RX11,RX01 RX02 SS PERF EXER AH-E513C-MC
RX02 CZRXDCO FICHE 1 OF 1

```
.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

TABLE OF CONTENTS

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

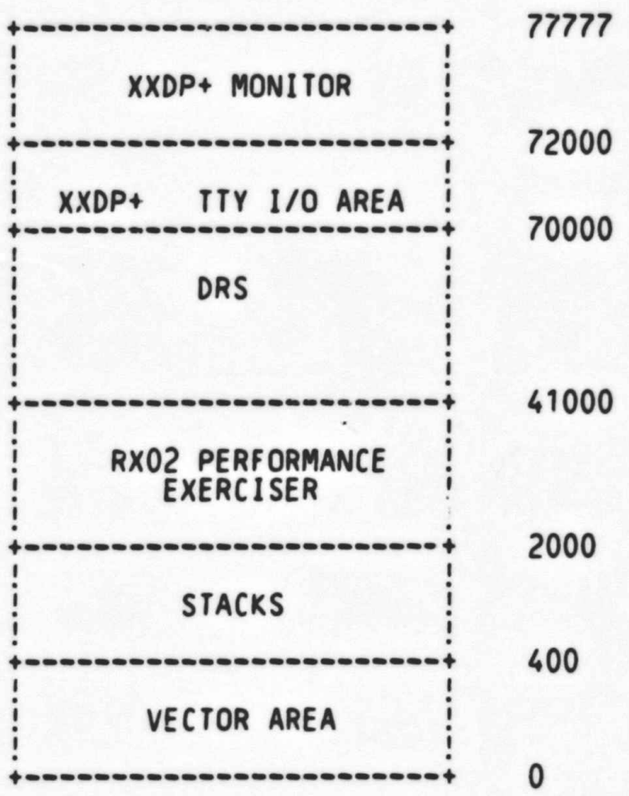
NONE

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 TESTING 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 R×21/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 "XERUUT")

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	DV0 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 EQUATES 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                                    ;
```

```
                                        ;EVENT FLAG DEFINITIONS
                                        ;       EF32:EF17       RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                                        ;       EF16:EF01       AVAILABLE FOR PROGRAM USE
000040                                  EF.START==      32.             ;START COMMAND WAS ISSUED.
000037                                  EF.RESTART==    31.             ;RESTART COMMAND WAS ISSUED.
000036                                  EF.CONTINUE==   30.             ;CONTINUE COMMAND WAS ISSUED.
000035                                  EF.NEW==        29.             ;A NEW PASS HAS BEEN STARTED.
000034                                  EF.PWR==        28.             ;A POWER FAIL/POWER-UP OCCURRED
                                        ;
000020                                  EF16==  16.
000017                                  EF15==  15.
000016                                  EF14==  14.
000015                                  EF13==  13.
000014                                  EF12==  12.
000013                                  EF11==  11.
000012                                  EF10==  10.
000011                                  EF09==  9.
000010                                  EF08==  8.
000007                                  EF07==  7
000006                                  EF06==  6
000005                                  EF05==  5
000004                                  EF04==  4
000003                                  EF03==  3
000002                                  EF02==  2
000001                                  EF01==  1
                                        ;
                                        ;PRIORITY LEVEL DEFINITIONS
                                        ;
000340                                  PRI07== 340
000300                                  PRI06== 300
000240                                  PRI05== 240
000200                                  PRI04== 200
000140                                  PRI03== 140
000100                                  PRI02== 100
000040                                  PRI01== 40
000000                                  PRI00== 0
                                        ;
                                        ;PROGRAM DEFINITIONS
                                        ;
000200                                  TRBIT==200
000040                                  DNBIT==40
004000                                  RX2BIT==BIT11
000003                                  SOFT==3
000002                                  HARD==2
000001                                  DVFT==1
000000                                  SYFT==0
000004                                  BTRP4==4
000006                                  BTRP6==6
000002                                  RESTAR==BIT1
000001                                  POWERF==BIT0
004000                                  SYSERR==BIT11
```

```
                                .SBTTL  GLOBAL DATA SECTION

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

                                ;
                                ; STORAGE FOR DEVICE REGISTERS
                                ;

                                ;-------------------------------------------------------------------
002220  000000                  U0ADR:  .WORD   0               ;UNIT 0 ADR
002222  000000                  U1ADR:  .WORD   0               ;UNIT 1 ADR
002224  000000                  U0VECT: .WORD   0               ;UNIT 0 VECTOR
002226  000000                  U1VECT: .WORD   0               ;UNIT 1 VECTOR
                                ;-------------------------------------------------------------------
002230  000000                  SDD:    .WORD   0               ;SYSTEM DRIVES DONE (SEE REG. DEF. BELOW)
002232  000000                  SUT:    .WORD   0               ;SYSTEM UNDER TEST (SEE REG. DEF. BELOW)
002234  000000                  UUT:    .WORD   0               ;UNIT UNDER TEST (SEE REG. DEF. BELOW)
002236  000000                  UUTADR: .WORD   0               ;UUT UNIBUS ADR
002240  000000                  UUTOFF: .WORD   0               ;UUT TABLE ADDRESSING OFFSET
002242  000000                  DEN:    .WORD   0               ;DENSITY FLAG
002244  000000                  DELDAT: .WORD   0               ;DELETED DATA FLAG
002246  000000                  CSRUUT: .WORD   0               ;CONT/STATUS REG UUT
002250  000000                  ESRUUT: .WORD   0               ;ERROR/STATUS REG UUT
                                ;-------------------------------------------------------------------
002252  000000                  WDCNT:  .WORD   0               ;WORD COUNT
002254  000000                  TRACK:  .WORD   0               ;TRACK ADR
002256  000000                  SECTOR: .WORD   0               ;SECTOR ADR
002260  000000                  TRKDN:  .WORD   0               ;TRACK DONE (UUT) FLAG
002262  000000                  SECDN:  .WORD   0               ;SECTOR DONE (UUT) FLAG
                                ;-------------------------------------------------------------------
002264  000000                  FLGDRS: .WORD   0               ;"DRS" FLAGS
002266  000000                  FLAGS:  .WORD   0               ;DIAGNOSTIC FLAGS
002270  000000                  ABORT:  .WORD   0               ;ABORT FLAG
002272  000000                  PRTECD: .WORD   0               ;PRINT ERR CODE FLAG
                                ;-------------------------------------------------------------------
002274  000000                  ERRSY:  .WORD   0               ;ERROR SYSTEM
002276  000000                  ERRTY:  .WORD   0               ;ERROR TYPE
002300  000000                  HARDER: .WORD   0               ;HARD ERROR
002302  000000                  HDERCT: .WORD   0               ;HARD ERROR COUNTER (USED FOR "DFTL")
                                ;-------------------------------------------------------------------
002304  000000                  RETRY:  .WORD   0               ;//(10)DATART/(4)RDRT/(2)WTRT/(1)SEEK/ SEE BELOW
002306  000000                  SEEKRT: .WORD   0               ;SEEK RETRY COUNT
002310  000000                  CKSMRT: .WORD   0               ;CHECK SUM RETRY COUNT
002312  000000                  CRCBRT: .WORD   0               ;CRC BAD RETRY COUNT
002314  000000                  CRCERT: .WORD   0               ;CRC ERR RETRY COUNT
002316  000000                  DATART: .WORD   0               ;DATA RETRY COUNT
002320  000000                  DARDRT: .WORD   0               ;DATA READ RETRY COUNT
002322  000000                  DAWTRT: .WORD   0               ;DATA WRITE RETRY COUNT
002324  000000                  READRT: .WORD   0               ;READ RETRY COUNT
002326  000000                  WRTRT:  .WORD   0               ;WRITE RETRY COUNT
002330  000000                  DDERCT: .WORD   0               ;D.D. ERR RETRY COUNT
                                ;-------------------------------------------------------------------
```

```
1136
1137  002332  000000
1138  002334  177777
1139  002336  177777
1140  002340  177777
1141  002342  177777
1142  002344  177777
1143
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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,<B,XERUUT>,<B,WC>,<B,CTK0>,<B,CTK1>
002522                                          PRINTX  #XER2,<B,TTRK>,<B,TSEC>,<B,SFTSTS>,<B,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                       ;
                                        ;-------------------------------------------------------------------------
002606  040445  052440  044516          IDENT1: .ASCIZ  /%A UNIT#%O1%A RXCSR=%O%A RXESR=%O%A CMD=%O%N/
002663     045  020101  051105          XER1:   .ASCIZ  /%A ERCD=%O3%A WC=%O3%A CTRK0=%D2%A. CTRK1=%D2%A./
002744  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
                                    ;-----------------------------------------------------------------
```

```
                                        .SBTTL  GLOBAL SUBROUTINES SECTION

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

                                        ;++
                                        ; FUNCTIONAL DESCRIPTION:
                                        ;     SUBROUTINE TO....
                                        ; INPUTS:  NONE
                                        ; IMPLICIT INPUTS:  NONE
                                        ; OUTPUTS:  RANUM
                                        ; IMPLICIT OUTPUTS:  NONE
                                        ; SUBORDINATE ROUTINES USED:  NONE
                                        ; FUNCTIONAL SIDE EFFECTS:  NONE
                                        ; CALLING SEQUENCE:  SUB
                                        ;--


                                        .SBTTL  -    MOD U.1.0 - RANDOM GENERATOR
                                        ;---------- RANDOM GENERATOR ----------------------------------------
004560  012700  000001          RANGEN: MOV     #1,R0
004564  063700  004646                  ADD     RAN1,R0
004570  063700  004650                  ADD     RAN2,R0
004574  042700  170000                  BIC     #170000,R0
004600  000241                          CLC
004602  006100                          ROL     R0
004604  006100                          ROL     R0
004606  010037  004646                  MOV     R0,RAN1
004612  005000                          CLR     R0
004614  013700  004650                  MOV     RAN2,R0
004620  006000                          ROR     R0
004622  006000                          ROR     R0
004624  063700  004646                  ADD     RAN1,R0
004630  042700  170000                  BIC     #170000,R0
004634  010037  004650                  MOV     R0,RAN2
004640  010037  004652                  MOV     R0,RANUM
004644  000207                          RTS     PC
                                        ;-------------------------------------------------------------------
004646  000000              RAN1:   0
004650  000000              RAN2:   0
004652  000000              RANUM:  0
                                        ;-------------------------------------------------------------------
```

```
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                     IAREC:  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
                                        ;-----------------------------------------------------------------------
```

```
                                                .SBTTL  -    PRINT REPORT HEADER
                                                ;-----  ----------------------------------------------------------------
005414  005003                                  PRTHDR: CLR     R3                      ;
005416  013705  005504                                  MOV     PRT1,R5                 ;SETUP 1ST PART OF HEADER PRINT
005422  004737  006030                                  CALL    PREPT2                  ;PRINT 1ST PART
005426  012737  002336  005410                        MOV     #UT00,UTTST             ;GET BEGIN ADR OF UNITS-->TESTED FLAGS
005434  012737  000004  005412                        MOV     #4,UTCNT                ;SET UNIT COUNTER
005442  005777  177742                          1$:     TST     @UTTST                  ;IF UNIT TESTED FLAG
005446  100407                                        BMI     2$                      ;NOT=-1, THEN
005450  017737  177734  006026                        MOV     @UTTST,PAR              ;SET UNIT TESTED # FOR PRINT
005456  013705  005506                                  MOV     PRT2,R5                 ;SET UNIT MSG
005462  004737  006002                                  CALL    PREPT1                  ;PRINT UNIT #
005466  062737  000002  005410                  2$:     ADD     #2,UTTST                ;ADVANCE ADR OF UNIT TESTED FLAG
005474  005337  005412                                  DEC     UTCNT                   ;DECREMENT UNIT COUNT
005500  001360                                        BNE     1$                      ;IF UNIT COUNT=0, THEN
005502  000207                                        RTS     PC                      ;RETURN
                                                ;-----  ----------------------------------------------------------------
005504  000000                                  PRT1:   0                               ;
005506  000000                                  PRT2:   0                               ;
                                                ;-----  ----------------------------------------------------------------
                                                .SBTTL  -    PRINT REPORT DATA
                                                ;-----  ----------------------------------------------------------------
005510  000240                                  PRTDAT: NOP                             ;
005512  005737  005644                          1$:     TST     PRNUM                   ;IF MODE
005516  001410                                        BEQ     2$                      ;
005520  013737  005636  006026                        MOV     LINECT,PAR              ;SETUP LINE # TO PRINT
005526  013705  005642                                  MOV     LINTYP,R5               ;SETUP LINE TYPE TO PRINT
005532  004737  006002                                  CALL    PREPT1                  ;PRINT LINE #
005536  000403                                        BR      3$                      ;
005540  012105                                  2$:     MOV     (R1)+,R5                ;SETUP LOG TITLE ADR
005542  004737  006030                                  CALL    PREPT2                  ;PRINT LOG TITLES
005546  012737  002336  005410                  3$:     MOV     #UT00,UTTST             ;GET UNIT # FOR PRINT
005554  012737  000004  005412                        MOV     #4,UTCNT                ;SETUP UNIT COUNT
005562  012237  006026                          4$:     MOV     (R2)+,PAR               ;SETUP DATA TO PRINT
005566  005777  177616                                TST     @UTTST                  ;IF UNIT # NOT = -1
005572  100404                                        BMI     5$                      ;THEN
005574  012705  006243                                MOV     #PTDAT1,R5              ;SETUP TO PRINT
005600  004737  006002                                CALL    PREPT1                  ;PRINT DATA
005604  062737  000002  005410                  5$:     ADD     #2,UTTST                ;SETUP TO CK NEXT UNIT
005612  005337  005412                                  DEC     UTCNT                   ;DECREMENT UNIT COUNT
005616  001361                                        BNE     4$                      ;IF DONE ALL UNITS THEN
005620  005237  005636                                INC     LINECT                  ;INCREMENT LINE COUNT
005624  023737  005640  005636                        CMP     LINES,LINECT            ;IF DONE ALL
005632  101327                                        BHI     1$                      ;LINES, THEN
005634  000207                                        RTS     PC                      ;RETURN
                                                ;-----  ----------------------------------------------------------------
005636  000000                                  LINECT: 0                               ;LINE COUNTER
005640  000000                                  LINES:  0                               ;# OF LINES TO PRINT
005642  000000                                  LINTYP: 0                               ;LINE PRINT TYPE.
005644  000000                                  PRNUM:  0                               ;PRINT MODE
                                                ;-----  ----------------------------------------------------------------
```

```
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                                                ;-------------------------------------------------------------------
```

```
                                        .SBTTL  -    PRINT REPORT TYPE 1
                                        ;-------------------------------------------------------------------------
006002                                  PREPT1: PRINTS  R5,PAR
006024  000207                                 RTS     PC              ;
                                        ;-------------------------------------------------------------------------
006026  000000                          PAR:    0                       ;
                                        ;-------------------------------------------------------------------------
                                        .SBTTL  -    PRINT REPORT TYPE 2
                                        ;-------------------------------------------------------------------------
006030                                  PREPT2: PRINTS  R5
006046  000207                                 RTS     PC
                                        ;-------------------------------------------------------------------------
                                        .SBTTL  -    PRINT REPORT TYPE 3
                                        ;-------------------------------------------------------------------------
006050                                  PREPT3: PRINTS  R5,R4,R3
006072  000207                                 RETURN
                                        ;-------------------------------------------------------------------------
006074  047045  047045  051445          PT20SP: .ASCIZ  /%N%N%S20/
006105     045  022516  022516          PT19SP: .ASCIZ  /%N%N%S19/
006116  047045  040445  020043          PTRDSC: .ASCIZ  /%N%A# SECTOR READS  (8)=/
006147     045  022516  021501          PTWTSC: .ASCIZ  /%N%A# SECTOR WRITES (8)=/
006200  047045  047045  040445          PTEC:   .ASCIZ  /%N%N%AERR%N%ACODE#  /
006225     045  022516  022516          PTTK:   .ASCIZ  /%N%N%ATRACK# /
006243     045  020101  022440          PTDAT1: .ASCIZ  /%A  %D6/
006253     045  030523  040445          PTUNT1: .ASCIZ  /%S1%AUNIT#%D1%S1/
006274  051445  022462  052501          PTUNT2: .ASCIZ  /%S2%AUNIT#%D1%S5/
006315     045  031123  047445          PTFMN1: .ASCIZ  /%S2%06%05/
006327     045  022516  031117          PTECN:  .ASCIZ  /%N%02%A0%S3/
006343     045  022516  030523          PTTKN:  .ASCIZ  /%N%S1%D2%S3/
             006360                             .EVEN
                                        ;-------------------------------------------------------------------------
```

```
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 ERR:          /
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
                                                ;-------------------------------------------------------------------
```

```
                                        .SBTTL  -    STATISTICAL TABLES
                                        ;-------------------------------------------------------------------------
                                        READSC: .BLKW   8.              ;READ SECTOR COUNTER
                                        WRITSC: .BLKW   8.              ;WRITE SECTOR COUNTER
                                        CKSML:  .BLKW   4               ;CKSUM LOG
                                        BUFERL: .BLKW   4               ;FILL/EMPTY BUFFER ERROR LOG
                                        NOERL:  .BLKW   4               ;NO ERR BIT LOG
                                        UKINT:  .BLKW   4               ;INTERRUPT - NO DONE LOG
                                        INTER:  .BLKW   4               ;INTERRUPT ERR
                                        SEK:    .BLKW   4               ;SEEK ERR
                                        CRC:    .BLKW   4               ;CRC ERR
                                        CRCBAD: .BLKW   4               ;CRC BAD ERR
                                        RD:     .BLKW   4               ;READ ERR
                                        WRT:    .BLKW   4               ;WRITE ERR
                                        DATA:   .BLKW   4               ;DATA ERR
                                        DLDTER: .BLKW   4               ;DEL DATA  ERR
                                        HSEK:   .BLKW   4               ;HARD SEEK ERR
                                        HCRC:   .BLKW   4               ;HARD CRC ERR
                                        HCRCBD: .BLKW   4               ;HARD CRC BAD ERR
                                        HRD:    .BLKW   4               ;HARD READ ERR
                                        HWRT:   .BLKW   4               ;HARD WRITE ERR
                                        HDATA:  .BLKW   4               ;HARD DATA ERR
                                        HDD:    .BLKW   4               ;HARD DEL DATA ERR
                                        ECLOG:  .BLKW   90.             ;ERROR CODE LOG
                                        TKXX:   .BLKW   308.            ;TRACK ERR LOG
                                        ;-------------------------------------------------------------------------
011240  000000                          ENDST:  .WORD   0               ;END TABLE

                                                .EVEN

                                        .SBTTL  LOAD DEVICE PROTECTION
                                        ;-------------------------------------------------------------------------
011242                                          BGNPROT
011242  000000                                  .WORD   0               ;RX CSR - HARDWARE P-TABLE OFFSET
011244  177777                                  .WORD   -1              ;DON'T CARE
011246  000004                                  .WORD   4               ;RX DRIVER-HARDWARE P-TABLE OFFSET
011250                                          ENDPROT
                                        ;-------------------------------------------------------------------------
```

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

```
                                        .SBTTL  -    MOD I.1 - UNPACK HARDWARE P-TABLES
                                        ;-----------------------------------------------------------------
                                        ;
011656  000240                  UNPKHP: NOP                     ;
011660  005037  012330                  CLR     UNT             ;CLEAR UNT
011664  013701  011604                  MOV     PLOC,R1         ;SAVE P-TABLE LOCATION
011670  005737  002334          IFAI1:  TST     UNIT            ;IF UNIT
011674  001005                          BNE     IFBI1           ;IS ZERO
011676  012137  002220                  MOV     (R1)+,U0ADR     ;LOAD UNIT #0 ADR
011702  012137  002224                  MOV     (R1)+,U0VECT    ;LOAD UNIT #0 VECTOR
011706  000426                          BR      IFEI1           ;BR TO END IF 'A'
011710  021137  002220          IFBI1:  CMP     (R1),U0ADR      ;IF THIS ADR
011714  001003                          BNE     IFCI1           ;EQUALS UNIT #0 ADR
011716  062701  000004                  ADD     #4,R1           ;INCREMENT TEMP #1 BY 4
011722  000420                          BR      IFEI1           ;BR TO END IF 'A'
011724  005737  002222          IFCI1:  TST     U1ADR           ;IF UN1 ADDRESS
011730  001005                          BNE     IFDI1           ;NOT LOADED PREVIOUSLY
011732  012137  002222                  MOV     (R1)+,U1ADR     ;LOAD UNIT#1 ADR
011736  012137  002226                  MOV     (R1)+,U1VECT    ;LOAD UNIT #1 VECTOR
011742  000405                          BR      EICI1           ;BR TO END IF 'C'
011744  021137  002222          IFDI1:  CMP     (R1),U1ADR      ;IF UNIT ADR
011750  001153                          BNE     ELDI1           ;EQUALS UNIT #1 ADR
011752  062701  000004                  ADD     #4,R1           ;THEN ADD 4 TO TEMP #1
011756  012737  000001  012330  EICI1:  MOV     #1,UNT          ;SET UNT=1
011764  005737  002172          IFEI1:  TST     RXXX            ;IF RXXX
011770  001445                          BEQ     IFII1           ;THEN
011772  005711                  IFFI1:  TST     (R1)            ;IF DRIVE #0
011774  001021                          BNE     IFHI1           ;THEN
011776  062701  000002          IFGI1:  ADD     #2,R1           ;ADD 2 TO TEMP #1
012002  005711                          TST     (R1)            ;IF SIDE #0 SELECTED
012004  001006                          BNE     ELGI1           ;THEN
012006  052737  000001  002232          BIS     #BIT0,SUT       ;SET SIDE #0, DRIVE #0
012014  005037  012326                  CLR     UNTCOD          ;CLEAR UNIT CODE
012020  000501                          BR      EIFI1           ;BR TO END IF 'F'
012022  052737  000004  002232  ELGI1:  BIS     #BIT2,SUT       ;SET SIDE #1, DRIVE #0
012030  012737  000002  012326          MOV     #2,UNTCOD       ;SET UNIT CODE = 10
012036  000472                          BR      EIFI1           ;BR TO END IF 'F'
012040  062701  000002          IFHI1:  ADD     #2,R1           ;ADD 2 TO TEMP #1
012044  005711                          TST     (R1)            ;IF SIDE #0 SELECTED
012046  001007                          BNE     ELHI1           ;THEN
012050  052737  000002  002232          BIS     #BIT1,SUT       ;SET SIDE #0, DRIVE #1
012056  012737  000001  012326          MOV     #1,UNTCOD       ;SET UNIT CODE = 01
012064  000457                          BR      EIFI1           ;BR TO END IF 'F'
012066  052737  000010  002232  ELHI1:  BIS     #BIT3,SUT       ;SET SIDE #1, DRIVE #1
012074  012737  000003  012326          MOV     #3,UNTCOD       ;SET UNIT CODE = 11
012102  000450                          BR      EIFI1           ;BR TO END IF 'F'
012104  062701  000002          IFII1:  ADD     #2,R1           ;ADD 2 TO R1
012110  005711                          TST     (R1)            ;IF SIDE
012112  001056                          BNE     ELII1           ;EQUALS 0, THEN
012114  162701  000002          IFJI1:  SUB     #2,R1           ;SUBTRACT 2 FROM TEMP #1
012120  005711                          TST     (R1)            ;IF DRIVE
012122  001020                          BNE     IFLI1           ;EQUALS ZERO, THEN
012124  005737  012330          IFKI1:  TST     UNT             ;IF UNIT
012130  001006                          BNE     ELKI1           ;EQUALS ZERO
012132  052737  000001  002232          BIS     #BIT0,SUT       ;SET UNIT #0, DRIVE #0
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                                  DOCLN
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            ;DROP 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
                                        ;-------------------------------------------------------------
                                        ;
2151  012774  000240                    ADRTST: NOP                     ;
2152  012776  005037  002270                    CLR     ABORT           ;CLEAR ABORT FLAG
2153  013002                                    SETVEC  #BTRP4,#TRAP,#PRI07
2154  013030  011201                            MOV     (R2),R1         ;READ RXCSR
2155  013032                                    CLRVEC  #BTRP4
2156  013040  005737  002270                    TST     ABORT           ;IF ABORT FLAG
2157  013044  001426                            BEQ     2$              ;SET, THEN
2158  013046  012701  013144                    MOV     #TRPMS1,R1      ;SET TRAP MESSAGE
2159  013052  012337  002074                    MOV     (R3)+,L$LUN     ;IF UNIT
2160  013056  100005                            BPL     1$              ;NOT SELECTED, THEN
2161  013060  011337  002074                    MOV     (R3),L$LUN      ;IF NEXT UNIT
2162  013064  100002                            BPL     1$              ;NOT SELECTED, THEN
2163  013066  005037  002074                    CLR     L$LUN           ;CLEAR UNIT
2164  013072  012737  000620  002376    1$:     MOV     #400.,ERRNBR    ;SETUP ERR NBR = ADR ERR
2165  013100  012737  013124  002400            MOV     #TOMSG,ERRMSG   ;SETUP ERROR MSG
2166  013106  012737  004510  002402            MOV     #PRTB1,ERRBLK   ;SETUP ERROR BLK
2167  013114  005037  002374                    CLR     ERRTYP          ;SETUP ERR TYP = SYS FTL
2168  013120                                    ERROR                   ;CALL ERROR
2169  013122  000207                    2$:     RETURN                  ;RETURN
2170                                    ;-------------------------------------------------------------
2171  013124  042101  051104  051505  TOMSG:  .ASCIZ  /ADDRESSING TEST/
2172  013144  040445  041040  051525  TRPMS1: .ASCII  /%A BUS TRAP AT ADDRESS:%O6%N/
2173  013200  040445  044440  052116          .ASCIZ  /%A INTERFACE BAD OR NOT SET TO ABOVE ADDRESS%N/
2174          013260                          .EVEN
```

```
                                        .SBTTL  -    MOD U.SFT.TRP - BUS TRAP HANDLER
                                        ;++
                                        ; FUNCTIONAL DESCRIPTION:  SUBR TO HANDLE DEVICE BUS TRAP
                                        ; INPUTS:  NONE
                                        ; IMPLICIT INPUTS:  BUS TRAP
                                        ; OUTPUTS:  BUS TRAP ERROR, ABORT TEST
                                        ; IMPLICIT OUTPUTS:  NONE
                                        ; SUBORDINATE ROUTINES USED:  NONE
                                        ; FUNCTIONAL SIDE EFFECTS:  NONE
                                        ; CALLING SEQUENCE:  INTERRUPT
                                        ;--

                                        ;-------------------------------------------------------------------------

013260  052737  004000  002274         TRAP:   BIS     #SYSERR,ERRSY   ;SET SYSTEM ERROR
013266  005237  002270                         INC     ABORT           ;ABORT TEST
013272  000002                         RTI                             ;RETURN FROM TRAP INTERRUPT
                                        ;-------------------------------------------------------------------------
```

```
                                        .SBTTL  DROP UNIT SECTION

                                        ;++
                                        ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
                                        ; TO NO LONGER BE TESTED.
                                        ;--


013274                                          BGNDU

013274  010037  013436                          MOV     R0,UNITDP       ;GET LOGICAL UNIT #
013300  005002                                  CLR     R2              ;LET R2=UNIT CODE# & UNIT COUNT /CLEAR IT!
013302  012701  002336                          MOV     #UT00,R1        ;GET BEGIN UNIT CODE ADRESS
013306  023721  013436                  1$:     CMP     UNITDP,(R1)+    ;IF USER UNIT#
013312  001417                                  BEQ     2$              ;IS  = UNIT CODE - UNIT#
013314  005202                                  INC     R2              ;INCREMENT UNIT CODE# & UNIT COUNT
013316  022702  000005                          CMP     #5,R2           ;IF MAX # OF UNITS
013322  101371                                  BHI     1$              ;EXCEEDED, THEN
013324                                          PRINTF  #DUMSG2,UNITDP  ;PRINT UNIT# NOT FOUND
013350  000431                                  BR      3$              ;BR TO EXIT
013352  012741  177777                  2$:     MOV     #-1,-(R1)       ;DESELECT UNIT
013356  010237  004752                          MOV     R2,CVUNIT       ;SET UNIT CODE FOR CONVERSION
013362  004737  004654                          CALL    CVUTST          ;CALL MOD U.A.1 CONVERT UNIT# TO SUT CODE
013366  013737  004754  013440                  MOV     SUTCV,SUTDRP    ;SET SUT DROP CODE = SUT CONVERTED CODE
013374  043737  013440  002232                  BIC     SUTDRP,SUT      ;DROP UNIT SPEC IN SUTDRP
013402  043737  013440  002230                  BIC     SUTDRP,SDD      ;CLEAR UNIT SPEC IN SUT DROP
013410                                          PRINTF  #DUMSG1,UNITDP

013434                                  3$:     ENDDU
                                        ;-------------------------------------------------------------------------
013436  000000                          UNITDP: 0                       ;UNIT TO BE DROPPED
013440  000000                          SUTDRP: 0                       ;SYS UNDER TST, DROP BIT
                                        ;-------------------------------------------------------------------------
013442  047045  040445  042040          DUMSG1: .ASCIZ  /%N%A DROP UNIT#%D1%A FROM TEST%N/
013503     045  022516  020101          DUMSG2: .ASCIZ  /%N%A COULD NOT DROP UNIT#%D1%A -NOT SELECTED%N/
                                        ;-------------------------------------------------------------------------


                                                .EVEN
```

```
                                        .SBTTL  ADD UNIT SECTION

                                        ;++
                                        ; THE ADD-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
                                        ;  TO BE (A) TESTED FOR THE FIRST TIME, OR (B) RESUMED IN TESTING.  IF
                                        ;  ''EF.AUNIT'' IS SET, THE UNIT WILL BE TESTED AS A NEW UNIT.
                                        ;--

013562                                          BGNAU


013562                                          ENDAU


                                        .EVEN
```

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

```
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,INITL        ;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 ------------------------------------------
```

```
                                        .SBTTL  MOD 1.2 - GET SYSTEM TO EXERCISE
                                        ;---------------------------------------------------------------------
014216                          GTSYS:  BRESET                  ;ISSUE BUS RESET
014220  004737  014626                  CALL    GPSUN0          ;CALL GET PRINTABLE SYSTEM 0 UNIT #
014224  012737  000040  025330          MOV     #DNBIT,RDYWD    ;SET READY WORD = DONE
014232  013737  002220  025332          MOV     U0ADR,CSRADR    ;SET ADDRESS
014240  004737  025230                  CALL    DELAY           ;CALL MOD - DELAY FOR DONE
014244  032777  000040  165746  IFA12:  BIT     #DNBIT,@U0ADR   ;IF UNIT #0 DONE BIT
014252  001006                          BNE     ELA12           ;NOT SET THEN
014254  012737  016167  016130          MOV     #INTER2,ITMSG   ;SET PRINT MSG#
014262  004737  016016                  CALL    ITERR           ;INITIALIZE ERR-U0-NO DONE BIT
014266  000442                          BR      EIA12           ;BR TO END IF 'A'
014270  012777  040000  165722  ELA12:  MOV     #40000,@U0ADR   ;ELSE-ISSUE PROG INIT TO U0
014276  012737  000040  025330          MOV     #DNBIT,RDYWD    ;SET READY WORD = DONE
014304  013737  002220  025332          MOV     U0ADR,CSRADR    ;SET TEST ADDRESS
014312  004737  025230                  CALL    DELAY           ;CALL MOD - DELAY FOR DONE
014316  032777  000040  165674  IFB12:  BIT     #DNBIT,@U0ADR   ;IF UNIT #0 DONE BIT
014324  001006                          BNE     ELB12           ;NOT SET THEN
014326  012737  016235  016130          MOV     #INTER3,ITMSG   ;SET PRINT MSG#
014334  004737  016016                  CALL    ITERR           ;INITIALIZE ERR-U0, NO DONE BIT
014340  000415                          BR      EIA12           ;BR TO END IF 'A'
014342  012737  000002  015276  ELB12:  MOV     #2,UNTCNT       ;SET # DRVS TO CK
014350  012737  000001  015302          MOV     #1,SUTPOS       ;SET POSITION IN SUT TO TEST = 1
014356  005037  015300                  CLR     UNTCD           ;SET UUT CODE = 0
014362  013704  002220                  MOV     U0ADR,R4        ;SET TEMP #4 = U0 ADDRESS
014366  004737  014742                  CALL    CKDVAV          ;CALL MOD 1.2.1 - CK DRIVE STATUS
014372  000412                          BR      IFC12           ;BR TO IF 'C'
014374  005737  002172          EIA12:  TST     RXXX            ;IF RXXX
014400  001404          IFH12:  BEQ     ELH12           ;THEN
014402  042737  000017  002232          BIC     #17,SUT         ;CLEAR RXXX U0 SELECTED DRIVES
014410  000403                          BR      IFC12           ;BR TO IF 'C'
014412  042737  000003  002232  ELH12:  BIC     #3,SUT          ;CLEAR RX02 U0 SELECTED DRIVES
014420  005737  002172          IFC12:  TST     RXXX            ;IF RXXX
014424  001401                          BEQ     IFD12           ;THEN
014426  000463                          BR      IFG12           ;BR TO IF 'G'
014430  032737  000014  002232  IFD12:  BIT     #14,SUT         ;IF U1
014436  001457                          BEQ     IFG12           ;SELECTED THEN
014440  004737  014702                  CALL    GPSUN1          ;CALL GET PRINTABLE SYSTEM 1 UNIT #
014444  032777  000040  165550  IFE12:  BIT     #DNBIT,@U1ADR   ;IF U1 DONE BIT
014452  001441                          BEQ     ELE12           ;SET THEN
014454  012777  040000  165540          MOV     #40000,@U1ADR   ;INITIALIZE DEVICE U1
014462  012737  000040  025330          MOV     #DNBIT,RDYWD    ;SET READY WORD = DONE BIT
014470  013737  002222  025332          MOV     U1ADR,CSRADR    ;SET TEST ADR
014476  004737  025230                  CALL    DELAY           ;CALL MOD - WAIT FOR DONE
014502  032777  000040  165512  IFF12:  BIT     #DNBIT,@U1ADR   ;IF U1 DONE BIT
014510  001416                          BEQ     ELF12           ;SET THEN
014512  012737  000004  015302          MOV     #4,SUTPOS       ;SET POSITION IN SUT = 4
014520  012737  000002  015276          MOV     #2,UNTCNT       ;SET # DRVS TO CK = 2
014526  012737  000002  015300          MOV     #2,UNTCD        ;SET UUT CODE = 2
014534  013704  002222                  MOV     U1ADR,R4        ;SET TEMP #4 = U1 ADR
014540  004737  014742                  CALL    CKDVAV          ;CALL MOD 1.2.1 - CK DRIVE STATUS
014544  000414                          BR      IFG12           ;BR TO IF 'G'
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                                  ;-----------------------------------------------------------------------
```

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

```
                                        .SBTTL  -    MOD 1.2.U.3 - INITIALIZE ERROR
                                        ;-------------------------------------------------------------------
016016  012737  000310  002376          ITERR:  MOV     #200.,ERRNBR    ;SET ERR NBR = INIT ERR
016024  012737  016132  002400                  MOV     #ITERMG,ERRMSG  ;
016032  012737  004506  002402                  MOV     #NONE,ERRBLK    ;
016040  012737  000001  002374                  MOV     #1,ERRTYP       ;SET ERR TYP = DEV FTL
016046  013737  002334  002074                  MOV     UNIT,L$LUN      ;SETUP LUN FOR PRINT
016054                                          ERROR                   ;CALL ERROR
016056  004737  016102                          CALL    ITPRNT          ;CALL INITIALIZE PRINT
016062  000207                                  RETURN                  ;RETURN
                                        ;-------------------------------------------------------------------
                                        .SBTTL  -    MOD 1.2.U.4 - INITIALIZE DROP
                                        ;-------------------------------------------------------------------
016064  013737  015302  013440          ITDROP: MOV     SUTPOS,SUTDRP   ;SETUP SYS. UNDER TEST DROP BIT
016072                                          DODU    UNIT            ;DROP THIS UNIT FROM TEST
016100  000207                                  RTS     PC              ;RETURN
                                        ;-------------------------------------------------------------------
                                        .SBTTL  -    MOD 1.2.U.5 - INITIALIZE PRINT
                                        ;-------------------------------------------------------------------
016102  013702  002334                  ITPRNT: MOV     UNIT,R2         ;SETUP TO PRINT UNIT #
016106  012701  016153                          MOV     #ITERUT,R1      ;SETUP MSG
016112  004737  004536                          CALL    PRTB1S          ;PRINT BASIC-1 ARG
016116  013701  016130                          MOV     ITMSG,R1        ;SETUP TO PRINT MSG
016122  004737  004516                          CALL    PRTBOS          ;PRINT BASIC-0 ARG
016126  000207                                  RTS     PC              ;RETURN
                                        ;-------------------------------------------------------------------
016130  000000                          ITMSG:  0                       ;INITIALIZE MSG#
                                        ;-------------------------------------------------------------------
016132  047111  052111  040511          ITERMG: .ASCIZ  /INITIALIZE ERROR/
016153     045  020101  047125          ITERUT: .ASCIZ  /%A UNIT#%D1/
016167     045  026501  026455          INTER2: .ASCIZ  /%A---NO DONE BIT AFTER BUS INITIALIZE/
016235     045  026501  026455          INTER3: .ASCIZ  /%A---NO DONE BIT AFTER PROG. INITIALIZE/
016305     045  022516  020101          INTER4: .ASCIZ  /%N%A NO SYSTEM TO TEST/
016334  040445  020055  047516          ITMSG1: .ASCIZ  /%A- NO DRIVE READY/
016357     045  026501  047040          ITMSG2: .ASCIZ  /%A- NO SIDE READY/
016401     045  026501  053440          ITMSG3: .ASCIZ  /%A- WRONG DENSITY -SINGLE DENSITY DISKETTE/
016454  040445  020055  052042          ITMSG4: .ASCIZ  /%A- "TR" BIT AFTER SET DENSITY CMD%N/
016521     045  026501  047040          ITMSG5: .ASCIZ  /%A- NOT CAPABLE OF DOUBLE DENSITY OPERATIONS/
016576  040445  020055  051127          ITMSG6: .ASCIZ  /%A- WRONG DENSITY - DOUBLE DENSITY DISKETTE/
016652  040445  042040  051511          ITMSG7: .ASCIZ  /%A DISKETTE WRONG DENSITY/
016704  040445  046440  047101          ITMSG8: .ASCIZ  /%A MAN. INTERVENTION REQ'D - REFORMATT/
016753     045  020101  047125          ITMSG9: .ASCIZ  /%A UNIT#%D1%A-REFORMATTING, DO NOT INTERRUPT%N/
017032  040445  020055  051105          ITER1:  .ASCIZ  /%A- ERROR BIT SET AFTER REFORMAT COMMAND SEQUENCE%N/
017116  040445  020055  047516          ITER2:  .ASCIZ  /%A- NO DONE BIT AFTER REFORMAT COMMAND SEQUENCE%N/
017200  040445  020055  041501          ITER3:  .ASCIZ  /%A- AC LOW BIT SET/
017223     040  020040  020040          FCKMSG: .ASCIZ  /          ->REFORMAT DISKETTE - ARE YOU SURE?/
        017302                                  .EVEN
                                        ;-------------------------------------------------------------------
```

```
 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 ----------------------------------------
```

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

```
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  017?'6          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 ----------------------------------------
```

```
                                        .SBTTL  MOD 1.3.2 - SET TRACK SEQUENCE
                                        ;-------------------------------------------------------------------
                                        ;   SEQ #      SEQUENCE
                                        ;   -----      --------
                                        ;     0        NO SEQUENCE SPECIFIED (DEFAULT TO SEQ 7)
                                        ;     1        INCREMENT FROM OD TO ID
                                        ;     2        DECREMENT FROM ID TO OD
                                        ;     3        INCREMENT THEN DECREMENT TRACKS
                                        ;     4        BOUNCE BETWEEN ID AND OD
                                        ;     5        BOUNCE BETWEEN DECREASING ID & INCREASING OD
                                        ;     6        STROBE BETWEEN OD AND DECREMENTING ID
                                        ;     7        RANDOM TRACK SELECTION
                                        ;-------------------------------------------------------------------
017752  005037  020634                STKSEQ: CLR     TKTBPT          ;CLEAR TRK TBL PTR
017756  005037  020642                        CLR     PRESTK          ;CLEAR PRESENT TRK
017762  005037  020640                        CLR     TARGET          ;CLEAR TARGET TRK
017766  112737  000177  020642              MOVB    #177,PRESTK     ;INIT PRESENT TRK TO HANDLE TRK #0
017774  113737  020650  020640              MOVB    OD,TARGET       ;INIT OD AS TARGET TRACK
020002  005037  020646                      CLR     XID             ;INIT WORDING ID AND OD LOCATIONS
020006  113737  020652  020646              MOVB    ID,XID          ;SAVE INSIDE DIA. IN TEMP INSIDE DIA.
020014  005037  020644                      CLR     XOD             ;CLEAR TEMP OUTSIDE DIA
020020  113737  020650  020644              MOVB    OD,XOD          ;SAVE OUTSIDE DIA. IN TEMP OUTSIDE DIA.
020026  013737  020646  020636              MOV     XID,TRKCNT      ;SET UP NUMBER OF TRACK MOVEMENTS
020034  163737  020644  020636              SUB     XOD,TRKCNT      ;
020042  005237  020636                      INC     TRKCNT          ;INCREMENT # OF TRACKS
020046  002005                            BGE     GTTK            ;IF # OF TRACKS IS NEGATIVE, THEN
020050  012737  100000  002274              MOV     #100000,ERRSY   ;SET SYSTEM ERROR
020056  000137  020632                      JMP     ENDTKS          ;EXIT
020062  013737  002202  020654    GTTK:     MOV     TRKSEQ,SEQUEN   ;GET TRACK SEQUENCE #
020070  142737  000377  020126              BICB    #377,@#BRONTK   ;CLEAR OUT BRANCH OFFSET
020076  005737  020654                      TST     SEQUEN          ;IF TRACK SEQUENCE
020102  001003                            BNE     1$              ;EQUALS ZERO, THEN
020104  012737  000007  020654              MOV     #7,SEQUEN       ;FORCE SEQ #7-RANDOM
020112  013704  020654    1$:       MOV     SEQUEN,R4       ;GET SEQUENCE BITS
020116  005304                            DEC     R4              ;ADJUST FOR CORRECT OFFSET
020120  006304                            ASL     R4              ;
020122  150437  020126                    BISB    R4,@#BRONTK     ;THIS BR INST. IS MODIFIED SELECTED TRACK SEQUEN
020126  000777                  BRONTK:   BR      .               ;BRANCH TO SELECTED TRACK SEQUENCE
020130  000137  020164                    JMP     SEQ1            ;
020134  000137  020220                    JMP     SEQ2            ;
020140  000137  020254                    JMP     SEQ3            ;
020144  000137  020272                    JMP     SEQ4            ;BOUNCE ID TO OD
020150  000137  020340                    JMP     SEQ5            ;DECREASING BOUNCE
020154  000137  020422                    JMP     SEQ6            ;STROBE
020160  000137  020476                    JMP     SEQ7            ;RANDOM
                                        ;-------------------------------------------------------------------
020164  123737  020646  020642    SEQ1:     CMPB    XID,PRESTK      ;IF PRESENT TRACK=ID
020172  001004                            BNE     1$              ;THEN
020174  012737  177777  020640            MOV     #-1,TARGET      ;TERMINATE TABLE
020202  000405                            BR      2$              ;END SEQ1
020204  113737  020644  020640    1$:       MOVB    XOD,TARGET      ;ELSE SET NEW TRACK-OUTSIDE DIA
020212  005237  020644                      INC     XOD             ;INCREMENT OUTSIDE DIA
020216  000565                  2$:       BR      NEWTRK          ;END SEQ1
                                        ;-------------------------------------------------------------------
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 ------------------------------------------
```

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

```
                                        .SBTTL  MOD 2.1 - GET A TEST
                                        ;-----------------------------------------------------------------------
                                        ;
                                GETTST: NOP                     ;
                                        MOV     EXN,R1          ;GET EXERCISE NUMBER
                                        ASL     R1              ;DOUBLE EXERCISE NUMBER
                                        MOV     #EXADTB,R2      ;GET EXERCISE ADDRESS TABLE
                                        ADD     R1,R2           ;CAL EXERCISE TO BE USED
                                        MOV     (R2),EXADR      ;GET BEGIN ADR EXERCISE
                                IFL21:  TST     INITL           ;IF INITIALIZE
                                        BEQ     IFA21           ;IS SET, THEN
                                        CLR     TSTPTR          ;CLEAR TST PTR
                                IFF21:  INLOOP                  ;IF IN LOOP
                                        BNCOMPLETE IFA21        ;SET, THEN
                                        JMP     EIF21           ;BR TO END IF 'F'
                                IFA21:  TST     RETRY           ;IF RETRY
                                        BEQ     IFB21           ;NOT=0, AND
                                        BIT     #BIT02,SWREG    ;IF RETRY ON ERROR
                                        BNE     IFH21           ;IS NOT SET, THEN
                                        BIT     #EVL,FLGDRS     ;IF DRS "EVL" FLAG
                                        BNE     IFH21           ;IS NOT SET, THEN
                                IFB21:  TST     TSTPTR          ;IF TST PTR
                                        BNE     IFC21           ;EQUALS ZERO
                                        MOV     #2,TSTPTR       ;ADV. TST PTR I CMD
                                        CLR     TBPRCT          ;CLEAR TABLE PAIR COUNT
                                        BR      EIF21           ;BR TO END IF 'F'
                                IFC21:  TST     SECDN           ;IF SECTOR DONE IS
                                        BEQ     IFG21           ;SET THEN
                                IFK21:  TST     TBPRCT          ;IF TABLE PAIR CNT=1,
                                        BEQ     IFG21           ;THEN
                                        ADD     #2,TSTPTR       ;ADVANCE ONE TEST CMD
                                        CLR     TBPRCT          ;CLEAR TABLE PAIR  COUNT
                                        CLR     DVDNCK          ;CLEAR DRV DONE CK FLAG
                                IFD21:  BIT     #40000,TSTWD    ;IF DONE CK
                                        BEQ     IFM21           ;IS SET, THEN
                                        TST     TRKDN           ;IF TRACK DONE IS
                                        BEQ     IFM21           ;SET, THEN
                                        CLR     TRKDN           ;CLEAR TRK DONE
                                        MOV     #1,DVDNCK       ;SET DRV DONE CK
                                        BR      EIF21           ;BR TO END IF 'F'
                                IFM21:  BIT     #6000,TSTWD     ;IF ADV OR INCR TRK
                                        BEQ     EIF21           ;IS SET, THEN
                                IFN21:  BIT     #100000,TSTWD   ;IF '4 CMD SEQ'
                                        BEQ     ELN21           ;IS SET, THEN
                                        SUB     #10,TSTPTR      ;BACK UP 4 CMDS
                                        BR      EIF21           ;BR TO END IF 'F'
                                ELN21:  SUB     #4,TSTPTR       ;BACK UP TWO TEST CMDS
                                        BR      EIF21           ;BR TO END IF 'F'
                                IFG21:  TST     TBPRCT          ;IF TABLE PAIR COUNT
                                        BEQ     ELG21           ;EQUALS 1 THEN
                                        CLR     TBPRCT          ;CLEAR TABLE PAIR COUNT
                                        SUB     #2,TSTPTR       ;BACK UP ONE CMD
                                        BR      EIF21           ;BR END IF 'F'
                                ELG21:  INC     TBPRCT          ;INCREMENT TABLE PAIR COUNT
                                        ADD     #2,TSTPTR       ;ADVANCE ONE CMD
                                        BR      EIF21           ;BR END IF 'F'
```

```
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  001001                                  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                  ;-------------------------------------------------------------------------
```

```
                                .SBTTL  -    EXERCISE/TEST TABLE
                                ;-------------------------------------------------------------------------
3245  022204  177777    EX1:    .WORD   -1
3246  022206  000000            .WORD   0               ;-,                             / FILL BUFFER
3247  022210  044002            .WORD   44002           ;DCK,ADVTRK                     / WRITE SECTOR
3248  022212  000777            .WORD   777             ;NXTUNT,                        / -1
3249  022214  177777    EX2:    .WORD   -1
3250  022216  000000            .WORD   0               ;-,                             / FILL BUFFER
3251  022220  000002            .WORD   2               ;-,                             / WRITE SECTOR
3252  022222  000003            .WORD   3               ;-,                             / READ SECTOR
3253  022224  154001            .WORD   154001          ;4CMD,DCK,ADVTRK,RAW,           / EMPTY BUFFER
3254  022226  000777            .WORD   777             ;NXTUNT,                        / -1
3255  022230  177777    EX3:    .WORD   -1
3256  022232  000000            .WORD   0               ;-,                             / FILL BUFFER
3257  022234  000002            .WORD   2               ;-,                             / WRITE SECTOR
3258  022236  000003            .WORD   3               ;-,                             / READ SECTOR
3259  022240  174001            .WORD   174001          ;4CMD,DCK,ADVTK,DACK,RAW/       / EMPTY BUFFER
3260  022242  000777            .WORD   777             ;NXTUNT,                        / -1
3261  022244  177777    EX4:    .WORD   -1
3262  022246  000003            .WORD   3               ;-,                             / READ SECTOR
3263  022250  064001            .WORD   64001           ;DCK,ADVTRK,DATACK,             / EMPTY BUFFER
3264  022252  000777            .WORD   777             ;NXTUNT,                        / -1
3265  022254  177777    EX5:    .WORD   -1
3266  022256  000003            .WORD   3               ;-,                             / READ SECTOR
3267  022260  044001            .WORD   44001           ;DCK,ADVTRK,                    / EMPTY BUFFER
3268  022262  000777            .WORD   777             ;NXTUNT,                        / -1
3269  022264  177777    EX6:    .WORD   -1
3270  022266  000000            .WORD   0               ;-,                             / FILL BUFFER
3271  022270  000002            .WORD   2               ;-,                             / WRITE SECTOR
3272  022272  000003            .WORD   3               ;-,                             / READ SECTOR
3273  022274  170001            .WORD   170001          ;4CMD,DCK,DATACK, RAW,          / EMPTY BUFFER
3274  022276  004777            .WORD   4777            ;ADVTRK, NXTUNT,                / -1
3275  022300  177777    EX7:    .WORD   -1
3276  022302  000000            .WORD   0               ;-,                             / FILL BUFFER
3277  022304  000002            .WORD   2               ;-,                             / WRITE SECTOR
3278  022306  000003            .WORD   3               ;-,                             / READ SECTOR
3279  022310  172001            .WORD   172001          ;4CMD,DCK,DACK,RAW,INCTK/       / EMPTY BUFFER
3280  022312  000003            .WORD   3               ;-,                             / READ SECTOR
3281  022314  064001            .WORD   64001           ;DCK,DATACK,ADVTRK,             / EMPTY BUFFER
3282  022316  001777            .WORD   1777            ;DDCHK, NXTUNT,                 / -1
3283                            ;-------------------------------------------------------------------------
3284                            ;       BIT#            NUMONIC         FUNCTION
3285                            ;       ----            -------         --------
3286                            ;
3287                            ;         15            4CMD            4 COMMAND SEQUENCE
3288                            ;         14            DCK             DONE CHECK
3289                            ;         13            DATACK          DO DATA CHECK
3290                            ;         12            RAW             READ AFTER WRITE FLAG
3291                            ;         11            ADVTRK          ADVANCE TRACK MODE
3292                            ;         10            INCTK           INCREMENT TRACK MODE
3293                            ;         09            DDCHK           DEL. DATA CHECK
3294                            ;         08            NXTUNT          GET NEXT UNIT, IF DONE LAST UNIT
3295
3296                            ;MOD 2.1 ----- END MODULE ----------------------------------------------
```

```
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 ----------------------------------------------
```

```
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     R2,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                          ;-----------------------------------------------------------------------
```

```
3443
3444                                        ;-------------------------------------------------------------------
3445  023276  000000                        CSEC:    .WORD   0              ;CURRENT DRV SECTOR TABLE
3446  023300  000000                                 .WORD   0
3447  023302  000000                                 .WORD   0
3448  023304  000000                                 .WORD   0
3449  023306  000000                        CTRK:    .WORD   0              ;CURRENT DRV TRK TABLE
3450  023310  000000                                 .WORD   0
3451  023312  000000                                 .WORD   0
3452  023314  000000                                 .WORD   0
3453
3454  023316  000000                        CNSCLC: .WORD   0              ;CURRENT SECTOR LOCATOR
3455  023320  000000                        CNTKLC: .WORD   0              ;CURRENT TRACK LOCATOR
3456  023322  000000                        SEEK:    .WORD   0              ;SEEK FLAG
3457  023324  000000                        DRVTST: .WORD   0              ;DRIVE TEST
3458  023326  000000                        WDCT:    .WORD   0              ;WORD COUNT
3459  023330  000000                        WDOT:    .WORD   0              ;FUNCTION WORD TO SEND OUT
3460  023332  000000                        DRVFN:   .WORD   0              ;DRIVE FUNCTION WORD
3461                                        ;MOD 2.3 ----- END MODULE ------------------------------------------
```

```
                                        .SBTTL  MOD 2.3.1 - GET A SECTOR
                                        ;---------------------------------------------------------------------
023334  005037  023704                GETSEC: CLR     UTSCDN          ;CLEAR UUT SECTOR DONE
023340  013705  002234                        MOV     UUT,R5          ;GET UNIT UNDER TST
023344  006305                              ASL     R5              ;DOUBLE FOR WRD ADR
023346  005737  014016                IFI231: TST     INITL           ;IF INITIALIZE IS
023352  001406                              BEQ     EII231          ;SET, THEN
023354  012701  023664                      MOV     #SSEC,R1        ;GET STARTING SEC ADR
023360  005021                              CLR     (R1)+           ;CLEAR UNT00 SSEC
023362  005021                              CLR     (R1)+           ;CLEAR UNT01 SSEC
023364  005021                              CLR     (R1)+           ;CLEAR UNT10 SSEC
023366  005011                              CLR     (R1)            ;CLEAR UNT11 SSEC
023370  012701  023664                EII231: MOV     #SSEC,R1        ;GET START SECTOR BASE ADR
023374  060501                              ADD     R5,R1           ;FIND ADR UUT START SECTOR (TEMP 1)
023376  011102                              MOV     (R1),R2         ;SAVE UUT STARTING SECTOR (TEMP 2)
023400  012703  023674                      MOV     #NSEC,R3        ;GET NEXT SECTOR BASE ADR
023404  060503                              ADD     R5,R3           ;FIND ADR UUT NEXT SECTOR (TEMP 3)
023406  011304                              MOV     (R3),R4         ;SAVE UUT NEXT SECTOR (TEMP 4)
023410  020237  002212                IFA231: CMP     R2,MINSEC       ;IF STARTING SECTOR < MIN. SECTOR
023414  103422                              BLO     ELA231          ;THEN
023416  010437  023710                      MOV     R4,CURSEC       ;SET CURRENT SECTOR=UUT NEXT SECTOR
023422  023737  023660  023706        IFG231: CMP     SCPSCT,INTLV    ;IF SECTOR PASS CNT< INTERLV
023430  103053                              BHIS    THF231          ;THEN BR TO THEN 'F',ELSE
023432  005737  023662                IFH231: TST     STSCFG          ;IF START SEC FLAG
023436  001405                              BEQ     ELH231          ;IS SET, THEN
023440  005037  023662                      CLR     STSCFG          ;CLEAR FLAG
023444  010204                              MOV     R2,R4           ;SET DRV NXT SEC= DRV START SEC
023446  010213                              MOV     R2,(R3)         ;SAVE DRV NXT SEC
023450  000426                              BR      IFC231          ;BR TO IF 'C'
023452  063704  023706                ELH231: ADD     INTLV,R4        ;NSEC=NSEC+INTERLV
023456  010413                              MOV     R4,(R3)         ;SAVE NEXT SEC
023460  000422                              BR      IFC231          ;BR TO IF 'C'
023462  013737  002212  023710        ELA231: MOV     MINSEC,CURSEC   ;SET CURRENT SECTOR = MIN. SECTOR
023470  013711  002212                      MOV     MINSEC,(R1)     ;SET UUT START SECTOR = MIN. SECTOR
023474  013702  002212                      MOV     MINSEC,R2       ;SET R2=MINSEC
023500  005037  023660                      CLR     SCPSCT          ;CLEAR SECTOR PASS COUNT
023504  023737  002212  002214        IFB231: CMP     MINSEC,MAXSEC   ;IF MAX. SECTOR NOT=MIN. SECTOR
023512  001443                              BEQ     ELB231          ;THEN
023514  010205                        THB231: MOV     R2,R5           ;GET UUT STARTING SECTOR
023516  063705  023706                      ADD     INTLV,R5        ;ADD SECTOR INTERLEAVE
023522  010513                              MOV     R5,(R3)         ;SAVE NEXT UUT NEXT SEC (TEMP 5)
023524  010504                              MOV     R5,R4           ;SAVE NEXT UUT NEXT SEC (TEMP 4)
023526  020437  002214                IFC231: CMP     R4,MAXSEC       ;IF NEXT SECTOR > MAX. SECTOR
023532  103432                              BLO     ELC231          ;THEN
023534  005211                              INC     (R1)            ;INCREMENT UUT STARTING SECTOR
023536  011102                              MOV     (R1),R2         ;SET UP NEW START SEC
023540  005237  023660                      INC     SCPSCT          ;INCR SECTOR PASS CNT
023544  020437  002214                IFD231: CMP     R4,MAXSEC       ;IF NXT SEC NOT = MAX SEC
023550  001417                              BEQ     ELD231          ;THEN
023552  020237  002214                IFF231: CMP     R2,MAXSEC       ;IF DRV START SEC > MAX SEC
023556  101411                              BLOS    ELF231          ;THEN
023560  012737  000001  023704        THF231: MOV     #1,UTSCDN       ;SET UUT SECTOR DONE
023566  004737  023712                      CALL    STSCDN          ;CALL MOD 2.3.1.A - SET DRIVE SECTOR DONE FLAG
023572  005011                              CLR     (R1)            ;CLEAR UUT STARTING SECTOR
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 ---------------------------------------
```

```
                                        .SBTTL  MOD 2.3.2 - GET A TRACK
                                        ;---------------------------------------------------------------------
                                GETTRK: MOV     INDITK,MAXTRK   ;GET INSIDE DIA AS SET BY OP
                                        MOV     OTDITK,MINTRK   ;GET OUTSIDE DIA AS SET BY OP
                                IFH232: TST     INITTK          ;IF INITIALIZE TRK IS
                                        BEQ     EIH232          ;SET, THEN
                                        CLR     INITTK          ;RESET INITIALIZE TRK FLG
                                        MOV     #TKTL,R1        ;GET START OF TRK TBL
                                        CLR     (R1)+           ;SET  UNT00
                                        CLR     (R1)+           ;SET  UNT01
                                        CLR     (R1)+           ;SET  UNT10
                                        CLR     (R1)            ;SET  UNT11
                                        MOV     MINTRK,CURTRK   ;SET MIN CURRENT TRK
                                EIH232: MOV     UUT,R2          ;GET UNIT UNDER TEST INDICATOR
                                        ASL     R2              ;DOUBLE FOR ADDRESSING WORDS
                                        CLR     TRKDNF          ;CLEAR TRACK DONE FLAG
                                IFA232: BIT     #2000,TRKINC    ;IF INCREMENT TRACK FLAG
                                        BNE     IFG232          ;NOT SET, THEN (USE SELECTED TRK SEQ)
                                        MOV     #TKTL,R1        ;GET DRIVE TRACK TABLE LOCATOR BASE ADR
                                        ADD     R2,R1           ;CAL. DRV. TRK. TAB. LOCATOR ADR
                                        MOV     (R1),R2         ;GET DRV.TRK. TAB. LOCATOR
                                        MOV     #TRKTBL,R3      ;GET BEGIN TRACK TABLE ADR
                                        ADD     R2,R3           ;CAL. TRACK TAB. ADR. THIS DRIVE
                                        INC     R2              ;INCREMENT DRV. TRK. TAB. LOCATOR
                                        MOV     R2,(R1)         ;SAVE DRV. TRK. TAB. LOCATOR
                                        MOVB    (R3),CURTRK     ;SAVE CURRENT TRACK
                                        INC     R3              ;INCREMENT TRACK TAB. POINTER
                                IFF232: TSTB    (R3)            ;IF NEXT TRACK
                                        BGE     ELF232          ;EQUALS -1
                                        MOV     #1,TRKDNF       ;THEN SET TRACK DONE FLAG
                                        CLR     (R1)            ;RESET DRV. TRK. TAB. LOCATOR ADR.
                                ELF232: BR      END232          ;BR TO END MOD.
                                IFG232: CMPB    CURTRK,MAXTRK   ;IF CURRENT TRK > OR = MAX TRK (O. D.)
                                        BLO     IFB232          ;THEN
                                        MOV     MINTRK,CURTRK   ;SET CURRENT TRK = MIN TRK
                                IFB232: CMPB    CURTRK,MINTRK   ;IF CURRENT TRK > OR = MIN TRK (O.D.)
                                        BLO     ELB232          ;THEN
                                        MOV     CURTRK,R1       ;GET CURRENT TRACK
                                        INC     R1              ;INCREMENT CURRENT TRACK
                                IFC232: CMPB    R1,MAXTRK       ;IF CURRENT TRK +1 < MAX TRK (I.D.)
                                        BHIS    IFD232          ;THEN
                                        BR      EID232          ;BRANCH TO END IF 'D'
                                IFD232: CMPB    R1,MAXTRK       ;IF CURRENT TRK +1 = MAX TRK
                                        BNE     IFE232          ;THEN
                                        MOV     #1,TRKDNF       ;SET TRK DONE FLAG
                                EID232: MOV     R1,CURTRK       ;SAVE CURRENT TRK +1 = CURRENT TRK
                                        BR      END232          ;BR END OF MOD.
                                IFE232: CMPB    MAXTRK,MINTRK   ;IF TRK MAX = TRK MIN
                                        BNE     ELB232          ;THEN
                                        MOV     #1,TRKDNF       ;SET TRK DONE FLAG
                                ELB232: MOV     MINTRK,CURTRK   ;SET CURRENT TRK = MIN. TRK (O.D.)
                                END232: MOV     TRKDNF,TRKDN    ;SAVE TRACK DONE FLAG
                                        CLR     TRKINC          ;CLEAR TRK INCR FLAG
                                        RTS     PC              ;
                                        ;---------------------------------------------------------------------
```

```
 3623
 3624   024230  000000                  ;-------------------------------------------------------------------
 3625   024232  000000                  TRKDNF: .WORD   0               ;TRACK DONE FLAG
 3626   024234  000000                  MINTRK: .WORD   0               ;MINIMUM TRACK - O.D.
 3627   024236  000000                  MAXTRK: .WORD   0               ;MAXIMUM TRACK - I.D.
 3628   024240  000000                  TRKINC: .WORD   0               ;INCREMENT TRK FLAG
 3629   024242  000000                  CURTRK: .WORD   0               ;CURRENT TRACK
 3630   024244  000000                  TKTL:   .WORD   0               ;DRV TRK TABLE LOCATOR
 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 ----------------------------------------
```

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

```
                                                .SBTTL  MOD U.2.3.4  - WATCH DOG TIMER
                                                ;-------------------------------------------------------------------
025104  005037  025226                  WATCH:  CLR     DNFLAG          ;CLEAR DONE FLAG
025110                                          SETPRI  #PRI00          ;SET PROCESSOR PRI=0 - ALLOW INTERRUPTS
025116  013704  025222                          MOV     DX,R4           ;SET DELAY MULT
025122  013703  025224                  BAU234: MOV     DLY,R3          ;SET DELAY
025126  005737  025226                  IBU234: TST     DNFLAG          ;IF INTERRUPTS DONE FLAG
025132  001410                                  BEQ     LBU234          ;IS SET, THEN
025134  032777  000040  177672          ICU234: BIT     #DNBIT,@CSADR   ;IF DONT BIT
025142  001023                                  BNE     XU234           ;IS NOT SET, THEN
025144  012737  010000  002276                  MOV     #BIT12,ERRTY    ;SET INTERR, BUT NO DONE ERROR
025152  000417                                  BR      XU234           ;BR TO MOD 'EXIT'
025154  005303                  LBU234: DEC     R3              ;DECREMENT DELAY COUNT
025156  001363                  UDU234: BNE     IBU234          ;DO UNIT DELAY COUNT=0
025160  005304                          DEC     R4              ;DECREMENT DELAY MULT
025162  001357                  UAU234: BNE     BAU234          ;DO UNTIL DELAY MULT=0
025164  032777  000040  177642  IEU234: BIT     #DNBIT,@CSADR   ;IF DONE BIT IS
025172  001404                          BEQ     LEU234          ;SET, THEN
025174  052737  020000  002276          BIS     #BIT13,ERRTY    ;SET DONE, BUT NO INTERRUPT ERROR
025202  000403                          BR      XU234           ;BR TO MOD 'EXIT'
025204  052737  040000  002274  LEU234: BIS     #BIT14,ERRSY    ;SET T.O. ERROR
025212                          XU234:  SETPRI  #PRI07          ;SET PROCESSOR PRI=7 - NO INTERRUPTS
025220  000207                          RTS     PC              ;RETURN TO MOD 2.3.4
                                                ;-------------------------------------------------------------------
025222  000040                  DX:     40                      ;DELAY MULT
025224  100000                  DLY:    100000                  ;DELAY
025226  000000                  DNFLAG: 0                       ;DONE FLAG
                                                ;MOD U.2.3.4 ---- END MODULE ----------------------------------------


                                                .SBTTL  MOD U.2.3/4 DELAY
                                                ;-------------------------------------------------------------------
025230  000240                  DELAY:  NOP                     ;
025232  023727  025330  000000  IFAU23: CMP     RDYWD,#0        ;IF READY WORD
025240  001430                          BEQ     XU23            ;EQUALS ZERO, THEN BR TO END IF 'A'
025242  013704  025324                  MOV     RYDX,R4         ;SET READY DELAY MULT
025246  013703  025326          BDAU23: MOV     RYDLY,R3        ;SET READY DELAY
025252  033777  025330  000052  BDBU23: BIT     RDYWD,@CSRADR   ;IF READY
025260  001020                          BNE     XU23            ;EQUAL TO "1" ,THEN BR TO END IF 'B'
025262  005303                          DEC     R3              ;ELSE DECREMENT DELAY
025264  001372                          BNE     BDBU23          ;DO UNTIL R3=0
025266  005304                          DEC     R4              ;DECREMENT DELAY MULT.
025270  001366                          BNE     BDAU23          ;DO UNTIL R4=0
025272  052737  040000  002274          BIS     #40000,ERRSY    ;SET TIME OUT ERR
025300  017737  000026  002246          MOV     @CSRADR,CSRUUT  ;GET UUT C&S REG
025306  062737  000002  025332          ADD     #2,CSRADR       ;SET CSRADR TO DB REG
025314  017737  000012  002250          MOV     @CSRADR,ESRUUT  ;GET UUT E&S REG
025322  000207                  XU23:   RTS     PC              ;RETURN TO CALLING MOD
                                                ;-------------------------------------------------------------------
025324  000040                  RYDX:   40                      ;READY MULTIPLIER
025326  100000                  RYDLY:  100000                  ;READY DELAY
025330  000000                  RDYWD:  0                       ;READY WORD - TEST FOR DEVICE READY
025332  000000                  CSRADR: 0                       ;C&S REG OF UNIT- WAITING FOR
                                                ;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 ERR 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                IFO242:   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
```

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  4030  027074  000000                          ESREV:  0
  4031                                          ;MOD 2.4.2 ----- END MODULE ----------------------------------------
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                                        .SBTTL  MOD 2.4.2.1 - EVALUATE DRIVE RESPONSE
                                        ;-------------------------------------------------------------------
027076  013701  025410                EVDVRE: MOV     TSTEV,R1        ;GET TEST FUNCTION
027102  042701  177771                        BIC     #177771,R1      ;CLEAR BITS
027106  032701  000006                        BIT     #6,R1           ;IF NOT FILL/EMPTY BUFFER
027112  001445                              BEQ     6$              ;THEN
027114  005737  002172                      TST     RXXX            ;IF RXXX
027120  001421                              BEQ     1$              ;AND
027122  032737  000002  002234              BIT     #2,UUT          ;SIDE # SELECTED
027130  001403                              BEQ     2$              ;THEN
027132  012701  001000                      MOV     #1000,R1        ;SET R1 TO TEST SIDE #1 SELECT
027136  000401                              BR      3$              ;BR TO TEST RESPONSE
027140  005001                        2$:   CLR     R1              ;SET R1 TO TEST SIDE #0 SELECT
027142  013702  002250                3$:   MOV     ESRUUT,R2       ;GET ESR UNIT UNDER TEST
027146  042702  176777                      BIC     #176777,R2      ;CLEAR ALL BITS BUT SIDE SELECT
027152  020102                              CMP     R1,R2           ;IF SIDE SELECT
027154  001403                              BEQ     1$              ;NOT=SIDE RESPONDING THEN
027156  052737  001000  002274              BIS     #1000,ERRSY     ;SET WRONG SIDE RESPONDING SYS ERR
027164  032737  000001  002234        1$:   BIT     #1,UUT          ;IF DRIVE #1 SELECTED
027172  001403                              BEQ     4$              ;THEN
027174  012701  000400                      MOV     #400,R1         ;SET R1 TO TEST DRIVE #1 SEL
027200  000401                              BR      5$              ;BR TO TEST RESPONSE
027202  005001                        4$:   CLR     R1              ;SET R1 TO TEST DRIVE #0 SEL
027204  013702  002250                5$:   MOV     ESRUUT,R2       ;GET ESR UNIT UNDER TEST
027210  042702  177377                      BIC     #177377,R2      ;CLEAR ALL BITS BUT DRIVE RESPONDING
027214  020102                              CMP     R1,R2           ;
027216  001403                              BEQ     6$              ;
027220  052737  000400  002274              BIS     #400,ERRSY      ;SET WRONG DRIVE RESPONDING SYS ERR
027226  000207                        6$:   RTS     PC              ;
                                        ;MOD 2.4.2.1 ----- END MODULE ----------------------------------------
```

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

```
                                        .SBTTL  MOD 2.4.3.1 - UPDATE HARD ERROR STATISTICS
                                        ;-----------------------------------------------------------------
                                        ;
027670  000240                  UDHDST: NOP                     ;
027672  032737  000007  027620  IA2431: BIT     #7,CLASWD       ;IF ERROR CLASS WORD-
027700  001007                          BNE     X2431           ;CLASS=HD(7), THEN
027702  013701  027622                  MOV     LOGOFF,R1       ;GET ERROR LOG OFFSET
027706  062701  007354                  ADD     #CKSML,R1       ;ERR LOG ADR=ERR LOG OFF + CKSML ADR
027712  063701  002240                  ADD     UUTOFF,R1       ;UUT ERR LOG ADR=UUT OFFSET + ERR LOG ADR
027716  005211                          INC     (R1)            ;INCREMENT THE ERROR LOG
027720  000207                  X2431:  RTS     PC              ;RETURN
                                        ;MOD 2.4.3.1 ----- END MODULE -----------------------------------


                                        .SBTTL  MOD 2.4.3.2 - UPDATE CRC STATISTICS
                                        ;-----------------------------------------------------------------
                                        ;
027722  000240                  UDCRST: NOP                     ;
027724  032737  020000  027626  IA2432: BIT     #BIT13,TSTCK    ;IF TEST=DATA CHECK
027732  001425                          BEQ     LA2432          ;BIT SET, THEN
027734  032737  000010  002276  IB2432: BIT     #BIT03,ERRTY    ;IF ERR TYPE=DATA ERR
027742  001007                          BNE     LB2432          ;NOT SET, THEN
027744  012737  000020  027622          MOV     #20,LOGOFF      ;SET LOG OFFSET=CRC BAD LOG
027752  012737  000006  027624          MOV     #6,RTOFF        ;SET RETRY OFFSET=CRC ERR
027760  000420                          BR      IC2432          ;BR TO 'C'
027762  012737  000050  027622  LB2432: MOV     #50,LOGOFF      ;SET DATA LOG OFFSET
027770  005037  030474                  CLR     RTMASK          ;CLEAR RETRY MASK
027774  012737  000012  027624          MOV     #12,RTOFF       ;SET DUMMY DATA RETRY COUNTER OFFSET
030002  004737  030344                  CALL    SFERLG          ;CALL SOFT ERROR LOGGER
030006  012737  000010  027622  LA2432: MOV     #10,LOGOFF      ;SET LOG OFFSET=CRC ERR LOG
030014  012737  000006  027624          MOV     #6,RTOFF        ;SET RETRY OFFSET=CRC ERR
030022  032737  010000  027626  IC2432: BIT     #BIT12,TSTCK    ;IF READ AFTER WRITE (RAW)
030030  001407                          BEQ     LC2432          ;BIT SET, THEN
030032  012737  000020  030474          MOV     #BIT04,RTMASK   ;SET RETRY MASK=CRC
030040  052737  000002  030474          BIS     #BIT1,RTMASK    ;SET RETRY MASK=WRITE
030046  000406                          BR      EC2432          ;BR TO END 'C'
030050  012737  000020  030474  LC2432: MOV     #BIT04,RTMASK   ;SET RETRY MASK=CRC
030056  052737  000004  030474          BIS     #BIT02,RTMASK   ;SET RETRY MASK=READ
030064  004737  030344          EC2432: CALL    SFERLG          ;CALL SOFT ERROR LOGGER
030070  000207                          RETURN                  ;RETURN
                                        ;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                                    .SBTTL  MOD 2.4.4 - EVALUATE UNIT ERROR CODE
4321                                    ;-------------------------------------------------------------------
4322
4323  030476  013701  033544            EVUTEC: MOV     XERUUT,R1       ;GET ERR CODE & SAVE
4324  030502  042701  177400                    BIC     #177400,R1      ;CLEAR TOP BYTE
4325  030506  005701                    IFA244: TST     R1              ;IF ERRCODE
4326  030510  001443                            BEQ     END244          ;NOT=0, THEN
4327  030512  006201                            ASR     R1              ;SHIFT ERR CODE FOR LOOK UP
4328  030514  006201                            ASR     R1              ;AND ADDRESSING
4329  030516  062701  030624                    ADD     #ECCLAS,R1      ;CAL ERR TABLE CLASSIFICATION ADR
4330  030522  011102                            MOV     (R1),R2         ;GET ERR CODE CLASSIFICATION WORD
4331  030524  105702                    IFB244: TSTB    R2              ;IF LOWER BYTE
4332  030526  001003                            BNE     IFC244          ;EQUALS 0, THEN
4333  030530  050237  002274                    BIS     R2,ERRSY        ;SET ERR ONTO ERRSY
4334  030534  000431                            BR      END244          ;BR TO END IF 'B'
4335  030536  122702  000300            IFC244: CMPB    #300,R2         ;IF LOW BYTE
4336  030542  001024                            BNE     ELC244          ;EQUALS 300, THEN
4337  030544  022737  000003  030622    IFD244: CMP     #3,FNEV4        ;IF FUNCTION WAS
4338  030552  001004                            BNE     IFE244          ;A READ, THEN
4339  030554  052737  002000  002276            BIS     #2000,ERRTY     ;SET READ ERR
4340  030562  000416                            BR      END244          ;BR TO END IF 'B'
4341  030564  022737  000002  030622    IFE244: CMP     #2,FNEV4        ;IF FUNCTION WAS
4342  030572  001004                            BNE     ELE244          ;A WRITE, THEN
4343  030574  052737  004000  002276            BIS     #4000,ERRTY     ;SET WRITE ERROR
4344  030602  000406                            BR      END244          ;BR TO END IF 'B'
4345  030604  052737  040000  002276    ELE244: BIS     #40000,ERRTY    ;SET UNK ERROR
4346  030612  000402                            BR      END244          ;BR TO END IF 'B'
4347  030614  050237  002276            ELC244: BIS     R2,ERRTY        ;SET CLASSIFIED ERROR ONTO ERRTY
4348  030620  000207                    END244: RTS     PC              ;RETURN
4349                                    ;-------------------------------------------------------------------
4350  030622  000000                    FNEV4:  0                       ;FUNCTION FOR EVALUATION
4351                                    ;-------------------------------------------------------------------
4352  030624  000000                    ECCLAS: .WORD   0               ;ERR CODE # 00  ---> NOT USED (NO ERROR)
4353  030626  000001                            .WORD   1               ;ERR CODE # 10  ---> SEEK
4354  030630  000001                            .WORD   1               ;ERR CODE # 20  ---> SEEK
4355  030632  000000                            .WORD   0               ;ERR CODE # 30  ---> NOT ASSIGNED
4356  030634  004000                            .WORD   4000            ;ERR CODE # 40  ---> SYS ERR
4357  030636  000001                            .WORD   1               ;ERR CODE # 50  ---> SEEK
4358  030640  002000                            .WORD   2000            ;ERR CODE # 60  ---> SELF DIAG ERR
4359  030642  000300                            .WORD   300             ;ERR CODE # 70  ---> READ OR WRITE ERR
4360  030644  004000                            .WORD   4000            ;ERR CODE # 100 ---> SYS ERR
4361  030646  000300                            .WORD   300             ;ERR CODE # 110 ---> READ OR WRITE ERR
4362  030650  000300                            .WORD   300             ;ERR CODE # 120 ---> READ OR WRITE ERR
4363  030652  000300                            .WORD   300             ;ERR CODE # 130 ---> READ OR WRITE ERR
4364  030654  000002                            .WORD   2               ;ERR CODE # 140 ---> CRC ERR
4365  030656  000001                            .WORD   1               ;ERR CODE # 150 ---> SEEK ERR
4366  030660  000300                            .WORD   300             ;ERR CODE # 160 ---> READ OR WRITE ERR
4367  030662  000300                            .WORD   300             ;ERR CODE # 170 ---> READ OR WRITE ERR
4368  030664  000002                            .WORD   2               ;ERR CODE # 200 ---> CRC ERR
4369  030666  000000                            .WORD   0               ;ERR CODE # 210 ---> NOT ASSIGNED
4370  030670  002000                            .WORD   2000            ;ERR CODE # 220 ---> SELF DIAG ERR
4371  030672  004000                            .WORD   4000            ;ERR CODE # 230 ---> SYS ERR
4372  030674  020000                            .WORD   20000           ;ERR CODE # 240 ---> DENSITY ERR
4373  030676  020000                            .WORD   20000           ;ERR CODE # 250 ---> DENSITY ERR
4374  030700  000000                            .WORD   0               ;ERR CODE # 260 ---> NOT ASSIGNED
4375                                    ;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 ----------------------------------------------
```

```
                                        .SBTTL  MOD 2.5.1 - PRINT RETRY
                                        ;---------------------------------------------------------------------
                                        ;
031676  000240                  PTRTY:  NOP                     ;
031700  005737  002304          IFA251: TST     RETRY           ;IF RETRY
031704  001500                          BEQ     END251          ;NOT=0, THEN
031706  032737  000001  002304  IFB251: BIT     #1,RETRY        ;IF RETRY
031714  001405                          BEQ     IFC251          ;IS SEEK, THEN
031716  013702  002306                  MOV     SEEKRT,R2       ;SET SEEK RT COUNT
031722  012701  032110                  MOV     #MSKRT,R1       ;SET SEEK RT MSG
031726  000465                          BR      EIB251          ;BR TO END IF 'B'
031730  032737  000002  002304  IFC251: BIT     #2,RETRY        ;IF RETRY
031736  001427                          BEQ     IFE251          ;IS WRT, THEN
031740  032737  000030  002304  IFD251: BIT     #30,RETRY       ;IF RETRY
031746  001416                          BEQ     ELD251          ;IS DATA OR CRC , THEN
031750  032737  000010  002304  IFG251: BIT     #10,RETRY       ;IF RETRY
031756  001405                          BEQ     ELG251          ;IS DATA, THEN
031760  013702  002316                  MOV     DATART,R2       ;SET DATA RT COUNT
031764  012701  032134                  MOV     #MDWTRT,R1      ;SET DATA WRT MSG
031770  000444                          BR      EIB251          ;BR TO END IF 'B'
031772  013702  002314          ELG251: MOV     CRCERT,R2       ;SET CRC RETRY COUNT
031776  012701  032270                  MOV     #MCWTRT,R1      ;SET CRC WRT MSG
032002  000437                          BR      EIB251          ;BR TO END IF 'B'
032004  013702  002326          ELD251: MOV     WRTRT,R2        ;SET WRT RT COUNT
032010  012701  032166                  MOV     #MWTRT,R1       ;SET WRT RT MSG
032014  000432                          BR      EIB251          ;BR TO END IF 'B'
032016  032737  000004  002304  IFE251: BIT     #4,RETRY        ;IF RETRY
032024  001430                          BEQ     END251          ;IS READ, THEN
032026  032737  000030  002304  IFF251: BIT     #30,RETRY       ;IF RETRY
032034  001416                          BEQ     ELF251          ;IS DATA OR CRC, THEN
032036  032737  000010  002304  IFH251: BIT     #10,RETRY       ;IF RETRY
032044  001405                          BEQ     ELH251          ;IS DATA, THEN
032046  013702  002316                  MOV     DATART,R2       ;SET DATA RT COUNT
032052  012701  032213                  MOV     #MDRDRT,R1      ;SET DATA READ RT MSG
032056  000411                          BR      EIB251          ;BR TO END IF 'B'
032060  013702  002314          ELH251: MOV     CRCERT,R2       ;SET CRC RETRY COUNT
032064  012701  032321                  MOV     #MCRDRT,R1      ;SET CRC READ MSG
032070  000404                          BR      EIB251          ;BR TO END IF 'B'
032072  013702  002324          ELF251: MOV     READRT,R2       ;SET READ RT COUNT
032076  012701  032244                  MOV     #MRDRT,R1       ;SET READ RT MSG
032102  004737  004536          EIB251: CALL    PRTB1S          ;PRINT RETRY # & TYPE
032106  000207                  END251: RTS     PC              ;RETURN
                                        ;---------------------------------------------------------------------
032110  040445  051440  042505  MSKRT:  .ASCIZ  /%A SEEK RETRY#%D2%N/
032134  040445  042040  052101  MDWTRT: .ASCIZ  /%A DATA WRITE RETRY#%D2%N/
032166  040445  053440  044522  MWTRT:  .ASCIZ  /%A WRITE RETRY#%D2%N/
032213     045  020101  040504  MDRDRT: .ASCIZ  /%A DATA READ RETRY#%D2%N/
032244  040445  051040  040505  MRDRT:  .ASCIZ  /%A READ RETRY#%D2%N/
032270  040445  041440  041522  MCWTRT: .ASCIZ  /%A CRC WRITE RETRY#%D2%N/
032321     045  020101  051103  MCRDRT: .ASCIZ  /%A CRC READ RETRY#%D2%N/
        032352                          .EVEN
                                        ;MOD 2.5.1 ----- END MODULE ----------------------------------------
```

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

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

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

```
                                .SBTTL  SOFTWARE PARAMETER CODING SECTION

                                ;++
                                ; THE SOFTWARE 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.
                                ;--

035134                                  BGNSFT

035136                                  GPRML   MSG6,2,1,YES
035144                                  XFERF   1$
035146                                  GPRML   MSG7,2,2,YES
035154                          1$:     GPRMD   MSG8,4,0,177777,0,6,YES
035166                                  GPRMD   MSG11,6,0,177777,0,6,YES
035200                                  GPRMD   MSG14,10,0,177777,0,6,YES
035212                                  GPRMD   MSG9,24,D,177777,1.,10000.,YES
035224                                  GPRML   MSG15,12,1,YES
035232                                  GPRML   MSG16,12,2,YES
035240                                  GPRML   MSG17,2,100,YES
035246                                  XFERF   4$
035250                                  GPRML   MSG18,12,4,YES
035256                                  GPRML   MSG19,12,10,YES
035264                                  GPRML   MSG20,12,20,YES
035272                                  GPRML   MSG21,12,40,YES
035300                          4$:     GPRML   MSG22,2,200,YES
035306                                  XFERF   5$
035310                                  GPRMD   MSG23,14,D,177777,0.,76.,YES
035322                                  GPRMD   MSG24,16,D,177777,0.,76.,YES
035334                          5$:     GPRML   MSG25,2,400,YES
035342                                  XFERF   6$
035344                                  GPRMD   MSG26,20,D,177777,1.,26.,YES
035356                                  GPRMD   MSG27,22,D,177777,1.,26.,YES
035370                          6$:     GPRML   MSG5,0,177777,YES
035376                                  EXIT    SFT


                                .EVEN

035400                                  ENDSFT
```

```
4878
4879                000015
4880                000012
4881   035400       054122  054130  042440   MSG5:   .ASCIZ  /RXXX EXPANSION TYPE <CR> /
4882   035432       042510  050114  052040   MSG6:   .ASCIZ  /HELP TEST SETUP /
4883   035453          105  042530  041522   MSG7:   .ASCII  /EXERCISE OPTIONS/<CR><LF>
4884   035475          040  020040  020060           .ASCII  /   0 = WRITE-READ-DATA CK & READ-DATA CK/<CR><LF>
4885   035547          040  020040  020061           .ASCII  /   1 = WRITE ONLY/<CR><LF>
4886   035572       020040  031040  036440           .ASCII  /   2 = WRITE-READ/<CR><LF>
4887   035615          040  020040  020063           .ASCII  /   3 = WRITE-READ-DATA CHECK/<CR><LF>
4888   035653          040  020040  020064           .ASCII  /   4 = READ-DATA CHECK ONLY/<CR><LF>
4889   035710       020040  032440  036440           .ASCII  /   5 = READ ONLY (CRC CHECK)/<CR><LF>
4890   035746       020040  033040  036440           .ASCII  /   6 = WRITE-READ-DATA CHECK ON ALTERNATE DRIVES/<CR><LF>
4891   036030       040504  040524  050040           .ASCII  /DATA PATTERN OPTIONS/<CR><LF>
4892   036056       020040  030040  036440           .ASCII  /   0 = RANDOM/<CR><LF>
4893   036075          040  020040  020061           .ASCII  /   1 = ZEROS/<CR><LF>
4894   036113          040  020040  020062           .ASCII  /   2 = ONES/<CR><LF>
4895   036130       020040  031440  036440           .ASCII  /   3 = FLOATING ZERO/<CR><LF>
4896   036156       020040  032040  036440           .ASCII  /   4 = FLOATING ONE/<CR><LF>
4897   036203          040  020040  020065           .ASCII  /   5 = 125/<CR><LF>
4898   036217          040  020040  020066           .ASCII  /   6 = 333/<CR><LF>
4899   036233          124  040522  045503           .ASCII  /TRACK SEQUENCE OPTIONS/<CR><LF>
4900   036263          040  020040  020060           .ASCII  /   0 = RANDOM/<CR><LF>
4901   036302       020040  030440  036440           .ASCII  /   1 = INCREMENT O.D./<CR><LF>
4902   036331          040  020040  020062           .ASCII  /   2 = DECREMENT I.D./<CR><LF>
4903   036360       020040  031440  036440           .ASCII  /   3 = INCREMENT O.D.-DECREMENT I.D./<CR><LF>
4904   036426       020040  032040  036440           .ASCII  /   4 = BOUNCE BETWEEN I.D. & O.D./<CR><LF>
4905   036471          040  020040  020065           .ASCII  /   5 = BOUNCE BETWEEN INCR. O.D. & DECR. I.D./<CR><LF>
4906   036550       020040  033040  036440           .ASCII  /   6 = BOUNCE BETWEEN O.D. & DECR. I.D./<CR><LF>
4907   036621          040  020040  020040           .ASCII  /      (O.D. = OUTSIDE DIA. & I.D. = INSIDE DIA.)/<CR><LF>
4908   036703          055  042076  053105           .ASCII  /->DEVICE FATAL THRESHOLD LVL=NO. OF HARD ERRS THAT CAUSE DEVICE
4909   037016       020040  043111  042040           .ASCII  /  IF DRS "EVL" FLAG IS SET, BUT HARD ERR WILL STILL LOG AS A HA
4910   037126       020040  044124  020105           .ASCII  /  THE "EVL" FLAG WILL CAUSE 10 RETRIED SOFT ERRS TO BECOME A HA
4911   037235          124  050131  020105           .ASCIZ  /TYPE "CR" TO CONTINUE/
4912   037263          105  042530  041522   MSG8:   .ASCIZ  /EXERCISE #       (0-6)/
4913   037312       040504  040524  050040   MSG11:  .ASCIZ  /DATA PATTERN #   (0-6)/
4914   037341          124  040522  045503   MSG14:  .ASCIZ  /TRACK SEQUENCE # (0-6)/
4915   037370       042504  044526  042503   MSG9:   .ASCIZ  /DEVICE FATAL THRESHOLD LEVEL/
4916   037425          122  047125  052040   MSG15:  .ASCIZ  /RUN TEST IN DOUBLE DENSITY   /
4917   037463          122  047125  052040   MSG16:  .ASCIZ  /RUN TEST IN DELETED DATA MODE/
4918   037521          101  054516  050040   MSG17:  .ASCIZ  /ANY PROGRAM CONTROL FLAGS    /
4919   037557          040  020040  042522   MSG18:  .ASCIZ  /   RETRY ON ERROR, LOG SOFT & HARD ERRS/
4920   037627          040  020040  042522   MSG19:  .ASCIZ  /   RECALIBRATE ON SEEK ERRORS        /
4921   037677          040  020040  051120   MSG20:  .ASCIZ  /   PRINT ONLY 10 DATA ERRORS & CONTINUE/
4922   037747          040  020040  046103   MSG21:  .ASCIZ  /   CLEAR STATISTICAL TABLES NEXT PASS  /
4923   040017          115  042117  043111   MSG22:  .ASCIZ  /MODIFY TRACK ADDRESS LIMITS  /
4924   040055          040  020040  052517   MSG23:  .ASCIZ  /   OUTER DIAMETER ADR #/
4925   040105          040  020040  047111   MSG24:  .ASCIZ  /   INNER DIAMETER ADR #/
4926   040135          115  042117  043111   MSG25:  .ASCIZ  /MODIFY SECTOR ADDRESS LIMITS /
4927   040173          040  020040  044515   MSG26:  .ASCIZ  /   MIN. SECTOR ADR #/
4928   040220       020040  046440  054101   MSG27:  .ASCIZ  /   MAX. SECTOR ADR #/
4929
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*  2354   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*   3079    3089*   3129#   4567*
DRVFN   023332          3397    3431    3437    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  030624          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#
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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#	

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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    031176           4436#   4453
ERT10   031371           4445#   4462
ERT11   031423           4446#   4463
ERT12   031435           4447#   4464
ERT13   031450           4448#   4465
ERT14   031507           4449#   4466
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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  002250          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$BGN = 000040           785#    811     913     975    1347    1366    1552    1605    1613    1875    1889    2057    2089
                        2210    2262    2333    2335    2350    2356    2367    2379    2542    2612    3055    4736    4797
                        4804    4838    4864    4948    4950    4951    4956    4957    4962    4963
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F$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 = 000010   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
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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#
IACO    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#
ICATDP  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#
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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#
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IFC25   031030          4401    4409#
IFC251  031730          4500    4504#
IFC40   032614          4607    4615#
IFDI1   011744          1977    1981#
IFD12   014430          2470    2472#
IFD121  015156          2567    2570#
IFD21   021622          3169#
IFD22   022402          3306    3317#
IFD23   022742          3385    3388#
IFD231  023544          3512#
IFD232  024146          3606    3608#
IFD233  024344          3651    3655    3657#
IFD234  024612          3703#
IFD241  025570          3868#
IFD242  026444          3953    3956#
IFD244  030544          4337#
IFD25   031156          4429#
IFD251  031740          4506#
IFEI1   011764          1971    1975    1985#
IFE12   014444          2475#
IFE121  015164          2572#
IFE21   022136          3220#
IFE22   022430          3320    3322#
IFE23   023064          3406    3408    3410#
IFE232  024170          3609    3613#
IFE233  024302          3647#
IFE234  024744          3702    3721#
IFE241  025604          3867    3869    3871#
IFE242  026460          3957    3959#
IFE244  030564          4338    4341#
IFE25   031074          4418#
IFE251  032016          4505    4519#
IFFI1   011772          1987#
IFF12   014502          2481#
IFF121  015174          2574#
IFF20   021122          3071#
IFF21   021510          3148#
IFF23   023072          3412#
IFF231  023552          3514#
IFF232  024064          3593#
IFF241  025614          3873#
IFF242  026722          3997    4000#
IFF25   031060          4415#
IFF251  032026          4521#
IFGI1   011776          1989#
IFG12   014576          2471    2473    2488    2494#
IFG20   021142          3075#
IFG21   021714          3163    3165    3184#
IFG23   023040          3383    3387    3403#
IFG231  023422          3486#
IFG232  024102          3583    3598#
IFG242  026506          3940    3965#
IFG251  031750          4508#
IFHI1   012040          1988    1998#
IFH12   014400          2465#
IFH121  015076          2558#
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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#
IFII1   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#
IFJI1   012114          2010#
IFJ21   022030          3198    3203#
IFJ23   022706          3379#
IFJ241  025762          3887#
IFJ242  026546          3968    3973#
IFKI1   012124          2013#
IFK20   020700          3036#
IFK21   021576          3164#
IFK234  024532          3692#
IFK241  025770          3889#
IFK242  026574          3976    3979#
IFLI1   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#
```

```
SEQ4    020272            2910    2938#
SEQ5    020340            2911    2950#
SEQ6    020422            2912    2965#
SEQ7    020476            2913    2977#   2982    2985    2987
SETUP   011364            1910    1912#
SE1     033416            4596    4650#
SFERLG  030344            4210*   4220*   4248*   4290#
SFERR   021446            3045*   3117*   3130#
SFPTBL  002172 G           890#
SFTSTS  033552            1260    4716#
SOFT  = 000003 G          1057#   4406
SSEC    023664            3472    3477    3538#
STCNTR  027616            4080*   4087    4102*   4103    4147#
STDVDN  032352            3061*   4550#
STERRG  027614            4079*   4081    4083*   4085*   4146#
STKSEQ  017752            2751*   2882#
STSCDN  023712            3517*   3528*   3556#
STSCFG  023662            3488    3490*   3524*   3537#
STSTPA  017376            2747*   2780#
SUM     017744            2781*   2851*   2856    2857*   2858    2862#
SUT     002232            1097#   1906*   1992*   1995*   2001*   2004*   2015*   2018*   2023*   2026*   2226*   2466*   2468*
                          2472    2493*   2494    2540    2609    3046    3312    3322    4575
SUTCV   004754            1487*   1492*   1494*   1498*   1500*   1504#   2225
SUTDRP  013440            2225*   2226    2227    2233#   2703*
SUTPOS  015302            2459*   2483*   2540    2582*   2601#   2609    2703
SUTPTR  021426            1510    2348*   3046    3051*   3052    3079*   3116*   3122#
SVCGBL= 000000             785#    794#    828     836     847     865     890    1208    1251    1347    1366    1613    1875
                          1889    2057    2089    2210    2262    4797    4838    4947#
SVCINS= 177777             785#    791#    828     836     847     865     890    1208    1248    1256    1259    1260    1288
                          1348    1368    1370    1373    1649    1743    1755    1765    1895    1896    1897    1900    1901
                          1909    1910    1921    1922    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    2629    2630    2680    2696    2704    3055    3114    3148
                          3149    3379    3380    3764    3782    3880    3881    4736    4797    4799    4800    4801    4802
                          4804    4811    4838    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    4875    4947    4951    4957
SVCSUB= 177777             785#    793#    2335    2356
SVCTAG= 177777             785#    795#    878     911     1348    1368    1649    1933    2070    2130    2230    2270    2350
                          2367    2578    2630    2680    3114    4736    4811    4875    4951    4956    4957    4962
SVCTST= 177777             785#    792#    2333
SVUTRG  033516            4686*   4693*   4699#
SWREG   002204             897#    2372    2394    2412    2419    2424    2613    2754    2756*   3153    3384    3391    3873
                          4293
SYFT  = 000000 G          1060#   4621
SYSERR= 004000 G          1065#   2191
SYSE10  033122            4640#   4656
SYSE11  033151            4641#   4657
SYSE12  033161            4642#   4658
SYSE13  033171            4643#   4659
SYSE14  033225            4644#   4660
SYSE15  033242            4645#   4661
SYSE16  033302            4646#   4662
SYSE4   032700            4634#   4650
SYSE5   032733            4635#   4651
```

```
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
```

```
INLOOP  3148  3379
LASTAD  4947
MANUAL  2628
M$BYTE   828#
M$CHEC  2379#  4804#  4864#
M$CNTO  2630#  4799#  4800#  4801#  4802#  4840#  4842#  4843#  4844#  4845#  4846#  4847#  4848#  4849#  4851#
        4852#  4853#  4854#  4855#  4857#  4858#  4859#  4861#  4862#  4863#
M$COUN  1256#  1259#  1260#  1288#  1370#  1373#  1743#  1755#  1765#  1926#  2035#  2038#  2220#  2228#  3880#
        3881#
M$DATA   828#   836#  1208#
M$DECR   878#   911#   913#  1348#  1368#  1552#  1649#  1879#  1933#  2070#  2130#  2230#  2270#  2350#  2367#
        2578#  2680#  3114#  4736#  4811#  4875#  4948#  4951#  4957#
M$DEFA  2630#  4799#  4800#  4801#  4802#  4840#  4842#  4843#  4844#  4845#  4846#  4847#  4848#  4849#  4851#
        4852#  4853#  4854#  4855#  4857#  4858#  4859#  4861#  4862#  4863#
M$ENDE   878#   911#   913#  1348#  1368#  1552#  1649#  1933#  2070#  2130#  2230#  2270#  2350#  2367#  2578#
        2680#  3114#  4736#  4811#  4875#  4948#
M$EXCP  4799#  4800#  4801#  4802#  4843#  4844#  4845#  4846#  4857#  4858#  4861#  4862#
M$EXIT  2379#  4804#  4864#
M$EXSE  2379#  4804#  4864#
M$EXTJ  2379#  4804#  4864#
M$GEN    828#   836#   847#   865#   878#   890#   911#  1208#  1251#  1347#  1348#  1366#  1368#  1613#  1649#
        1875#  1889#  1933#  2057#  2070#  2089#  2130#  2210#  2230#  2262#  2270#  2333#  2335#  2350#  2356#
        2367#  2578#  2630#  2680#  3114#  4736#  4797#  4811#  4838#  4875#  4947#  4951#  4956#  4957#  4962#
M$GENB  2630#
M$GETS   878#   911#   913#  1348#  1368#  1552#  1649#  1879#  1933#  2070#  2130#  2230#  2270#  2350#  2367#
        2578#  2680#  3114#  4736#  4804#  4811#  4841#  4850#  4856#  4860#  4864#  4875#  4948#
M$GETT  2379#  4804#  4841#  4850#  4856#  4860#  4864#
M$GNGB   811#   828#   836#   847#   865#   890#   975#  1208#  1251#  1347#  1366#  1605#  1613#  1875#  1889#
        2057#  2089#  2210#  2262#  4797#  4838#  4947#
M$GNIN   828#   836#   847#   865#   890#  1208#  1248#  1256#  1259#  1260#  1288#  1348#  1368#  1370#  1373#
        1649#  1743#  1755#  1765#  1895#  1896#  1897#  1900#  1901#  1909#  1910#  1921#  1922#  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#  2629#  2630#  2680#  2696#  2704#  3055#  3114#
        3148#  3149#  3379#  3380#  3764#  3782#  3880#  3881#  4736#  4797#  4799#  4800#  4801#  4802#  4804#
        4811#  4838#  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#  4875#  4947#  4951#
        4957#
M$GNLS  2578#  2630#  2680#  3114#
M$GNSU  2335#  2356#
M$GNTA   878#   911#  1348#  1368#  1649#  1933#  2070#  2130#  2230#  2270#  2350#  2367#  4736#  4811#  4875#
        4951#  4956#  4957#  4962#
M$GNTE  2333#
M$HAPT   828#
M$HNAP   828#
M$INCR   811#   865#   890#   975#  1248#  1256#  1259#  1260#  1288#  1347#  1348#  1366#  1368#  1370#  1373#
        1605#  1613#  1649#  1743#  1755#  1765#  1875#  1889#  1895#  1896#  1900#  1909#  1921#  1926#  1928#
        1929#  1932#  1933#  2035#  2036#  2038#  2057#  2065#  2068#  2069#  2070#  2089#  2099#  2102#  2108#
        2111#  2122#  2125#  2128#  2130#  2153#  2155#  2168#  2210#  2220#  2228#  2230#  2262#  2270#  2333#
        2335#  2350#  2356#  2366#  2367#  2376#  2378#  2379#  2439#  2542#  2578#  2612#  2628#  2630#  2680#
        2696#  2704#  3055#  3114#  3148#  3379#  3764#  3782#  3880#  3881#  4736#  4797#  4838#  4950#  4951#
        4957#
M$LDRO  1896#  1900#  1909#  1921#  2065#  2068#  2099#  2102#  2108#  2111#  2122#  2125#  2155#  2704#  3764#
        3782#
M$MCHI   785#
M$MCLO   785#
```

```
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)