   2489*   2491*   2560*   2564*   2568*   2576*   2617*   2625*   2668*   2670*   2672*
                        2676*   2678*   2714    2718#
ITMSG1  016334          2564    2725#
ITMSG2  016357          2576    2726#
ITMSG3  016401          2617    2727#
ITMSG4  016454          2672    2728#
ITMSG5  016521          2568    2729#
ITMSG6  016576          2625    2730#
ITMSG7  016652          2676    2731#
ITMSG8  016704          2678    2732#
ITMSG9  016753          2651    2733#
ITPRNT  016102          2618*   2626*   2697*   2711#
IXE     = 004000 G       982#
I$AU    = 000041         785#   2262#   2270#
I$AUTO= 000041           785#   2089#   2130#
I$CLN   = 000041         785#   2057#   2070#
I$DU    = 000041         785#   2210#   2230#
I$HRD   = 000041        4797#   4811#
I$INIT= 000041           785#   1889#   1933#
I$MOD   = 000041         785#    811#    913#    975#   1552#   1605#   4948#
I$MSG   = 000041         785#   1347#   1348#   1366#   1368#
```

```
I$PROT= 000040            785#  1875#
I$PTAB= 000041            785#  4951#  4956#  4957#  4962#
I$PWR = 000041            785#
I$RPT = 000041            785#  1613#  1649#
I$SEG = 000041            785#  2333   2335   2356   2542#  2578#  2612#  2680#  3055#  3114#
I$SETU= 000041            785#  4950#  4951   4957   4963#
I$SFT = 000041           4838#  4875#
I$SRV = 000041            785#
I$SUB = 000041            785#  2333   2335#  2350#  2356#  2367#
I$TST = 000041            785#  2333#  2335   2356   2379   4736#
J$JMP = 000167            785#
LAREC   005130           1543   1546#
LA2432  030006           4201   4211#
LA2433  030176           4237   4246#
LBU234  025154           3768   3773#
LB1211  015366           2616   2621#
LB24U1  030424           4296   4298   4303#
LB2432  027762           4203   4207#
LB2433  030152           4239   4242#
LB2434  030270           4266   4269#
LC243   027402           4098   4101#
LC2432  030050           4214   4218#
LD00    013742           2359   2365#
LD1211  015772           2629   2678#
LEU234  025204           3778   3781#
LE1211  015762           2632   2676#
LF    = 000012 G         4880#  4883   4884   4885   4886   4887   4888   4889   4890   4891   4892   4893   4894
                         4895   4896   4897   4898   4899   4900   4901   4902   4903   4904   4905   4906   4907
                         4908   4909   4910
LF00    014010           2375   2378#
LH1211  015742           2648   2672#
LINECT  005636           1623*  1633*  1643*  1682   1698*  1699   1703#
LINES   005640           1627*  1637*  1646*  1699   1704#  1714*  1731*  1732
LINTYP  005642           1638*  1647*  1683   1705#
LI1211  015732           2662   2670#
LI243   027572           4126   4139#
LOAD    017704           2804   2817   2831   2842   2851#
LOE   = 040000 G          982#
LOGOFF  027622           4096*  4149#  4187   4204*  4207*  4211*  4244*  4247*  4290   4309
LOT   = 000010 G          982#
L$ACP   002110 G          828#
L$APT   002036 G          828#
L$AU    013562 G          828   2262#
L$AUT   002070 G          828#
L$AUTO  012552 G          828   2089#
L$CCP   002106 G          828#
L$CLEA  012522 G          828   2057#
L$CO    002032 G          828#
L$DEPO  002011 G          828#
L$DESC  002122 G          828    836#
L$DESP  002076 G          828#
L$DEVP  002060 G          828#
L$DISP  002154 G          828    847#
L$DLY   002116 G          828#
L$DTP   002040 G          828#
L$DTYP  002034 G          828#
```

```
L$DU    013274 G        828    2210#
L$DUT   002072 G        828#
L$DVTY  002346 G        828    1208#
L$EF    002052 G        828#
L$ENVI  002044 G        828#
L$ERRT  002374 G        828    1251#
L$ETP   002102 G        828#
L$EXP1  002046 G        828#
L$EXP4  002064 G        828#
L$EXP5  002066 G        828#
L$HARD  035012 G        828    4797#
L$HIME  002120 G        828#
L$HPCP  002016 G        828#
L$HPTP  002022 G        828#
L$HW    002160 G        828     865#
L$ICP   002104 G        828#
L$INIT  011250 G        828    1889#
L$LADP  002026 G        828#
L$LAST  040454 G        828    4947#   4963
L$LOAD  002100 G        828#
L$LUN   002074 G        828#   1247*   2159*   2161*   2163*   2695*
L$MREV  002050 G        828#
L$NAME  002000 G        828#
L$PRIO  002042 G        828#
L$PROT  011242 G        828    1875#
L$PRT   002112 G        828#
L$REPP  002062 G        828#
L$REV   002010 G        828#
L$RPT   005140 G        828    1613#
L$SOFT  035136 G        828    4838#
L$SPC   002056 G        828#
L$SPCP  002020 G        828#
L$SPTP  002024 G        828#
L$STA   002030 G        828#
L$SW    002172 G        828     890#
L$TEST  002114 G        828#
L$TIML  002014 G        828#
L$UNIT  002012 G        828#   1907    1919
L10000  002170          865     878#
L10001  002220          890     911#
L10002  004506         1348#
L10003  004514         1368#
L10004  005406         1649#
L10006  011602         1933#
L10007  012550         2070#
L10010  012772         2130#
L10011  013434         2230#
L10012  013562         2270#
L10013  035006         2379    4736#
L10014  013664         2350#
L10015  013750         2367#
L10016  035060         4797    4804    4811#
L10017  035400         4838    4864    4875#
L10020  040460         4951#
L10021  040474         4951    4957#
L10022  040470         4951    4956#
```

```
L10024  040504          4957    4962#
MAXSEC  002214           901#   3501    3507    3512    3514
MAXTRK  024234          3568*   3598    3605    3608    3613    3626#
MCRDRT  032321          4529    4542#
MCWTRT  032270          4514    4541#
MDRDRT  032213          4526    4539#
MDWTRT  032134          4511    4537#
MINSEC  002212           900#   3483    3497    3498    3499    3501
MINTRK  024232          3569*   3578    3600    3601    3613    3616    3625#
MRDRT   032244          4532    4540#
MSG1    035060          4799    4813#
MSG11   037312          4844    4913#
MSG14   037341          4845    4914#
MSG15   037425          4847    4916#
MSG16   037463          4848    4917#
MSG17   037521          4849    4918#
MSG18   037557          4851    4919#
MSG19   037627          4852    4920#
MSG2    035073          4800    4814#
MSG20   037677          4853    4921#
MSG21   037747          4854    4922#
MSG22   040017          4855    4923#
MSG23   040055          4857    4924#
MSG24   040105          4858    4925#
MSG25   040135          4859    4926#
MSG26   040173          4861    4927#
MSG27   040220          4862    4928#
MSG3    035106          4801    4815#
MSG4    035121          4802    4816#
MSG5    035400          4863    4881#
MSG6    035432          4840    4882#
MSG7    035453          4842    4883#
MSG8    037263          4843    4912#
MSG9    037370          4846    4915#
MSKRT   032110          4502    4536#
MWTRT   032166          4517    4538#
NEWTRK  020572          2921    2929    2948    2963    2975    2992    2994#
NOERL   007374          1837#
NONE    004506 G        1246    1347#   2693
NSEC    023674          3480    3542#
NXSCSA  023656          3532*   3535#
OD      020650          2417*   2749*   2886    2890    3010#
ODCOMP  020524          2981    2983#
ODTFLG= ****** U        1891    4964
ONEFIL= 000001             3#      4     806     914     915     928    1554    1555    1568    4752
OTDITK  002206           898#   2417    2749    3357    3368    3569
OTDVFN  024406          3399*   3436*   3674#
OTERTP  030702          3111*   4380#
OTEXCM  032444          2363*   2365*   4574#
OTSYER  032466          2353*   2360*   4584#
OUTSWD  025042          3680    3691    3699    3709    3714    3719    3728    3749#
O$APTS= 000000           785#    828
O$AU  = 000001           785#    818#    828
O$BGNR= 000001           785#    818#    828
O$BGNS= 000001           785#    818#    828
O$DU  = 000001           785#    818#    828
```

```
O$ERRT= 000001            785#    818#    828
O$GNSW= 000001            785#    818#    828
O$POIN= 000001            785#    818#    828
O$SETU= 000001            785#    818#    828    4947
PAR     006026           1665*   1682*   1690*   1743    1746#
PAT     017750           2746*   2782    2784*   2785    2864#
PATCH   040246           4935#
PAT125  017622           2799    2830#
PAT333  017646           2800    2837#
PG      017524           2804#   2807    2810
PLOC    011604           1921*   1954#   1966
PNT   = 001000 G          982#
POWERF= 000001 G         1064#   1898    2391
PREPT1  006002           1667*   1684*   1694*   1717*   1743#
PREPT2  006030           1660*   1687*   1755#
PREPT3  006050           1726*   1765#
PRESCK  020536           2984    2986#
PRESTK  020642           2883*   2885*   2915    2923    2967    2986    3000*   3007#
PRI   = 002000 G          982#
PRIDXX  006360           1626    1785#
PRID01  006426           1785    1807#
PRID02  006455           1786    1808#
PRID03  006504           1787    1809#
PRID04  006533           1788    1810#
PRID05  006562           1789    1811#
PRID06  006611           1790    1812#
PRID07  006640           1791    1813#
PRID08  006667           1792    1814#
PRID09  006716           1793    1815#
PRID10  006745           1794    1816#
PRID11  006774           1795    1817#
PRID12  007023           1796    1818#
PRID13  007052           1797    1819#
PRID14  007101           1798    1820#
PRID15  007130           1799    1821#
PRID16  007157           1800    1822#
PRID17  007206           1801    1823#
PRID18  007235           1802    1824#
PRID19  007264           1803    1825#
PRI00 = 000000 G          982#   1050#   3764
PRI01 = 000040 G          982#   1049#
PRI02 = 000100 G          982#   1048#
PRI03 = 000140 G          982#   1047#
PRI04 = 000200 G          982#   1046#
PRI05 = 000240 G          982#   1045#
PRI06 = 000300 G          982#   1044#
PRI07 = 000340 G          982#   1043#   1929    1932    2153    3782
PRNUM   005644           1624*   1634*   1644*   1680    1706#
PRTBOS  004516           1370#   2497*   2715*
PRTB1   004510 G         1366#   2166
PRTB1S  004536           1367*   1373#   2652*   2713*   4533*
PRTCTR  005646           1618*   1713#
PRTDAT  005510           1628*   1639*   1648*   1679#
PRTECD  002272           1115#   1257    1261*   1533*
PRTERR  002404           1256#   2674*   4425*   4624*
PRTHDR  005414           1617*   1621*   1631*   1642*   1658#
```

```
PRT1    005504          1615* 1619* 1629* 1640* 1659  1673#
PRT2    005506          1616* 1620* 1630* 1641* 1666  1674#
PTDAT1  006243          1693  1774#
PTEC    006200          1629  1772#
PTECN   006327          1636  1638  1778#
PTFMN1  006315          1725  1777#
PTHEAD  026062          3841* 3877  3879* 3910#
PTRDSC  006116          1716  1770#
PTRTY   031676          4431* 4496#
PTTK    006225          1640  1773#
PTTKN   006343          1647  1779#
PTUNT1  006253          1620  1630  1641  1775#
PTUNT2  006274          1616  1776#
PTWTSC  006147          1735  1771#
PT19SP  006105          1619  1769#
PT20SP  006074          1615  1768#
RANDAT  017656          2801  2840# 2845
RANGEN  004560          1459# 2840  2978
RANUM   004652          1474* 1479# 2841  2979* 2980  2983  2986  2988
RAN1    004646          1460  1466* 1471  1477#
RAN2    004650          1461  1468  1473* 1478#
RD      007454          1843#
RDERCD  005026          1531# 2667* 4024*
RDYWD   025330          1540* 2441* 2450* 2478* 2556* 2645* 2654* 3677* 3688* 3697* 3705* 3712* 3716*
                        3725* 3751* 3753  3794  3798  3812# 3928* 3950*
READRT  002324          1130# 4531
READSC  007314          1715  1833# 3021  4272* 4274* 4276* 4278* 4280*
RECCMD  005136          1534* 1535* 1536  1549#
REFCMD  015264          2594# 2619* 2627* 2634* 2637* 2642* 2643  2665
REFDRV  015306          2581* 2609#
REPORT  005140          1614#
RESTAR= 000002 G        1063# 1911
RESTK   021450          3069* 3070* 3080* 3081* 3131# 3352  3354  3359*
RETRY   002304          1122# 2339* 3151  3192  3194  3197  3200* 3203  3206* 3213* 3382  3388  3401*
                        4137* 4300* 4306* 4497  4499  4504  4506  4508  4519  4521  4523
RTMASK  030474          4208* 4215* 4216* 4218* 4219* 4240* 4242* 4246* 4300  4306  4316#
RTOFF   027624          4150# 4205* 4209* 4212* 4233* 4243* 4291
RXXX    002172           892# 1985  2103  2464  2469  2514  2570  2638  3345  3650  4042
RX2BIT= 004000 G        1056# 2566
RYDLY   025326          3797  3811#
RYDX    025324          2655  2656* 2658* 3796  3810#
SAVDLY  016014          2655* 2658  2684#
SCPSCT  023660          3486  3500* 3511* 3519* 3529* 3536#
SCSYEX  020676          2357* 3035#
SDD     002230          1096# 2227* 2340* 3078* 4575
SECADR  025040          3434* 3438  3706  3740#
SECDN   002262          1110# 3162  3358* 3410  3531*
SECTOR  002256          1108# 3438* 3880
SEEK    023322          3393* 3400* 3417* 3419* 3456#
SEEKCK  026046          3840* 3870* 3887  3904#
SEEKRT  002306          1123# 4130  4292  4501
SEK     007424          1840# 4310
SEQUEN  020654          2748* 2897* 2899  2901* 2902  3012#
SEQ1    020164          2907  2915# 2936
SEQ2    020220          2908  2923# 2934
SEQ3    020254          2909  2931#
```

```
SYSE6   032764          4636#   4652
SYSE7   033010          4637#   4653
SYSE8   033033          4638#   4654
SYSE9   033072          4639#   4655
S$LSYM= 010000           785#    878#   911#  1348#  1368#  1649#  1933#  2070#  2130#  2230#  2270#  2350#  2367#
                        2542#   2612#  2630#  3055#  4736#  4811#  4875#
TARGET  020640          2884*   2886*  2917*  2919*  2925*  2927*  2940*  2943*  2947*  2955*  2959*  2962*  2969*
                        2972*   2974*  2988*  2991*  2997   2998   3000   3006#
TBPRCT  022160          3160*   3164   3167*  3184   3186*  3189*  3214*  3216*  3229#
THA234  024464          3682    3684#
THA25   030756          4389    4396#
THA40   032544          4597    4603#
THB231  023514          3503#
THC13   017366          2753    2757#
THD23   022772          3392    3395#
THE22   022440          3316    3324#
THE234  024754          3723#
THF231  023560          3487    3516#
THF241  025624          3872    3875#
TKTBPT  020634          2882*   2995*  2996   3004#
TKTL    024242          3573    3584   3629#
TKXX    010070          1645    1855#  4122
TRACK   002254          1107#   3437*  3880   4118
TRAP    013260          2153    2191#
TRBIT = 000200 G        1054#   1540   2645   3688   3697   3705   3712   3716   3725
TRKADR  025036          3433*   3437   3710   3739#
TRKCNT  020636          2891*   2892*  2893*  2945*  2989*  3005#
TRKDN   002260          1109#   3171   3173*  3617*
TRKDNF  024230          3581*   3595*  3610*  3615*  3617   3624#
TRKINC  024236          3414*   3582   3618*  3627#
TRKSEQ  002202           896#   2748   2897
TRKTBL  033554          2994    3587   4722#
TRPMS1  013144          2158    2172#
TSAVCT  022162          3201*   3207*  3209*  3211   3230#
TSEC    033551          1260    4715#
TST     021422          3058*   3059   3062   3071   3099   3103   3120#
TSTCK   027626          3828*   4071   4151#  4200   4213   4238
TSTEV   025410          3101*   3821   3823   3825   3828   3832#  3973   3979   3985   4000   4038
TSTN    002176           894#   3056
TSTPAT  002200           895#   2746
TSTPTR  022152          3147*   3157   3159*  3166*  3180*  3182*  3187*  3190*  3199*  3205*  3210*  3217   3222*
                        3226#
TSTSUT  022502          3309*   3311*  3312   3319*  3321*  3322   3334#
TSTWD   022156          3058    3169   3176   3178   3219*  3228#
TTRK    033550          1260    4714#
T$ARGC= 000004           828#   1256#  1259#  1260#  1288#  1370#  1373#  1743#  1755#  1765#  1926#  2035#  2038#
                        2220#   2228#  3880#  3881#
T$CODE= 001004          2630#   4799#  4800#  4801#  4802#  4804#  4840#  4841#  4842#  4843#  4844#  4845#  4846#
                        4847#   4848#  4849#  4850#  4851#  4852#  4853#  4854#  4855#  4856#  4857#  4858#  4859#
                        4860#   4861#  4862#  4863#  4864#
T$ERRN= 000000           785#
T$EXCP= 000000          4799#   4800#  4801#  4802#  4843#  4844#  4845#  4846#  4857#  4858#  4861#  4862#
T$FLAG= 000041          2379#   4804#  4864#
T$FREE= 040504          4947    4963#
T$GMAN= 000000           785#
T$HILI= 000032          4799#   4800#  4801#  4802#  4843#  4844#  4845#  4846#  4857#  4858#  4861#  4862#
```

```
T$LAST= 000001   785#  4947#  4950
T$LOLI= 000001  4799#  4800#  4801#  4802#  4843#  4844#  4845#  4846#  4857#  4858#  4861#  4862#
T$LSYM= 010000   785#   878   911  1348  1368  1649  1933  2070  2130  2230  2270  2350  2367
                4736  4811  4875
T$LTNO= 000001  4947#
T$NEST= 177777   785#   811#   865#   878#   890#   911#   913#   975#  1347#  1348#  1366#  1368#  1552#
                1605#  1613#  1649#  1875#  1879#  1889#  1933#  2057#  2070#  2089#  2130#  2210#  2230#
                2262#  2270#  2333#  2335#  2350#  2356#  2367#  2542#  2578#  2612#  2680#  3055#  3114#
                4736#  4797#  4804  4811#  4838#  4841  4850  4856  4860  4864  4875#  4948#
T$NS0 = 000000   811#   913   975#  1552  1605#  4948
T$NS1 = 000005   865#   878   890#   911  1347#  1348  1366#  1368  1613#  1649  1875#  1879  1889#
                1933  2057#  2070  2089#  2130  2210#  2230  2262#  2270  2333#  4736  4797#  4804
                4811  4838#  4841  4850  4856  4860  4864  4875
T$NS2 = 000003  2335#  2350  2356#  2367  2542#  2578  2612#  2680  3055#  3114
T$PCNT= 000000  4950#  4951#  4957#
T$PTAB= 010023  4951#  4957#
T$PTHV= 000002   828  4963#
T$PTNU= 000002   785#  4951#  4957#  4963
T$SAVL= 177777   785#
T$SEGL= 177777   785#  2542#  2578#  2612#  2680#  3055#  3114#
T$SEKO= 010003  2542#  2578  2612#  2680  3055#  3114
T$SIZE= 000014  4947  4963#
T$SUBN= 000002   785#  2333#  2335#  2356#
T$TAGL= 177777   785#
T$TAGN= 010025   785#   865#   890#  1347#  1366#  1613#  1875#  1889#  2057#  2089#  2210#  2262#  2333#
                2335#  2356#  4797#  4838#  4950#  4951#  4957#
T$TEMP= 000000   847#   878#   911#   913#  1348#  1368#  1552#  1649#  1879#  1933#  2070#  2130#  2230#
                2270#  2350#  2367#  2379#  2578#  2630#  2680#  3114#  4736#  4799#  4800#  4801#  4802#
                4804#  4811#  4840#  4842#  4843#  4844#  4845#  4846#  4847#  4848#  4849#  4851#  4852#
                4853#  4854#  4855#  4857#  4858#  4859#  4861#  4862#  4863#  4864#  4875#  4948#
T$TEST= 000001   785#  2333#  2335  2356  4947
T$TSTM= 177777   785#  1248  1256  1259  1260  1288  1348  1368  1370  1373  1649  1743  1755
                1765  1895  1896  1900  1909  1921  1926  1928  1929  1932  1933  2035  2036
                2038  2065  2068  2069  2070  2099  2102  2108  2111  2122  2125  2128  2130
                2153  2155  2168  2220  2228  2230  2270  2335  2350  2356  2366  2367  2376
                2378  2379  2439  2542  2578  2612  2628  2630  2680  2696  2704  3055  3114
                3148  3379  3764  3782  3880  3881  4736
T$TSTS= 000001   785#  2333#
T$$AU = 010012  2262#  2270
T$$AUT= 010010  2089#  2130
T$$CLE= 010007  2057#  2070
T$$DAT= 010024  4951#  4956  4957#  4962
T$$DU = 010011  2210#  2230
T$$HAR= 010016  4797#  4804  4811
T$$HW = 010000   865#   878
T$$INI= 010006  1889#  1933
T$$MSG= 010003  1347#  1348  1366#  1368
T$$PC = 000002  4950#  4963
T$$PRO= 010005  1875#
T$$PTA= 010023  4950#  4951#  4957#
T$$RPT= 010004  1613#  1649
T$$SEG= 010003  2542#  2578#  2612#  2680#  3055#  3114#
T$$SOF= 010017  4838#  4864  4875
T$$SUB= 010015  2335#  2350  2356#  2367
T$$SW = 010001   890#   911
T$$TES= 010013  2333#  2379  4736
```

```
TOMSG   013124          2165    2171#
T1      013564 G         847    2333#
T1.1    013566         2335#
T1.2    013706         2356#
UAM   = 000200 G         982#
UAU234  025162         3776#
UC00    013752         2368#
UDCRST  027722         4075*   4199#
UDHDST  027670         4101*   4184#
UDSFST  030072         4099*   4228#
UDU234  025156         3774#
UF243   027412         4103#
UG00    013766         2355    2372#
UKINT   007404         1838#
UK243   027554         4134#
UNIT    002334         1138#   1247    1256    1521*   1913*   1918*   1919    1921    1967    2032    2035    2038    2505*
                       2508*   2512*   2522*   2525*   2529*   2546*   2650    2695    2704    2711    3331*   3880
UNITDP  013436         2212*   2215    2220    2228    2232#
UNITST  005024         1517*   1524#   3049
UNPKHP  011656         1924    1964#
UNT     012330         1965*   1984*   2013    2021    2042#
UNTCD   015300         2460*   2485*   2543    2547    2572    2584*   2600#   2635    2640
UNTCNT  015276         2458*   2484*   2583*   2585    2599#
UNTCOD  012326         1993*   1996*   2002*   2005*   2016*   2019*   2024*   2027*   2029    2041#
UPDVST  027230         3829*   4071#
UPSECT  030216         4072*   4257#
UTCNT   005412         1652#   1662*   1669*   1689*   1696*   1719*   1729*
UTSCDN  023704         3467*   3516*   3527*   3531    3546#
UTTST   005410         1651#   1661*   1663    1665    1668*   1688*   1691    1695*   1718*   1720    1727*
UT00    002336         1139#   1520    1661    1688    1718    1914*   2028    2092    2097    2099    2214    2506    2508
                       2545    3330
UT01    002340         1140#   1915*   2100    2102    2510    2512
UT10    002342         1141#   1916*   2105    2106    2108    2115    2120    2122    2523    2525
UT11    002344         1142#   1917*   2109    2111    2123    2125    2527    2529
UUT     002234         1098#   3049*   3069    3080    3305    3307    3314*   3317    3324*   3326*   3327    3347    3468
                       3556    3579    3652    3657    3941    4044    4054    4257    4555    4561
UUTADR  002236         1099#   1532    1537    1539    2666*   3349*   3351*   3398    3435    3920    3927    3949    3959
UUTOFF  002240         1100#   1519*   3329*   3344    4112    4123    4189    4304    4311
UOADR   002220         1091#   1902*   1969*   1972    2090    2093    2126    2442    2444    2449*   2451    2453    2461
                       3351    4685
UOVECT  002224         1093#   1904*   1929    1970*   2065
U1ADR   002222         1092#   1903*   1976    1978*   1981    2113    2116    2475    2477*   2479    2481    2486    3349
                       4692
U1VECT  002226         1094#   1905*   1930    1932    1979*   2066    2068
VALWD   025030         3726    3736#
WATCH   025104         3729*   3763#
WC      033545         1259    4711#
WDCNT   002252         1106#   2414*   2416*   2790    3343    3842
WDCT    023326         3343*   3458#   3689
WDOT    023330         2347*   3397*   3432*   3459#   3678    3681    3684    3686    3692    3701    3703    3721
WRDS    025022         3678*   3689*   3694*   3696*   3706*   3707*   3710*   3711*   3717*   3726*   3733#   3755
WRITSC  007334         1734    1834#
WRT     007464         1844#
WRTRT   002326         1131#   4516
XATDP   012766         2110    2112    2119    2127    2129#
XDVTST  022504         3100*   3343#
```

```
XERPRT  003034  1280#  4428*  4625*
XERUUT  033544  1259  1280  1282  1289*  1546  2345*  3717  3923*  4105  4323  4710#
XER1  002663  1259  1268#
XER2  002744  1260  1269#
XID  020646  2887*  2888*  2891  2915  2927  2928*  2943  2950  2959  2960*  2965  2969  2970*
             2980  3009#
XOD  020644  2889*  2890*  2892  2919  2920*  2923  2940  2950  2955  2956*  2965  2967  2972
             2983  3008#
XPG  017554  2813#  2828
XPSUN0  014700  2509  2513  2515  2517#
XPSUN1  014740  2526  2528  2530#
XREC  005134  1545  1547#
XUPSCT  030340  4268  4273  4277  4281#
XU23  025322  3795  3799  3808#
XU234  025212  3770  3772  3780  3782#
XXPG  017630  2831#  2835  2838
X$ALWA=  000000  785#  4804  4864
X$FALS=  000040  785#  4841  4850  4856  4860
X$OFFS=  000400  785#  4804  4841  4850  4856  4860  4864
X$TRUE=  000020  785#
X1211  016012  2611  2621  2624  2664  2682#
X24U1  030470  4313#
X2431  027720  4186  4191#
X2433  030214  4249#
.  =  040504  808#  1208#  1270#  1780#  1826#  1833#  1834#  1835#  1836#  1837#  1838#  1839#  1840#
            1841#  1842#  1843#  1844#  1845#  1846#  1847#  1848#  1849#  1850#  1851#  1852#  1853#
            1854#  1855#  2046#  2174#  2379  2738#  2794  2906  4543#  4649#  4679#  4804  4841
            4850  4856  4860  4864  4930#  4936#  4951  4957  4963
```

```
BGNAU    2262
BGNAUT   2089
BGNCLN   2057
BGNDU    2210
BGNHRD   4797
BGNHW     865
BGNINI   1889
BGNMOD    811    975   1605
BGNMSG   1347   1366
BGNPRO   1875
BGNPTA   4951   4957
BGNRPT   1613
BGNSEG   2542   2612   3055
BGNSET   4950
BGNSFT   4838
BGNSUB   2335   2356
BGNSW     890
BGNTST   2333
BNCOMP   1897   1901   1910   1922   2629   3149   3380
BRESET   2069   2439
CKLOOP   2366
CLRVEC   2065   2068   2155
DESCRI    836
DEVTYP   1208
DISPAT    847
DOCLN    1928   2036   2128   2376
DODU     2099   2102   2108   2111   2122   2125   2704
DORPT    2378
ENDAU    2270
ENDAUT   2130
ENDCLN   2070
ENDDU    2230
ENDHRD   4811
ENDHW     878
ENDINI   1933
ENDMOD    913   1552   4948
ENDMSG   1348   1368
ENDPRO   1879
ENDPTA   4956   4962
ENDRPT   1649
ENDSEG   2578   2680   3114
ENDSET   4963
ENDSFT   4875
ENDSUB   2350   2367
ENDSW     911
ENDTST   4736
EQUALS    982
ERROR    1248   2168   2696
ERRTBL   1251
EXIT     2379   4804   4864
GMANIL   2630
GPHARD   1921
GPRMA    4799   4800
GPRMD    4801   4802   4843   4844   4845   4846   4857   4858   4861   4862
GPRML    2630#  4840   4842   4847   4848   4849   4851   4852   4853   4854   4855   4859   4863
HEADER    828
```

```
M$POP     878#   911#   913#  1348#  1368#  1552#  1649#  1879#  1933#  2070#  2130#  2230#  2270#  2350#  2367#
         2578#  2680#  3114#  4736#  4811#  4875#  4948#
M$PRIN   1256#  1259#  1260#  1288#  1370#  1373#  1743#  1755#  1765#  1926#  2035#  2038#  2220#  2228#  3880#
         3881#
M$PUSH    811#   865#   890#   975#  1347#  1366#  1605#  1613#  1875#  1889#  2057#  2089#  2210#  2262#  2333#
         2335#  2356#  2542#  2612#  3055#  4797#  4838#
M$PUT    1256#  1259#  1260#  1288#  1370#  1373#  1743#  1755#  1765#  1926#  1929#  1932#  2035#  2038#  2153#
         2220#  2228#  3880#  3881#
M$PUT1   1256#  1259#  1260#  1288#  1370#  1373#  1743#  1755#  1765#  1926#  1929#  1932#  2035#  2038#  2153#
         2220#  2228#  3880#  3881#
M$RADI   2630#  4799#  4800#  4801#  4802#  4840#  4842#  4843#  4844#  4845#  4846#  4847#  4848#  4849#  4851#
         4852#  4853#  4854#  4855#  4857#  4858#  4859#  4861#  4862#  4863#
M$RNRO   1895#  1921#
M$SETS    811#   865#   890#   975#  1347#  1366#  1605#  1613#  1875#  1889#  2057#  2089#  2210#  2262#  2333#
         2335#  2356#  2542#  2612#  3055#  4797#  4838#
M$SVC    1248#  1256#  1259#  1260#  1288#  1348#  1368#  1370#  1373#  1649#  1743#  1755#  1765#  1895#  1896#
         1900#  1909#  1921#  1926#  1928#  1929#  1932#  1933#  2035#  2036#  2038#  2065#  2068#  2069#  2070#
         2099#  2102#  2108#  2111#  2122#  2125#  2128#  2130#  2153#  2155#  2168#  2220#  2228#  2230#  2270#
         2335#  2350#  2356#  2366#  2367#  2376#  2378#  2379#  2439#  2542#  2578#  2612#  2628#  2630#  2680#
         2696#  2704#  3055#  3114#  3148#  3379#  3764#  3782#  3880#  3881#  4736#  4804#  4864#
M$TLAB   1248#  1256#  1259#  1260#  1288#  1348#  1368#  1370#  1373#  1649#  1743#  1755#  1765#  1895#  1896#
         1900#  1909#  1921#  1926#  1928#  1929#  1932#  1933#  2035#  2036#  2038#  2065#  2068#  2069#  2070#
         2099#  2102#  2108#  2111#  2122#  2125#  2128#  2130#  2153#  2155#  2168#  2220#  2228#  2230#  2270#
         2335#  2350#  2356#  2366#  2367#  2376#  2378#  2379#  2439#  2542#  2578#  2612#  2628#  2630#  2680#
         2696#  2704#  3055#  3114#  3148#  3379#  3764#  3782#  3880#  3881#  4736#
M$TSTL   1248#  1256#  1259#  1260#  1288#  1348#  1368#  1370#  1373#  1649#  1743#  1755#  1765#  1895#  1896#
         1900#  1909#  1921#  1926#  1928#  1929#  1932#  1933#  2035#  2036#  2038#  2065#  2068#  2069#  2070#
         2099#  2102#  2108#  2111#  2122#  2125#  2128#  2130#  2153#  2155#  2168#  2220#  2228#  2230#  2270#
         2335#  2350#  2356#  2366#  2367#  2376#  2378#  2379#  2439#  2542#  2578#  2612#  2628#  2630#  2680#
         2696#  2704#  3055#  3114#  3148#  3379#  3764#  3782#  3880#  3881#  4736#
M$WORD    828#   847#  2379#  2630#  4799#  4800#  4801#  4802#  4804#  4840#  4841#  4842#  4843#  4844#  4845#
         4846#  4847#  4848#  4849#  4850#  4851#  4852#  4853#  4854#  4855#  4856#  4857#  4858#  4859#  4860#
         4861#  4862#  4863#  4864#  4951#  4957#
M$XFER   4804#  4841#  4850#  4856#  4860#  4864#
POINTE    818
PRINTB   1256   1370   1373   3880   3881
PRINTF   1926   2035   2038   2220   2228
PRINTS   1743   1755   1765
PRINTX   1259   1260   1288
READEF   1896   1900   1909
RFLAGS   1895
SETPRI   3764   3782
SETVEC   1929   1932   2153
SVC       784#   785
XFER     2379#  4804#  4864#
XFERF    4841   4850   4856   4860

. ABS.  040504     000

 ERRORS DETECTED:  0

 CZRXDC,CZRXDC/CRF=SVC.SML/ML,CZRXDC.P11
 RUN-TIME: 22 22 3 SECONDS
 RUN-TIME RATIO: 379/48=7.8
```

CORE USED: 22K (44 PAGES)