

RX02

SS PERF EXER  
CNRXDAO

AH-T474A-MC  
FICHE 1 OF 1

MAY 1983  
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The main body of the document is a large grid of data, likely a performance or exercise log. It consists of approximately 15 columns and 20 rows of small, illegible text or numbers. The data is organized in a structured format, possibly representing individual test results or performance metrics over time.



IDENTIFICATION

PRODUCT CODE: AC-T473A-MC  
PRODUCT NAME: CNRXDAO RX02 SS PERF EXER  
PRODUCT DATE: DEC 1982  
MAINTAINER: DIAGNOSTICS SERVICES/ISS  
AUTHOR: L. S. PRUCHA

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PROGRAM HEADER AND TABLES  
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## 1.0 GENERAL INFORMATION

### 1.1 PROGRAM ABSTRACT

THIS PROGRAM EXERCISES TWO RX02 SUBSYSTEMS (FOUR DRIVES), IN SBC-11/21 PROCESSOR, 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

SBC-11/21 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

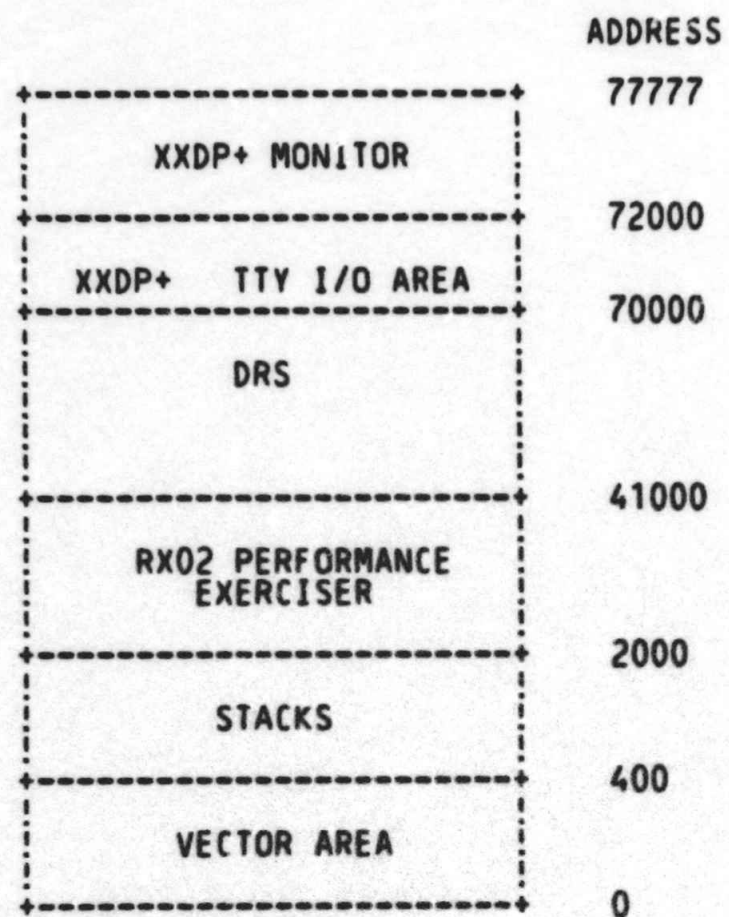
NONE

### 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 A SUPERVISOR DIAGNOSTIC SPECIFIC TO SBC-11/21 PROCESSOR: 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 &lt;CR&gt;

THIS WORD IS FOR FUTURE EXPANSION, ANSWER WITH A  
CARRIAGE RETURN.



### 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 RX21/RX02 SUBSYSTEM.

3.7 ERROR NUMBERS

ERROR	- TYPE	- ERR #
SEEK	- SOFT	- 0 -32
CRC	- SOFT	- 1 -33
CKSUM	- HARD	- -34
DATA	- SOFT	- 3 -35
DEL. DATA UNEX	- HARD	- -37
DEL. DATA MISSING	- HARD	- -38
UNK ERR	- HARD	- -40
FILL/EMPTY BUFFER	- HARD	- -41
READ	- SOFT	- 10-42
WRITE	- SOFT	- 11-43
INTER-BUT NO DONE	- HARD	- -44
DONE-BUT NO INTER	- HARD	- -45
ERR-BUT NO ERR BIT	- HARD	- -46
ERR BIT SET	- HARD	- -47

NO DONE ON INIT	- SYS FATAL	- 128
NO DONE ON FUNCTION	- DEV FATAL	- 65
NO DRIVE RDY	- DEV FATAL	- 66
NO SIDE RDY	- DEV FATAL	- 67
NO DONE AFTER RD STA	- DEV FATAL	- 68
WRG DRV RESPOND	- SYS FATAL	- 133
WRG SIDE RESPOND	- SYS FATAL	- 134
DISKETT WRG DEN	- DEV FATAL	- 73
DENSITY ERR	- DEV FATAL	- 74
T.O. ON "TR" OR "DONE"	- SYS FATAL	- 139
SYS ERR	- SYS FATAL	- 140
INITIALIZE ERROR	- DEV FATAL	- 200
ADDRESSING ERROR	- SYS FATAL	- 400

- NOTES: 1. SOFT ERRORS HAVE TWO ERROR NUMBERS:  
 LOW # = SOFT ERROR  
 HIGH # = HARD ERROR (RECLASSIFIED SOFT ERROR)
2. IF "EVL" FLAG IS SET HARD ERRORS WILL BE RE-CLASSIFIED DEVICE FATAL ERRORS, BUT THE ERROR NUMBER WILL REFLECT THE ORIGINAL HARD ERROR.

4.0 PERFORMANCE AND PROGRESS REPORTS

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

5.0 DEVICE INFORMATION TABLES

RX02 REGISTER BITS

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

READ ERROR CODE REGISTERS - (SEE LABEL "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	DV1	HD	DVO	X	X	X	LCD
								SEL	DEN	LD	DEN					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 = RANDCM

## 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       |

<FF>

7.0 HISTORY FILE

THIS DIAGNOSTIC HAS BEEN MODIFIED TO RUN IN SBC-11/21 PROCESSOR FROM CZF:XDB0 SS PERF EXER.

8.0 LISTING INDEX



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78-	2603	MOD 1.2.1.1 - REFORMAT DRIVE DENSITY
80-	2685	- MOD 1.2.U.3 - INITIALIZE ERROR
80-	2698	- MOD 1.2.U.4 - INITIALIZE DROP
80-	2705	- MOD 1.2.U.5 - INITIALIZE PRINT
82-	2740	MOD 1.3 - GET EXERCISE

84-	2760	MOD 1.3.1 - SET DATA PATTERN
86-	2866	MOD 1.3.2 - SET TRACK SEQUENCE
86-	3015	MOD 1.3.3 - CLEAR STATISTICAL TABLES
88-	3029	MOD 2.0 - SCHEDULE SYSTEM EXERCISE
90-	3133	MOD 2.1 - GET A TEST
92-	3240	- EXERCISE/TEST TABLE
94-	3298	MOD 2.2 - GET A DRIVE
96-	3337	MOD 2.3 - EXECUTE DRIVE TEST
100-	3461	MOD 2.3.1 - GET A SECTOR
100-	3550	MOD 2.3.1.A - SET SECTOR DONE
102-	3562	MOD 2.3.2 - GET A TRACK
106-	3634	MOD 2.3.3 - GET A DRIVE FUNCTION
108-	3668	MOD 2.3.4 - OUTPUT DRIVE FUNCTION
108-	3743	MOD 2.3.4.1 - OUTPUT SINGLE WORD
110-	3757	MOD U.2.3.4 - WATCH DOG TIMER
110-	3787	MOD U.2.3/4 DELAY
112-	3815	MOD 2.4 - EVALUATE TEST RESULTS
114-	3833	MOD 2.4.1 - EVALUATE DATA
116-	3915	MOD 2.4.2 - EVALUATE DRIVE STATE
118-	4032	MOD 2.4.2.1 - EVALUATE DRIVE RESPONSE
120-	4065	MOD 2.4.3 - UPDATE DRIVE STATISTICS
122-	4178	MOD 2.4.3.1 - UPDATE HARD ERROR STATISTICS
122-	4193	MOD 2.4.3.2 - UPDATE CRC STATISTICS
124-	4222	MOD 2.4.3.3 - UPDATE SOFT ERROR STATISTICS
126-	4251	MOD 2.4.3.4 - UPDATE SECTOR WRITTEN/READ COUNTERS
128-	4284	- MOD 2.4.U.1 - SOFT ERROR LOGGER
130-	4317	MOD 2.4.4 - EVALUATE UNIT ERROR CODE
132-	4375	MOD 2.5 - OUTPUT ERROR TYPE
134-	4490	MOD 2.5.1 - PRINT RETRY
136-	4544	MOD 2.6 - SET DRIVES DONE
138-	4569	MOD 3.0 - OUTPUT EXERCISE COMPLETE
140-	4579	MOD 4.0 - OUTPUT SYSTEM ERROR
144-	4680	- MOD INTR.1 - INTERRUPT HANDLER #0
144-	4687	- MOD INTR.2 - INTERRUPT HANDLER #1
144-	4694	MOD U.INTR.U - SAVE UNIT REG
144-	4705	- READ ERROR CODE BUFFER
144-	4717	- TRACK TABLE
144-	4724	- DATA BUFFERS
146-	4748	HARDWARE PARAMETER CODING SECTION
148-	4824	SOFTWARE PARAMETER CODING SECTION
152-	4930	- PATCH AREA

PROGRAM HEADER AND TABLES

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```

771      .TITLE PROGRAM HEADER AND TABLES
772      .SBTTL PROGRAM HEADER
806
808      .ENABL ABS,AMA
809      =      2000
811      002000
812      BGNMOD
813
814      :++
815      : THE PROGRAM HEADER IS THE INTERFACE BETWEEN
816      : THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
817      :--
818
819      002000      POINTER BGNRPT,BGNSW,BGNSFT,BGNAU,BGNDU,ERRTBL,BGNSETUP
820
828
829      002000      HEADER CNRXDA0,0,0,2100,1
830
836      :-----
837      002122      DESCRIPT      ^$RX02 SS PERF EXER      $
838      .EVEN
839      :-----
840
841      .SBTTL DISPATCH TABLE
842
843      :++
844      : THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
845      : IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
846      :--
847
848      002152      DISPATCH 1
849

```



PROGRAM HEADER AND TABLES  
DEFAULT HARDWARE P-TABLE

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```

858          .SBTTL  DEFAULT HARDWARE P-TABLE
859
860          :++
861          : THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
862          : THE TEST-DEVICE PARAMETERS. THE STRUCTURE OF THIS TABLE
863          : IS IDENTICAL TO THE STRUCTURE OF THE RUN-TIME P-TABLE.
864          :--
865
866 002156          BGNHW  DFPTBL
867
868 002160 177170    .WORD  177170    :UNIBUS ADDRESS
869 002162 000264    .WORD  264      :VECTOR ADDRESS
870 002164 000000    .WORD  0        :DRIVE #
871 002166 000000    .WORD  0        :FUTURE EXPANSION
872
873
874
875
876
877
878
879 002170          ENDPHW
880
881
882
883
884          .SBTTL  SOFTWARE P-TABLE
885
886          :++
887          : THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
888          : PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
889          :--
890
891 002170          BGNSW  SFPTBL
892
893 002172 000000    RXXX:  .WORD  0        :FUTURE EXPANSION-R:
894 002174 000000    .WORD  0        :P-TABLE CONTROL WORD
895 002176 000000    TSTN:  .WORD  0        :TEST #
896 002200 000000    TSTPAT: .WORD  0        :TEST PATTERN #
897 002202 000000    TRKSEQ: .WORD  0        :TRACK SEQUENCE #
898 002204 000021    SWREG:  .WORD  21       :SOFTWARE SWITCH REG
899 002206 000000    OTDITK: .WORD  0        :OUTSIDE DIA. TRACK LIMIT
900 002210 000114    INDITK: .WORD  114      :INSIDE DIA. TRACK LIMIT
901 002212 000001    MINSEC: .WORD  1        :MINIMUM SECTOR LIMIT
902 002214 000032    MAXSEC: .WORD  32       :MAXIMUM SECTOR LIMIT
903 002216 000001    DFTL:  .WORD  1        :DEVICE FATAL THRESHOLD LVL
904
905
906
907
908
909
910
911
912 002220          ENDSW
913
914 002220          ENDMOD

```

927  
928  
965  
975  
976 002220  
977  
978  
979  
980  
981  
982  
983 002220

.TITLE GLOBAL AREAS  
.SBTTL GLOBAL EQUATES SECTION

BGNMOD

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

EQUALS

: BIT DIFINITIONS

100000	BIT15== 100000
040000	BIT14== 40000
020000	BIT13== 20000
010000	BIT12== 10000
004000	BIT11== 4000
002000	BIT10== 2000
001000	BIT09== 1000
000400	BIT08== 400
000200	BIT07== 200
000100	BIT06== 100
000040	BIT05== 40
000020	BIT04== 20
000010	BIT03== 10
000004	BIT02== 4
000002	BIT01== 2
000001	BIT00== 1

001000	BIT9== BIT09
000400	BIT8== BIT08
000200	BIT7== BIT07
000100	BIT6== BIT06
000040	BIT5== BIT05
000020	BIT4== BIT04
000010	BIT3== BIT03
000004	BIT2== BIT02
000002	BIT1== BIT01
000001	BIT0== BIT00

: EVENT FLAG DEFINITIONS  
: EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION

000040	EF.START== 32.	: BIT POSITION IN SECOND STATUS WORD
000037	EF.RESTART== 31.	: (100000) START COMMAND WAS ISSUED
000036	EF.CONTINUE== 30.	: (040000) RESTART COMMAND WAS ISSUED
000035	EF.NEW== 29.	: (020000) CONTINUE COMMAND WAS ISSUED
000034	EF.PWR== 28.	: (010000) A NEW PASS HAS BEEN STARTED
		: (004000) A POWER-FAIL/POWER-UP OCCURRED

: PRIORITY LEVEL DEFINITIONS

000340 PRI07== 340

GLOBAL AREAS MACRO M1200 15-DEC-82 13:50 PAGE 19-1  
 GLOBAL EQUATES SECTION

```

000300 PRI06== 300
000240 PRI05== 240
000200 PRI04== 200
000140 PRI03== 140
000100 PRI02== 100
000040 PRI01== 40
000000 PRI00== 0
    
```

.;OPERATOR FLAG BITS

```

000004 EVL== 4
000010 LOT== 10
000020 ADR== 20
000040 IDU== 40
000100 ISR== 100
000200 UAM== 200
000400 BOE== 400
001000 PNT== 1000
002000 PRI== 2000
004000 IXE== 4000
010000 IBE== 10000
020000 IER== 20000
040000 LOE== 40000
100000 HOE== 100000
    
```

.;BIT DEFINITIONS

```

984
985
986
987
988 100000 BIT15== 100000
989 040000 BIT14== 40000
990 020000 BIT13== 20000
991 010000 BIT12== 10000
992 004000 BIT11== 4000
993 002000 BIT10== 2000
994 001000 BIT09== 1000
995 000400 BIT08== 400
996 000200 BIT07== 200
997 000100 BIT06== 100
998 000040 BIT15== 40
999 000020 BIT04== 20
1000 000010 BIT03== 10
1001 000004 BIT02== 4
1002 000002 BIT01== 2
1003 000001 BIT00== 1
    
```

```

1004
1005 001000 BIT9== BIT09
1006 000400 BIT8== BIT08
1007 000200 BIT7== BIT07
1008 000100 BIT6== BIT06
1009 000040 BIT5== BIT05
1010 000020 BIT4== BIT04
1011 000010 BIT3== BIT03
1012 000004 BIT2== BIT02
1013 000002 BIT1== BIT01
1014 000001 BIT0== BIT00
    
```

.;EVENT FLAG DEFINITIONS

1015  
1016



GLOBAL AREAS MACRO M1200 15-DEC-82 13:50 PAGE 19-2  
GLOBAL EQUATES SECTION

```

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

```

```

RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
AVAILABLE FOR PROGRAM USE
:START COMMAND WAS ISSUED.
:RESTART COMMAND WAS ISSUED.
:CONTINUE COMMAND WAS ISSUED.
:A NEW PASS HAS BEEN STARTED.
:A POWER FAIL/POWER-UP OCCURRED

```

GLOBAL AREAS MACRO M1200 15-DEC-82 13:50 PAGE 21  
GLOBAL DATA SECTION

```

1080      .SBTTL GLOBAL DATA SECTION
1081
1082      :++
1083      : THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
1084      : IN MORE THAN ONE TEST.
1085      :--
1086
1087      :
1088      : STORAGE FOR DEVICE REGISTERS
1089      :
1090
1091      :-----
1092 002220 000000 UOADR: .WORD 0 ;UNIT 0 ADR
1093 002222 000000 U1ADR: .WORD 0 ;UNIT 1 ADR
1094 002224 000000 UOVECT: .WORD 0 ;UNIT 0 VECTOR
1095 002226 000000 U1VECT: .WORD 0 ;UNIT 1 VECTOR
1096      :-----
1097 002230 000000 SDD: .WORD 0 ;SYSTEM DRIVES DONE (SEE REG. DEF. BELOW)
1098 002232 000000 SUT: .WORD 0 ;SYSTEM UNDER TEST (SEE REG. DEF. BELOW)
1099 002234 000000 UUT: .WORD 0 ;UNIT UNDER TEST (SEE REG. DEF. BELOW)
1100 002236 000000 UUTADR: .WORD 0 ;UUT UNIBUS ADR
1101 002240 000000 UUTOFF: .WORD 0 ;UUT TABLE ADDRESSING OFFSET
1102 002242 000000 DEN: .WORD 0 ;DENSITY FLAG
1103 002244 000000 DELDAT: .WORD 0 ;DELETED DATA FLAG
1104 002246 000000 CSRUUT: .WORD 0 ;CONT/STATUS REG UUT
1105 002250 000000 ESRUUT: .WORD 0 ;ERROR/STATUS REG UUT
1106      :-----
1107 002252 000000 WDCNT: .WORD 0 ;WORD COUNT
1108 002254 000000 TRACK: .WORD 0 ;TRACK ADR
1109 002256 000000 SECTOR: .WORD 0 ;SECTOR ADR
1110 002260 000000 TRKDN: .WORD 0 ;TRACK DONE (UUT) FLAG
1111 002262 000000 SECDN: .WORD 0 ;SECTOR DONE (UUT) FLAG
1112      :-----
1113 002264 000000 FLGDRS: .WORD 0 ;"DRS" FLAGS
1114 002266 000000 FLAGS: .WORD 0 ;DIAGNOSTIC FLAGS
1115 002270 000000 ABORT: .WORD 0 ;ABORT FLAG
1116 002272 000000 PRTECD: .WORD 0 ;PRINT ERR CODE FLAG
1117      :-----
1118 002274 000000 ERRSY: .WORD 0 ;ERROR SYSTEM
1119 002276 000000 ERRTY: .WORD 0 ;ERROR TYPE
1120 002300 000000 HARDER: .WORD 0 ;HARD ERROR
1121 002302 000000 HDERCT: .WORD 0 ;HARD ERROR COUNTER (USED FOR "DFTL")
1122      :-----
1123 002304 000000 RETRY: .WORD 0 ;//(10)DATART/(4)RDRT/(2)WTRT/(1)SEEK/ SEE BELOW
1124 002306 000000 SEEKRT: .WORD 0 ;SEEK RETRY COUNT
1125 002310 000000 CKSMRT: .WORD 0 ;CHECK SUM RETRY COUNT
1126 002312 000000 CRCBRT: .WORD 0 ;CRC BAD RETRY COUNT
1127 002314 000000 CRCERT: .WORD 0 ;CRC ERR RETRY COUNT
1128 002316 000000 DATART: .WORD 0 ;DATA RETRY COUNT
1129 002320 000000 DARDRT: .WORD 0 ;DATA READ RETRY COUNT
1130 002322 000000 DAWTRT: .WORD 0 ;DATA WRITE RETRY COUNT
1131 002324 000000 READRT: .WORD 0 ;READ RETRY COUNT
1132 002326 000000 WRTRT: .WORD 0 ;WRITE RETRY COUNT
1133 002330 000000 DDERCT: .WORD 0 ;D.D. ERR RETRY COUNT
1134      :-----

```

GLOBAL AREAS MACRO M1200 15-DEC-82 13:50 PAGE 23  
GLOBAL DATA SECTION

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

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

1144  
1145  
1146  
1147  
1148  
1149  
1150  
1151  
1152  
1153  
1154  
1155  
1156  
1157  
1158  
1159  
1160  
1161  
1162  
1163  
1164  
1165  
1166  
1167  
1168  
1169  
1170  
1171  
1172  
1173  
1174  
1175  
1176  
1177  
1178  
1179  
1180  
1181  
1182

```
-----
**** 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
              : AA                |
              :
              : ---<DRIVE #
              : ---<UNIT # (RX02) OR SIDE # (RXXX)
-----
```

```
-----
              15! 14! 13! 12! 11! 10! 09! 08! 07! 06! 05! 04! 03! 02! 01! 00
ERRTY:       ERR!ERR!DON!ITR!WRT!RD!FIL!UNK!  DD DD  CK
              BIT!NOT!NO!NO!ERR!ERR!EMP!ERR! -  MIS UNX -  DAT SUM!CRC!SEK
              SET!ITR!DON!          ERR!
ERRSY:       UNR! TO!DEN!DEN!SYS!DAG!  WRONG!DON!SID!DRV!NO!DONE!  FUNCTION
              ERR!ERR!ERR!ERR!ERR!ERR!SID!DRV! #2!ERR!ERR!FUN!INT!  CAUSING
              ERR!ERR!ERR!ERR!ERR!ERR!SID!DRV! #2!ERR!ERR!FUN!INT!  ERROR
RETRY:       :                                     :CRC!DAT!RD!WRT!SEK
              :                                     :RT!RT!RT!RT!RT
-----
```

:NOTE: RXXX IS REFERENCE FOR FURTHER EXPANSION



GLOBAL AREAS MACRO M1200 15-DEC-82 13:50 PAGE 25  
GLOBAL TEXT SECTION

```
1198          .SBTTL GLOBAL TEXT SECTION
1199
1200          :++
1201          : THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
1202          : MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
1203          : MORE THAN ONE TEST.
1204          :--
1205
1206          :
1207          : NAMES OF DEVICES SUPPORTED BY PROGRAM
1208          :
1209          :   DEVTYP <RX02>
1210
1211          :
1212          : FORMAT STATEMENTS USED IN PRINT CALLS
1213          :
1214
1215
1216
1217
1218
1219
1220
1221
1222
1223
1224
1225
1226
1227
```

002346

GLOBAL AREAS MACRO M1200 15-DEC-82 13:50 PAGE 27  
 GLOBAL ERROR REPORT SECTION

1237  
 1238  
 1239  
 1240  
 1241  
 1242  
 1243  
 1244  
 1245  
 1246  
 1247  
 1248  
 1249  
 1250  
 1251  
 1252  
 1253  
 1254  
 1255  
 1256  
 1257  
 1258  
 1259  
 1260  
 1261  
 1262  
 1263  
 1264  
 1265  
 1266  
 1267  
 1268  
 1269  
 1270  
 1271  
 1272  
 1273  
 1274

```

.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
-----
ERROR: MOV #NONE,ERRBLK ;SETUP ERROR BLOCK CODE
      MOV UNIT,L$LUN ;SETUP LUN FOR PRINT
      ERROR ;
      RETURN ;
-----
      ERRTBL
ERRTYP: .WORD 0
ERRNBR: .WORD 0
ERRMSG: .WORD 0
ERRBLK: .WORD 0
-----

.SBTTL - MOD U.PRT.ERR - PRINT ERRORS
-----
PRTErr: PRINTB #IDENT1,UNIT,CSRUT,ESRUT,CMD
IFAUP: TST PRTECD ;IF ERR CODE FLAG
      BEQ ENDUP ;SET, THEN
      PRINTX #XER1,<B,XERUT>,<B,WC>,<B,CTK0>,<B,CTK1>
      PRINTX #XER2,<B,TTRK>,<B,TSEC>,<B,SFTSTS>,<B,BTRK>
      CLR PRTECD ;CLEAR ERR CODE FLAG
ENDUP: CLR ERRREG ;CLEAR ERR REGISTER
      RTS PC ;RETURN
-----
ERRREG: 0 ;
-----
IDENT1: .ASCIZ /% UNIT#%01% RXCSR=%0% RXESR=%0% CMD=%0%N/
XER1: .ASCIZ /% ERCD=%03% WC=%03% CTRK0=%D2%. CTRK1=%D2%. /
XER2: .ASCIZ /% TTRK=%D2%. TSEC=%D2%. SFTSTAT=%03% BTRK=%D2%.%N/
      .EVEN
;MOD U.PRT.ERR ----- END MODULE -----
    
```

012737 004506 002402  
 013737 002334 002074  
 000207  
 002374  
 002374 000000  
 002376 000000  
 002400 000000  
 002402 000000  
 002404  
 002444 005737 002272  
 002450 001452  
 002452  
 002522  
 002572 005037 002272  
 002576 005037 002604  
 002602 000207  
 002604 000000  
 002606 045 101 040  
 002663 045 101 040  
 002744 045 101 040

GLOBAL AREAS MACRO M1200 15-DEC-82 13:50 PAGE 29  
 - MOD U.PRT.ERR - PRINT ERRORS

```

1277
1278
1279
1280
1281 003034 105737 033544
1282 003040 001424
1283 003042 013701 033544
1284 003046 042701 177400
1285 003052 006201
1286 003054 006201
1287 003056 062701 003114
1288 003062 011137 003114
1289 003066
1290 003106 105037 033544
1291 003112 000207
1292
1293
1294 003114 000000
1295
1296
1297 003116 003170
1298 003120 003236
1299 003122 003304
1300 003124 003332
1301 003126 003400
1302 003130 003451
1303 003132 003477
1304 003134 003555
1305 003136 003603
1306 003140 003660
1307 003142 003714
1308 003144 003773
1309 003146 004021
1310 003150 004107
1311 003152 004153
1312 003154 004207
1313 003156 004254
1314 003160 004311
1315 003162 004360
1316 003164 004413
1317 003166 004442
1318

.SBTTL - MOD U.PRT.EC - PRINT UNIT ERROR CODE
-----
XERPRT: TSTB XERUUT :IF ERROR
        BEQ  ENDXER  :NOT=0, THEN
        MOV  XERUUT,R1 :SAVE EXTENDED ERR CODE IN TEMP #1
        BIC  #177400,R1 :CLR TOP BYTE
        ASR  R1       :FORMAT E.C.
        ASR  R1       :FORMAT E.C. FOR ADR
        ADD  #ECTAB-2,R1 :FIND ADR OF ERROR MSG
        MOV  (R1),EXMSG :SET ADR OF ERROR MSG FOR PRINT
        PRINTX EXMSG  :PRINT UNIT CODE ERROR MSG
        CLRB XERUUT   :CLEAR ERROR CODE
ENDXER: RTS  PC      :RETURN
-----
EXMSG: 0 :MSG ADR FOR PRINT
-----
ECTAB: .WORD EC1
        .WORD EC2
        .WORD EC3
        .WORD EC4
        .WORD EC5
        .WORD EC6
        .WORD EC7
        .WORD EC10
        .WORD EC11
        .WORD EC12
        .WORD EC13
        .WORD EC14
        .WORD EC15
        .WORD EC16
        .WORD EC17
        .WORD EC20
        .WORD EC21
        .WORD EC22
        .WORD EC23
        .WORD EC24
        .WORD EC25
-----

```



```

1321
1322 003170      045      101      040  EC1:  .ASCIZ  /%A  >NO HOME ON INITIALIZE-DRV #0.%N/
1323 003236      045      101      040  EC2:  .ASCIZ  /%A  >NO HOME ON INITIALIZE-DRV #1.%N/
1324 003304      045      101      040  EC3:  .ASCIZ  /%A  >ILL ERR CODE.%N/
1325 003332      045      101      040  EC4:  .ASCIZ  /%A  >TRIED TO ACCESS A TRACK > 76.%N/
1326 003400      045      101      040  EC5:  .ASCIZ  /%A  >HOME FOUND BEFORE DESIRED TRACK.%N/
1327 003451      045      101      040  EC6:  .ASCIZ  /%A  >ILL ERR CODE.%N/
1328 003477      045      101      040  EC7:  .ASCIZ  /%A  >52 HEADERS PASSED & SECTOR NOT FOUND.%N/
1329 003555      045      101      040  EC10: .ASCIZ  /%A  >ILL ERR CODE.%N/
1330 003603      045      101      040  EC11: .ASCIZ  /%A  >NO SEPCLOCK SEEN IN 40 MICROSECONDS.%N/
1331 003660      045      101      040  EC12: .ASCIZ  /%A  >PREAMBLE NOT FOUND.%N/
1332 003714      045      101      040  EC13: .ASCIZ  /%A  >PREAMBLE FOUND BUT NO ID MARK IN TIME.%N/
1333 003773      045      101      040  EC14: .ASCIZ  /%A  >ILL ERR CODE.%N/
1334 004021      045      101      040  EC15: .ASCIZ  /%A  >GOOD TRACK ADDRESS HEADER NOT=SELECTED TRACK.%N/
1335 004107      045      101      040  EC16: .ASCIZ  /%A  >TOO MANY TRIES FOR AN IDAM.%N/
1336 004153      045      101      040  EC17: .ASCIZ  /%A  >NO DATA AM IN TIME.%N/
1337 004207      045      101      040  EC20: .ASCIZ  /%A  >CRC ERROR ON READING SECTOR.%N/
1338 004254      045      101      040  EC21: .ASCIZ  /%A  >UNASSIGNED ERR CODE.%N/
1339 004311      045      101      040  EC22: .ASCIZ  /%A  >R-W ELECT. FAILED MAINT. TEST.%N/
1340 004360      045      101      040  EC23: .ASCIZ  /%A  >WORD CNT OVERFLOW.%N/
1341 004413      045      101      040  EC24: .ASCIZ  /%A  >DENSITY ERROR.%N/
1342 004442      045      101      040  EC25: .ASCIZ  /%A  >SET DENSITY WRONG KEY WORD.%N/
1343
1344
1345
1346 .SBTTL - ERROR PRINT CALLS/MSG CALLS
1347
1348 004506      BGNMSG  NONE
1349 004506      ENDMSG
1350
1367 004510      BGNMSG  PRTB1
1368 004510 004737 004536 CALL    PRTB1S
1369 004514      ENDMSG
1370
1371 004516      PRTBOS: PRINTB  R1
1372 004534 000207 RETURN
1373
1374 004536      PRTB1S: PRINTB  R1,R2
1375 004556 000207 RETURN
1376

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.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 -----  
RANGEN: MOV #1,R0  
ADD RAN1,R0  
ADD RAN2,R0  
BIC #170000,R0  
CLC  
ROL R0  
ROL R0  
MOV R0,RAN1  
CLR R0  
MOV RAN2,R0  
ROR R0  
ROR R0  
ADD RAN1,R0  
BIC #170000,R0  
MOV R0,RAN2  
MOV R0,RANUM  
RTS PC  
-----  
RAN1: 0  
RAN2: 0  
RANUM: 0  
-----

GLOBAL AREAS MACRO M1200 15-DEC-82 13:50 PAGE 35  
 - MOD U.A.1 - CONVERSION UUT CODE --> SUTPTR

```

1484      .SBTTL - MOD U.A.1 - CONVERSION UUT CODE --> SUTPTR
1485      :-----
1486
1487 004654 000240      CVUTST: NOP      ;
1488 004656 005037 004754      CLR      SUTCV      ;CLEAR SYS UNDER TEST CONVERTED
1489 004662 032737 000001 004752      BIT      #1,CVUNIT  ;IF DRIVE #0.
1490 004670 001014      BNE      2$        ;SELECTED, THEN
1491 004672 032737 000002 004752      BIT      #2,CVUNIT  ;IF UNIT #0 OR RXXX SIDE #0,
1492 004700 001004      BNE      1$        ;THEN
1493 004702 052737 000001 004754      BIS      #1,SUTCV   ;SET FOR UNIT CODE=00 IN SUT WORD
1494 004710 000417      BR      ENDCVT     ;BR TO END
1495 004712 052737 000004 004754 1$:  BIS      #4,SUTCV   ;ELSE, SET FOR UNIT CODE=10 IN SUT WORD
1496 004720 000413      BR      ENDCVT     ;BR TO END
1497 004722 032737 000002 004752 2$:  BIT      #2,CVUNIT  ;IF UNIT #0 OR RXXX SIDE #0,
1498 004730 001004      BNE      3$        ;THEN
1499 004732 052737 000002 004754      BIS      #2,SUTCV   ;SET FOR UNIT CODE=01 IN SUT WORD
1500 004740 000403      BR      ENDCVT     ;BR TO END
1501 004742 052737 000010 004754 3$:  BIS      #10,SUTCV  ;ELSE, SET FOR UNIT CODE=11 IN SUT WORD
1502 004750 000207      ENDCVT: RTS      PC      ;RETURN
1503      :-----
1504 004752 000000      CVUNIT: 0          ;UNIT CODE TO BE CONVERTED
1505 004754 000000      SUTCV: 0          ;SYS UNDER TEST AS CONVERTED
1506      :MOD U.A.1 ----- END MODULE -----
1507
1508      .SBTTL - MOD U.A.2 - CONVERSION SUTPTR --> UUT CODE
1509      :-----
1510
1511 004756 013705 021426      CVSTUT: MOV      SUTPTR,R5  ;SAVE SUT POINTER IN R5
1512 004762 005004      CLR      R4        ;CLEAR R4 (RESET UNIT CODE)
1513 004764 032705 000001 1$:  BIT      #1,R5     ;IF LSB R5
1514 004770 001003      BNE      2$        ;EQUALS 1, THEN BR TO 2$
1515 004772 006205      ASR      R5        ;SHIFT RIGHT R5
1516 004774 005204      INC      R4        ;INCREMENT R4
1517 004776 000772      BR      1$        ;BR TO 1$
1518 005000 010437 005024 2$:  MOV      R4,UNITST  ;THEN R4 CONTAINS UUT CODE
1519 005004 006304      ASL      R4        ;DOUBLE UNIT CODE FOR ADR
1520 005006 010437 002240      MOV      R4,UUTOFF  ;SET UUT OFFSET
1521 005012 062704 002336      ADD      #U00,R4    ;GET UUT UNIT# FOR PRINT
1522 005016 011437 002334      MOV      (R4),UNIT  ;SET UNIT=PRINT UNIT#
1523 005022 000207      RTS      PC        ;RETURN
1524      :-----
1525 005024 000000      UNITST: 0         ;
1526      :MOD 2.0A ----- END MODULE -----

```



GLOBAL AREAS MACRO M1200 15-DEC-82 13:50 PAGE 37  
 - MOD U.DEV.REC - DEVICE READ ERROR CODE

```

1529          .SBTTL - MOD U.DEV.REC - DEVICE READ ERROR CODE
1530          :-----:
1531
1532 005026 000240          RDERCD: NOP          ;
1533 005030 013705 002236      MOV          UUTADR,R5          ;SET R5 = UUT ADDRESS
1534 005034 012737 000001 002272      MOV          #1,PRTECD          ;SET PRINT ERROR CODE FLAG
1535 005042 012737 000017 005136      MOV          #17,RECCMD          ;SET UUT EXTENDED ERROR CODE
1536 005050 053737 002242 005136      BIS          DEN,RECCMD          ;SET DEN FOR CMD
1537 005056 013715 005136      MOV          RECCMD,(R5)          ;SEND CMD TO UUT
1538 005062 013701 002236      MOV          UUTADR,R1          ;GET UUT ADDR
1539 005066 062701 000002          ADD          #2,R1          ;CAL DATA ADR
1540 005072 013737 002236 025332      MOV          UUTADR,CSRADR          ;SET CSR ADR
1541 005100 012737 000200 025330      MOV          #TRBIT,RDYWD          ;SET "TR" BIT TEST
1542 005106 004737 025230          CALL         DELAY          ;CALL DELAY MODULE-WAIT FOR TR
1543 005112 032715 000200          IAREC: BIT          #200,(R5)          ;IF TR
1544 005116 001004          BNE          LAREC          ;NOT SET
1545 005120 052737 040007 002274      BIS          #40007,ERRSY          ;THEN SET "TR" ERR ON FUNCTION
1546 005126 000402          BR          XREC          ;BR TO END MOD
1547 005130 012711 033544          LAREC: MOV          #XERUUT,(R1)          ;SEND BASE ADDR FOR EXTEND ERR CODE
1548 005134 000207          XREC: RETURN          ;RETURN
1549          :-----:
1550 005136 000000          RECCMD: 0          ;COMMAND WORD USED IN THIS MODULE
1551          :-----:
1552
1553 005140          ENDMOD
1554
  
```

```

1567          .TITLE MISCELLANEOUS SECTIONS
1568          .SBTTL  REPORT CODING SECTION
1605
1606 005140          BGNMOD
1607
1608          :++
1609          : THE REPORT CODING SECTION CONTAINS THE
1610          : 'PRINTS' CALLS THAT GENERATE STATISTICAL REPORTS.
1611          :--
1612
1613          :-----
1614 005140          BGNRPT
1615 005140 000240  REPORT: NOP
1616 005142 012737 006074 005504  MOV      #PT20SP,PRT1  :SETUP CTR HDR
1617 005150 012737 006274 005506  MOV      #PTUNT2,PRT2  :
1618 005156 004737 005414          CALL     PRTHDR        :PRINT HEADER
1619 005162 004737 005646          CALL     PRTCTR        :PRINT SEQ CTR
1620 005166 012737 006105 005504  MOV      #PT19SP,PRT1  :SETUP REPORT HEADER PART 1
1621 005174 012737 006253 005506  MOV      #PTUNT1,PRT2  :
1622 005202 004737 005414          CALL     PRTHDR        :PRINT HEADER
1623 005206 000240          NOP                    :SETUP DATA PART 1
1624 005210 005037 005636          CLR      LINECT        :          ZERO LINE COUNTER
1625 005214 005037 005644          CLR      PRNUM         :          CLEAR PRINT MODE
1626 005220 012702 007354          MOV      #CKSML,R2     :          SET BEGIN ADR OF DATA-PART 1
1627 005224 012701 006360          MOV      #PRIDX,R1     :          SET BEGIN ADR OF TABLE LABELS-PART 1
1628 005230 012737 000023 005640  MOV      #19.,LINES     :          SET # OF LINES TO PRINT
1629 005236 004737 005510          CALL     PRDAT         :PRINT DATA
1630 005242 012737 006200 005504  MOV      #PTEC,PRT1     :SETUP HEADER PART 2
1631 005250 012737 006253 005506  MOV      #PTUNT1,PRT2  :
1632 005256 004737 005414          CALL     PRTHDR        :PRINT HEADER
1633 005262 000240          NOP                    :SETUP DATA PART 2
1634 005264 012737 000001 005636  MOV      #1,LINECT      :          SET LINE COUNTER=1
1635 005272 012737 000001 005644  MOV      #1,PRNUM       :          SET PRINT MODE=1
1636 005300 012702 007604          MOV      #ECLOG,R2     :          SET BEGIN ADR ERROR CODE DATA-PART 2
1637 005304 012701 006327          MOV      #PTECN,R1     :          SET ERROR CODE PRINT-FORMATED MSG-PART 2
1638 005310 012737 000027 005640  MOV      #23.,LINES     :          SET # OF LINES TO PRINT
1639 005316 012737 006327 005642  MOV      #PTECN,LINTYP  :
1640 005324 004737 005510          CALL     PRDAT         :PRINT DATA
1641 005330 012737 006225 005504  MOV      #PTTK,PRT1     :SETUP HEADER PART 3
1642 005336 012737 006253 005506  MOV      #PTUNT1,PRT2  :
1643 005344 004737 005414          CALL     PRTHDR        :PRINT HEADER
1644 005350 005037 005636          CLR      LINECT        :
1645 005354 012737 000001 005644  MOV      #1,PRNUM       :
1646 005362 012702 010070          MOV      #TKXX,R2     :SETUP DATA PART 3
1647 005366 012737 000115 005640  MOV      #77.,LINES     :
1648 005374 012737 006343 005642  MOV      #PTTKN,LINTYP  :
1649 005402 004737 005510          CALL     PRDAT         :PRINT DATA PART 3
1650 005406          ENDRPT: ENDRPT
1651          :-----
1652 005410 000000          UTTST: 0              :UNIT #
1653 005412 000000          UTCNT: 0             :UNIT COUNT
1654          :-----

```

```

1657 .SBTTL - PRINT REPORT HEADER
1658 -----
1659 005414 005003 PRTHDR: CLR R3 ;SETUP 1ST PART OF HEADER PRINT
1660 005416 013705 005504 MOV PRT1,R5 ;PRINT 1ST PART
1661 005422 004737 006030 CALL PREPT2 ;GET BEGIN ADR OF UNITS-->TESTED FLAGS
1662 005426 012737 002336 005410 MOV #UT00,UTTST ;SET UNIT COUNTER
1663 005434 012737 000004 005412 1$: MOV #4,UTCNT ;IF UNIT TESTED FLAG
1664 005442 005777 177742 TST @UTTST ;NOT=-1, THEN
1665 005446 100407 BMI 2$ ;SET UNIT TESTED # FOR PRINT
1666 005450 017737 177734 006026 MOV @UTTST,PAR ;SET UNIT MSG
1667 005456 013705 005506 MOV PRT2,R5 ;PRINT UNIT #
1668 005462 004737 006002 CALL PREPT1 ;ADVANCE ADR OF UNIT TESTED FLAG
1669 005466 062737 000002 005410 2$: ADD #2,UTTST ;DECREMENT UNIT COUNT
1670 005474 005337 005412 DEC UTCNT ;IF UNIT COUNT=0, THEN
1671 005500 001360 BNE 1$ ;RETURN
1672 005507 000207 RTS PC
1673 -----
1674 005504 000000 PRT1: 0 ;
1675 005506 000000 PRT2: 0 ;
1676 -----
1677 .SBTTL - PRINT REPORT DATA
1678 -----
1679 PRDAT: NOP ;
1680 005510 000240 1$: TST PRNUM ;IF MODE
1681 005512 005737 005644 BEQ 2$ ;SETUP LINE # TO PRINT
1682 005516 001410 MOV LINECT,PAR ;SETUP LINE TYPE TO PRINT
1683 005520 013737 005636 006026 MOV LINTYP,R5 ;PRINT LINE #
1684 005526 013705 005642 CALL PREPT1 ;
1685 005532 004737 006002 BR 3$ ;
1686 005536 000403 2$: MOV (R1)+,R5 ;SETUP LOG TITLE ADR
1687 005540 012105 CALL PREPT2 ;PRINT LOG TITLES
1688 005542 004737 006030 3$: MOV #UT00,UTTST ;GET UNIT # FOR PRINT
1689 005546 012737 002336 005410 MOV #4,UTCNT ;SETUP UNIT COUNT
1690 005554 012737 000004 005412 4$: MOV (R2)+,PAR ;SETUP DATA TO PRINT
1691 005562 012237 006026 TST @UTTST ;IF UNIT # NOT = -1
1692 005566 005777 177616 BMI 5$ ;THEN
1693 005572 100404 MOV #PTDAT1,R5 ;SETUP TO PRINT
1694 005574 012705 CALL PREPT1 ;PRINT DATA
1695 005600 004737 006002 5$: ADD #2,UTTST ;SETUP TO CK NEXT UNIT
1696 005604 062737 000002 005410 DEC UTCNT ;DECREMENT UNIT COUNT
1697 005612 005337 005412 BNE 4$ ;IF DONE ALL UNITS THEN
1698 005616 001361 INC LINECT ;INCREMENT LINE COUNT
1699 005620 005237 005636 005636 CMP LINES,LINECT ;IF DONE ALL
1700 005624 023737 005640 005636 BHI 1$ ;LINES, THEN
1701 005632 101327 RTS PC ;RETURN
1702 005634 000207 -----
1703 LINECT: 0 ;LINE COUNTER
1704 005636 000000 LINES: 0 ;# OF LINES TO PRINT
1705 005640 000000 LINTYP: 0 ;LINE PRINT TYPE.
1706 005642 000000 PRNUM: 0 ;PRINT MODE
1707 005644 000000 -----
1708
    
```



MISCELLANEOUS SECTIONS MACRO M1200 15-DEC-82 13:50 PAGE 42  
 - PRINT READ/WRITE SECTOR COUNTERS

```

1711      .SBTTL - PRINT READ/WRITE SECTOR COUNTERS
1712      :-----
1713
1714 005646 000240      PRTCTR: NOP
1715 005650 005037 005640      CLR      LINES      ;CLEAR LINE COUNTER
1716 005654 012702 007314      MOV      #READSC,R2  ;GET ADDRESS OF READ SECTOR CTR
1717 005660 012705 006116      MOV      #PTRDSC,R5  ;SETUP READ SECTORS MSG
1718 005664 004737 006002      1$: CALL  PREPT1     ;CALL PRINT REPORT-MSG
1719 005670 012737 002336 005410  MOV      #UT00,UTTST ;GET UNIT # FOR PRINT
1720 005676 012737 000004 005412  MOV      #4,UTCNT    ;SETUP UNIT COUNT
1721 005704 005777 177500      2$: TST   @UTTST     ;IF UNIT #
1722 005710 100410      BMI     5$          ;NOT=-1, THEN
1723 005712 062702 000002      ADD     #2,R2       ;INCREMENT ADR TO UPPER WORD
1724 005716 011204      MOV     (R2),R4     ;SETUP DATA UPPER PART FOR PRINT
1725 005720 014203      MOV     -(R2),R3    ;SETUP DATA LOWER PART FOR PRINT
1726 005722 012705 006315      MOV     #PTFMN1,R5  ;SETUP TO PRINT DATA
1727 005726 004737 006050      CALL   PREPT3     ;PRINT DATA
1728 005732 062737 000002 005410  5$: ADD     #2,UTTST   ;SETUP TO CK NEXT UNIT
1729 005740 062702 000004      ADD     #4,R2       ;SET ADR TO NEXT CTR
1730 005744 005337 005412      DEC     UTCNT       ;DECREMENT UNIT COUNT
1731 005750 001355      BNE     2$          ;IF DONE THIS LINE, THEN
1732 005752 005237 005640      INC     LINES       ;INCREMENT LINE CTR
1733 005756 022737 000002 005640  CMP     #2,LINES    ;DO WHILE LINE CTR
1734 005764 001405      BEQ     6$          ;EQUALS <2
1735 005766 012702 007334      MOV     #WRITSC,R2  ;GET ADDRESS OF WRITE SECTOR CTR
1736 005772 012705 006147      MOV     #PTWTSC,R5  ;SETUP WRITE SECTORS MSG
1737 005776 000732      BR      1$         ;BR TO WRITE SECTORS SECTION
1738 006000 000207      6$: RETURN
1739      :-----

```

MISCELLANEOUS SECTIONS MACRO M1200 15-DEC-82 13:50 PAGE 44  
- PRINT REPORT TYPE 1

1742  
1743  
1744 006002  
1745 006024 000207  
1746  
1747 006026 000000  
1748  
1749  
1750  
1751  
1752  
1753  
1754  
1755  
1756 006030  
1757 006046 000207  
1758  
1759  
1760  
1761  
1762  
1763  
1764  
1765  
1766 006050  
1767 006072 000207  
1768  
1769 006074 045 116  
1770 006105 045 116  
1771 006116 045 116  
1772 006147 045 116  
1773 006200 045 116  
1774 006225 045 116  
1775 006243 045 101  
1776 006253 045 123  
1777 006274 045 123  
1778 006315 045 123  
1779 006327 045 116  
1780 006343 045 116  
1781  
1782

```
.SBTTL - PRINT REPORT TYPE 1
-----
PREPT1: PRINTS R5,PAR
        RTS     PC      ;
-----
PAR:    0          ;
-----
```

```
.SBTTL - PRINT REPORT TYPE 2
-----
PREPT2: PRINTS R5
        RTS     PC      ;
-----
```

```
.SBTTL - PRINT REPORT TYPE 3
-----
PREPT3: PRINTS R5,R4,R3
        RETURN
-----
PT20SP: .ASCIZ /%N%N%S20/
PT19SP: .ASCIZ /%N%N%S19/
PTRDSC: .ASCIZ /%N%A# SECTOR READS (8)=/
PTWTSC: .ASCIZ /%N%A# SECTOR WRITES (8)=/
PTEC:   .ASCIZ /%N%N%AERR%N%ACODE# /
PTTK:   .ASCIZ /%N%N%ATRACK# /
PTDAT1: .ASCIZ /%A %D6/
PTUNT1: .ASCIZ /%S1%AUNIT#%D1%S1/
PTUNT2: .ASCIZ /%S2%AUNIT#%D1%S5/
PTFMN1: .ASCIZ /%S2%06%05/
PTECN:  .ASCIZ /%N%02%A0%S3/
PTTKN:  .ASCIZ /%N%S1%D2%S3/
        .EVEN
-----
```

1785  
 1786 006360 006426  
 1787 006362 006455  
 1788 006364 006504  
 1789 006366 006533  
 1790 006370 006562  
 1791 006372 006611  
 1792 006374 006640  
 1793 006376 006667  
 1794 006400 006716  
 1795 006402 006745  
 1796 006404 006774  
 1797 006406 007023  
 1798 006410 007052  
 1799 006412 007101  
 1800 006414 007130  
 1801 006416 007157  
 1802 006420 007206  
 1803 006422 007235  
 1804 006424 007264

```

-----
PRIDXX: .WORD PRID01
        .WORD PRID02
        .WORD PRID03
        .WORD PRID04
        .WORD PRID05
        .WORD PRID06
        .WORD PRID07
        .WORD PRID08
        .WORD PRID09
        .WORD PRID10
        .WORD PRID11
        .WORD PRID12
        .WORD PRID13
        .WORD PRID14
        .WORD PRID15
        .WORD PRID16
        .WORD PRID17
        .WORD PRID18
        .WORD PRID19
-----

```

1805  
 1806  
 1807  
 1808 006426 045 116  
 1809 006455 045 116  
 1810 006504 045 116  
 1811 006533 045 116  
 1812 006562 045 116  
 1813 006611 045 116  
 1814 006640 045 116  
 1815 006667 045 116  
 1816 006716 045 116  
 1817 006745 045 116  
 1818 006774 045 116  
 1819 007023 045 116  
 1820 007052 045 116  
 1821 007101 045 116  
 1822 007130 045 116  
 1823 007157 045 116  
 1824 007206 045 116  
 1825 007235 045 116  
 1826 007264 045 116  
 1827  
 1828

```

-----
PRID01: .ASCIZ /%ZACHECK SUM: /
PRID02: .ASCIZ /%ZAFILL-EMP BUFF LOG:/
PRID03: .ASCIZ /%ZANO ERR BIT: /
PRID04: .ASCIZ /%ZAINTER-NO DONE ERR:/
PRID05: .ASCIZ /%ZAINERRUPT ERR: /
PRID06: .ASCIZ /%ZASEEK: /
PRID07: .ASCIZ /%ZACRC ERR: /
PRID08: .ASCIZ /%ZACRC BAD: /
PRID09: .ASCIZ /%ZAREAD ERR: /
PRID10: .ASCIZ /%ZAWRITE ERR: /
PRID11: .ASCIZ /%ZADATA ERR: /
PRID12: .ASCIZ /%ZADEL. DATA ERR: /
PRID13: .ASCIZ /%ZAHRD SEEK: /
PRID14: .ASCIZ /%ZAHRD CRC ERR: /
PRID15: .ASCIZ /%ZAHRD CRC BAD: /
PRID16: .ASCIZ /%ZAHRD READ: /
PRID17: .ASCIZ /%ZAHRD WRITE: /
PRID18: .ASCIZ /%ZAHRD DATA: /
PRID19: .ASCIZ /%ZAHRD DEL. DATA ERR:/
.EVEN
-----

```



```

1831      .SBTTL - STATISTICAL TABLES
1832      :-----
1833
1834 007314 READSC: .BLKW 8.      :READ SECTOR COUNTER
1835 007334 WRITSC: .BLKW 8.      :WRITE SECTOR COUNTER
1836 007354 CKSML: .BLKW 4      :CKSUM LOG
1837 007364 BUFLERL: .BLKW 4      :FILL/EMPTY BUFFER ERROR LOG
1838 007374 NOERL: .BLKW 4      :NO ERR BIT LOG
1839 007404 UKINT: .BLKW 4      :INTERRUPT - NO DONE LOG
1840 007414 INTER: .BLKW 4      :INTERRUPT ERR
1841 007424 SEK: .BLKW 4      :SEEK ERR
1842 007434 CRC: .BLKW 4      :CRC ERR
1843 007444 CRCBAD: .BLKW 4      :CRC BAD ERR
1844 007454 RD: .BLKW 4      :READ ERR
1845 007464 WRT: .BLKW 4      :WRITE ERR
1846 007474 DATA: .BLKW 4      :DATA ERR
1847 007504 DLDTER: .BLKW 4      :DEL DATA ERR
1848 007514 HSEK: .BLKW 4      :HARD SEEK ERR
1849 007524 HCRC: .BLKW 4      :HARD CRC ERR
1850 007534 HCRCBD: .BLKW 4      :HARD CRC BAD ERR
1851 007544 HRD: .BLKW 4      :HARD READ ERR
1852 007554 HWRT: .BLKW 4      :HARD WRITE ERR
1853 007564 HDATA: .BLKW 4      :HARD DATA ERR
1854 007574 HDD: .BLKW 4      :HARD DEL DATA ERR
1855 007604 ECLOG: .BLKW 90.      :ERROR CODE LOG
1856 010070 TKXX: .BLKW 308.      :TRACK ERR LOG
1857      :-----
1858 011240 000000 ENDST: .WORD 0      :END TABLE
1859
1871      .EVEN
1872
1873      .SBTTL LOAD DEVICE PROTECTION
1874      :-----
1875
1876 011242 BGNPROT
1877 011242 000000 .WORD 0      :RX CSR - HARDWARE P-TABLE OFFSET
1878 011244 177777 .WORD -1      :DON'T CARE
1879 011246 000004 .WORD 4      :RX DRIVER-HARDWARE P-TABLE OFFSET
1880 011250 ENDPROT
1881      :-----

```

MISCELLANEOUS SECTIONS  
LOAD DEVICE PROTECTION

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```

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1891 011250
1892 011250 005037 002266
1897 011254
1898 011262
1899 011270
1900 011272 052737 000001 002266
1901 011300 000507
1902 011302
1903 011310
1904 011312 005037 002220
1905 011316 005037 002222
1906 011322 005037 002224
1907 011326 005037 002226
1908 011332 005037 002232
1909 011336 023727 002012 000004
1910 011344 003051
1911 011346
1912 011354
1913 011356 052737 000002 002266
1914 011364 005037 002270
1915 011370 012737 177777 002334
1916 011376 012737 177777 002336
1917 011404 012737 177777 002340
1918 011412 012737 177777 002342
1919 011420 012737 177777 002344
1920 011426 062737 000001 002334
1921 011434 023737 002012 002334
1922 011442 001426
1923 011444
1924 011456
1925 011460 000240
1926 011462 004737 011656
1927 011466 000757
1928 011470
1929 011510 012737 000001 002270
1930 011516
1931 011520
1932 011546 005737 002226
1933 011552 001413
1934 011554
1935 011602
1955
1956 011604 000000
1957
1958 011606 045 116 045
1959
1960

.SBTTL INITIALIZE SECTION
*****
: THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
: AT THE BEGINNING OF EACH PASS. PRI07 HAS BEEN CHANGED TO PRI06
: TO MAKE THIS DIAGNOSTIC SBC-11/21 PROCESSOR SPECIFIC.
-----
INIT: BGNINIT
      CLR     FLAGS           :CLEAR ALL FLAGS
      RFLAGS  FLGDRS         :GET 'DRS' FLAGS
      REDEF   #EF.PWR        :IF POWER FAIL FLAG IS
      BNCOMPLETE 1$         :SET, THEN
      BIS     #POWERF,FLAGS  :SET POWER FAIL FLAG
      BR      FIN            :BR TO 'FIN'
1$:   REDEF   #EF.START      :IF START FLAG
      BNCOMPLETE 2$         :SET, THEN
      CLR     U0ADR          :CLEAR SYS U0 ADDRESS
      CLR     U1ADR          :CLEAR SYS U1 ADDRESS
      CLR     U0VECT         :CLEAR SYS U0 VECTOR
      CLR     U1VECT         :CLEAR SYS U1 VECTOR
2$:   CLR     SUT            :CLEAR SYS UNDER TST WORD
      CMP     LSUNIT,#4      :IF 4 UNITS OR LESS SELECTED
      BGT     INITER         :THEN
      REDEF   #EF.RESTART    :IF RESTART FLAG
      BNCOMPLETE SETUP      :SET, THEN
      BIS     #RESTAR,FLAGS  :SET RESTART FLAG
      CLR     ABORT          :CLEAR ABORT FLAG
      MOV     #-1,UNIT        :RESTORE UNIT # CTR
      MOV     #-1,U00         :RESET UNIT#1
      MOV     #-1,U01         :RESET UNIT#2
      MOV     #-1,U10         :RESET UNIT#3
      MOV     #-1,U11         :RESET UNIT#4
1$:   ADD     #1,UNIT        :INCREMENT TO NEXT UNIT
      CMP     LSUNIT,UNIT    :IF LOGICAL UNIT & UNIT
      BEQ     FIN            :NOT YET EQUAL, THEN
      GPHARD  UNIT,PLOC      :GET HARDWARE P-TABLE
      BNCOMPLETE 1$         :IF P-TABLE AVAILABLE, THEN
      NOP
      JSR     PC,UNPKHP      :CALL UNPACK HARDWARE P-TABLE
      BR      1$            :BR TO BEGIN DO
INITER: PRINTF #INTER1      :PRINT "TOO MANY UNITS"
      MOV     #1,ABORT       :SET ABORT
      DOCLN
      FIN: SETVEC U0VECT,#INTH0,#PRI06 :DO CLEAN UP
      TST    U1VECT         :SET SYS U0 VECTOR
      BEQ    2$             :IF SYS U1 VECTOR
      SETVEC U1VECT,#INTH1,#PRI06 :NOT=0, THEN
      SETVEC U1VECT,#INTH1,#PRI06 :SET SYS U1 VECTOR
2$:   ENDINIT
-----
PLOC: .WORD 0
-----
INTER1: .ASCIZ /%N%AONLY FOUR UNITS ALLOWED, START OVER/
       .EVEN
-----

```



```

1963      .SBTTL - MOD I.1 - UNPACK HARDWARE P-TABLES
1964      ;-----
1965
1966 011656 000240 UNPKHP: NOP          ; CLEAR UNT
1967 011660 005037 012330 CLR          ; SAVE P-TABLE LOCATION
1968 011664 013701 011604 MOV PLOC,R1 ; IF UNIT
1969 011670 005737 002334 IFAI1: TST   UNIT          ; IS ZERO
1970 011674 001005 BNE   IFBI1          ; LOAD UNIT #0 ADR
1971 011676 012137 002220 MOV   (R1)+,UOADR      ; LOAD UNIT #0 VECTOR
1972 011702 012137 002224 MOV   (R1)+,UOVECT    ; BR TO END IF 'A'
1973 011706 000426 BR    IFEI1          ; IF THIS ADR
1974 011710 021137 002220 IFBI1: CMP   (R1),UOADR ; EQUALS UNIT #0 ADR
1975 011714 001003 BNE   IFCI1          ; INCREMENT TEMP #1 BY 4
1976 011716 062701 000004 ADD   #4,R1          ; BR TO END IF 'A'
1977 011722 000420 BR    IFEI1          ; IF UN1 ADDRESS
1978 011724 005737 002222 IFCI1: TST   U1ADR      ; NOT LOADED PREVIOUSLY
1979 011730 001005 BNE   IFDI1          ; LOAD UNIT#1 ADR
1980 011732 012137 002222 MOV   (R1)+,U1ADR      ; LOAD UNIT #1 VECTOR
1981 011736 012137 002226 MOV   (R1)+,U1VECT    ; BR TO END IF 'C'
1982 011742 000405 BR    EICI1          ; IF UNIT ADR
1983 011744 021137 002222 IFDI1: CMP   (R1),U1ADR ; EQUALS UNIT #1 ADR
1984 011750 001153 BNE   ELDI1          ; THEN ADD 4 TO TEMP #1
1985 011752 062701 000004 ADD   #4,R1          ; SET UNT=1
1986 011756 012737 000001 012330 EICI1: MOV   #1,UNT ; IF RXXX
1987 011764 005737 002172 IFEI1: TST   RXXX      ; THEN
1988 011770 001445 BEQ   IFI11          ; IF DRIVE #0
1989 011772 005711 IFFI1: TST   (R1)      ; THEN
1990 011774 001021 IFGI1: ADD   #2,R1      ; ADD 2 TO TEMP #1
1991 011776 062701 000002 TST   (R1)          ; IF SIDE #0 SELECTED
1992 012002 005711 BNE   ELGI1          ; THEN
1993 012004 001006 BIS   #BIT0,SUT      ; SET SIDE #0, DRIVE #0
1994 012006 052737 000001 002232 CLR   UNTCOD        ; CLEAR UNIT CODE
1995 012014 005037 012326 BR    EIFI1          ; BR TO END IF 'F'
1996 012020 000501 ELGI1: BIS   #BIT2,SUT ; SET SIDE #1, DRIVE #0
1997 012022 052737 000004 002232 MOV   #2,UNTCOD    ; SET UNIT CODE = 10
1998 012030 012737 000002 012326 BR    EIFI1          ; BR TO END IF 'F'
1999 012036 000472 IFHI1: ADD   #2,R1      ; ADD 2 TO TEMP #1
2000 012040 062701 000002 TST   (R1)          ; IF SIDE #0 SELECTED
2001 012044 005711 BNE   ELHI1          ; THEN
2002 012046 001007 BIS   #BIT1,SUT      ; SET SIDE #0, DRIVE #1
2003 012050 052737 000002 002232 MOV   #1,UNTCOD    ; SET UNIT CODE = 01
2004 012056 012737 000001 012326 BR    EIFI1          ; BR TO END IF 'F'
2005 012064 000457 ELHI1: BIS   #BIT3,SUT ; SET SIDE #1, DRIVE #1
2006 012066 052737 000010 002232 MOV   #3,UNTCOD    ; SET UNIT CODE = 11
2007 012074 012737 000003 012326 BR    EIFI1          ; BR TO END IF 'F'
2008 012102 000450 IFI11: ADD   #2,R1      ; ADD 2 TO R1
2009 012104 062701 000002 TST   (R1)          ; IF SIDE
2010 012110 005711 BNE   ELI11          ; EQUALS 0, THEN
2011 012112 001056 IFJI1: SUB   #2,R1      ; SUBTRACT 2 FROM TEMP #1
2012 012114 162701 000002 TST   (R1)          ; IF DRIVE
2013 012120 005711 BNE   IFLI1          ; EQUALS ZERO, THEN
2014 012122 001020 IFKI1: TST   UNT          ; IF UNIT
2015 012124 005737 012330 BNE   ELKI1          ; EQUALS ZERO
2016 012130 001006 BIS   #BIT0,SUT      ; SET UNIT #0, DRIVE #0
2017 012132 052737 000001 002232 CLR   UNTCOD        ; CLEAR UNIT CODE
2018 012140 005037 012326 BR    EIFI1          ; BR TO END IF 'F'
2019 012144 000427
    
```



MISCELLANEOUS SECTIONS MACRO M1200 15-DEC-82 13:50 PAGE 52-1  
 - MOD I.1 - UNPACK HARDWARE P-TABLES

```

2020 012146 052737 000004 002232 ELK11: BIS #BIT2,SUT ;SET UNIT #1, DRIVE #0
2021 012154 012737 000002 012326 MOV #2,UNTCOD ;SET UNIT CODE = 10
2022 012162 000420 BR EIFI1 ;BR TO END IF 'F'
2023 012164 005737 012330 IFL11: TST UNT ;IF UNIT
2024 012170 001007 BNE ELL11 ;EQUALS 0
2025 012172 052737 000002 002232 BIS #BIT1,SUT ;SET UNIT #0, DRIVE #1
2026 012200 012737 000001 012326 MOV #1,UNTCOD ;SET UNIT CODE = 01
2027 012206 000406 BR EIFI1 ;BR TO END IF 'F'
2028 012210 052737 000010 002232 ELL11: BIS #BIT3,SUT ;SET UNIT #1, DRIVE #1
2029 012216 012737 000003 012326 MOV #3,UNTCOD ;SET UNIT CODE = 11
2030 012224 012701 002336 EIFI1: MOV #UT00,R1 ;GET BEGINING OF UNIT CODE TABLE
2031 012230 013702 012326 MOV UNTCOD,R2 ;GET UNIT CODE
2032 012234 006302 ASL R2 ;DOUBLE R2 FOR ADDRESSING
2033 012236 060201 ADD R2,R1 ;FIND ADDRESS FOR THIS UNIT CODE
2034 012240 013703 002334 MOV UNIT,R3 ;GET LOGICAL UNIT#
2035 012244 010311 MOV R3,(R1) ;SET USER UNIT# FOR PRINT OUT
2036 012246 000426 BR ENDI1 ;BR TO END MOD
2037 012250 ELI11: PRINTF #INMSG2,UNIT ;PRINT "MUST SELECT RXXX TO SEL SIDE"
2038 012274 DOCLN
2039 012276 000412 BR ENDI1 ;BR TO END MOD
2040 012300 ELD11: PRINTF #INMSG3,UNIT ;PRINT "NOT SCHEDULED-TWO BUS ADR ONLY"
2041 012324 000207 ENDI1: RTS PC ;RETURN
2042 :-----
2043 012326 000000 UNTCOD: 0 ;UNIT CODE
2044 012330 000000 UNT: 0 ;UNIT FLAG
2045 :-----
2046 012332 045 116 045 INMSG2: .ASCIZ /%N%AUNIT#%D1%A ANS RXXX EXPANSION TO SELECT SIDE #1->START OVER/
2047 012432 045 116 045 INMSG3: .ASCIZ /%N%AUNIT#%D1%A NOT SCHEDULED-TWO BUS ADDRESSSES ONLY%N/
2048 .EVEN
2049 :MOD I.1 ----- END MODULE -----

```

MISCELLANEOUS SECTIONS MACRO M1200 15-DEC-82 13:50 PAGE 54  
CLEANUP CODING SECTION

2052  
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2086

012522  
012522 000240  
012524  
012532 005737 002226  
012536 001403  
012540  
012546  
012550

.SBTTL CLEANUP CODING SECTION

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

2\$: BGNCLN  
NOP  
CLRVEC UOJECT  
TST U1VECT  
BEQ 2\$  
CLRVEC U1VECT  
BRESET  
ENDCLN

.EVEN

MISCELLANEOUS SECTIONS MACRO M1200 15-DEC-82 13:50 PAGE 56  
 AUTO DROP SECTION

```

2089          .SBTTL 'AUTO DROP SECTION
2090          :-----
2091 012552          BGNAUTO
2092 012552 005737 002220 IAATDP: TST      UOADR      ;IF SYS UNIT 0 ADDRESS
2093 012556 001447          BEQ      IDATDP      ;NOT=0, THEN
2094 012560 012703 002336          MOV      #UT00,R3    ;SETUP R3 = ADR OF SELECTED UNIT
2095 012564 013702 002220          MOV      UOADR,R2    ;GET SYS UNIT 0 ADDRESS
2096 012570 004737 012774          CALL     ADRTST     ;CALL ADDRESSING TEST
2097 012574 005737 002270 IBATDP: TST      ABORT     ;IF ABORT FLAG
2098 012600 001436          BEQ      IDATDP      ;SET, THEN
2099 012602 005737 002336 IGATDP: TST      UT00     ;IF UT00 SELECTED
2100 012606 100403          BMI      IHATDP      ;THEN
2101 012610          DODU      UT00     ;DROP UNIT 00
2102 012616 005737 002340 IHATDP: TST      UT01     ;IF UT01 SELECTED
2103 012622 100403          BMI      ICATDP      ;THEN
2104 012624          DODU      UT01     ;DROP UNIT 01
2105 012632 005737 002172 ICATDP: TST      RXXX     ;IF RXXX DEVICE
2106 012636 001417          BEQ      IDATDP      ;THEN
2107 012640 012703 002342          MOV      #UT10,R3    ;SETUP R3 = ADR OF SELECTED UNIT
2108 012644 005737 002342 IIATDP: TST      UT10     ;IF UT10 SELECTED
2109 012650 100403          BMI      IJATDP      ;THEN
2110 012652          DODU      UT10     ;DROP UNIT 10
2111 012660 005737 002344 IJATDP: TST      UT11     ;IF UT11 SELECTED
2112 012664 100440          BMI      XATDP      ;THEN
2113 012666          DODU      UT11     ;DROP UNIT 11
2114 012674 000434          BR       XATDP      ;BR TO EXIT
2115 012676 005737 002222 IDATDP: TST      U1ADR     ;IF SYS UNIT 1 ADDRESS
2116 012702 001425          BEQ      IFATDP      ;NOT=0, THEN
2117 012704 012703 002342          MOV      #UT10,R3    ;SETUP R3 = ADR OF SELECTED UNIT
2118 012710 013702 002222          MOV      U1ADR,R2    ;GET SYS UNIT 1 ADDRESS
2119 012714 004737 012774          CALL     ADRTST     ;CALL ADDRESSING TEST
2120 012720 005737 002270 IEATDP: TST      ABORT     ;IF ABORT FLAG
2121 012724 001420          BEQ      XATDP      ;SET, THEN
2122 012726 005737 002342 IKATDP: TST      UT10     ;IF UT10 SELECTED
2123 012732 100403          BMI      ILATDP      ;THEN
2124 012734          DODU      UT10     ;DROP UNIT 10
2125 012742 005737 002344 ILATDP: TST      UT11     ;IF UT11 SELECTED
2126 012746 100403          BMI      IFATDP      ;THEN
2127 012750          DODU      UT11     ;DROP UNIT 11
2128 012756 005737 002220 IFATDP: TST      UOADR     ;IF SYS UNIT 0 ADDRESS
2129 012762 001001          BNE      XATDP      ;EQUALS 0, THEN
2130 012764          DOCLN          ;DO CLEAN
2131 012766 005037 002270 XATDP: CLR      ABORT     ;CLEAR ABORT FLAG
2132 012772          ENDAUTO
2133          :-----

```



```

2136 .SBTTL - TEST 0: ADDRESSING TEST
2137 -----
2138 BGNSUB
2139 IF FUNCTION TEST
2140 : THEN-SETUP TEST
2141 : SETUP BUS TRAPS
2142 : READ RXCSR
2143 : RESET BUS TRAPS
2144 : IF TRAP
2145 : : THEN-SET SYSTEM FATAL FLAG
2146 : : CALL FUNCTION TEST ERROR
2147 : : REPORT BUS TRAP ON RXCSR
2148 :
2149 : ENDIF
2150 ENDSUB
2151 -----
2152
2153 012774 000240 ADRTST: NOP ;
2154 012776 005037 002270 CLR ABORT ;CLEAR ABORT FLAG
2155 013002 SETVEC #BTRP4,#TRAP,#PRI06
2156 013030 011201 MOV (R2),R1 ;READ RXCSR
2157 013032 CLRVEC #BTRP4
2158 013040 005737 002270 TST ABORT ;IF ABORT FLAG
2159 013044 001426 BEQ 2$ ;SET, THEN
2160 013046 012701 013144 MOV #TRPMS1,R1 ;SET TRAP MESSAGE
2161 013052 012337 002074 MOV (R3)+,L$LUN ;IF UNIT
2162 013056 100005 BPL 1$ ;NOT SELECTED, THEN
2163 013060 011337 002074 MOV (R3),L$LUN ;IF NEXT UNIT
2164 013064 100002 BPL 1$ ;NOT SELECTED, THEN
2165 013066 005037 002074 CLR L$LUN ;CLEAR UNIT
2166 013072 012737 000620 002376 1$: MOV #400,ERRNBR ;SETUP ERR NBR = ADR ERR
2167 013100 012737 013124 002400 MOV #TOMSG,ERRMSG ;SETUP ERROR MSG
2168 013106 012737 004510 002402 MOV #PRTB1,ERRBLK ;SETUP ERROR BLK
2169 013114 005037 002374 CLR ERR TYP ;SETUP ERR TYP = SYS FTL
2170 013120 ERROR ;CALL ERROR
2171 013122 000207 2$: RETURN ;RETURN
2172 -----
2173 013124 101 104 104 TOMSG: .ASCIZ /ADDRESSING TEST/
2174 013144 045 101 040 TRPMS1: .ASCII /%A BUS TRAP AT ADDRESS:%06%N/
2175 013200 045 101 040 .ASCIZ /%A INTERFACE BAD OR NOT SET TO ABOVE ADDRESS%N/
2176 .EVEN
    
```

MISCELLANEOUS SECTIONS MACRO M1200 15-DEC-82 13:50 PAGE 60  
- MOD U.SFT.TRP - BUS TRAP HANDLER

```

2179      .SBTTL - MOD U.SFT.TRP - BUS TRAP HANDLER
2180      :++
2181      : FUNCTIONAL DESCRIPTION: SUBR TO HANDLE DEVICE BUS TRAP
2182      : INPUTS: NONE
2183      : IMPLICIT INPUTS: BUS TRAP
2184      : OUTPUTS: BUS TRAP ERROR, ABORT TEST
2185      : IMPLICIT OUTPUTS: NONE
2186      : SUBORDINATE ROUTINES USED: NONE
2187      : FUNCTIONAL SIDE EFFECTS: NONE
2188      : CALLING SEQUENCE: INTERRUPT
2189      :--
2190
2191      :-----
2192
2193 013260 052737 004000 002274 TRAP:  BIS      #SYSERR,ERRSY ;SET SYSTEM ERROR
2194 013266 005237 002270          INC      ABORT      ;ABORT TEST
2195 013272 000002          RTI          ;RETURN FROM TRAP INTERRUPT
2196      :-----

```

```

2199          .SBTTL  DROP UNIT SECTION
2200
2201          :++
2202          : THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
2203          : TO NO LONGER BE TESTED.
2204          :--
2205
2211
2212 013274          BGNDU
2213
2214 013274 010037 013436          MOV      R0,UNITDP          :GET LOGICAL UNIT #
2215 013300 005002          CLR      R2                      :LET R2=UNIT CODE# & UNIT COUNT /CLEAR IT!
2216 013302 012701 002336          MOV      #UT00,R1          :GET BEGIN UNIT CODE ADDRESS
2217 013306 023721 013436          1$:    CMP      UNITDP,(R1)+      :IF USER UNIT#
2218 013312 001417          BEQ      2$                      :IS = UNIT CODE - UNIT#
2219 013314 005202          INC      R2                      :INCREMENT UNIT CODE# & UNIT COUNT
2220 013316 022702 000005          CMP      #5,R2                :IF MAX # OF UNITS
2221 013322 101371          BHI      1$                      :EXCEEDED, THEN
2222 013324          PRINTF #DUMSG2,UNITDP      :PRINT UNIT# NOT FOUND
2223 013350 000431          BR      3$                      :BR TO EXIT
2224 013352 012741 177777          2$:    MOV      #-1,-(R1)        :DESELECT UNIT
2225 013356 010237 004752          MOV      R2,CVUNIT            :SET UNIT CODE FOR CONVERSION
2226 013362 004737 004654          CALL    CVUTST                :CALL MOD U.A.1 CONVERT UNIT# TO SUT CODE
2227 013366 013737 004754 013440          MOV      SUTCV,SUTDRP         :SET SUT DROP CODE = SUT CONVERTED CODE
2228 013374 043737 013440 002232          BIC      SUTDRP,SUT           :DROP UNIT SPEC IN SUTDRP
2229 013402 043737 013440 002230          BIC      SUTDRP,SDD           :CLEAR UNIT SPEC IN SUT DROP
2230 013410          PRINTF #DUMSG1,UNITDP
2231
2232 013434          3$:    ENDDU
2233          -----
2234 013436 000000          UNITDP: 0                      :UNIT TO BE DROPPED
2235 013440 000000          SUTDRP: 0                     :SYS UNDER TST, DROP BIT
2236          -----
2237 013442 045 116 045          DUMSG1: .ASCIZ /%N% DROP UNIT#%D1% FROM TEST%/
2238 013503 045 116 045          DUMSG2: .ASCIZ /%N% COULD NOT DROP UNIT#%D1% -NOT SELECTED%/
2239          -----
2240
2252
2253          .EVEN

```



MISCELLANEOUS SECTIONS MACRO M1200 15-DEC-82 13:50 PAGE 64  
ADD UNIT SECTION

2256  
2257  
2258  
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2261  
2262  
2263  
2264 013562  
2265  
2271  
2272 013562  
2273  
2285  
2286

.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.  
:--

BGNAU

ENDAU

.EVEN

2289  
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```

.TITLE HARDWARE TESTS
.SBTTL TEST 1: RX02 SS PERF EXERCISER
++
: TEST TO EXCERCISE RX02/XX SYSTEM
--
.SBTTL MOD 0.0 - EXERCISE A SYSTEM
-----
BGNTST
BGND0
: BGNSUB
: : INITIALIZE (LOCATIONS, ETC.)
: : CALL MOD 1.0
: ENDSUB
: IF ERR SYS=1
: : THEN-
: : CALL MOD 4.0
: ENDF
: IF ABORT=0
: : THEN-
: : BGND0
: : : BGNSUB
: : : CALL MOD 2.0
: : : IF ERR SYS NOT=0
: : : : THEN-
: : : : CALL MOD 4.0
: : : : IF ABORT=0
: : : : : THEN-
: : : : : CALL MOD 3.0
: : : : ENDF
: : : ELSE-
: : : CALL MOD 3.0
: : : ENDF
: : : CK LOOP
: : : ENDSUB
: : DO UNTIL ABORT=1 OR EXCMP=1
: ENDF
DO UNTIL SWREG BIT#15 NOT SET
IF ABORT=1
: THEN-
: DO CLEAN UP
: ELSE-
: DO REPORT
: ENDF
ENDTST
-----

```

```

2335 013564          BGNTST
2336 013564 000240  CONTRL: NOP
2337 013566          BG00: BGNSUB
2338 013570 005037 014020  CLR      EXCMP
2339 013574 005037 002270  CLR      ABORT
2340 013600 012737 000001 014016  MOV      #1,INITL
2341 013606 005037 002304  CLR      RETRY
2342 013612 005037 002230  CLR      SDD
2343 013616 005037 002274  CLR      ERRSY
2344 013622 005037 002276  CLR      ERRTY
2345 013626 005037 002246  CLR      CSRUUT
2346 013632 005037 002250  CLR      ESRUUT
2347 013636 005037 033544  CLR      XERUUT
2348 013642 005037 002332  CLR      CMD
2349 013646 005037 023330  CLR      WDOT
2350 013652 012737 000001 021426  MOV      #1,SUTPTR
2351 013660 004737 014022  CALL     GTSYEX
2352 013664          ENDSUB
2353 013666 005737 002274  IA00:   TST      ERRSY
2354 013672 001402          BEQ      IB00
2355 013674 004737 032466  CALL     OTSYER
2356 013700 005737 002270  IB00:   TST      ABORT
2357 013704 001030          BNE      UG00
2358 013706          BC00:   BGNSUB
2359 013710 004737 020676  CALL     SCSYEX
2360 013714 005737 002274  ID00:   TST      ERRSY
2361 013720 001410          BEQ      LD00
2362 013722 004737 032466  CALL     OTSYER
2363 013726 005737 002270  IE00:   TST      ABORT
2364 013732 001005          BNE      ED00
2365 013734 004737 032444  CALL     OTEXCM
2366 013740 000402          BR       ED00
2367 013742 004737 032444  LD00:   CALL     OTEXCM
2368 013746          ED00:   CKLOOP
2369 013750          ENDSUB
2370 013752 005737 002270  UC00:   TST      ABORT
2371 013756 001007          BNE      IF00
2372 013760 005737 014020  TST      EXCMP
2373 013764 001750          BEQ      BC00
2374 013766 032737 100000 002204  UG00:   BIT      #100000,SWREG
2375 013774 001274          BNE      BG00
2376 013776 005737 002270  IF00:   TST      ABORT
2377 014002 001402          BEQ      LF00
2378 014004          DOCLN
2379 014006 000401          BR       ENDOO
2380 014010          LF00:   DORPT
2381 014012          ENDOO: EXIT    TST
2382
-----
2383 014016 000000          INITL:  0          ;INITIALIZE POINTERS FLAG
2384 014020 000000          EXCMP:  0          ;EXERCISE COMPLETE FLAG
2385
;MOD 0.0 ----- END MODULE -----

```



HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 69  
MOD 0.0 - EXERCISE A SYSTEM

```

2388
2389
2390
2391      .SBTTL  MOD 1.0 - GET SYSTEM EXERCISE
2392 014022 000240      GTSYEX: NOP
2393 014024 032737 000001 002266 IFB10: BIT      #POWERF,FLAGS      ;IF POWER FLAG
2394 014032 001002      BNE      IFA10      ;NOT SET, THEN
2395 014034 004737 014076      JSR      PC,GTEXCD   ;CALL GET EXERCISE CONDITION
2396 014040 032737 040000 002204 IFA10: BIT      #40000,SWREG   ;IF NO INITIALIZE
2397 014046 001002      BNE      ELA10      ;NOT SET, THEN
2398 014050 004737 014216      JSR      PC,GTSYS   ;CALL GET SYSTEM TO EXERCISE
2399 014054 004737 017302      ELA10: JSR      PC,GTEX   ;CALL GET EXERCISE
2400 014060 042737 040000 002274      BIC      #BIT14,ERRSY ;CLEAR ANY TIME OUT ERRORS ALREADY REPORTED
2401 014066 005037 014074      CLR      FIRST      ;CLEAR FIRST PASS FLAG
2402 014072 000207      RTS      PC          ;RETURN
2403
2404 014074 000001      FIRST: 1            ;FIRST PASS FLAG
2405      :MOD 1.0 ----- END MODULE -----
2406
2407
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2409      .SBTTL  MOD 1.1 - GET EXERCISE CONDITIONS
2410
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2413 014076 000240      GTEXCD: NOP
2414 014100 032737 000001 002204 IFA11: BIT      #1,SWREG      ;IF SET FOR DOUBLE DENSITY
2415 014106 001404      BEQ      ELA11      ;THEN
2416 014110 012737 000200 002252      MOV      #200,WDCNT   ;SET WORD COUNT=256 BYTES
2417 014116 000403      BR      EIA11      ;BR TO END IF 'A'
2418 014120 012737 000100 002252 ELA11: MOV      #100,WDCNT  ;SET WORD COUNT=128 BYTES
2419 014126 013737 002206 020650 EIA11: MOV      OTDITK,OD   ;SET OUTSIDE TRACK ADR. (FROM SOFTW P-TAB)
2420 014134 013737 002210 020652      MOV      INDITK,ID    ;SET INSIDE TRACK ADR. (FROM SOFT P-TAB)
2421 014142 032737 000002 002204      BIT      #2,SWREG     ;IF DEL DATA SET
2422 014150 001404      BEQ      ELB11      ;THEN
2423 014152 012737 000010 002244      MOV      #10,DEL DAT  ;SET DEL DATA MODE
2424 014160 000402      BR      IFC11      ;BR TO END IF 'B'
2425 014162 005037 002244      ELB11: CLR      DEL DAT  ;CLEAR DEL DATA MODE
2426 014166 032737 000001 002204 IFC11: BIT      #1,SWREG   ;IF DOUBLE DEN IS SET IN SOFT SWREG
2427 014174 001404      BEQ      ELC11      ;THEN
2428 014176 012737 000400 002242      MOV      #400,DEN    ;SET DEN=DOUBLE
2429 014204 000402      BR      EIC11      ;BR TO END IF 'C'
2430 014206 005037 002242      ELC11: CLR      DEN    ;SET DEN=SINGLE
2431 014212 000240      EIC11: NOP
2432 014214 000207      RTS      PC          ;RETURN
2433      :MOD 1.1 ----- END MODULE -----

```

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014216  
014220 004737 014626  
014224 012737 000040 025330  
014232 013737 002220 025332  
014240 004737 025230  
014244 032777 000040 165746  
014252 001006  
014254 012737 016167 016130  
014262 004737 016016  
014266 000442  
014270 012777 040000 165722  
014276 012737 000040 025330  
014304 013737 002220 025332  
014312 004737 025230  
014316 032777 000040 165674  
014324 001006  
014326 012737 016235 016130  
014334 004737 016016  
014340 000415  
014342 012737 000002 015276  
014350 012737 000001 015302  
014356 005037 015300  
014362 013704 002220  
014366 004737 014742  
014372 000412  
014374 005737 002172  
014400 001404  
014402 042737 000017 002232  
014410 000403  
014412 042737 000003 002232  
014420 005737 002172  
014424 001401  
014426 000463  
014430 032737 000014 002232  
014436 001457  
014440 004737 014702  
014444 032777 000040 165550  
014452 001441  
014454 012777 040000 165540  
014462 012737 000040 025330  
014470 013737 002222 025332  
014476 004737 025230  
014502 032777 000040 165512  
014510 001416  
014512 012737 000004 015302  
014520 012737 000002 015276  
014526 012737 000002 015300  
014534 013704 002222  
014540 004737 014742  
014544 000414  
014546 012737 016235 016130  
014554 000403

.SBTTL MOD 1.2 - GET SYSTEM TO EXERCISE

-----  
GTSYS: BRESET ;ISSUE BUS RESET  
CALL GPSUN0 ;CALL GET PRINTABLE SYSTEM 0 UNIT #  
MOV #DNBIT, RDYWD ;SET READY WORD = DONE  
MOV UOADR, CSRADR ;SET ADDRESS  
CALL DELAY ;CALL MOD - DELAY FOR DONE  
IFA12: BIT #DNBIT, @UOADR ;IF UNIT #0 DONE BIT  
BNE ELA12 ;NOT SET THEN  
MOV #INTER2, ITMSG ;SET PRINT MSG#  
CALL ITERR ;INITIALIZE ERR-UO-NO DONE BIT  
BR EIA12 ;BR TO END IF 'A'  
ELA12: MOV #40000, @UOADR ;ELSE-ISSUE PROG INIT TO UO  
MOV #DNBIT, RDYWD ;SET READY WORD = DONE  
MOV UOADR, CSRADR ;SET TEST ADDRESS  
CALL DELAY ;CALL MOD - DELAY FOR DONE  
IFB12: BIT #DNBIT, @UOADR ;IF UNIT #0 DONE BIT  
BNE ELB12 ;NOT SET THEN  
MOV #INTER3, ITMSG ;SET PRINT MSG#  
CALL ITERR ;INITIALIZE ERR-UO, NO DONE BIT  
BR EIA12 ;BR TO END IF 'A'  
ELB12: MOV #2, UNTCNT ;SET # DRVS TO CK  
MOV #1, SUTPOS ;SET POSITION IN SUT TO TEST = 1  
CLR UNTCO ;SET UUT CODE = 0  
MOV UOADR, R4 ;SET TEMP #4 = UO ADDRESS  
CALL CKDVAV ;CALL MOD 1.2.1 - CK DRIVE STATUS  
BR IFC12 ;BR TO IF 'C'  
EIA12: TST RXXX ;IF RXXX  
IFH12: BEQ ELH12 ;THEN  
BIC #17, SUT ;CLEAR RXXX UO SELECTED DRIVES  
BR IFC12 ;BR TO IF 'C'  
ELH12: BIC #3, SUT ;CLEAR RX02 UO SELECTED DRIVES  
IFC12: TST RXXX ;IF RXXX  
BEQ IFD12 ;THEN  
BR IFG12 ;BR TO IF 'G'  
IFD12: BIT #14, SUT ;IF U1  
BEQ IFG12 ;SELECTED THEN  
CALL GPSUN1 ;CALL GET PRINTABLE SYSTEM 1 UNIT #  
IFE12: BIT #DNBIT, @U1ADR ;IF U1 DONE BIT  
BEQ ELE12 ;SET THEN  
MOV #40000, @U1ADR ;INITIALIZE DEVICE U1  
MOV #DNBIT, RDYWD ;SET READY WORD = DONE BIT  
MOV U1ADR, CSRADR ;SET TEST ADR  
CALL DELAY ;CALL MOD - WAIT FOR DONE  
IFF12: BIT #DNBIT, @U1ADR ;IF U1 DONE BIT  
BEQ ELF12 ;SET THEN  
MOV #4, SUTPOS ;SET POSITION IN SUT = 4  
MOV #2, UNTCNT ;SET # DRVS TO CK = 2  
MOV #2, UNTCO ;SET UUT CODE = 2  
MOV U1ADR, R4 ;SET TEMP #4 = U1 ADR  
CALL CKDVAV ;CALL MOD 1.2.1 - CK DRIVE STATUS  
BR IFG12 ;BR TO IF 'G'  
ELF12: MOV #INTER3, ITMSG ;SET MSG#-U1-'NO DONE BIT-PROG INT'  
BR EIE12 ;BR TO END IF 'E'



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 MOD 1.2 - GET SYSTEM TO EXERCISE

```

2493 014556 012737 016167 016130 ELE12: MOV #INTER2,ITMSG ;SET MSG#-U1-'NO DONE BIT-BUS INIT''
2494 014564 004737 016016 EIE12: CALL ITERR ;INIT ERR
2495 014570 042737 000014 002232 BIC #14,SUT ;CLEAR SYS 1 FROM TEST
2496 014576 005737 002232 IFG12: TST SUT ;IF SYSTEM UNDER TEST
2497 014602 001007 BNE ELG12 ;EQUALS 0, THEN
2498 014604 012701 016305 MOV #INTER4,R1 ;SETUP PRINT - 'NO SYS TO TEST''
2499 014610 004737 004516 CALL PRTBOS ;CALL PRINT BASIC-0 ARG
2500 014614 012737 000001 002270 MOV #1,ABORT ;SET ABORT FLAG
2501 014622 000240 ELG12: NOP
2502 014624 000207 RTS PC ;RETURN
2503 ;MOD 1.2 ----- END MODULE -----
2504
2505 .SBTTL - MOD 1.2.U.1 - GET PRINTABLE SYSTEM 0 UNIT #
2506 -----
2507 014626 005037 002334 GPSUN0: CLR UNIT ;SET UNIT=0
2508 014632 005737 002336 TST UT00 ;IF UT00
2509 014636 100404 BMI 2$ ;VALID, THEN
2510 014640 013737 002336 002334 MOV UT00,UNIT ;SETUP UNIT FOR PRINT
2511 014646 000414 BR XPSUN0 ;BR TO EXIT
2512 014650 005737 002340 2$: TST UT01 ;IF UT01
2513 014654 100404 BMI 3$ ;VALID, THEN
2514 014656 013737 002340 002334 MOV UT01,UNIT ;SETUP UNIT FOR PRINT
2515 014664 000405 BR XPSUN0 ;BR TO EXIT
2516 014666 005737 002172 3$: TST RXXX ;IF RXXX
2517 014672 001402 BEQ XPSUN0 ;THEN
2518 014674 004737 014702 CALL GPSUN1 ;CALL GET PRINTABLE SYSTEM 1 UNIT #
2519 014700 000207 XPSUN0: RETURN ;RETURN
2520 -----
2521 .SBTTL - MOD 1.2.U.2 - GET PRINTABLE SYSTEM 1 UNIT #
2522 -----
2523
2524 014702 005037 002334 GPSUN1: CLR UNIT ;SET UNIT=0
2525 014706 005737 002342 1$: TST UT10 ;IF UT10
2526 014712 100404 BMI 2$ ;VALID, THEN
2527 014714 013737 002342 002334 MOV UT10,UNIT ;SETUP UNIT FOR PRINT
2528 014722 000406 BR XPSUN1 ;BR TO EXIT
2529 014724 005737 002344 2$: TST UT11 ;IF UT11
2530 014730 100403 BMI XPSUN1 ;VALID, THEN
2531 014732 013737 002344 002334 MOV UT11,UNIT ;SETUP UNIT FOR PRINT
2532 014740 000207 XPSUN1: RETURN ;RETURN
2533 -----

```



HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 73  
MOD 1.2.1 - CK DRIVE AVAILABLE

```

2536      .SBTTL MOD 1.2.1 - CK DRIVE AVAILABLE
2537      -----
2538 014742 010437 015272 CKDVAV: MOV R4,ITCSAD ;SAVE C & S ADR
2539 014746 062704 000002      ADD #2,R4 ;SET DATA BUFFER ADR
2540 014752 010437 015274      MOV R4,ITDBAD ;SAVE DB ADR
2541 014756 000240      BDA121: NOP ;
2542 014760 033737 015302 002232 IFA121: BIT SUTPOS,SUT ;IF THIS UNIT SUT & SUT
2543 014766 001521      BEQ EIA121 ;EQUAL, THEN
2544 014770      BGNSEG ;BEGIN SEGMENT-TO LOOP ON ERROR
2545 014772 013701 015300      MOV UNTCN,R1 ;SAVE UNIT CODE #
2546 014776 006301      ASL R1 ;DOUBLE UNIT CD FOR ADR
2547 015000 062701 002336      ADD #UTOO,R1 ;FIND ADR UNIT#
2548 015004 011137 002334      MOV (R1),UNIT ;SET UNIT# FOR PRINT
2549 015010 032737 000001 015300 IFB121: BIT #1,UNTCN ;IF DRIVE #1 SET IN UNIT CODE
2550 015016 001407      BEQ ELB121 ;THEN
2551 015020 012737 000033 015266      MOV #33,INTCMD ;SET READ STATUS DRV #1
2552 015026 012737 000001 015270      MOV #1,DRIVEN ;SET PRINT FOR DRV #1
2553 015034 000405      BR EIB121 ;BR TO END IF 'B'
2554 015036 012737 000013 015266 ELB121: MOV #13,INTCMD ;SET READ STATUS DRV #0
2555 015044 005037 015270      CLR DRIVEN ;SET PRINT FOR DRIVE #0
2556 015050 013777 015266 000214 EIB121: MOV INTCMD,@ITCSAD ;EXECUTE READ STATUS ON DRIVE AT TEMP #4
2557 015056 013737 015272 025332      MOV ITCSAD,CSRADR ;PASS DOWN ADRS
2558 015064 012737 000040 025330      MOV #DNBIT,RDYWD ;PASS DOWN "DONE" BIT TO TEST
2559 015072 004737 025230      CALL DELAY ;CALL MOD - DELAY FOR DONE BIT
2560 015076 032777 000010 000170 IFH121: BIT #10,@ITDBAD ;IF AC LOW BIT
2561 015104 001404      BEQ IFC121 ;SET, THEN
2562 015106 012737 017200 016130      MOV #ITER3,ITMSG ;SET MSG# - "AC LOW"
2563 015114 000436      BR EIC121 ;BR TO END IF 'C'
2564 015116 032777 000200 000150 IFC121: BIT #200,@ITDBAD ;IF DRV RDY BIT
2565 015124 001004      BNE IFI121 ;NOT SET, THEN
2566 015126 012737 016334 016130      MOV #ITMSG1,ITMSG ;SET MSG# - "NO DRIVE READY"
2567 015134 000426      BR EIC121 ;BR TO END IF 'C'
2568 015136 032777 004000 000126 IFI121: BIT #RX2BIT,@ITCSAD ;IF CSR RX02 BIT
2569 015144 001004      BNE IFD121 ;NOT SET, THEN
2570 015146 012737 016521 016130      MOV #ITMSG5,ITMSG ;SET MSG # "NOT CAP. OF DOUBLE DENS. OPS."
2571 015154 000416      BR EIC121 ;BR TO END IF 'C'
2572 015156 005737 002172      IFD121: TST RXXX ;IF UNIT IS TO BE TESTED AS RXXX
2573 015162 001421      BEQ EID121 ;THEN
2574 015164 032737 000002 015300 IFE121: BIT #2,UNTCN ;IF SIDE #1
2575 015172 001415      BEQ EID121 ;SELECTED
2576 015174 032777 000002 000072 IFF121: BIT #2,@ITDBAD ;IF SIDE #1
2577 015202 001011      BNE EID121 ;NOT READY, THEN
2578 015204 012737 016357 016130      MOV #ITMSG2,ITMSG ;SET MSG# - "NO SIDE RDY"
2579 015212 004737 016016      EIC121: CALL ITERR ;CALL INITIALIZE ERROR
2580 015216      ENDSEG ;END SEGMENT-TO LOOP ON ERROR
2581 015220 004737 016064      CALL ITDROP ;CALL DROP UNIT
2582 015224 000402      BR EIA121 ;BR TO ENDIF 'A'
2583 015226 004737 015306      EID121: CALL REFDIV ;CALL REFORMAT DRIVE DENSITY
2584 015232 006137 015302      EIA121: ROL SUTPOS ;MOVE SELECT BIT TO TEST SYS UNDER TEST
2585 015236 005337 015276      DEC UNTCN ;DECREMENT UNIT COUNT
2586 015242 005237 015300      INC UNTCN ;INCREMENT UNIT UNDER TEST CODE
2587 015246 005737 015276      DUA121: TST UNTCN ;DO
2588 015252 001402      BEQ END121 ;UNTIL
2589 015254 000137 014756      JMP BDA121 ;ALL UNITS DONE
2590 015260 000240      END121: NOP ;
2591 015262 000207      RTS PC ;RETURN
2592      -----

```

HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 75  
MOD 1.2.1 - CK DRIVE AVAILABLE

2595			:	-----
2596	015264	000000	REFCMD: 0	: REFORMAT COMMAND
2597	015266	000000	INTCMD: 0	: INITIAL COMMAND WORD
2598	015270	000000	DRIVEN: 0	: DRIVE NUMBER
2599	015272	000000	ITCSAD: 0	: INITIAL C & S ADR
2600	015274	000000	ITDBAD: 0	: INITIAL DATA BUFFER ADR
2601	015276	000000	UNTCNT: 0	: UNIT COUNT
2602	015300	000000	UNTCO: 0	: UNIT CODE
2603	015302	000000	SUTPOS: 0	: SYS UNDER TST POSITION
2604	015304	000000	FORMCK: 0	: FORMATT CK FLAG
2605			:	-----





HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 77-1  
 MOD 1.2.1.1 - REFORMAT DRIVE DENSITY

```

2665 015672 032777 100000 177372 IJ1211: BIT #100000,@ITCSAD :IF ERR BIT NOT SET
2666 015700 001444 BEQ X1211 :THEN BR TO EXIT
2667 015702 013737 015264 002332 MOV REFCMD,CMD :SET COMMAND FOR PRINT
2668 015710 013737 015272 002236 MOV ITCSAD,UUTADR :SET UUT ADR
2669 015716 004737 005026 CALL RDERCD :CALL DEVICE READ ERROR CODE
2670 015722 012737 017032 016130 MOV #ITER1,ITMSG :ELSE, SET "ERROR ON REFORMAT" MSG
2671 015730 000407 BR EH1211 :BR TO END IF 'H'
2672 015732 012737 017116 016130 LI1211: MOV #ITER2,ITMSG :SET "NO DONE BIT AFTER REFORMAT" MSG
2673 015740 000403 BR EH1211 :BR TO END IF 'H'
2674 015742 012737 016454 016130 LH1211: MOV #ITMSG4,ITMSG :SET MSG# NO "TR" BIT TIME OUT ERR
2675 015750 004737 016016 EH1211: CALL ITERR :CALL INITIALIZE ERROR
2676 015754 004737 002404 CALL PRERR :CALL PRINT ERR
2677 015760 000411 BR EA1211 :BR TO END IF 'A'
2678 015762 012737 016652 016130 LE1211: MOV #ITMSG7,ITMSG :SET MSG# DISK WRG DEN
2679 015770 000403 BR ED1211 :BR TO END IF 'D'
2680 015772 012737 016704 016130 LD1211: MOV #ITMSG8,ITMSG :SET MSG# MAN INTERVENTION NOT ALL
2681 016000 004737 016016 ED1211: CALL ITERR :CALL INITIALIZE ERROR
2682 016004 EA1211: ENDSEG :END SEGMENT-TO LOOP ON ERROR
2683 016006 004737 016064 CALL ITDROP :CALL DROP UNIT
2684 016012 000207 X1211: RTS PC :RETURN
2685 :-----:
2686 016014 000000 SAVDLY: 0 :SAVE NORMAL DELAY MULTIPLIER
2687 :-----:

```

HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 79  
 - MOD 1.2.U.3 - INITIALIZE ERROR

```

2690          .SBTTL - MOD 1.2.U.3 - INITIALIZE ERROR
2691          :-----:
2692
2693 016016 012737 000310 002376 ITERR: MOV #200,ERRNBR ;SET ERR NBR = INIT ERR
2694 016024 012737 016132 002400      MOV #ITERMG,ERRMSG ;
2695 016032 012737 004506 002402      MOV #NONE,ERRBLK ;
2696 016040 012737 000001 002374      MOV #1,ERRTYP ;SET ERR TYP = DEV FTL
2697 016046 013737 002334 002074      MOV UNIT,L$LUN ;SETUP LUN FOR PRINT
2698 016054      ERROR ;CALL ERROR
2699 016056 004737 016102      CALL ITPRNT ;CALL INITIALIZE PRINT
2700 016062 000207      RETURN ;RETURN
2701          :-----:
2702
2703          .SBTTL - MOD 1.2.U.4 - INITIALIZE DROP
2704          :-----:
2705 016064 013737 015302 013440 ITDROP: MOV SUTPOS,SUTDRP ;SETUP SYS. UNDER TEST DROP BIT
2706 016072      DODU UNIT ;DROP THIS UNIT FROM TEST
2707 016100 000207      RTS PC ;RETURN
2708          :-----:
2709
2710          .SBTTL - MOD 1.2.U.5 - INITIALIZE PRINT
2711          :-----:
2712
2713 016102 013702 002334 ITPRNT: MOV UNIT,R2 ;SETUP TO PRINT UNIT #
2714 016106 012701 016153      MOV #ITERUT,R1 ;SETUP MSG
2715 016112 004737 004536      CALL PRTB1S ;PRINT BASIC-1 ARG
2716 016116 013701 016130      MOV ITMSG,R1 ;SETUP TO PRINT MSG
2717 016122 004737 004516      CALL PRTB0S ;PRINT BASIC-0 ARG
2718 016126 000207      RTS PC ;RETURN
2719          :-----:
2720 016130 000000 ITMSG: 0 ;INITIALIZE MSG#
2721          :-----:
2722 016132 111 116 111 ITERMG: .ASCIZ /INITIALIZE ERROR/
2723 016153 045 101 040 ITERUT: .ASCIZ /%A UNIT#%D1/
2724 016167 045 101 055 INTER2: .ASCIZ /%A---NO DONE BIT AFTER BUS INITIALIZE/
2725 016235 045 101 055 INTER3: .ASCIZ /%A---NO DONE BIT AFTER PROG. INITIALIZE/
2726 016305 045 116 045 INTER4: .ASCIZ /%N% NO SYSTEM TO TEST/
2727 016334 045 101 055 ITMSG1: .ASCIZ /%A- NO DRIVE READY/
2728 016357 045 101 055 ITMSG2: .ASCIZ /%A- NO SIDE READY/
2729 016401 045 101 055 ITMSG3: .ASCIZ /%A- WRONG DENSITY -SINGLE DENSITY DISKETTE/
2730 016454 045 101 055 ITMSG4: .ASCIZ /%A- "TR" BIT AFTER SET DENSITY CMD%N/
2731 016521 045 101 055 ITMSG5: .ASCIZ /%A- NOT CAPABLE OF DOUBLE DENSITY OPERATIONS/
2732 016576 045 101 055 ITMSG6: .ASCIZ /%A- WRONG DENSITY - DOUBLE DENSITY DISKETTE/
2733 016652 045 101 040 ITMSG7: .ASCIZ /%A DISKETTE WRONG DENSITY/
2734 016704 045 101 040 ITMSG8: .ASCIZ /%A MAN. INTERVENTION REQ'D - REFORMAT/
2735 016753 045 101 040 ITMSG9: .ASCIZ /%A UNIT#%D1%-REFORMATTING, DO NOT INTERRUPT%N/
2736 017032 045 101 055 ITER1: .ASCIZ /%A- ERROR BIT SET AFTER REFORMAT COMMAND SEQUENCE%N/
2737 017116 045 101 055 ITER2: .ASCIZ /%A- NO DONE BIT AFTER REFORMAT COMMAND SEQUENCE%N/
2738 017200 045 101 055 ITER3: .ASCIZ /%A- AC LOW BIT SET/
2739 017223 040 040 040 FCKMSG: .ASCIZ / ->REFORMAT DISKETTE - ARE YOU SURE?/
2740      .EVEN
2741          :-----:

```

HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 81  
 - MOD 1.2.U.5 - INITIALIZE PRINT

```

2744
2745      .SBTTL  MOD 1.3 - GET EXERCISE
2746      :-----
2747
2748 017302 013737 002200 017750 GTEX:  MOV    TSTPAT,PAT      ;GET TEST PATTERN #
2749 017310 004737 017376          CALL    STSTPA        ;CALL MOD 1.3.1 SET TEST PATTERN
2750 017314 013737 002202 020654          MOV    TRKSEQ,SEQUEN ;GET TRACK SEQ #
2751 017322 013737 002206 020650          MOV    OTDITK,OD     ;GET OUTSIDE DIA. TRK
2752 017330 013737 002210 020652          MOV    INDITK,ID     ;GET INSIDE DIA. TRK
2753 017336 004737 017752          CALL    STKSEQ       ;CALL MOD 1.3.2 SET TRACK SEQUENCE
2754 017342 005737 014074          IFB13: TST    FIRST   ;IF A FIRST PASS
2755 017346 001007          BNE    THC13        ;THEN
2756 017350 032737 000040 002204          IFC13: BIT    #40,SWREG ;IF CLEAR STATISTICAL TABLES
2757 017356 001406          BEQ    END13        ;IS SELECTED THEN
2758 017360 042737 000040 002204          BIC    #40,SWREG    ;CLEAR SELECTED - CLR STAT TABLE
2759 017366 004737 020656          THC13: CALL    CLRSTA  ;CALL MOD 1.3.3 - CLEAR STATISTICAL TABLES
2760 017372 000240          NOP
2761 017374 000207          END13: RTS    PC    ;RETURN
2762      :MOD 1.3 ----- END MODULE -----

```



HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 83  
MOD 1.3.1 - SET DATA PATTERN

```

2765 .SBTTL MOD 1.3.1 - SET DATA PATTERN
2766 -----
2767 : PAT # ROUTINE DATA PATTERN
2768 : -----
2769 : 0 RANDAT NO PATTERN SPECIFIED (FORCE RANDOM DATA)
2770 : 1 DATA0 ALL ZEROS
2771 : 2 DATA1 ALL ONES
2772 : 3 FLOAT0 FLOAT ZERO THRU ONE'S
2773 : 4 FLOAT1 FLOAT ONE THRU ZERO'S
2774 : 5 PAT125 ALTERNATING BITS IN ONE BYTE COMP IN NEXT
2775 : 6 PAT333 ALTERNATING 1'S PAIR & 0 IN ONE BYTE COMP IN NEXT
2776 : 7 RANDAT RANDOM
2777
2778 :NOTE: DATA PATTERNS WILL BE MODIFIED SO BYTE #0 WILL CONTAIN TRACK ADDRESS
2779 : AND BYTE #1 THE SECTOR ADDRESS IN WHICH THE DATA IS WRITTEN.
2780 : THE LAST TWO BYTES CONTAIN THE CHECK SUM NUMBERS.
2781 -----
2782 017376 042737 000377 017462 STSTPA: BIC #377,@#BRONPT ;CLEAR BRANCH OFFSET
2783 017404 005037 017744 CLR SUM ;SET UP FOR ACCUMULATION OF CHECK SUM
2784 017410 005737 017750 TST PAT ;IF NO PATTERN SPECIFIED FORCE PATTERN 7
2785 017414 001003 BNE 1$
2786 017416 012737 000007 017750 MOV #7,PAT
2787 017424 013704 017750 1$: MOV PAT,R4 ;GET PATTERN BITS
2788 017430 005304 DEC R4 ;ADJUST FOR CORRECT OFFSET
2789 017432 006304 ASL R4
2790 017434 150437 017462 BISB R4,@#BRONPT ;INSERT OFFSET
2791 017440 012704 034010 MOV #DATPAT+2,R4 ;SET UP ADDRESS OF FIRST BYTE
2792 017444 013705 002252 MOV WDCNT,R5 ;SETUP WORD COUNT
2793 017450 006305 ASL R5 ;DOUBLE WORD COUNT FOR ADR
2794 017452 062705 034006 ADD #DATPAT,R5 ;ADD DATA PATTERN ADR
2795 017456 162705 000004 SUB #4,R5 ;ADJ. FOR CHECKSUM
2796 017462 000777 BRONPT: BR ;BRANCH BY OFFSET SELECTED
2797 017464 000137 017520 JMP DATA0 ;000 DATA BYTE
2798 017470 000137 017536 JMP DATA1 ;377 DATA BYTE
2799 017474 000137 017546 JMP FLOAT0 ;FLOAT A 0 THROUGH ALL 1'S
2800 017500 000137 017614 JMP FLOAT1 ;FLOAT A 1 THROUGH ALL 0'S
2801 017504 000137 017622 JMP PAT125 ;125/052 DATA WORD
2802 017510 000137 017646 JMP PAT333 ;314/063 DATA WORD
2803 017514 000137 017656 JMP RANDAT ;RANDOM DATA BYTE
2804 -----
2805 017520 005037 017746 DATA0: CLR DATBYT
2806 017524 004737 017704 PG: JSR PC,LOAD ;GO LOAD THE DATA BUFFER
2807 017530 005705 TST R5 ;IF R5
2808 017532 001463 BEQ END131 ;NOT =0 ,THEN
2809 017534 000773 BR PG
2810 -----
2811 017536 112737 000377 017746 DATA1: MOVB #377,DATBYT
2812 017544 000767 BR PG
2813 -----
2814 017546 112737 000376 017746 FLOAT0: MOVB #376,DATBYT ;SET UP A ONES FIELD
2815 017554 000261 XPG: SEC ;SET THE C BIT TO ROTATE THROUGH THE DATA
2816 017556 012702 000000 1$: MOV #0,R2 ;CLR R2 (CAN'T USE "CLR" AS IT CLEARS "C" BIT)
2817 017562 103001 BCC 2$ ;BR IF THE "C" BIT IS CLEARED
2818 017564 005202 INC R2 ;SET R2 IF NOT
2819 017566 004737 017704 2$: JSR PC,LOAD ;GO LOAD THE DATA BUFFER
2820 017572 005705 TST R5 ;IF R5
2821 017574 001442 BEQ END131 ;NOT ZERO THEN

```





```

2870
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2884 017752 005037 020634
2885 017756 005037 020642
2886 017762 005037 020640
2887 017766 112737 000177 020642
2888 017774 113737 020650 020640
2889 020002 005037 020646
2890 020006 113737 020652 020646
2891 020014 005037 020644
2892 020020 113737 020650 020644
2893 020026 013737 020646 020636
2894 020034 163737 020644 020636
2895 020042 005237 020636
2896 020046 002005
2897 020050 012737 100000 002274
2898 020056 000137 020632
2899 020062 013737 002202 020654
2900 020070 142737 000377 020126
2901 020076 005737 020654
2902 020102 001003
2903 020104 012737 000007 020654
2904 020112 013704 020654
2905 020116 005304
2906 020120 006304
2907 020122 150437 020126
2908 020126 000777
2909 020130 000137 020164
2910 020134 000137 020220
2911 020140 000137 020254
2912 020144 000137 020272
2913 020150 000137 020340
2914 020154 000137 020422
2915 020160 000137 020476
2916
2917 020164 123737 020646 020642
2918 020172 001004
2919 020174 012737 177777 020640
2920 020202 000405
2921 020204 113737 020644 020640
2922 020212 005237 020644
2923 020216 000565
2924
2925 020220 123737 020644 020642
2926 020226 001004

.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
-----
STKSEQ: CLR TKTPT ;CLEAR TRK TBL PTR
CLR PRESTK ;CLEAR PRESENT TRK
CLR TARGET ;CLEAR TARGET TRK
MOV #177,PRESTK ;INIT PRESENT TRK TO HANDLE TRK #0
MOV OD,TARGET ;INIT OD AS TARGET TRACK
CLR XID ;INIT WORDING ID AND OD LOCATIONS
MOV ID,XID ;SAVE INSIDE DIA. IN TEMP INSIDE DIA.
CLR XOD ;CLEAR TEMP OUTSIDE DIA
MOV OD,XOD ;SAVE OUTSIDE DIA. IN TEMP OUTSIDE DIA.
MOV XID,TRKCNT ;SET UP NUMBER OF TRACK MOVEMENTS
SUB XOD,TRKCNT
INC TRKCNT ;INCREMENT # OF TRACKS
BGE GTTK ;IF # OF TRACKS IS NEGATIVE, THEN
MOV #100000,ERRSY ;SET SYSTEM ERROR
JMP ENDTKS ;EXIT
GTTK: MOV TRKSEQ,SEQUEN ;GET TRACK SEQUENCE #
BICB #377,@#BRONTK ;CLEAR OUT BRANCH OFFSET
TST SEQUEN ;IF TRACK SEQUENCE
BNE 1$ ;EQUALS ZERO, THEN
MOV #7,SEQUEN ;FORCE SEQ #7-RANDOM
1$: MOV SEQUEN,R4 ;GET SEQUENCE BITS
DEC R4 ;ADJUST FOR CORRECT OFFSET
ASL R4
BRONTK: BISB R4,@#BRONTK ;THIS BR INST. IS MODIFIED SELECTED TRACK SEQUENCE
BR ;BRANCH TO SELECTED TRACK SEQUENCE
JMP SEQ1
JMP SEQ2
JMP SEQ3
JMP SEQ4 ;BOUNCE ID TO OD
JMP SEQ5 ;DECREASING BOUNCE
JMP SEQ6 ;STROBE
JMP SEQ7 ;RANDOM
-----
SEQ1: CMPB XID,PRESTK ;IF PRESENT TRACK=ID
BNE 1$ ;THEN
MOV #-1,TARGET ;TERMINATE TABLE
BR 2$ ;END SEQ1
1$: MOVB XOD,TARGET ;ELSE SET NEW TRACK-OUTSIDE DIA
INC XOD ;INCREMENT OUTSIDE DIA
2$: BR NEWTRK ;END SEQ1
-----
SEQ2: CMPB XOD,PRESTK ;
BNE 1$

```



HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 85-1  
 MOD 1.3.2 - SET TRACK SEQUENCE

```

2927 020230 012737 177777 020640      MOV    #-1,TARGET      ;TERMINATE TABLE
2928 020236 000405                    BR     2$              ;END SEQ2
2929 020240 013737 020646 020640 1$:  MOV    XID,TARGET      ;SET NEXT TRACK=INSIDIA
2930 020246 005337 020646                    DEC    XID              ;DECREMENT INSIDE DIA
2931 020252 000547                    BR     2$              ;
2932
2933 020254 005701  SEQ3:  TST    R1              ;IF MODE
2934 020256 001402                    BEQ    1$              ;NOT EQUAL TO ZERO
2935 020260 005001                    CLR    R1              ;THEN CHANGE MODE
2936 020262 000756                    BR     SEQ2            ;DO SEQ2
2937 020264 012701 000001 1$:  MOV    #1,R1           ;ELSE CHANGE MODE
2938 020270 000735                    BR     SEQ1            ;DO SEQ1
2939
2940 020272 005701  SEQ4:  TST    R1              ;IF MODE
2941 020274 001405                    BEQ    1$              ;NOT EQUAL TO ZERO
2942 020276 113737 020644 020640      MOVB   XOD,TARGET      ;THEN SET NEXT TRACK=OUTSIDE DIA
2943 020304 005001                    CLR    R1              ;CHANGE MODE
2944 020306 000405                    BR     2$              ;BR
2945 020310 113737 020646 020640 1$:  MOVB   XID,TARGET      ;ELSE SET NEXT TRACK=INSIDE DIA
2946 020316 012701 000001      MOV    #1,R1           ;TERMINATE TABLE
2947 020322 005337 020636      DEC    TRKCNT          ;
2948 020326 001003                    BNE    3$              ;
2949 020330 012737 177777 020640      MOV    #-1,TARGET      ;TERMINATE TABLE
2950 020336 000515                    BR     NEWTRK          ;
2951
2952 020340 123737 020646 020644  SEQ5:  CMPB   XID,XOD         ;IF INSIDE & OUTSIDE DIA
2953 020346 001421                    BEQ    2$              ;NOT EQUAL
2954 020350 005701                    TST    R1              ;THEN, IF MODE
2955 020352 001407                    BEQ    1$              ;
2956 020354 005001                    CLR    R1              ;CHANGE MODE
2957 020356 013737 020644 020640      MOV    XOD,TARGET      ;SET NEXT TRACK=OUTSIDE DIA
2958 020364 005237 020644                    INC    XOD             ;INCREMENT OUTSIDE DIA
2959 020370 000413                    BR     3$              ;END SEQ5
2960 020372 012701 000001 1$:  MOV    #1,R1           ;CHANGE MODE
2961 020376 013737 020646 020640      MOV    XID,TARGET      ;SET NEXT TRACK=INSIDE DIA
2962 020404 005337 020646      DEC    XID             ;DECREMENT INSIDE DIA
2963 020410 000403                    BR     3$              ;END SET5
2964 020412 012737 177777 020640 2$:  MOV    #-1,TARGET      ;TERMINATE TABLE
2965 020420 000464                    BR     NEWTRK          ;
2966
2967 020422 123737 020646 020644  SEQ6:  CMPB   XID,XOD         ;IF O.D. JUST DONE
2968 020430 001416                    BEQ    1$              ;THEN
2969 020432 123737 020642 020644      CMPB   PRESTK,XOD      ;SET TO DO I.D.
2970 020440 001006                    BNE    3$              ;DECREMENT I.D. FOR NEXT
2971 020442 113737 020646 020640      MOVB   XID,TARGET      ;
2972 020450 005337 020646      DEC    XID             ;ELSE SET TO DO O.D.
2973 020454 000407                    BR     2$              ;
2974 020456 113737 020644 020640 3$:  MOVB   XOD,TARGET      ;
2975 020464 000403                    BR     2$              ;
2976 020466 012737 177777 020640 1$:  MOV    #-1,TARGET      ;
2977 020474 000436                    BR     NEWTRK          ;
2978
2979 020476 000240  SEQ7:  NOP                    ;GET A RANDOM NUMBER
2980 020500 004737 004560      JSR    PC,RANGEN       ;CLEAR ALL BUT LOW 7 BITS
2981 020504 042737 177600 004652      BIC    #177600,RANUM   ;IF RANUM LARGER THAN ID ADDRESS
2982 020512 123737 004652 020646  IDCOMP: CMPB   RANUM,XID     ;THEN
2983 020520 003401                    BLE    ODCOMP          ;

```

HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 85-2  
 MOD 1.3.2 - SET TRACK SEQUENCE

```

2984 020522 000765          BR      SEQ7          ;BR TO GET ANOTHER RANDOM NUMBER
2985 020524 123737 004652 020644 ODCOMP: CMPB   RANUM,XOD      ;IF RANUM SMALLER THAN OD ADDRESS
2986 020532 002001          BGE    PRESCK        ;THEN
2987 020534 000760          BR      SEQ7          ;BR TO GET ANOTHER RANDOM NUMBER
2988 020536 123737 004652 020642 PRESCK: CMPB   RANUM,PRESCK ;IF RANUM EQUALS PRESENT TRACK
2989 020544 001754          BEQ    SEQ7          ;GET ANOTHER RANDOM NUMBER
2990 020546 013737 004652 020640      MOV    RANUM,TARGET ;RANUM OK PUT IT IN TARGET TRACK
2991 020554 005337 020636          DEC    TRKCNT
2992 020560 001003          BNE    1$
2993 020562 012737 177777 020640      MOV    #-1,TARGET  ;TERMINATE TABLE
2994 020570 000400          1$:   BR      NEWTRK
    
```

```

2995 -----
2996 020572 012702 033553      NEWTRK: MOV    #TRKTBL-1,R2
2997 020576 005237 020634          INC    TKTBP
2998 020602 063702 020634          ADD    TKTBP,R2
2999 020606 113712 020640          MOVB  TARGET,(R2)
3000 020612 005737 020640          TST   TARGET
3001 020616 100405          BMI   ENDTKS
3002 020620 113737 020640 020642      MOVB  TARGET,PRESCK
3003 020626 000137 020126          JMP   BRONTK
3004 020632 000207      ENDTKS: RTS    PC
    
```

```

3005 -----
3006 020634 000000      TKTBP: 0          ;TRACK TABLE POINTER
3007 020636 000000      TRKCNT: 0        ;TRACK COUNT
3008 020640 000000      TARGET: 0       ;TARGET TRACK
3009 020642 000000      PRESTK: 0       ;PRESENT TRACK
3010 020644 000000      XOD: 0          ;X OUTSIDE DIA.
3011 020646 000000      XID: 0          ;X INSIDE DIA.
3012 020650 000000      OD: 0           ;OUTSIDE DIA.
3013 020652 000000      ID: 0           ;INSIDE DIA.
3014 020654 000000      SEQUEN: 0       ;SEQUENCE #
    
```

;MOD 1.3.2 ----- END MODULE -----

.SBTTL MOD 1.3.3 - CLEAR STATISTICAL TABLES

```

3020 -----
3021 -----
3022 -----
3023 020656 012701 007314      CLRSTA: MOV    #READSC,R1 ;SET UP BEGINNING ADDRESS
3024 020662 012702 011240      MOV    #ENDST,R2       ;SET UP TABLE LENGTH
3025 020666 005021      BDA133: CLR    (R1)+     ;CLEAR ADDRESSED LOCATION
3026 020670 020102          CMP    R1,R2           ;
3027 020672 001375          BNE    BDA133         ;DO UNTIL LAST ADDRESS DONE
3028 020674 000207      END133: RTS    PC      ;RETURN
    
```

;MOD 1.3.3 ----- END MODULE -----

3029



HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 87  
MOD 1.3.3 - CLEAR STATISTICAL TABLES

```

3032
3033
3034
3035
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3037 020676 000240
3038 020700 005737 014016
3039 020704 001417
3040 020706 012737 000001 024252
3041 020714 005037 021430
3042 020720 005037 021432
3043 020724 005037 021434
3044 020730 005037 021442
3045 020734 005037 021444
3046 020740 005037 021452
3047 020744 005037 021446
3048 020750 033737 021426 002232
3049 020756 001406
3050 020760 004737 004756
3051 020764 013737 005024 002234
3052 020772 000410
3053 020774 006337 021426
3054 021000 022737 000020 021426
3055 021006 003360
3056 021010 000137 021404
3057 021014
3058 021016 013737 002176 021424
3059 021024 004737 021454
3060 021030 013737 022156 021422
3061 021036 032737 000400 021422
3062 021044 001514
3063 021046 004737 032352
3064 021052 032737 004000 021422
3065 021060 001001
3066 021062 000411
3067 021064 023727 021432 000003
3068 021072 001065
3069 021074 013737 021432 021444
3070 021102 005037 021432
3071 021106 013737 002234 021450
3072 021114 052737 002000 021450
3073 021122 032737 001000 021422
3074 021130 001001
3075 021132 000410
3076 021134 012737 002000 021440
3077 021142 005737 021430
3078 021146 001420
3079 021150 005037 021430
3080 021154 053737 021444 002230
3081 021162 006337 021426
3082 021166 013737 002234 021450
3083 021174 052737 002000 021450
3084 021202 005037 021432
3085 021206 000504
3086 021210 005737 002244
3087 021214 001403
3088 021216 005037 002244

.SBTTL MOD 2.0 - SCHEDULE SYSTEM EXERCISE
-----
SCSYEX: NOP
IFK20: TST INITL
BEQ ELK20
MOV #1,INITTK
CLR EXHCP
CLR BTHDRV
CLR BDVSCD
CLR DVDNCK
CLR DRVDN
CLR ERTSAV
ELK20: CLR SFERR
IFA20: BIT SUTPTR,SUT
BEQ ELA20
CALL CVSTUT
MOV UNITST,UUT
BR BDB20
ELA20: ASL SUTPTR
DUC20: CMP #20,SUTPTR
BGT IFA20
JMP EDC20
BDB20: BGNSEG
MOV TSTN,EXN
CALL GETTST
MOV TSTWD,TST
IFB20: BIT #400,TST
BEQ ELB20
CALL STDVDN
IFC20: BIT #4000,TST
BNE IFI20
BR EIC20
IFI20: CMP BTHDRV,#3
BNE IFL20
MOV BTHDRV,DRVDN
CLR BTHDRV
EIC20: MOV UUT,RESTK
BIS #2000,RESTK
IFF20: BIT #1000,TST
BNE ELF20
BR EIF20
ELF20: MOV #2000,ADVTRK
IFG20: TST EXHCP
BEQ IFH20
CLR EXHCP
EIF20: BIS DRVDN,SDD
ASL SUTPTR
MOV UUT,RESTK
BIS #2000,RESTK
CLR BTHDRV
BR END20
IFH20: TST DELDAT
BEQ ELH20
CLR DELDAT

:
: IF INITIALIZE
: THEN
: SET INITIALIZE TRK FLG
: CLEAR EX HALF COMPL
: CLEAR BOTH DRV DONE FLG
: CLEAR BOTH DRV SEC DONE FLG
: CLEAR DRV DONE CK FLG
: CLEAR DRV DONE
: CLEAR ERR TYP SAVE
: CLEAR SFT ERR
: IF SYSTEM UNDER TEST BIT
: IS SET
: CALL MOD U.A.2 - CONVERT SUTPTR-->UUT
: SET UNIT UNDER TEST
: BR TO BEGIN 'B'
: SHIFT SUT POINTER TO TEST
: DO UNTIL SUT POINTER
: EQUALS 10000 BIN
: BR TO END DO 'C'
: BEGIN SEGMENT FOR ERROR LOOPS
: GET TEST # = EXERCISE #
: CALL MOD 2.1 - GET A TEST
: SAVE TEST WORD
: IF NEXT UNIT BIT
: IS SET THEN
: CALL MOD 2.6 -SET DRIVES DONE
: IF ADV TRK BIT
: IS NOT SET THEN
: BR TO END IF 'C'
: IF BOTH DRIVES DONE
: THEN
: SET BOTH DRVS DONE TEST
: CLEAR BOTH DRIVES DONE FLAG & THEN
: SET UUT TO RESET TRK
: SET INC TRK ONTO RESET TRK
: IF DEL DATA CK BIT
: IS SET THEN
: BR TO IF 'F'
: SET ADV TRK = INCR TRK
: IF EXERCISE 1/2 COMPLETE
: IS SET, THEN
: CLEAR EX HALF COMPLETE
: SET THIS DRV DONE
: SETUP PTR TO CK NXT UNIT
: GET UUT
: SET INCTRK ON RESET TRK FLAG
: CLEAR BOTH DRV DN FLAG
: BR TO END
: IF DEL DATA MODE
: IS SET
: CLEAR DEL DATA MODE

```



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MOD 2.0 - SCHEDULE SYSTEM EXERCISE

```

3089 021222 000403
3090 021224 012737 000010 002244 ELH20: MOV EIH20 #10,DEL DAT ;BR TO END IF 'H'
3091 021232 005037 021444 EIH20: CLR DRVDN ;SET DEC DATA MODE
3092 021236 012737 000001 021430 MOV #1,EXHCP ;CLEAR DRV DONE
3093 021244 000443 BR EIB20 ;SET EX 1/2 COMPLETE
3094 021246 032737 000003 021434 IFL20: BIT #3,BDVSCD ;BR TO END IF 'B'
3095 021254 001405 BEQ ELL20 ;IF BOTH DRV SEC DONE
3096 021256 005037 021434 CLR BDVSCD ;THEN
3097 021262 012737 004000 021440 MOV #4000,ADVTRK ;CLEAR DRV SEC DONE FLAGS
3098 021270 004737 022320 ELL20: CALL GTDRV ;ALLOW TRACK ADVANCE
3099 021274 000427 BR EIB20 ;CALL MOD 2.2 - GET A DRIVE
3100 021276 053737 021440 021436 ELB20: BIS ADVTRK,INCTRK ;BR TO END IF 'B'
3101 021304 013737 021422 023324 MOV TST,DRVTST ;SET ADV TRK (IF SET BY PREV OP)
3102 021312 004737 022504 CALL XDTVST ;PASS DRIVE TEST
3103 021316 013737 023324 025410 MOV DRVTST,TSTEV ;CALL MOD 2.3. - EXECUTE DRIVE TEST
3104 021324 004737 025334 CALL EVTSTR ;PASS DRIVE TEST FOR EVAL
3105 021330 013701 021422 MOV TST,R1 ;CALL MOD 2.4 - EVAL. TEST RESULTS
3106 021334 042701 171777 BIC #171777,R1 ;GET DRV TST
3107 021340 010137 021436 MOV R1,INCTRK ;SAVE TRK BITS
3108 021344 005037 021440 CLR ADVTRK ;SET TRK BITS
3109 021350 005037 014016 CLR INITL ;CLEAR ADV TRK FLAG
3110 021354 000240 EIB20: NOP ;CLEAR INITIALIZE FLAG
3111 021356 005737 002276 IFM20: TST ERRTY ;IF ERR TYPE
3112 021362 001402 BEQ DUB20 ;NOT=0
3113 021364 004737 030702 CALL OTERTP ;CALL MOD 2.5 - O/P ERR TYPE
3114 021370 005737 002274 DUB20: TST ERRSY ;DO UNLESS SYSTEM ERROR
3115 021374 001011 BNE END20 ;NOT=0 THEN
3116 021376 ENDSEG ;END SEGMENT FOR ERROR LOOPS
3117 021400 000137 021014 JMP BDB20 ;BR TO END MOD
3118 021404 012737 000001 021426 EDC20: MOV #1,SUTPTR ;SET SYS UNDER TEST PTR
3119 021412 052737 000001 021446 BIS #1,SFERR ;SET SFT ERR
3120 021420 000207 END20: RTS PC ;END MODULE
-----
3121
3122 021422 000000 TST: 0 ;TEST FOR EXECUTION
3123 021424 000000 EXN: 0 ;EXERCISE #
3124 021426 000001 SUTPTR: 1 ;SYSTEM UNDER TEST POINTER
3125 021430 000000 EXHCP: 0 ;EXERCISE HALF COMPLETE (EX#7) DEL DATA PASS
3126 021432 000000 BTHDRV: 0 ;BOTH DRIVES DONE FLAG
3127 021434 000000 BDVSCD: 0 ;BOTH DRIVE SECTORS DONE FLAG
3128 021436 000000 INCTRK: 0 ;INCREMENT TRACK FLAGS
3129 021440 000000 ADVTRK: 0 ;ADVANCE TRACK FLAG
3130 021442 000000 DVDNCK: 0 ;DRV DONE CK FLAG
3131 021444 000000 DRVDN: 0 ;DRIVE DONE
3132 021446 000000 SFERR: 0 ;SOFTWARE ERR
3133 021450 000000 RESTK: 0 ;RESET TRK FLAG
3134 021452 000000 ERTSAV: 0 ;ERR TYP SAVE REG
3135 ;MOD 2.0 ----- END MODULE -----

```

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3138      .SBTTL MOD 2.1 - GET A TEST
3139      ;-----
3140
3141 021454 000240      GETTST: NOP      ;
3142 021456 013701 021424      MOV      EXN,R1      ;GET EXERCISE NUMBER
3143 021462 006301      ASL      R1          ;DOUBLE EXERCISE NUMBER
3144 021464 012702 022164      MOV      #EXADTB,R2 ;GET EXERCISE ADDRESS TABLE
3145 021470 060102      ADD      R1,R2      ;CAL EXERCISE TO BE USED
3146 021472 011237 022154      MOV      (R2),EXADR ;GET BEGIN ADR EXERCISE
3147 021476 005737 014016      IFL21: TST      INITL ;IF INITIALIZE
3148 021502 001406      BEQ      IFA21      ;IS SET, THEN
3149 021504 005037 022152      CLR      TSTPTR     ;CLEAR TST PTR
3150 021510      IFF21: INLOOP    ;IF IN LOOP
3151 021512      BNCOMPLET IFA21    ;SET, THEN
3152 021514 000137 022122      JMP      EIF21      ;BR TO END IF 'F'
3153 021520 005737 002304      IFA21: TST      RETRY ;IF RETRY
3154 021524 001410      BEQ      IFB21      ;NOT=0, AND
3155 021526 032737 000004 002204      BIT      #BIT02,SWREG ;IF RETRY ON ERROR
3156 021534 001106      BNE      IFH21      ;IS NOT SET, THEN
3157 021536 032737 000004 002264      BIT      #EVL,FLGDRS ;IF DRS "EVL" FLAG
3158 021544 001102      BNE      IFH21      ;IS NOT SET, THEN
3159 021546 005737 022152      IFB21: TST      TSTPTR ;IF TST PTR
3160 021552 001006      BNE      IFC21      ;EQUALS ZERO
3161 021554 012737 000002 022152      MOV      #2,TSTPTR  ;ADV. TST PTR I CMD
3162 021562 005037 022160      CLR      TBPRCT     ;CLEAR TABLE PAIR COUNT
3163 021566 000555      BR      EIF21      ;BR TO END IF 'F'
3164 021570 005737 002262      IFC21: TST      SECDN ;IF SECTOR DONE IS
3165 021574 001447      BEQ      IFG21      ;SET THEN
3166 021576 005737 022160      IFK21: TST      TBPRCT ;IF TABLE PAIR CNT=1,
3167 021602 001444      BEQ      IFG21      ;THEN
3168 021604 062737 000002 022152      ADD      #2,TSTPTR  ;ADVANCE ONE TEST CMD
3169 021612 005037 022160      CLR      TBPRCT     ;CLEAR TABLE PAIR COUNT
3170 021616 005037 021442      CLR      DVDNCK     ;CLEAR DRV DONE CK FLAG
3171 021622 032737 040000 022156      IFD21: BIT      #40000,TSTWD ;IF DONE CK
3172 021630 001411      BEQ      IFM21      ;IS SET, THEN
3173 021632 005737 002260      TST      TRKDN     ;IF TRACK DONE IS
3174 021636 001406      BEQ      IFM21      ;SET, THEN
3175 021640 005037 002260      CLR      TRKDN     ;CLEAR TRK DONE
3176 021644 012737 000001 021442      MOV      #1,DVDNCK  ;SET DRV DONE CK
3177 021652 000523      BR      EIF21      ;BR TO END IF 'F'
3178 021654 032737 006000 022156      IFM21: BIT      #6000,TSTWD ;IF ADV OR INCR TRK
3179 021662 001517      BEQ      EIF21      ;IS SET, THEN
3180 021664 032737 100000 022156      IFN21: BIT      #100000,TSTWD ;IF '4 CMD SEQ'
3181 021672 001404      BEQ      ELN21      ;IS SET, THEN
3182 021674 162737 000010 022152      SUB      #10,TSTPTR ;BACK UP 4 CMDS
3183 021702 000507      BR      EIF21      ;BR TO END IF 'F'
3184 021704 162737 000004 022152      ELN21: SUB      #4,TSTPTR ;BACK UP TWO TEST CMDS
3185 021712 000503      BR      EIF21      ;BR TO END IF 'F'
3186 021714 005737 022160      IFG21: TST      TBPRCT ;IF TABLE PAIR COUNT
3187 021720 001406      BEQ      ELG21      ;EQUALS 1 THEN
3188 021722 005037 022160      CLR      TBPRCT     ;CLEAR TABLE PAIR COUNT
3189 021726 162737 000002 022152      SUB      #2,TSTPTR  ;BACK UP ONE CMD
3190 021734 000472      BR      EIF21      ;BR END IF 'F'
3191 021736 005237 022160      ELG21: INC      TBPRCT ;INCREMENT TABLE PAIR COUNT
3192 021742 062737 000002 022152      ADD      #2,TSTPTR  ;ADVANCE ONE CMD
3193 021750 000464      BR      EIF21      ;BR END IF 'F'
3194 021752 032737 000010 002304      IFH21: BIT      #10,RETRY ;IF NO DATA RETRY IS
    
```



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MOD 2.1 - GET A TEST

```

3195 021760 001005          BNE      IFI21          :SET, OR
3196 021762 032737 000020 002304  BIT      #20,RETRY    :IF NO CRC RETRY IS
3197 021770 001001          BNE      IFI21          :SET, THEN
3198 021772 000453          BR       EIF21          :BR END IF 'F'
3199 021774 032737 000002 002304  IFI21:  BIT      #2,RETRY    :IF WRITE RETRY IS
3200 022002 001412          BEQ      IFJ21          :SET, THEN
3201 022004 162737 000006 022152  SUB      #6,TSTPTR    :BACK UP 3 CMDS
3202 022012 042737 000002 002304  BIC      #2,RETRY    :CLEAR WRITE RETRY
3203 022020 012737 000003 022162  MOV      #3,TSVCT    :SET TEST ADV COUNT=3
3204 022026 000433          BR       EII21          :BR TO END IF 'I'
3205 022030 032737 000004 002304  IFJ21:  BIT      #4,RETRY    :IF READ RETRY IS
3206 022036 001412          BEQ      ELJ21          :SET THEN
3207 022040 162737 000002 022152  SUB      #2,TSTPTR    :BACK UP 1 CMD
3208 022046 042737 000004 002304  BIC      #4,RETRY    :CLEAR READ RETRY
3209 022054 012737 000001 022162  MOV      #1,TSVCT    :SET TEST ADV COUNT=1
3210 022062 000415          BR       EII21          :BR TO END IF 'I'
3211 022064 005337 022162          ELJ21:  DEC      TSVCT    :DECREMENT TEST ADV COUNT
3212 022070 062737 000002 022152  ADD      #2,TSTPTR    :ADV TEST POINTER 1 CMD
3213 022076 005737 022162          IF021:  TST      TSVCT    :IF TEST ADV COUNTER
3214 022102 001007          BNE      EIF21          :EQUALS ZERO, THEN
3215 022104 005037 002304          CLR      RETRY      :CLEAR RETRY
3216 022110 005237 022160          INC      TBPRCT     :SET TABLE PAIR COUNT
3217 022114 000402          BR       EIF21          :BR TO END IF 'F'
3218 022116 005037 022160          EII21:  CLR      TBPRCT     :CLEAR TABLE PAIR CNT
3219 022122 013703 022152          EIF21:  MOV      TSTPTR,R3 :GET TEST POINTER
3220 022126 063703 022154          ADD      EXADR,R3    :CAL. CUR. TEST OF THIS EXERCISE
3221 022132 011337 022156          MOV      (R3),TSTWD  :PASS UP TEST WORD
3222 022136 105713          IFE21:  TSTB     (R3)   :IF CMD LOWER BYTE
3223 022140 002002          BGE      EIE21        :EQUALS -1, THEN
3224 022142 005037 022152          CLR      TSTPTR     :RESET TEST PTR
3225 022146 000240          EIE21:  NOP
3226 022150 000207          RTS      PC          :RETURN

```

```

3227 -----
3228 022152 000000          TSTPTR: .WORD 0      :TEST POINTER
3229 022154 000000          EXADR:  .WORD 0      :CURRENT EXERCISE TABLE BASE ADDRESS
3230 022156 000000          TSTWD:  .WORD 0      :TEST WORD TO PASS UP
3231 022160 000000          TBPRCT: .WORD 0      :TABLE PAIR COUNT
3232 022162 000000          TSVCT:  .WORD 0      :TEST ADVANCE COUNTER
3233 -----
3234 022164 022300          EXADTB: .WORD EX7    :EXERCISE ADDRESS TABLE
3235 022166 022204          .WORD EX1
3236 022170 022214          .WORD EX2
3237 022172 022230          .WORD EX3
3238 022174 022244          .WORD EX4
3239 022176 022254          .WORD EX5
3240 022200 022264          .WORD EX6
3241 022202 022300          .WORD EX7
3242 -----

```



		.SBTTL - EXERCISE/TEST TABLE		
3245				
3246				
3247	022204	177777	EX1:	.WORD -1
3248	022206	000000		.WORD 0
3249	022210	044002		.WORD 44002
3250	022212	000777		.WORD 777
3251	022214	177777	EX2:	.WORD -1
3252	022216	000000		.WORD 0
3253	022220	000002		.WORD 2
3254	022222	000003		.WORD 3
3255	022224	154001		.WORD 154001
3256	022226	000777		.WORD 777
3257	022230	177777	EX3:	.WORD -1
3258	022232	000000		.WORD 0
3259	022234	000002		.WORD 2
3260	022236	000003		.WORD 3
3261	022240	174001		.WORD 174001
3262	022242	000777		.WORD 777
3263	022244	177777	EX4:	.WORD -1
3264	022246	000003		.WORD 3
3265	022250	064001		.WORD 64001
3266	022252	000777		.WORD 777
3267	022254	177777	EX5:	.WORD -1
3268	022256	000003		.WORD 3
3269	022260	044001		.WORD 44001
3270	022262	000777		.WORD 777
3271	022264	177777	EX6:	.WORD -1
3272	022266	000000		.WORD 0
3273	022270	000002		.WORD 2
3274	022272	000003		.WORD 3
3275	022274	170001		.WORD 170001
3276	022276	004777		.WORD 4777
3277	022300	177777	EX7:	.WORD -1
3278	022302	000000		.WORD 0
3279	022304	000002		.WORD 2
3280	022306	000003		.WORD 3
3281	022310	172001		.WORD 172001
3282	022312	000003		.WORD 3
3283	022314	064001		.WORD 64001
3284	022316	001777		.WORD 1777
3285				
3286				
3287				
3288				
3289				
3290				
3291				
3292				
3293				
3294				
3295				
3296				
3297				
3298				

BIT#	NUMONIC	FUNCTION
15	4CMD	4 COMMAND SEQUENCE
14	DCK	DONE CHECK
13	DATAACK	DO DATA CHECK
12	RAW	READ AFTER WRITE FLAG
11	ADVTRK	ADVANCE TRACK MODE
10	INCTK	INCREMENT TRACK MODE
09	DDCHK	DEL. DATA CHECK
08	NXTUNT	GET NEXT UNIT, IF DONE LAST UNIT

:MOD 2.1 ----- END MODULE -----

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- EXERCISE/TEST TABLE

```

3301
3302
3303          .SBTTL  MOD 2.2 - GET A DRIVE
3304          :-----
3305
3306 022320 000240 GTDRV: NOP          ;
3307 022322 032737 000001 002234 IFA22: BIT #1,UUT      ;IF UUT=DRIVE 0
3308 022330 001024          BNE IFD22          ;THEN
3309 022332 032737 000002 002234 IFB22: BIT #2,UUT      ;IF UNIT/SIDE UNDER TEST (UUT)
3310 022340 001404          BEQ ELB22          ;EQUALS 1
3311 022342 012737 000010 022502          MOV #10,TSTSUT ;SET TEST OF SYS. UNDER TEST UNIT/SIDE=1
3312 022350 000403          BR IFC22          ;BR TO IF 'C'
3313 022352 012737 000002 022502 ELB22: MOV #2,TSTSUT ;SET TEST OF SYS. UNDER TEST UNIT/SIDE=0
3314 022360 033737 022502 002232 IFC22: BIT TSTSUT,SUT ;IF DRIVE 1 SELECTED FOR TEST
3315 022366 001404          BEQ ELC22          ;THEN
3316 022370 052737 000001 002234          BIS #1,UUT      ;SET UNIT UNDER TEST TO DRV #1
3317 022376 000427          BR EIE22          ;BR TO END IF 'E'
3318 022400 000417          ELC22: BR THE22          ;BR TO THEN 'E'
3319 022402 032737 000002 002234 IFD22: BIT #2,UUT      ;IF UNIT/SIDE UNDER TEST (UUT)
3320 022410 001404          BEQ ELD22          ;EQUALS 1
3321 022412 012737 000004 022502          MOV #4,TSTSUT ;SET TEST OF SYS. UNDER TEST UNIT/SIDE 1
3322 022420 000403          BR IFE22          ;BR TO IF 'E'
3323 022422 012737 000001 022502 ELD22: MOV #1,TSTSUT ;SET TEST OF SYS. UNDER TEST UNIT/SIDE 0
3324 022430 033737 022502 002232 IFE22: BIT TSTSUT,SUT ;IF DRIVE 0 SELECTED FOR TEST
3325 022436 001404          BEQ ELE22          ;THEN
3326 022440 042737 000001 002234 THE22: BIC #1,UUT      ;SET UNIT UNDER TEST TO DRV#0
3327 022446 000403          BR EIE22          ;BR TO END IF 'E'
3328 022450 052737 000001 002234 ELE22: BIS #1,UUT      ;SET UNIT UNDER TEST TO DRV#1
3329 022456 013704 002234          EIE22: MOV UUT,R4    ;GET UNIT UNDER TEST
3330 022462 006304          ASL R4          ;DOUBLE IT
3331 022464 010437 002240          MOV R4,UUTOFF  ;SET UUT OFFSET
3332 022470 062704 002336          ADD #U00,R4    ;GET UUT UNIT # FOR PRINT
3333 022474 011437 002334          MOV (R4),UNIT ;SET UNIT=PRINT UNIT #
3334 022500 000207          END22: RTS PC      ;RETURN
3335          :-----
3336 022502 000000          TSTSUT: 0
3337          ;MOD 2.2 ----- END MODULE -----

```



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MOD 2.2 - GET A DRIVE

```

3340
3341
3342      .SBTTL MOD 2.3 - EXECUTE DRIVE TEST
3343      -----
3344
3345 022504 013737 002252 023326 XDVTST: MOV      WDCNT,WDCNT      :SET DRIVE WORD CNT
3346 022512 013702 002240          MOV      UUTOFF,R2      :GET UUT OFFSET
3347 022516 005737 002172          IFA23: TST      RXXX          :IF DEVICE IS AN
3348 022522 001010          BNE      1$          :RX02 THEN
3349 022524 032737 000002 002234          BIT      #2,UUT      :IF UNIT UNDER TEST IS
3350 022532 001404          BEQ      1$          :#1 THEN
3351 022534 013737 002222 002236          MOV      U1ADR,UUTADR :GET UNIT #1 UNIBUS ADR
3352 022542 000403          BR       IFI23       :BR TO END IF 'A'
3353 022544 013737 002220 002236 1$: MOV      UOADR,UUTADR :GET UNIT #0 UNIBUS ADR
3354 022552 005737 021450          IFI23: TST      RESTK      :IF RESET TRK
3355 022556 001413          BEQ      IFB23       :IF SET, THEN
3356 022560 113705 021450          MOVVB   RESTK,R5     :GET UUT OFFSET
3357 022564 006305          ASL     R5           :DOUBLE OFFSET
3358 022566 062705 023306          ADD     #CTRK,R5     :ADD TRK TABLE ADR
3359 022572 013715 002206          MOV     OTDITK,(R5)  :RESET TO MIN TRK
3360 022576 005037 002262          CLR     SECDN        :CLEAR SEC DONE FLAG
3361 022602 005037 021450          CLR     RESTK        :CLEAR RESET TRK FLAG
3362 022606 005737 014016          IFB23: TST      INITL      :IF INITIALIZE IS
3363 022612 001415          BEQ     EIB23        :SET, THEN
3364 022614 012705 023276          MOV     #CSEC,R5     :GET START OF CUR TRK &SEC TBL
3365 022620 012704 000004          MOV     #4,R4        :SET TBL LENGTH
3366 022624 005025 1$: CLR     (R5)+       :CLEAR TABLES
3367 022626 005304          DEC     R4           :DECR TBL LENGTH
3368 022630 001375          BNE     1$          :DO UNTIL LENGHT=0
3369 022632 012704 000004          MOV     #4,R4        :SET TBL LENGTH
3370 022636 013725 002206          2$: MOV     OTDITK,(R5)+ :SET STARTING TRACKS
3371 022642 005304          DEC     R4           :DECREMENT TBL LENGTH
3372 022644 001374          BNE     2$          :DO UNTIL LENGTH=0
3373 022646 012701 023306          EIB23: MOV     #CTRK,R1     :GET BEGIN ADR DRIVE CURRENT TRK.
3374 022652 060201          ADD     R2,R1        :CAL. DRIVE CUR. TRK. LOCATOR
3375 022654 010137 023320          MOV     R1,CNTKLC    :SAVE DRV. CUR. TRK.
3376 022660 017737 000434 024240          MOV     @CNTKLC,CURTRK :GET DRIVE CUR. TRK.
3377 022666 012701 023276          MOV     #CSEC,R1     :GET BEGIN ADR DRIVE CUR. SEC.
3378 022672 060201          ADD     R2,R1        :CAL. DRIVE CUR. SEC. LOCATOR
3379 022674 010137 023316          MOV     R1,CNSCLC    :SAVE DRV CUR SEC LOC.
3380 022700 017737 000412 023710          MOV     @CNSCLC,CURSEC :GET DRIVE CUR SEC.
3381 022706          IFJ23: INLOOP      :IF IN LOOP
3382 022710          BNCOMPLETE IFC23   :THEN
3383 022712 000532          BR      EIJ23        :BR TO END IF 'I'
3384 022714 005737 002304          IFC23: TST      RETRY      :IF RETRY IS
3385 022720 001447          BEQ     IFG23        :NOT=0, AND
3386 022722 032737 000004 002204          BIT     #BIT02,SWREG :IF RETRY ON ERR
3387 022730 001004          BNE     IFD23        :SET OR
3388 022732 032737 000004 002264          BIT     #EVL,FLGDRS  :DRS "EVL" FLAG
3389 022740 001437          BEQ     IFG23        :IS SET, THEN
3390 022742 032737 000001 002304  IFD23: BIT     #1,RETRY     :IF SEEK RETRY
3391 022750 001001          BNE     1$          :IS = 0
3392 022752 000404          BR      2$          :THEN BR TO 2$
3393 022754 032737 000010 002204 1$: BIT     #BIT03,SWREG :ELSE IF RECAL SWITCH
3394 022762 001003          BNE     THD23        :IS NOT SET
3395 022764 005037 023322          2$: CLR     SEEK      :THEN CLEAR SEEK FUNCTION FLAG
3396 022770 000420          BR      EID23        :BR TO END IF 'D'

```



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MOD 2.3 - EXECUTE DRIVE TEST

```

3397 022772 012737 040000 024404 THD23: MOV #40000,DVTST ;PASS PROGRAM INITIALIZE TO DRIVE TEST
3398 023000 004737 024254          CALL GTDVFN ;CALL MOD 2.3.3 GET DRIVE FUNCTION
3399 023004 013737 023332 023330          MOV DRVFN,WDOT ;PASS DRIVE FUNCTION
3400 023012 013737 002236 025034          MOV UUTADR,CSADR ;SET ADR FOR DRIVE FUNCTION
3401 023020 004737 024406          CALL OTDVFN ;CALL MOD 2.3.4 O/P DRIVE FUNCTION
3402 023024 012737 000001 023322          MOV #1,SEEK ;SET SEEK FLAG
3403 023032 005037 002304          EID23: CLR RETRY ;CLEAR RETRY FLAGS
3404 023036 000460          BR EIJ23 ;BR TO END IF 'C'
3405 023040 013705 023324          IFG23: MOV DRVTST,R5 ;SETUP DRIVE TST
3406 023044 042705 177770          BIC #177770,R5 ;FOR TYPE CK
3407 023050 005705          TST R5 ;IF DRIVE TST
3408 023052 001404          BEQ IFE23 ;IS NOT 'FILL BUFF'
3409 023054 022705 000003          CMP #3,R5 ;OR
3410 023060 001401          BEQ IFE23 ;NOT 'READ SEC' , THEN
3411 023062 000434          BR IFH23 ;BR TO IF 'H'
3412 023064 005737 002262          IFE23: TST SECDN ;IF SEC DONE
3413 023070 001417          BEQ ELE23 ;IS = 1
3414 023072 005737 021436          IFF23: TST INCTRK ;IF INCR TRK FLAGS
3415 023076 001414          BEQ ELE23 ;ARE SET ,THEN
3416 023100 013737 021436 024236          MOV INCTRK,TRKINC ;PASS TRK FLAGS
3417 023106 004737 023742          CALL GETTRK ;CALL MOD 2.3.2 GET TRACK
3418 023112 013777 024240 000200          MOV CURTRK,@CNTKLC ;SAVE CURRENT TRACK
3419 023120 012737 000001 023322          MOV #1,SEEK ;SET SEEK FLAG
3420 023126 000402          BR EIE23 ;BR TO END IF 'E'
3421 023130 005037 023322          ELE23: CLR SEEK ;RESET SEEK
3422 023134 017737 000156 023710          EIE23: MOV @CNSCLC,CURSEC ;PASS CURRENT SECTOR
3423 023142 004737 023334          CALL GETSEC ;CALL MOD 2.3.1 GET A SECTOR
3424 023146 013777 023710 000142          MOV CURSEC,@CNSCLC ;SAVE UPDATED CURRENT SECTOR
3425 023154 032737 000006 023324          IFH23: BIT #6,DRVTST ;IF DRIVE TST
3426 023162 001006          BNE EIJ23 ;IS 'FILL BUFF' ,THEN
3427 023164 012701 034006          MOV #DATPAT,R1 ;SET UP DATA PATTERN ADR
3428 023170 117721 000124          MOVB @CNTKLC,(R1)+ ;SET TRK ADR IN DATA BUF BYTE #0
3429 023174 117711 000116          MOVB @CNSCLC,(R1) ;SET SEC ADR IN DATA BUF BYTE#1
3430 023200 005037 024404          EIJ23: CLR DVTST ;CLEAR DRIVE TEST
3431 023204 113737 023324 024404          MOVB DRVTST,DVTST ;PASS DRIVE TEST
3432 023212 004737 024254          CALL GTDVFN ;CALL MOD 2.3.3 GET DRIVE FUNCTION
3433 023216 013737 023332 002332          MOV DRVFN,CMD ;SET COMMAND FOR PRINT
3434 023224 013737 023332 023330          MOV DRVFN,WDOT ;PASS FUNCTION WORD (PASS TO 2.3.4)
3435 023232 017737 000062 025036          MOV @CNTKLC,TRKADR ;PASS CURRENT TRACK (PASS TO 2.3.4)
3436 023240 017737 000052 025040          MOV @CNSCLC,SECADR ;PASS CURRENT SECTOR (PASS TO 2.3.4)
3437 023246 013737 002236 025034          MOV UUTADR,CSADR ;PASS UUT C&S ADR (PASS TO 2.3.4)
3438 023254 004737 024406          CALL OTDVFN ;CALL MOD 2.3.4 O/P DRIVE FUNCTION
3439 023260 013737 025036 002254          MOV TRKADR,TRACK ;SAVE TRACK ADDR IN GLOBAL
3440 023266 013737 025040 002256          MOV SECADR,SECTOR ;SAVE SECTOR ADDR IN GLOBAL
3441 023274 000207          RTS PC ;RETURN
3442

```

HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 97  
 MOD 2.3 - EXECUTE DRIVE TEST

```

3445
3446 -----
3447 023276 000000 CSEC: .WORD 0 ;CURRENT DRV SECTOR TABLE
3448 023300 000000 .WORD 0
3449 023302 000000 .WORD 0
3450 023304 000000 .WORD 0
3451 023306 000000 CTRK: .WORD 0 ;CURRENT DRV TRK TABLE
3452 023310 000000 .WORD 0
3453 023312 000000 .WORD 0
3454 023314 000000 .WORD 0
3455
3456 023316 000000 CNSCLC: .WORD 0 ;CURRENT SECTOR LOCATOR
3457 023320 000000 CNTKLC: .WORD 0 ;CURRENT TRACK LOCATOR
3458 023322 000000 SEEK: .WORD 0 ;SEEK FLAG
3459 023324 000000 DRVTST: .WORD 0 ;DRIVE TEST
3460 023326 000000 WDCT: .WORD 0 ;WORD COUNT
3461 023330 000000 WDOT: .WORD 0 ;FUNCTION WORD TO SEND OUT
3462 023332 000000 DRVFN: .WORD 0 ;DRIVE FUNCTION WORD
3463 ;MOD 2.3 ----- END MODULE -----

```



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MOD 2.3.1 - GET A SECTOR

```

3466      .SBTTL MOD 2.3.1 - GET A SECTOR
3467      :-----
3468
3469 023334 005037 023704 GETSEC: CLR      UTSCDN      ;CLEAR UUT SECTOR DONE
3470 023340 013705 002234      MOV      UUT,R5      ;GET UNIT UNDER TST
3471 023344 006305      ASL      R5          ;DOUBLE FOR WRD ADR
3472 023346 005737 014016 IFI231: TST      INITL      ;IF INITIALIZE IS
3473 023352 001406      BEQ      EII231      ;SET, THEN
3474 023354 012701 023664      MOV      #SSEC,R1    ;GET STARTING SEC ADR
3475 023360 005021      CLR      (R1)+      ;CLEAR UNT00 SSEC
3476 023362 005021      CLR      (R1)+      ;CLEAR UNT01 SSEC
3477 023364 005021      CLR      (R1)+      ;CLEAR UNT10 SSEC
3478 023366 005011      CLR      (R1)       ;CLEAR UNT11 SSEC
3479 023370 012701 023664 EII231: MOV      #SSEC,R1 ;GET START SECTOR BASE ADR
3480 023374 060501      ADD      R5,R1      ;FIND ADR UUT START SECTOR (TEMP 1)
3481 023376 011102      MOV      (R1),R2    ;SAVE UUT STARTING SECTOR (TEMP 2)
3482 023400 012703 023674      MOV      #NSEC,R3   ;GET NEXT SECTOR BASE ADR
3483 023404 060503      ADD      R5,R3      ;FIND ADR UUT NEXT SECTOR (TEMP 3)
3484 023406 011304      MOV      (R3),R4    ;SAVE UUT NEXT SECTOR (TEMP 4)
3485 023410 020237 002212 IFA231: CMP      R2,MINSEC ;IF STARTING SECTOR < MIN. SECTOR
3486 023414 103422      BLO      ELA231     ;THEN
3487 023416 010437 023710      MOV      R4,CURSEC  ;SET CURRENT SECTOR=UUT NEXT SECTOR
3488 023422 023737 023660 023706 IFG231: CMP      SCPSCT,INTLV ;IF SECTOR PASS CNT< INTERLV
3489 023430 103053      BHIS    THF231     ;THEN BR TO THEN 'F',ELSE
3490 023432 005737 023662 IFH231: TST      STSCFG   ;IF START SEC FLAG
3491 023436 001405      BEQ      ELH231     ;IS SET, THEN
3492 023440 005037 023662      CLR      STSCFG    ;CLEAR FLAG
3493 023444 010204      MOV      R2,R4      ;SET DRV NXT SEC= DRV START SEC
3494 023446 010213      MOV      R2,(R3)    ;SAVE DRV NXT SEC
3495 023450 000426      BR      IFC231     ;BR TO IF 'C'
3496 023452 063704 023706 ELH231: ADD      INTLV,R4 ;NSEC=NSEC+INTERLV
3497 023456 010413      MOV      R4,(R3)    ;SAVE NEXT SEC
3498 023460 000422      BR      IFC231     ;BR TO IF 'C'
3499 023462 013737 002212 023710 ELA231: MOV      MINSEC,CURSEC ;SET CURRENT SECTOR = MIN. SECTOR
3500 023470 013711 002212      MOV      MINSEC,(R1) ;SET UUT START SECTOR = MIN. SECTOR
3501 023474 013702 002212      MOV      MINSEC,R2  ;SET R2=MINSEC
3502 023500 005037 023660      CLR      SCPSCT    ;CLEAR SECTOR PASS COUNT
3503 023504 023737 002212 002214 IFB231: CMP      MINSEC,MAXSEC ;IF MAX. SECTOR NOT=MIN. SECTOR
3504 023512 001443      BEQ      ELB231     ;THEN
3505 023514 010205      THB231: MOV      R2,R5 ;GET UUT STARTING SECTOR
3506 023516 063705 023706      ADD      INTLV,R5  ;ADD SECTOR INTERLEAVE
3507 023522 010513      MOV      R5,(R3)    ;SAVE NEXT UUT NEXT SEC (TEMP 5)
3508 023524 010504      MOV      R5,R4      ;SAVE NEXT UUT NEXT SEC (TEMP 4)
3509 023526 020437 002214 IFC231: CMP      R4,MAXSEC ;IF NEXT SECTOR > MAX. SECTOR
3510 023532 103432      BLO      ELC231     ;THEN
3511 023534 005211      INC      (R1)       ;INCREMENT UUT STARTING SECTOR
3512 023536 011102      MOV      (R1),R2    ;SET UP NEW START SEC
3513 023540 005237 023660      INC      SCPSCT    ;INCR SECTOR PASS CNT
3514 023544 020437 002214 IFD231: CMP      R4,MAXSEC ;IF NXT SEC NOT = MAX SEC
3515 023550 001417      BEQ      ELD231     ;THEN
3516 023552 020237 002214 IFF231: CMP      R2,MAXSEC ;IF DRV START SEC > MAX SEC
3517 023556 101411      BLOS    ELF231     ;THEN
3518 023560 012737 000001 023704 THF231: MOV      #1,UTSCDN ;SET UUT SECTOR DONE
3519 023566 004737 023712      CALL    STSCDN     ;CALL MOD 2.3.1.A - SET DRIVE SECTOR DONE FLAG
3520 023572 005011      CLR      (R1)       ;CLEAR UUT STARTING SECTOR
3521 023574 005037 023660      CLR      SCPSCT    ;CLEAR SEC PASS CNT
3522 023600 000420      BR      END231    ;BRANCH TO END GET SECTOR

```



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 MOD 2.3.1 - GET A SECTOR

```

3523 023602 010213      ELF231: MOV      R2,(R3)          ;SET DRV NXT SEC = DRV START SEC
3524 023604 010204      MOV      R2,R4           ;SAVE DRV NXT SEC
3525 023606 000415      BR       END231         ;BR TO END
3526 023610 012737 000001 023662  ELD231: MOV      #1,STSCFG      ;SET START SEC FLAG
3527 023616 000411      BR       END231         ;BR TO END
3528 023620 000410      ELC231: BR       END231         ;BRANCH TO END GET SECTOR
3529 023622 012737 000001 023704  ELB231: MOV      #1,UTSCDN      ;SET DRIVE SECTOR DONE FLAG
3530 023630 004737 023712      CALL    STSCDN          ;CALL MOD 2.3.1.A - SET DRIVE SECTOR DONE FLAG
3531 023634 005037 023660      CLR     SCPSCT          ;CLEAR SEC PASS CNT
3532 023640 005011      CLR     (R1)           ;CLEAR UUT STARTING SECTOR
3533 023642 013737 023704 002262  END231: MOV      UTSCDN,SECDN    ;PASSUP UNIT SECTOR DONE
3534 023650 010437 023656      MOV     R4,NXSCSA      ;
3535 023654 000207      RTS     PC             ;RETURN TO MOD 2.3
3536      ;MOD 2.3.1 ----- REGISTERS & TABLES -----
3537 023656 000000      NXSCSA: 0
3538 023660 000000      SCPSCT: 0              ;SEC PASS COUNT
3539 023662 000000      STSCFG: 0             ;GET NEW STARTING SEC FLAG
3540 023664 000000      SSEC: 0               ;UUT STARTING SECTOR
3541 023666 000000      0
3542 023670 000000      0
3543 023672 000000      0
3544 023674 000000      NSEC: 0               ;UUT NEXT SECTOR
3545 023676 000000      0
3546 023700 000000      0
3547 023702 000000      0
3548 023704 000000      UTSCDN: 0             ;UUT SECTOR DONE FLAG
3549 023706 000003      INTLV: 3              ;SECTOR INTERLEAVE
3550 023710 000000      CURSEC: 0             ;CURRENT SECTOR UUT
3551      ;MOD 2.3.1 ----- END MODULE -----
3552
3553
3554
3555      .SBTTL MOD 2.3.1.A - SET SECTOR DONE
3556      ;-----
3557
3558 023712 032737 000001 002234  STSCDN: BIT      #1,UUT          ;IF DRIVE #1 DONE
3559 023720 001404      BEQ     1$              ;THEN
3560 023722 052737 000002 021434      BIS     #2,BDVSCD      ;SET DRIVE #1 SEC DONE FLAG
3561 023730 000403      BR     2$              ;BR TO END
3562 023732 052737 000001 021434  1$:  BIS     #1,BDVSCD      ;SET DRIVE #0 SEC DONE FLAG
3563 023740 000207      2$:  RTS     PC             ;RETURN
3564      ;MOD 2.3.1.A ----- END MODULE -----
    
```

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 MOD 2.3.2 - GET A TRACK

```

3567      .SBTTL MOD 2.3.2 - GET A TRACK
3568      ;-----
3569
3570 023742 013737 002210 024234 GETTRK: MOV      INDITK,MAXTRK ;GET INSIDE DIA AS SET BY OP
3571 023750 013737 002206 024232      MOV      OTDITK,MINTRK ;GET OUTSIDE DIA AS SET BY OP
3572 023756 005737 024252      IFH232: TST      INITTK ;IF INITIALIZE TRK IS
3573 023762 001413      BEQ      EI232 ;SET, THEN
3574 023764 005037 024252      CLR      INITTK ;RESET INITIALIZE TRK FLG
3575 023770 012701 024242      MOV      #TKTL,R1 ;GET START OF TRK TBL
3576 023774 005021      CLR      (R1)+ ;SET UNT00
3577 023776 005021      CLR      (R1)+ ;SET UNT01
3578 024000 005021      CLR      (R1)+ ;SET UNT10
3579 024002 005011      CLR      (R1) ;SET UNT11
3580 024004 013737 024232 024240      MOV      MINTRK,CURTRK ;SET MIN CURRENT TRK
3581 024012 013702 002234      EI232: MOV      UUT,R2 ;GET UNIT UNDER TEST INDICATOR
3582 024016 006302      ASL      R2 ;DOUBLE FOR ADDRESSING WORDS
3583 024020 005037 024230      CLR      TRKDNF ;CLEAR TRACK DONE FLAG
3584 024024 032737 002000 024236      IFA232: BIT      #2000,TRKINC ;IF INCREMENT TRACK FLAG
3585 024032 001023      BNE      IFG232 ;NOT SET, THEN (USE SELECTED TRK SEQ)
3586 024034 012701 024242      MOV      #TKTL,R1 ;GET DRIVE TRACK TABLE LOCATOR BASE ADR
3587 024040 060201      ADD      R2,R1 ;CAL. DRV. TRK. TAB. LOCATOR ADR
3588 024042 011102      MOV      (R1),R2 ;GET DRV. TRK. TAB. LOCATOR
3589 024044 012703 033554      MOV      #TRKTBL,R3 ;GET BEGIN TRACK TABLE ADR
3590 024050 060203      ADD      R2,R3 ;CAL. TRACK TAB. ADR. THIS DRIVE
3591 024052 005202      INC      R2 ;INCREMENT DRV. TRK. TAB. LOCATOR
3592 024054 010211      MOV      R2,(R1) ;SAVE DRV. TRK. TAB. LOCATOR
3593 024056 111337 024240      MOV      (R3),CURTRK ;SAVE CURRENT TRACK
3594 024062 005203      INC      R3 ;INCREMENT TRACK TAB. POINTER
3595 024064 105713      IFF232: TSTB     (R3) ;IF NEXT TRACK
3596 024066 002004      BGE      ELF232 ;EQUALS -1
3597 024070 012737 000001 024230      MOV      #1,TRKDNF ;THEN SET TRACK DONE FLAG
3598 024076 005011      CLR      (R1) ;RESET DRV. TRK. TAB. LOCATOR ADR.
3599 024100 000445      ELF232: BR      END232 ;BR TO END MOD.
3600 024102 123737 024240 024234      IFG232: CMPB     CURTRK,MAXTRK ;IF CURRENT TRK > OR = MAX TRK (O. D.)
3601 024110 103403      BLO      IFB232 ;THEN
3602 024112 013737 024232 024240      MOV      MINTRK,CURTRK ;SET CURRENT TRK = MIN TRK
3603 024120 123737 024240 024232      IFB232: CMPB     CURTRK,MINTRK ;IF CURRENT TRK > OR = MIN TRK (O.D.)
3604 024126 103427      BLO      ELB232 ;THEN
3605 024130 013701 024240      MOV      CURTRK,R1 ;GET CURRENT TRACK
3606 024134 005201      INC      R1 ;INCREMENT CURRENT TRACK
3607 024136 120137 024234      IFC232: CMPB     R1,MAXTRK ;IF CURRENT TRK +1 < MAX TRK (I.D.)
3608 024142 103001      BHIS     IFD232 ;THEN
3609 024144 000406      BR      EID232 ;BRANCH TO END IF 'D'
3610 024146 120137 024234      IFD232: CMPB     R1,MAXTRK ;IF CURRENT TRK +1 = MAX TRK
3611 024152 001006      BNE      IFE232 ;THEN
3612 024154 012737 000001 024230      MOV      #1,TRKDNF ;SET TRK DONE FLAG
3613 024162 010137 024240      EID232: MOV      R1,CURTRK ;SAVE CURRENT TRK +1 = CURRENT TRK
3614 024166 000412      BR      END232 ;BR END OF MOD.
3615 024170 123737 024234 024232      IFE232: CMPB     MAXTRK,MINTRK ;IF TRK MAX = TRK MIN
3616 024176 001003      BNE      ELB232 ;THEN
3617 024200 012737 000001 024230      MOV      #1,TRKDNF ;SET TRK DONE FLAG
3618 024206 013737 024232 024240      ELB232: MOV      MINTRK,CURTRK ;SET CURRENT TRK = MIN. TRK (O.D.)
3619 024214 013737 024230 002260      END232: MOV      TRKDNF,TRKDN ;SAVE TRACK DONE FLAG
3620 024222 005037 024236      TRKINC ;CLEAR TRK INCR FLAG
3621 024226 000207      CLR      TRKINC
3622      RTS      PC
    
```

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MOD 2.3.2 - GET A TRACK

```
3625  
3626 024230 000000  
3627 024232 000000  
3628 024234 000000  
3629 024236 000000  
3630 024240 000000  
3631 024242 000000  
3632 024244 000000  
3633 024246 000000  
3634 024250 000000  
3635 024252 000000  
3636  
-----  
TRKDNF: .WORD 0 ; TRACK DONE FLAG  
MINTRK: .WORD 0 ; MINIMUM TRACK - O.D.  
MAXTRK: .WORD 0 ; MAXIMUM TRACK - I.D.  
TRKINC: .WORD 0 ; INCREMENT TRK FLAG  
CURTRK: .WORD 0 ; CURRENT TRACK  
TKTL: .WORD 0 ; DRV TRK TABLE LOCATOR  
      .WORD 0  
      .WORD 0  
      .WORD 0  
INITTK: .WORD 0 ; INITIALIZE TRK FLAG  
:MOD 2.3.2 ----- END MODULE -----
```



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 MOD 2.3.3 - GET A DRIVE FUNCTION

```

3639      .SBTTL MOD 2.3.3 - GET A DRIVE FUNCTION
3640      ;-----
3641
3642 024254 005001      GTDVFN: CLR      R1          ;CLEAR REG #1
3643 024256 013701 024404      MOV      DVTST,R1      ;GET DRIVE TEST
3644 024262 032701 040000      IFA233: BIT      #40000,R1 ;IF NOT INITIALIZE
3645 024266 001012      BNE      IFB233        ;THEN
3646 024270 042701 177700      BIC      #177700,R1    ;CLEAR TOP BYTE OF R1
3647 024274 006301      ASL      R1            ;FORMAT FUNCTION
3648 024276 052701 000001      BIS      #1,R1        ;SET GO BIT
3649 024302 020127 000005      IFE233: CMP      R1,#5   ;IF WRT FUNCT
3650 024306 001002      BNE      IFB233        ;THEN
3651 024310 053701 002244      BIS      DELDAT,R1    ;SET DEL DAT WRT (IF SET)
3652 024314 005737 002172      IFB233: TST      RXXX   ;IF DRIVE IS RXXX
3653 024320 001411      BEQ      IFD233        ;THEN
3654 024322 032737 000002 002234  IFC233: BIT      #2,UUT  ;IF SIDE #1 IS SELECTED
3655 024330 001403      BEQ      ELC233        ;THEN
3656 024332 052701 001000      BIS      #1000,R1     ;SET SIDE #1 BIT
3657 024336 000402      BR       IFD233        ;BRANCH TO IF 'D'
3658 024340 042701 001000      ELC233: BIC      #1000,R1 ;SET FOR SIDE #0
3659 024344 032737 000001 002234  IFD233: BIT      #1,UUT  ;IF UNIT UNDER TEST IS
3660 024352 001403      BEQ      ELD233        ;DRIVE #1
3661 024354 052701 000020      BIS      #20,R1      ;THEN SET DRIVE #1 SELECT BIT
3662 024360 000402      BR       EID233        ;BRANCH TO IF 'D'
3663 024362 042701 000020      ELD233: BIC      #20,R1 ;ELSE CLEAR DRIVE #1 SELECT BIT
3664 024366 053701 002242      EID233: BIS      DEN,R1 ;SET DENSITY BIT
3665 024372 052701 000100      BIS      #100,R1     ;SET INTERRUPT BIT
3666 024376 010137 023332      MOV      R1,DRVFN    ;PASS UP FUNCTION WORD
3667 024402 000207      END233: RTS      PC    ;RETURN
3668      ;-----
3669 024404 000000      DVTST: 0            ;DRIVE TEST WORD
3670      ;MOD 2.3.3 ----- END MODULE -----

```

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MOD 2.3.4 - OUTPUT DRIVE FUNCTION

```

3673      .SBTTL MOD 2.3.4 - OUTPUT DRIVE FUNCTION
3674      ;-----
3675
3676 024406 013701 025034      OTDVFN: MOV      CSADR,R1      ;GET STATUS REG ADR
3677 024412 062701 000002      ADD      #2,R1      ;ADD 2 TO ADR
3678 024416 010137 025032      MOV      R1,DBADR   ;SAVE AS DATA ADDRESS
3679 024422 012737 000040 025330  MOV      #DNBIT,RDYWD ;READY TEST WD (PASS TO 2.3.4.1)
3680 024430 013737 023330 025022  MOV      WDOT,WRDS   ;WORD FOR OUTPUT (PASS TO 2.3.4.1)
3681 024436 013737 025034 025024  MOV      CSADR,ADRS  ;ADDRESS OF OUTPUT (PASS TO 2.3.4.1)
3682 024444 004737 025042      JSR      PC,OUTSWD   ;OUTPUT FUNCTION WD (FW) DO 2.3.4.1)
3683 024450 032737 040000 023330  IFA234: BIT      #40000,WDOT ;IF FUNCTION IS
3684 024456 001402      BEQ      THA234     ;NOT AN "INITIALIZE" (FW BIT#14=0)
3685 024460 000137 025016      JMP      END234     ;THEN,
3686 024464 032737 000010 023330  THA234: BIT      #10,WDOT ;IF FUNCTION IS
3687 024472 001043      BNE      IFC234     ;"READ, WRITE, FILL, EMPTY" (FW BIT#3=0)
3688 024474 032737 000004 023330  IFH234: BIT      #4,WDOT  ;AND THEN IF FUNCTION IS
3689 024502 001047      BNE      ELH234     ;"EMPTY, FILL" (FW BIT#2=0)
3690 024504 012737 000200 025330  MOV      #TRBIT,RDYWD ;THEN SET OUTPUT READY TEST WORD (PASS TO 2.3.4.1)
3691 024512 013737 023326 025022  MOV      WDOT,WRDS   ;AND SET WORD FOR OUTPUT (PASS TO 2.3.4.1)
3692 024520 013737 025032 025024  MOV      DBADR,ADRS  ;AND SET ADDRESS OF OUTPUT (PASS TO 2.3.4.1)
3693 024526 004737 025042      JSR      PC,OUTSWD   ;OUTPUT BASE ADDRESS WORD DO 2.3.4.1)
3694 024532 032737 000002 023330  IFK234: BIT      #2,WDOT  ;IF "FILL" (FW BIT#1=0)
3695 024540 001004      BNE      ELK234     ;THEN
3696 024542 012737 034006 025022  MOV      #DATPAT,WRDS ;SET DATA PATTERN ADR (PASS TO 2.3.4.1)
3697 024550 000403      BR      EIK234     ;BR TO END IF "K"
3698 024552 012737 034406 025022  ELK234: MOV      #DATBUF,WRDS ;SET DATA BUFFER ADR (PASS TO 2.3.4.1)
3699 024560 012737 000200 025330  EIK234: MOV      #TRBIT,RDYWD ;SET OUTPUT READY TEST WORD (PASS TO 2.3.4.1)
3700 024566 013737 025032 025024  MOV      DBADR,ADRS  ;ADDRESS OF OUTPUT (PASS TO 2.3.4.1)
3701 024574 004737 025042      JSR      PC,OUTSWD   ;OUTPUT WORD COUNT WORD DO 2.3.4.1)
3702 024600 000444      BR      EIH234     ;BRANCH TO END IF "H"
3703 024602 032737 000004 023330  IFC234: BIT      #4,WDOT  ;IF FUNCTION WORD IS
3704 024610 001455      BEQ      IFE234     ;"WRITE D.D" OR "READ E.C" (FW BIT #2=1)
3705 024612 032737 000002 023330  IFD234: BIT      #2,WDOT  ;THEN, IF FUNCTION IS
3706 024620 001035      BNE      ELD234     ;"WRITE D.D", THEN (FW BIT#1=0)
3707 024622 012737 000200 025330  ELH234: MOV      #TRBIT,RDYWD ;SET OUTPUT READY TEST WORD
3708 024630 013737 025040 025022  MOV      SECADR,WRDS ;MOVE TRACK AND SECTOR ADDRESS
3709 024636 042737 177700 025022  BIC      #177700,WRDS ;FORMAT TO SECTOR ADDRESS
3710 024644 013737 025032 025024  MOV      DBADR,ADRS  ;ADDRESS OF OUTPUT
3711 024652 004737 025042      JSR      PC,OUTSWD   ;OUTPUT SECTOR ADDRESS
3712 024656 013737 025036 025022  MOV      TRKADR,WRDS ;MOVE TRACK AND SECTOR ADDRESS
3713 024664 042737 177600 025022  BIC      #177600,WRDS ;FORMAT TRACK ADDRESS
3714 024672 012737 000200 025330  MOV      #TRBIT,RDYWD ;SET OUTPUT READY TEST WORD
3715 024700 013737 025032 025024  MOV      DBADR,ADRS  ;ADDRESS OF OUTPUT
3716 024706 004737 025042      JSR      PC,OUTSWD   ;OUTPUT TRACK ADDRESS
3717 024712 000437      BR      EIB234     ;ENDIF H -DONE
3718 024714 012737 000200 025330  ELD234: MOV      #TRBIT,RDYWD ;SET READY WD TO TR MODE
3719 024722 012737 033544 025022  MOV      #XERUUT,WRDS ;EXT ERR. CODE TABLE ADD
3720 024730 013737 025032 025024  MOV      DBADR,ADRS  ;ADDRESS OF OUTPUT, RXDB
3721 024736 004737 025042      JSR      PC,OUTSWD   ;O/P BASE ADD FOR ERR. CODE
3722 024742 000423      BR      EIB234     ;DONE
3723 024744 032737 000002 023330  IFE234: BIT      #2,WDOT  ;IF FUNCTION IS
3724 024752 001404      BEQ      ELE234     ;"READ STATUS" (FW BIT#1=1)
3725 024754 012737 000001 025026  THE234: MOV      #1,ERSTAT ;THEN-SET ERR STATUS FLAG
3726 024762 000413      BR      EIB234     ;DONE
3727 024764 012737 000200 025330  ELE234: MOV      #TRBIT,RDYWD ;SET OUTPUT READY TEST WD
3728 024772 013737 025030 025022  MOV      VALWD,WRDS  ;VALIDATION WORD
3729 025000 013737 025032 025024  MOV      DBADR,ADRS  ;ADDRESS OF OUTPUT, RXDB

```

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 MOD 2.3.4 - OUTPUT DRIVE FUNCTION

```

3730 025006 004737 025042
3731 025012 004737 025104
3732 025016 000240
3733 025020 000207
3734
3735 025022 000000
3736 025024 000000
3737 025026 000000
3738 025030 000111
3739 025032 000000
3740 025034 000000
3741 025036 000000
3742 025040 000000
3743
3744
3745
3746
3747
3748
3749
3750
3751 025042 000240
3752 025044 013737 025034 025332
3753 025052 013737 025330 025330
3754 025060 004737 025230
3755 025064 033777 025330 177742
3756 025072 001403
3757 025074 013777 025022 177722
3758 025102 000207
3759

EIB234: JSR PC,OUTSWD ;OUTPUT VALIDATION WORD
          CALL WATCH ;CALL MOD U.2 -WATCH DOG
END234:  NOP          ;
          RTS PC      ;RETURN TO MOD 2.3
-----
WRDS:    0 ;MODULE 2.3.4.1 OUTPUT WORD
ADRS:    0 ;MODULE 2.3.4.1 OUTPUT ADDRESS
ERSTAT:  0 ;MODULE 0.0 ERR STATUS READ FLAG
VALWD:   111 ;EXTERNAL, VALIDATION WD (SET DENS-ASCII 'I')
DBADR:   0 ;RX DATA BUFFER ADDRESS
CSADR:   0 ;RX CONT/STATUS ADDRESS
TRKADR:  0 ;TRACK ADDRESS
SECADR:  0 ;SECTOR ADDRESS
;MOD 2.3.4 ----- END MODULE -----
-----
.SBTTL MOD 2.3.4.1 - OUTPUT SINGLE WORD
-----
OUTSWD:  NOP
          MOV CSADR,CSRADR ;SET C&S REG ADR
          MOV RDYWD,RDYWD ;OUTPUT READY WORD (PASS TO DELAY)
          JSR PC,DELAY ;DELAY FOR READY DO DELAY
          BIT RDYWD,@CSADR ;IF READY,
          BEQ ED2341 ;THEN
          MOV WRDS,@ADRS ;MOV WORD TO ADDRESS
ED2341:  RTS PC ;RETURN TO MOD 2.3.4
;MOD 2.3.4.1 ----- END MODULE -----

```



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 MOD U.2.3.4 - WATCH DOG TIMER

```

3762          .SBTTL MOD U.2.3.4 - WATCH DOG TIMER
3763          ;-----
3764
3765 025104 005037 025226 WATCH: CLR DNFLAG ;CLEAR DONE FLAG
3766 025110          SETPRI #PRI00 ;SET PROCESSOR PRI=0 - ALLOW INTERRUPTS
3767 025116 013704 025222          MOV DX,R4 ;SET DELAY MULT
3768 025122 013703 025224 BAU234: MOV DLY,R3 ;SET DELAY
3769 025126 05737 025226 IBU234: TST DNFLAG ;IF INTERRUPTS DONE FLAG
3770 025132 001410          BEQ LBU234 ;IS SET, THEN
3771 025134 032777 000040 177672 ICU234: BIT #DNBIT,@CSADR ;IF DON'T BIT
3772 025142 001023          BNE XU234 ;IS NOT SET, THEN
3773 025144 012737 010000 002276          MOV #BIT12,ERRTY ;SET INTERR, BUT NO DONE ERROR
3774 025152 000417          BR XU234 ;BR TO MOD 'EXIT'
3775 025154 005303          LBU234: DEC R3 ;DECREMENT DELAY COUNT
3776 025156 001363          UDU234: BNE IBU234 ;DO UNIT DELAY COUNT=0
3777 025160 005304          DEC R4 ;DECREMENT DELAY MULT
3778 025162 001357          UAU234: BNE BAU234 ;DO UNTIL DELAY MULT=0
3779 025164 032777 000040 177642 IEU234: BIT #DNBIT,@CSADR ;IF DONE BIT IS
3780 025172 001404          BEQ LEU234 ;SET, THEN
3781 025174 052737 020000 002276          BIS #BIT13,ERRTY ;SET DONE, BUT NO INTERRUPT ERROR
3782 025202 000403          BR XU234 ;BR TO MOD 'EXIT'
3783 025204 052737 040000 002274 LEU234: BIS #BIT14,ERRSY ;SET T.O. ERROR
3784 025212          XU234: SETPRI #PRI06 ;SET PROCESSOR PRI=6 - NO INTERRUPTS
3785 025220 000207          RTS PC ;RETURN TO MOD 2.3.4
3786          ;-----
3787 025222 000040          DX: 40 ;DELAY MULT
3788 025224 100000          DLY: 100000 ;DELAY
3789 025226 000000          DNFLAG: 0 ;DONE FLAG
3790          ;MOD U.2.3.4 ---- END MODULE ----
3791
3792          .SBTTL MOD U.2.3/4 DELAY
3793          ;-----
3794
3795 025230 000240          DELAY: NOP ;
3796 025232 023727 025330 000000 IFAU23: CMP RDYWD,#0 ;IF READY WORD
3797 025240 001430          BEQ XU23 ;EQUALS ZERO, THEN BR TO END IF 'A'
3798 025242 013704 025324          MOV RYDX,R4 ;SET READY DELAY MULT
3799 025246 013703 025326          BDAU23: MOV RYDLY,R3 ;SET READY DELAY
3800 025252 033777 025330 000052 BDBU23: BIT RDYWD,@CSRADR ;IF READY
3801 025260 001020          BNE XU23 ;EQUAL TO '1', THEN BR TO END IF 'B'
3802 025262 005303          DEC R3 ;ELSE DECREMENT DELAY
3803 025264 001372          BNE BDBU23 ;DO UNTIL R3=0
3804 025266 005304          DEC R4 ;DECREMENT DELAY MULT.
3805 025270 001366          BNE BDAU23 ;DO UNTIL R4=0
3806 025272 052737 040000 002274          BIS #40000,ERRSY ;SET TIME OUT ERR
3807 025300 017737 000026 002246          MOV @CSRADR,CSRUUT ;GET UUT C&S REG
3808 025306 062737 000002 025332          ADD #2,CSRADR ;SET CSRADR TO DB REG
3809 025314 017737 000012 002250          MOV @CSRADR,ESRUUT ;GET UUT E&S REG
3810 025322 000207          XU23: RTS PC ;RETURN TO CALLING MOD
3811          ;-----
3812 025324 000040          RYDX: 40 ;READY MULTIPLIER
3813 025326 100000          RYDLY: 100000 ;READY DELAY
3814 025330 000000          RDYWD: 0 ;READY WORD - TEST FOR DEVICE READY
3815 025332 000000          CSRADR: 0 ;C&S REG OF UNIT- WAITING FOR
3816          ;MOD U.2.3.4 ----- END MODULE -----

```

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MOD U.2.3/4 DELAY

```

3819
3820
3821      .SBTTL  MOD 2.4 - EVALUATE TEST RESULTS
3822      ;-----
3823 025334 013737 025410 027070 EVTSTR: MOV      TSTEV,FUNEV      ;PASS TEST FUNCTION
3824 025342 004737 026206          CALL      EVDVST      ;CALL MOD 2.4.2 - EVALUATE DRIVE STATE
3825 025346 013737 025410 030622          MOV      TSTEV,FNEV4    ;PASS TEST FUNCTION
3826 025354 004737 030476          CALL      EVUTEC      ;CALL MOD 2.4.4 - EVAL UNIT ERR CODE
3827 025360 032737 020000 025410 IFA24: BIT      #20000,TSTEV  ;IF DATA CK BIT
3828 025366 001402          BEQ      EIA24      ;IS SET, THEN
3829 025370 004737 025412          CALL      EVDATA      ;CALL MOD 2.4.1 - EVALUATE DATA
3830 025374 013737 025410 027626 EIA24: MOV      TSTEV,TSTCK  ;PASS DRIVE TEST
3831 025402 004737 027230          CALL      UPDVST      ;CALL MOD 2.4.3 UPDATE DRIVE STATISTICS
3832 025406 000207          RTS      PC          ;
3833      ;-----
3834 025410 000000      TSTEV: 0
3835      ;MOD 2.4 ----- END MODULE -----

```



```

3838                                     .SBTTL MOD 2.4.1 - EVALUATE DATA
3839                                     :-----
3840
3841 025412 005037 026054      EVDATA: CLR      DAERCT      :CLEAR DATA ERR COUNT
3842 025416 005037 026046      CLR      SEEKCK      :CLEAR SEEK CK
3843 025422 012737 000001 026062  MOV      #1,PTHEAD    :SET PRINT HEADER FLAG
3844 025430 013701 002252      MOV      WDCNT,R1     :SAVE WORD COUNT
3845 025434 006301              ASL      R1           :
3846 025436 162701 000001      SUB      #1,R1        :SUBTRACT 2 TO GET CHECKSUM
3847 025442 012702 034006      MOV      #DATPAT,R2   :GET ADDRESS DATA SOURCE
3848 025446 012703 034406      MOV      #DATBUF,R3   :GET ADDRESS DATA BUFFER
3849 025452 060102              ADD      R1,R2        :CAL. ADDR SOURCE CHECKSUM
3850 025454 060103              ADD      R1,R3        :CAL. ADDR BUFFER CHECKSUM
3851 025456 121213      IFA241: CMPB      (R2),(R3) :IF CHECK SUMS
3852 025460 001407      BEQ      ELA241      :NOT= THEN
3853 025462 032737 000002 021452  IFI241: BIT      #2,ERTSAV :IF CRC ERR
3854 025470 001003      BNE      ELA241      :NOT SET, THEN
3855 025472 052737 000004 002276  BIS      #4,ERRTY     :SET CHECKSUM ERR
3856 025500 005037 026052      ELA241: CLR      BYTNUM  :CLEAR BYTE NUMBER
3857 025504 162701 000001      SUB      #1,R1        :CAL. TOTAL BYTE COUNT-LAST TWO
3858 025510 010137 026050      MOV      R1,BYTCNT    :SAVE BYTE COUNT
3859 025514 012701 034006      BDA241: MOV      #DATPAT,R1 :SET TEMP#1=DATA SOURCE BEGIN ADR
3860 025520 012702 034406      MOV      #DATBUF,R2  :SET TEMP#2=DATA BUFFER BEGIN ADR
3861 025524 063701 026052      ADD      BYTNUM,R1    :CAL CURRENT BYTE ADDR (SOURCE)
3862 025530 063702 026052      ADD      BYTNUM,R2    :CAL CURRENT BYTE ADDR (BUFFER)
3863 025534 121112      CMPB      (R1),(R2)   :IF SOURCE BYTE & BUFFER BYTE
3864 025536 001502      BEQ      ELB241      :NOT EQUAL
3865 025540 005237 026054      INC      DAERCT      :INCREMENT DATA ERR COUNT
3866 025544 052737 000010 002276  BIS      #10,ERRTY    :SET DATA ERR-ERR TYPE
3867 025552 042737 000004 002276  BIC      #4,ERRTY     :CLR CK SUM ERR-ERR TYPE
3868 025560 023727 026052 000002  IFC241: CMP      BYTNUM,#2 :IF BYTE #0 OR #1
3869 025566 002006      BGE      IFE241      :THEN
3870 025570 005737 026052      IFD241: TST      BYTNUM  :IF BYTE #0
3871 025574 001003      BNE      IFE241      :THEN
3872 025576 052737 000001 026046  BIS      #1,SEEKCK    :SET SEEK ERR-ERR TYPE
3873 025604 023727 026054 000012  IFE241: CMP      DAERCT,#12  :IF OVER 10 DATA ERRORS
3874 025612 103404      BLO      THF241      :THEN
3875 025614 032737 000020 002204  IFF241: BIT      #20,SWREG   :IF PRINT ONLY 10 DATA ERROR FLAG
3876 025622 001047      BNE      EIF241      :IS NOT SET, THEN
3877 025624 111137 026056      THF241: MOVB      (R1),DATASB
3878 025630 111237 026060      MOVB      (R2),DATAWS
3879 025634 005737 026062      IFM241: TST      PTHEAD   :IF PRINT HEADER
3880 025640 001420      BEQ      EIM241      :OK, THEN
3881 025642 005037 026062      CLR      PTHEAD     :CLEAR PRINT HEADER
3882 025646      PRINTB #DMSG1,UNIT,TRACK,SECTOR
3883 025702      PRINTB #DMSG2,BYTNUM,<B,DATASB>,<B,DATAWS>
3884 025742 000240      EIF241: NOP
3885 025744 005237 026052      ELB241: INC      BYTNUM  :INCREMENT BYTE #
3886 025750 005337 026050      DEC      BYTCNT      :DECREMENT BYTE COUNT
3887 025754 005737 026050      TST      BYTCNT      :DO UNTIL BYTE COUNT
3888 025760 003255      BGT      BDA241      :EQUALS 0
3889 025762 005737 026046      IFJ241: TST      SEEKCK  :IF DISK SEEK ERR
3890 025766 001413      BEQ      END241      :IS SET AND
3891 025770 032737 000010 002276  IFK241: BIT      #10,ERRTY :IF DATA ERR
3892 025776 001007      BNE      END241      :NOT SET AND
3893 026000 032737 000002 021452  IFL241: BIT      #2,ERTSAV  :IF CRC ERR
3894 026006 001003      BNE      END241      :NOT SET

```



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 MOD 2.4.1 - EVALUATE DATA

```

3895 026010 052737 000001 002276      BIS      #1,ERRTY      ;THEN SET SEEK ERR
3896 026016 000240      END241: NOP          ;
3897 026020 005037 021452      CLR      ERTSAV     ;CLEAR ERR TYP SAV
3898 026024 012705 034406      MOV      #DATBUF,R5 ;GET BEGIN OF DATA BUFFER
3899 026030 012704 000200      MOV      #128.,R4   ;SET WORD LENGTH OF TABLE
3900 026034 005025      BDB241: CLR      (R5)+ ;CLEAR WORD IN DATA BUFFER TABLE
3901 026036 005304      DEC      R4         ;DECREMENT WORD COUNT
3902 026040 005704      TST     R4         ;DO UNTIL
3903 026042 001374      EDB241: BNE     BDB241 ;ALL TABLE WORDS ZEROED
3904 026044 000207      RTS      PC        ;RETURN
3905
-----
3906 026046 000000      SEEKCK: 0          ;SEEK CECK FLAG
3907 026050 000000      BYTCNT: 0         ;BYTE COUNT
3908 026052 000000      BYTNUM: 0        ;BYTE NUMBER
3909 026054 000000      DAERCT: 0       ;DATA ERR COUNT
3910 026056 000000      DATASB: 0       ;DATA SHOULD BE
3911 026060 000000      DATAWS: 0      ;DATA WAS
3912 026062 000000      PTHEAD: 0       ;PRINT HEADER FLAG
3913
-----
3914 026064      045      116      045      DMSG1: .ASCIZ /%N% UNIT#%01%A TRK#%D3%A SEC#%D2%N%A BYTE#%S2%AGOOD%S6%ABAD/
3915 026161      045      116      045      DMSG2: .ASCIZ /%N%S3%D3%S2%B8%S2%B8/
3916      .EVEN
3917      ;MOD 2.4.1 ----- END MODULE -----

```

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 MOD 2.4.2 - EVALUATE DRIVE STATE

```

3920 .SBTTL MOD 2.4.2 - EVALUATE DRIVE STATE
3921 -----
3922 026206 013705 002236      EVDVST: MOV      UUTADR,R5
3923 026212 013737 002246 027072 MOV      CSRUUT,CSREV      ;GET COMMAND & STATUS LAST OP UUT
3924 026220 013737 002250 027074 MOV      ESRUUT,ESREV      ;GET ERROR STATUS LAST OP UUT
3925 026226 005037 033544      CLR      XERUUT          ;CLEAR EXTENDED ERROR CODE LOCATION
3926 026232 032737 000040 027072 IFA242: BIT      #40,CSREV      ;IF DONE NOT
3927 026240 001032      BNE      IFB242          ;SET THEN
3928 026242 012715 040000      MOV      #40000,(R5)      ;ISSUE PROG INIT TO UUT
3929 026246 013737 002236 025332 MOV      UUTADR,CSRADR      ;SET CSR ADR
3930 026254 012737 000040 025330 MOV      #DNBIT,RDYWD      ;SET DONE TEST
3931 026262 004737 025230      CALL     DELAY           ;WAIT FOR TR
3932 026266 032715 000040      IFC242: BIT      #40,(R5)      ;IF DONE NOT
3933 026272 001005      BNE      ELC242          ;SET THEN
3934 026274 052737 000010 002274 BIS      #10,ERRSY        ;SET NO DONE ON INT-SYS ERR
3935 026302 000137 027064      JMP      END242          ;BR TO END MOD
3936 026306 113701 027070      ELC242: MOVB     FUNEV,R1      ;GET DRIVE FUNCTION
3937 026312 042701 177770      BIC      #177770,R1      ;CLEAR ALL BUT FUNCTION
3938 026316 050137 002274      BIS      R1,ERRSY        ;SET NO DONE ON FUNCTION-SYS ERR
3939 026322 000137 027064      JMP      END242          ;BR TO END MOD
3940 026326 004737 027076      IFB242: CALL     EVDVRE      ;CALL MOD 2.4.2.1 EVALUATE DRIVE RESPONSE
3941 026332 005737 002274      TST     ERRSY           ;IF SYS ERR
3942 026336 001463      BEQ     IFG242          ;NOT=0 THEN
3943 026340 032737 000001 002234 BIT      #1,UUT          ;IF DRV#1 UNDER TST
3944 026346 001404      BEQ     1$              ;THEN
3945 026350 012737 000020 027066 MOV      #20,EVCMD        ;SET CMD TO DRV#1
3946 026356 000402      BR      2$              ;BR
3947 026360 005037 027066      1$:    CLR      EVCMD      ;SET CMD TO DRV#0
3948 026364 052737 000013 027066 2$:    BIS      #13,EVCMD      ;SET READ UUT ESR IN CMD
3949 026372 053737 002242 027066 BIS      DEN,EVCMD        ;SET DEN FOR CMD
3950 026400 013715 027066      MOV     EVCMD,(R5)      ;READ UUT ESR
3951 026404 013737 002236 025332 MOV      UUTADR,CSRADR      ;SET CSR ADR
3952 026412 012737 000040 025330 MOV      #DNBIT,RDYWD      ;SET DONE BIT
3953 026420 004737 025230      CALL     DELAY           ;CALL
3954 026424 032715 000040      IFX242: BIT      #40,(R5)      ;IF DONE BIT
3955 026430 001005      BNE      IFD242          ;NOT SET THEN
3956 026432 052737 000200 002274 BIS      #200,ERRSY        ;SET NO DONE BIT (SECONDARY PROBLEM)
3957 026440 000137 027064      JMP      END242          ;BK TO END
3958 026444 032715 100000      IFD242: BIT      #100000,(R5) ;IF ERR BIT
3959 026450 001403      BEQ     IFE242          ;SET
3960 026452 052737 100000 002276 BIS      #100000,ERRTY      ;ERR BIT - ERR TYPE
3961 026460 013701 002236      IFE242: MOV     UUTADR,R1      ;GET UUT ADR
3962 026464 062701 000002      ADD     #2,R1           ;CAL DBR ADR
3963 026470 032711 000200      BIT     #200,(R1)        ;IF DRV RDY BIT
3964 026474 001102      BNE     IFN242          ;EQUALS 0
3965 026476 052737 000040 002274 BIS      #40,ERRSY        ;SET DRIVE NOT RDY-SYS ERR
3966 026504 000561      BR      IFS242          ;BR TO END IF 'E'
3967 026506 032737 002021 027074 IFG242: BIT      #2021,ESREV      ;IF ANY ESR ERR BIT SET
3968 026514 001410      BEQ     IFH242          ;THEN
3969 026516 032737 100000 027072 IFI242: BIT      #100000,CSREV      ;IF UUT ERR BIT
3970 026524 001010      BNE     IFJ242          ;NOT=1 THEN
3971 026526 052737 040000 002276 BIS      #40000,ERRTY      ;SET MISSING ERR BIT
3972 026534 000450      BR      IFL242          ;BR TO IF 'L'
3973 026536 032737 100000 027072 IFH242: BIT      #100000,CSREV      ;IF UUT CSR ERR BIT
3974 026544 001456      BEQ     IFN242          ;EQUALS 1 THEN
3975 026546 013701 025410      IFJ242: MOV     TSTEV,R1      ;GET TEST FUNCTION
3976 026552 042701 177774      BIC     #177774,R1      ;CLEAR ALL BUT TWO BOTTOM BITS
    
```







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 MOD 2.4.2 - EVALUATE DRIVE STATE

```

4036
4037
4038
4039
4040 027076 013701 025410
4041 027102 042701 177771
4042 027106 032701 000006
4043 027112 001445
4044 027114 005737 002172
4045 027120 001421
4046 027122 032737 000002 002234
4047 027130 001403
4048 027132 012701 001000
4049 027136 000401
4050 027140 005001
4051 027142 013702 002250
4052 027146 042702 176777
4053 027152 020102
4054 027154 001403
4055 027156 052737 001000 002274
4056 027164 032737 000001 002234
4057 027172 001403
4058 027174 012701 000400
4059 027200 000401
4060 027202 005001
4061 027204 013702 002250
4062 027210 042702 177377
4063 027214 020102
4064 027216 001403
4065 027220 052737 000400 002274
4066 027226 000207
4067

.SBTTL MOD 2.4.2.1 - EVALUATE DRIVE RESPONSE
-----
EVDVRE: MOV TSTEV,R1 ;GET TEST FUNCTION
BIC #177771,R1 ;CLEAR BITS
BIT #6,R1 ;IF NOT FILL/EMPTY BUFFER
BEQ 6$ ;THEN
TST RXXX ;IF RXXX
BEQ 1$ ;AND
BIT #2,UUT ;SIDE # SELECTED
BEQ 2$ ;THEN
MOV #1000,R1 ;SET R1 TO TEST SIDE #1 SELECT
BR 3$ ;BR TO TEST RESPONSE
2$: CLR R1 ;SET R1 TO TEST SIDE #0 SELECT
3$: MOV ESRUUT,R2 ;GET ESR UNIT UNDER TEST
BIC #176777,R2 ;CLEAR ALL BITS BUT SIDE SELECT
CMP R1,R2 ;IF SIDE SELECT
BEQ 1$ ;NOT=SIDE RESPONDING THEN
BIS #1000,ERRSY ;SET WRONG SIDE RESPONDING SYS ERR
1$: BIT #1,UUT ;IF DRIVE #1 SELECTED
BEQ 4$ ;THEN
MOV #400,R1 ;SET R1 TO TEST DRIVE #1 SEL
BR 5$ ;BR TO TEST RESPONSE
4$: CLR R1 ;SET R1 TO TEST DRIVE #0 SEL
5$: MOV ESRUUT,R2 ;GET ESR UNIT UNDER TEST
BIC #177377,R2 ;CLEAR ALL BITS BUT DRIVE RESPONDING
CMP R1,R2 ;
BEQ 6$ ;
BIS #400,ERRSY ;SET WRONG DRIVE RESPONDING SYS ERR
6$: RTS PC
:MOD 2.4.2.1 ----- END MODULE -----

```

```

4070          .SBTTL MOD 2.4.3 - UPDATE DRIVE STATISTICS
4071          :-----
4072
4073 027230 013737 027626 030342 UPDVST: MOV      TSTCK,FUNTY ;PASS TEST FUNCTION TO UPDATE SEC CTR
4074 027236 004737 030216          CALL    UPSECT ;CALL UP DATE SECTOR CONTENTS
4075 027242 032737 000002 027606 IA243: BIT      #2,ETSAV ;IF ERRTY SAVE
4076 027250 001405          BEQ     EA243 ;HAS CRC ERR BIT SET, THEN
4077 027252 004737 027722          CALL    UDCRST ;CALL UPDATE CRC STATISTICS
4078 027256 005037 027606          CLR     ETSAV ;CLEAR ERR TYPE SAVE
4079 027262 000457          BR      IG243 ;BR TO IF 'G'
4080 027264 013737 002276 027606 EA243: MOV      ERRTY,ETSAV ;SAVE ERR TYP --> ETSAV
4081 027272 013737 002276 027614          MOV     ERRTY,STERRG ;GET ERR TYP --> STAT ERR REG
4082 027300 005037 027616          CLR     STCNTR ;ZERO STAT COUNTER
4083 027304 032737 000002 027614 ID243: BIT      #2,STERRG ;IF ERR IS
4084 027312 001403          BEQ     BF243 ;CRC, THEN
4085 027314 042737 006002 027614          BIC     #6002,STERRG ;CLEAR CRC, RD, & WRT ERR BITS OF STAT ERR REG
4086 027322 000241          CLC     ;CLEAR CARRY BIT
4087 027324 006037 027614          ROR     STERRG ;ROTATE RIGHT STAT ERROR REG
4088 027330 103026          IB243: BCC     EB243 ;IF CARRY BIT SET, THEN
4089 027332 013701 027616          MOV     STCNTR,R1 ;GET STAT COUNTER
4090 027336 006301          ASL     R1 ;& DOUBLE FOR WORD ADDRESSING
4091 027340 062701 027630          ADD     #ETTAB,R1 ;CAL. CLASSIFICATION WORD-ADDRESS
4092 027344 011137 027620          MOV     (R1),CLASWD ;GET CLASSIFICATION WORD
4093 027350 011102          MOV     (R1),R2 ;GET CLASSIFICATION WORD-TO FIND LOG OFFSET
4094 027352 000302          SWAB   R2 ;GET CLASSIFICATION WORD UPPER BYTE
4095 027354 006302          ASL     R2 ;--SHIFT LEFT TO GET LOG REG OFFSET (LAST 6 BITS)
4096 027356 006302          ASL     R2 ;--SHIFT LEFT AGAIN
4097 027360 042702 177004          BIC     #177004,R2 ;CLEAR UNWANTED BITS
4098 027364 010237 027622          MOV     R2,LOGOFF ;SAVE ERROR LOG OFFSET
4099 027370 005711          IC243: TST     (R1) ;IF ERR TYP CLASSIFICATION WORD
4100 027372 100403          BMI     LC243 ;TYPE=SOFT, THEN
4101 027374 004737 030072          CALL    UDSFST ;CALL UPDATE SOFT ERROR STATISTICS
4102 027400 000402          BR      EB243 ;BR TO END 'B'
4103 027402 004737 027670          LC243: CALL    UDHDST ;CALL UPDATE HARD ERROR STATISTICS
4104 027406 005237 027616          EB243: INC     STCNTR ;INCREMENT STAT COUNTER
4105 027412 022737 000020 027616 UF243: CMP     #16,STCNTR ;DG UNTIL ALL 16
4106 027420 101340          BHI     BF243 ;BITS ARE DONE
4107 027422 013703 033544          IG243: MOV     XERUUT,R3 ;GET EXTENDED ERROR CODE
4108 027426 042703 177400          BIC     #177400,R3 ;CLEAR UPPER BYTE
4109 027432 005703          TST     R3 ;IF EXTENDED ERROR CODE
4110 027434 001410          BEQ     IH243 ;NOT=0, THEN
4111 027436 162703 000010          SUB     #10,R3 ;ADJ ERROR CODE # FOR LOGGING
4112 027442 012702 007604          MOV     #ECLOG,R2 ;GET LOC OF ERR CODE LOG
4113 027446 060302          ADD     R3,R2 ;ADD ERR CODE TO LOC ERR CODE LOG
4114 027450 063702 002240          ADD     UUTOFF,R2 ;FIND LOC ERR REG THIS UNIT
4115 027454 005212          INC     (R2) ;INCREMENT UNIT ERR REG
4116 027456 013703 002276          IH243: MOV     ERRTY,R3 ;GET ERR TYPE
4117 027462 042703 171774          BIC     #171774,R3 ;CLEAR ALL ERRS BUT RD, WT, CRC, SEEK
4118 027466 005703          TST     R3 ;IF ONE OF THESE ERRORS
4119 027470 001412          BEQ     I1243 ;THEN
4120 027472 013702 002254          MOV     TRACK,R2 ;GET TRACK ADR
4121 027476 006302          ASL     R2 ;DOUBLE TRACK ADR FOR WORD ADDRESSING
4122 027500 006302          ASL     R2 ;ADJ TRK
4123 027502 006302          ASL     R2 ;FOR ADR.
4124 027504 062702 010070          ADD     #TKXX,R2 ;ADD TRACK LOG LOCATION
4125 027510 063702 002240          ADD     UUTOFF,R2 ;FIND LOC ERR REG THIS UNIT
4126 027514 005212          INC     (R2) ;INCREMENT UNIT ERR REG

```



HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 119-1  
MOD 2.4.3 - UPDATE DRIVE STATISTICS

```

4127 027516 005737 027610      I1243: TST      ERRSAV      ;IF ERR SAVE HAS
4128 027522 001023              BNE      L1243      ;NO ERROR SET, THEN
4129 027524 005237 027612      INC      ERSVCT     ;INCREMENT ERROR SAVE COUNTER
4130 027530 022737 000004 027612 IJ243: CMP      #4,ERSVCT ;IF ERROR SAVE COUNTER
4131 027536 101017              BHI      E1243     ;NOT=4, THEN
4132 027540 012701 002306      MOV      #SEEKRT,R1 ;SET BEGIN ADDRESS OF RETRY COUNTERS
4133 027544 012702 000011      MOV      #11,R2    ;SET # OF RETRY COUNTERS
4134 027550 005021      BK243: CLR      (R1)+ ;CLEAR RETRY COUNTER
4135 027552 005302              DEC      R2        ;DECREMENT RETRY COUNTER #
4136 027554 005702      UK243: TST      R2    ;DO UNTIL
4137 027556 001374              BNE      BK243    ;ALL COUNTERS CLEARED
4138 027560 005037 027612      CLR      ERSVCT     ;CLEAR ERROR SAVE COUNTER
4139 027564 005037 002304      CLR      RETRY     ;CLEAR RETRY COUNTER
4140 027570 000402              BR       E1243    ;BR TO END 'I'
4141 027572 005037 027612      L1243: CLR      ERSVCT ;CLEAR ERROR SAVE COUNT
4142 027576 013737 002276 027610 E1243: MOV      ERRTY,ERRSAV ;SAVE ERROR TYPE FOR NEXT ERROR CHECK
4143 027604 000207      END243: RTS     PC   ;RETURN
4144
4145 027606 000000      ETSAV: 0          ;ERR TYPE SAVE
4146 027610 000000      ERRSAV: 0        ;ERR TYPE SAVE REG
4147 027612 000000      ERSVCT: 0        ;ERROR SAVE COUNTER-COUNTS # OF NO ERROR PASSES
4148 027614 000000      STERRG: 0       ;STAT ERR REG
4149 027616 000000      STCNTR: 0       ;STAT COUNTER
4150 027620 000000      CLASWD: 0       ;ERROR CLASSIFICATION WORD-FROM TABLE
4151 027622 000000      LOGOFF: 0       ;ERROR LOG OFFSET FROM #CKSML
4152 027624 000000      RTOFF: 0        ;RETRY COUNTER OFFSET FROM # SEEKRT
4153 027626 000000      TSTCK: 0        ;TEST WORD-USED TO CHECK TEST DONE
4154
;MOD 2.4.3 ----- END MODULE -----

```

----- ERROR TYPE CLASSIFICATION & OFFSETS TABLE -----

		:TYPE/LOG-OFF/RT-OFF/CLASS /BIT#			
		/	/	/	/
4158	ETTAB:	.WORD	005001	:SFT /SEEK	/SEEK /SK-RTMSK/ 0
4159	027630	005001		:SFT /CRC	/CRC /CRC / 1
4160	027632	006005		:HRD /CKSML	/ - /HD / 2
4161	027634	100407		:SFT /DATA	/DATA /DT-RTMSK/ 3
4162	027636	012106		:HRD / -	/ - / - / 4
4163	027640	154400		:HRD /DDUNX	/DD /HD / 5
4164	027642	113227		:HRD /DDMIS	/DD /HD / 6
4165	027644	113227		:HRD / -	/ - / - / 7
4166	027646	154400		:HRD /UNK	/ - / - / 8
4167	027650	154400		:HRD /FIL-EMP/	- /HD / 9
4168	027652	101407		:SFT /RD	/RD /RD-RTMSK/ 10
4169	027654	010164		:SFT /WRT	/WT /WT-RTMSK/ 11
4170	027656	011202		:HRD /INTR-ND/	- /HD / 12
4171	027660	103407		:HRD /D-NINTR/	- /HD / 13
4172	027662	104407		:HRD /ER-NSET/	- /HD / 14
4173	027664	102407		:HRD /ERR BIT/	- /HD / 15
4174	027666	154407			

```

-----<CLASSIFICATION (SEEK=1/CRC=5/DATA=6/WRITE=2/READ=4)
-----<RETRY COUNTER OFFSET
-----<LOG REGISTER OFFSET-(FROM CKSML ADDRESS)
-----<TYPE (SOFT=0/HARD=1)
-----

```

4175  
4176  
4177  
4178  
4179  
4180



HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 121  
 MOD 2.4.3.1 - UPDATE HARD ERROR STATISTICS

```

4183      .SBTTL MOD 2.4.3.1 - UPDATE HARD ERROR STATISTICS
4184      :-----
4185
4186 027670 000240 UDHDST: NOP
4187 027672 032737 000007 027620 IA2431: BIT #7,CLASWD ; IF ERROR CLASS WORD-
4188 027700 001007 BNE X2431 ; CLASS=HD(7), THEN
4189 027702 013701 027622 MOV LOGOFF,R1 ; GET ERROR LOG OFFSET
4190 027706 062701 007354 ADD #CKSML,R1 ; ERR LOG ADR=ERR LOG OFF + CKSML ADR
4191 027712 063701 002240 ADD UUTOFF,R1 ; UUT ERR LOG ADR=UUT OFFSET + ERR LOG ADR
4192 027716 005211 INC (R1) ; INCREMENT THE ERROR LOG
4193 027720 000207 X2431: RTS PC ; RETURN
4194      :MOD 2.4.3.1 ----- END MODULE -----
4195
4196
4197      .SBTTL MOD 2.4.3.2 - UPDATE CRC STATISTICS
4198      :-----
4199
4200
4201 027722 000240 UDCRST: NOP
4202 027724 032737 020000 027626 IA2432: BIT #BIT13,TSTCK ; IF TEST=DATA CHECK
4203 027732 001425 BEQ LA2432 ; BIT SET, THEN
4204 027734 032737 000010 002276 IB2432: BIT #BIT03,ERRTY ; IF ERR TYPE=DATA ERR
4205 027742 001007 BNE LB2432 ; NOT SET, THEN
4206 027744 012737 000020 027622 MOV #20,LOGOFF ; SET LOG OFFSET=CRC BAD LOG
4207 027752 012737 000006 027624 MOV #6,RTOFF ; SET RETRY OFFSET=CRC ERR
4208 027760 000420 BR IC2432 ; BR TO 'C'
4209 027762 012737 000050 027622 LB2432: MOV #50,LOGOFF ; SET DATA LOG OFFSET
4210 027770 005037 030474 CLR RTMASK ; CLEAR RETRY MASK
4211 027774 012737 000012 027624 MOV #12,RTOFF ; SET DUMMY DATA RETRY COUNTER OFFSET
4212 030002 004737 030344 CALL SFERLG ; CALL SOFT ERROR LOGGER
4213 030006 012737 000010 027622 LA2432: MOV #10,LOGOFF ; SET LOG OFFSET=CRC ERR LOG
4214 030014 012737 000006 027624 MOV #6,RTOFF ; SET RETRY OFFSET=CRC ERR
4215 030022 032737 010000 027626 IC2432: BIT #BIT12,TSTCK ; IF READ AFTER WRITE (RAW)
4216 030030 001407 BEQ LC2432 ; BIT SET, THEN
4217 030032 012737 000020 030474 MOV #BIT04,RTMASK ; SET RETRY MASK=CRC
4218 030040 052737 000002 030474 BIS #BIT1,RTMASK ; SET RETRY MASK=WRITE
4219 030046 000406 BR EC2432 ; BR TO END 'C'
4220 030050 012737 000020 030474 LC2432: MOV #BIT04,RTMASK ; SET RETRY MASK=CRC
4221 030056 052737 000004 030474 BIS #BIT02,RTMASK ; SET RETRY MASK=READ
4222 030064 004737 030344 EC2432: CALL SFERLG ; CALL SOFT ERROR LOGGER
4223 030070 000207 RETURN ; RETURN
4224      :MOD 2.4.3.2 ----- END MODULE -----

```

HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 123  
 MOD 2.4.3.3 - UPDATE SOFT ERROR STATISTICS

```

4227      .SBTTL MOD 2.4.3.3 - UPDATE SOFT ERROR STATISTICS
4228      :-----
4229
4230 030072 013702 027620      UDSFST: MOV      CLASWD,R2      ;PUT CLASSIFICATION WORD IN R1
4231 030076 006202              ASR      R2              ;  SHIFT WORD RIGHT
4232 030100 006202              ASR      R2              ;  3 TIMES TO GET
4233 030102 006202              ASR      R2              ;  RETRY COUNTER OFFSET (LAST 6 BITS)
4234 030104 042702 177700      BIC      #177700,R2      ;CLEAR TOP 10 BITS
4235 030110 010237 027624      MOV      R2,RTOFF        ;SET RETRY COUNTER OFFSET
4236 030114 013702 027620      IA2433: MOV      CLASWD,R2      ;GET CLASSIFICATION WORD
4237 030120 042702 177770      BIC      #177770,R2      ;CLEAR ALL BIT ERROR CLASSIFICATION
4238 030124 022702 000006      CMP      #6,R2          ;IF ERROR
4239 030130 001022              BNE      LA2433          ;CLASS=DATA, THEN
4240 030132 032737 010000 027626  IB2433: BIT      #BIT12,TSTCK    ;IF TEST HAS
4241 030140 001404              BEQ      LB2433          ;READ AFTER WRITE (RAW) BIT SET, THEN
4242 030142 012737 000012 030474      MOV      #12,RTMASK      ;SET DATA & WRITE RETRY
4243 030150 000403              BR       EB2433          ;BR TO END IF 'B'
4244 030152 012737 000014 030474  LB2433: MOV      #14,RTMASK      ;SET DATA & READ RETRY
4245 030160 012737 000010 027624  EB2433: MOV      #10,RTOFF        ;SET DATA RT COUNTER OFFSET
4246 030166 012737 000050 027622      MOV      #50,LOGOFF      ;SET DATA LOG OFFSET
4247 030174 000405              BR       EA2433          ;BR TO END 'A'
4248 030176 010237 030474      LA2433: MOV      R2,RTMASK      ;ELSE-PUT CLASS INTO RETRY MASK
4249 030202 162737 000050 027622      SUB      #50,LOGOFF      ;ADJ. LOG OFFSET SO THAT 'SEK' IS LOG BEGIN
4250 030210 004737 030344      EA2433: CALL     SFERLG        ;CALL SOFT ERROR LOGGER
4251 030214 000207      X2433:  RTS      PC          ;RETURN
4252      :MOD 2.4.3.3 ----- END MODULE -----

```

HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 125  
 MOD 2.4.3.3 - UPDATE SOFT ERROR STATISTICS

```

4255
4256      .SBTTL MOD 2.4.3.4 - UPDATE SECTOR WRITTEN/READ COUNTERS
4257      :-----
4258
4259 030216 013701 002234      UPSECT: MOV      UUT,R1      ;GET UNIT UNDER TEST
4260 030222 006301              ASL      R1      ;DOUBLE FOR WORD ADDRESSING
4261 030224 006301              ASL      R1      ;DOUBLE FOR 2 WORD ADDRESSING
4262 030226 042737 177770 030342 BIC      #177770,FUNTY ;CLEAR ALL BUT FUNCTION
4263 030234 022737 000003 030342 IA2434: CMP      #3,FUNTY ;IF FUNCTION TYPE
4264 030242 001002              BNE      IB2434 ;IS READ, THEN
4265 030244 005002              CLR      R2      ;CLEAR R2
4266 030246 000412              BR       EA2434 ;BR TO END 'A'
4267 030250 022737 000002 030342 IB2434: CMP      #2,FUNTY ;IF FUNCTION TYPE
4268 030256 001404              BEQ      LB2434 ;IS NOT WRITE #1, THEN
4269 030260 022737 000006 030342 IC2434: CMP      #6,FUNTY ;IF FUNCTION TYPE
4270 030266 001024              BNE      XUPSCT ;IS WRITE #2, THEN
4271 030270 012702 000020      LB2434: MOV      #20,R2 ;SET R2 OFFSET=WRITE
4272 030274 000241      EA2434: CLC      ;CLEAR CARRY BIT
4273 030276 060102              ADD      R1,R2 ;SETUP OFFSET
4274 030300 005262 007314              INC      READSC(R2) ;INCREMENT SECTOR COUNTER
4275 030304 100015              BPL      XUPSCT ;IF BIT#15 SET, THEN
4276 030306 005062 007314              CLR      READSC(R2) ;CLEAR SECTOR COUNTER
4277 030312 062702 000002              ADD      #2,R2 ;SETUP TO INCREMENT DOUBLE PRECISION WORD
4278 030316 005262 007314              INC      READSC(R2) ;INCREMENT DOUBLE PRECISION WORD
4279 030322 103006              BCC      XUPSCT ;IF CARRY BIT SET, THEN
4280 030324 005062 007314              CLR      READSC(R2) ;CLEAR DOUBLE PRECISION CTR
4281 030330 162702 000002              SUB      #2,R2 ;
4282 030334 005062 007314              CLR      READSC(R2) ;CLEAR DOUBLE PRECISION CTR
4283 030340 000207      XUPSCT: RETURN ;RETURN
4284      :-----
4285 030342 000000      FUNTY: 0 ;STATISTICS FUNCTION CK
4286      :-----

```





```

4322      .SBTTL MOD 2.4.4 - EVALUATE UNIT ERROR CODE
4323      -----
4324
4325 030476 013701 033544 EVUTEC: MOV XERUUT,R1      ;GET ERR CODE & SAVE
4326 030502 042701 177400      BIC #177400,R1      ;CLEAR TOP BYTE
4327 030506 005701      IFA244: TST R1          ;IF ERRCODE
4328 030510 001443      BEQ END244          ;NOT=0, THEN
4329 030512 006201      ASR R1              ;SHIFT ERR CODE FOR LOOK UP
4330 030514 006201      ASR R1              ;AND ADDRESSING
4331 030516 062701 030624      ADD #ECCLAS,R1     ;CAL ERR TABLE CLASSIFICATION ADR
4332 030522 011102      MOV (R1),R2        ;GET ERR CODE CLASSIFICATION WORD
4333 030524 105702      IFB244: TSTB R2     ;IF LOWER BYTE
4334 030526 001003      BNE IFC244         ;EQUALS 0, THEN
4335 030530 050237 002274      BIS R2,ERRSY      ;SET ERR ONTO ERRSY
4336 030534 000431      BR END244         ;BR TO END IF 'B'
4337 030536 122702 000300      IFC244: CMPB #300,R2 ;IF LOW BYTE
4338 030542 001024      BNE ELC244        ;EQUALS 300, THEN
4339 030544 022737 000003 030622 IFD244: CMP #3,FNEV4 ;IF FUNCTION WAS
4340 030552 001004      BNE IFE244        ;A READ, THEN
4341 030554 052737 002000 002276      BIS #2000,ERRTY  ;SET READ ERR
4342 030562 000416      BR END244        ;BR TO END IF 'B'
4343 030564 022737 000002 030622 IFE244: CMP #2,FNEV4 ;IF FUNCTION WAS
4344 030572 001004      BNE ELE244        ;A WRITE, THEN
4345 030574 052737 004000 002276      BIS #4000,ERRTY  ;SET WRITE ERROR
4346 030602 000406      BR END244        ;BR TO END IF 'B'
4347 030604 052737 040000 002276 ELE244: BIS #40000,ERRTY ;SET UNK ERROR
4348 030612 000402      BR END244        ;BR TO END IF 'B'
4349 030614 050237 002276      ELC244: BIS R2,ERRTY ;SET CLASSIFIED ERROR ONTO ERRTY
4350 030620 000207      END244: RTS PC    ;RETURN
4351      -----
4352 030622 000000      FNEV4: 0          ;FUNCTION FOR EVALUATION
4353      -----
4354 030624 000000      ECCLAS: .WORD 0    ;ERR CODE # 00 ----> NOT USED (NO ERROR)
4355 030626 000001      .WORD 1          ;ERR CODE # 10 ----> SEEK
4356 030630 000001      .WORD 1          ;ERR CODE # 20 ----> SEEK
4357 030632 000000      .WORD 0          ;ERR CODE # 30 ----> NOT ASSIGNED
4358 030634 004000      .WORD 4000       ;ERR CODE # 40 ----> SYS ERR
4359 030636 000001      .WORD 1          ;ERR CODE # 50 ----> SEEK
4360 030640 002000      .WORD 2000       ;ERR CODE # 60 ----> SELF DIAG ERR
4361 030642 000300      .WORD 300        ;ERR CODE # 70 ----> READ OR WRITE ERR
4362 030644 004000      .WORD 4000       ;ERR CODE # 100 ----> SYS ERR
4363 030646 000300      .WORD 300        ;ERR CODE # 110 ----> READ OR WRITE ERR
4364 030650 000300      .WORD 300        ;ERR CODE # 120 ----> READ OR WRITE ERR
4365 030652 000300      .WORD 300        ;ERR CODE # 130 ----> READ OR WRITE ERR
4366 030654 000002      .WORD 2          ;ERR CODE # 140 ----> CRC ERR
4367 030656 000001      .WORD 1          ;ERR CODE # 150 ----> SEEK ERR
4368 030660 000300      .WORD 300        ;ERR CODE # 160 ----> READ OR WRITE ERR
4369 030662 000300      .WORD 300        ;ERR CODE # 170 ----> READ OR WRITE ERR
4370 030664 000002      .WORD 2          ;ERR CODE # 200 ----> CRC ERR
4371 030666 000000      .WORD 0          ;ERR CODE # 210 ----> NOT ASSIGNED
4372 030670 002000      .WORD 2000       ;ERR CODE # 220 ----> SELF DIAG ERR
4373 030672 004000      .WORD 4000       ;ERR CODE # 230 ----> SYS ERR
4374 030674 020000      .WORD 20000      ;ERR CODE # 240 ----> DENSITY ERR
4375 030676 020000      .WORD 20000      ;ERR CODE # 250 ----> DENSITY ERR
4376 030700 000000      .WORD 0          ;ERR CODE # 260 ----> NOT ASSIGNED
4377      -----
:MOD 2.4.4 ----- END MODULE -----

```



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MOD 2.5 - OUTPUT ERROR TYPE

```

4380 .SBTTL MOD 2.5 - OUTPUT ERROR TYPE
4381 -----
4382 030702 013737 002276 002604 OTERTP: MOV ERRTY,ERRREG ;SET ERROR TYPE FOR PRINT OUT
4383 030710 013701 002276 MOV ERRTY,R1 ;GET ERROR TYPE
4384 030714 005002 CLR R2 ;CLEAR ERROR # COUNT
4385 030716 000240 BDA25: NOP ;
4386 030720 032701 000001 IFA25: BIT #1,R1 ;IF BIT #1
4387 030724 001405 BEQ ELA25 ;EQUALS 1, THEN
4388 030726 010204 MOV R2,R4 ;SAVE ERROR # COUNT
4389 030730 006304 ASL R4 ;DOUBLE ERR # COUNT FOR ADDRESSING
4390 030732 062704 031616 ADD #ET1,R4 ;SET ADDR FOR ERR MSG PRINT
4391 030736 000407 BR THA25 ;BR TO THEN 'A'
4392 030740 000241 ELA25: CLC ;CLEAR CARRY BIT
4393 030742 006201 ASR R1 ;SHIFT ERR TYPE RIGHT
4394 030744 005202 INC R2 ;INCREMENT ERROR # COUNT
4395 030746 022702 000017 CMP #17,R2 ;DC UNTIL ERROR # COUNT
4396 030752 001361 BNE BDA25 ;EQUALS 15, THEN
4397 030754 000507 BR EIA25 ;BR TO END IF 'A'
4398 030756 005003 THA25: CLR R3 ;CLEAR R3
4399 030760 010205 MOV R2,R5 ;GET ERR#
4400 030762 062705 031656 ADD #ETCLAS,R5 ;CAL. ERR# CLASSIFICATION ADR
4401 030766 111503 MOVB (R5),R3 ;GET ERR# CLASSIFICATION
4402 030770 032703 000001 IFB25: BIT #1,R3 ;IF SOFT ERR
4403 030774 001415 BEQ IFC25 ;CLASS, THEN
4404 030776 005737 002300 TST HARDER ;IF HARD ERR
4405 031002 001015 BNE ELB25 ;NOT SET, THEN
4406 031004 010237 002376 MOV R2,ERRNBR ;SET ERR #
4407 031010 011437 002400 MOV (R4),ERRMSG ;SET ERR MSG
4408 031014 012737 000003 002374 MOV #SOFT,ERRTYP ;SET ERRTYP=SOFT
4409 031022 004737 002354 CALL ERROR ;CALL ERROR
4410 031026 000437 BR EIC25 ;
4411 031030 032703 000002 IFC25: BIT #2,R3 ;IF HARD ERR
4412 031034 001434 BEQ EIC25 ;CLASS, THEN
4413 031036 052702 000040 ELB25: BIS #40,R2 ;SET HARD ERROR #
4414 031042 010237 002376 MOV R2,ERRNBR ;SET ERR #
4415 031046 011437 002400 MOV (R4),ERRMSG ;SET ERR MSG
4416 031052 012737 000002 002374 MOV #HARD,ERRTYP ;PRESET ERRTYP=HARD ERR
4417 031060 032737 000004 002264 IFF25: BIT #EVL,FLGDRS ;IF DRS 'EVL' FLAG
4418 031066 001413 BEQ EIF25 ;IS SET, THEN
4419 031070 005237 002302 INC HDRCT ;INCREMENT HARD ERROR CTR
4420 031074 023737 002302 002216 IFE25: CMP HDRCT,DFTL ;IF DEVICE FATAL THRESHOLD
4421 031102 101005 BHI EIF25 ;REACHED, THEN
4422 031104 012737 000001 002374 MOV #DVFT,ERRTYP ;RESET ERRTYP=DEVICE FATAL
4423 031112 005037 002302 CLR HDRCT ;CLEAR HARD ERROR CTR
4424 031116 004737 002354 EIF25: CALL ERROR ;CALL ERROR
4425 031122 005237 002300 INC HARDER ;SET HARD ERROR FLAG
4426 031126 013737 002276 002604 EIC25: MOV ERRTY,ERRREG ;SET ERR TYPE FOR PRINT OUT
4427 031134 004737 002404 CALL PRERR ;CALL U.P.ERR - PRINT ERR INFO
4428 031140 013737 002276 021452 MOV ERRTY,ERTSAV ;SAVE ERR TYP FOR DATA CK
4429 031146 005037 002276 CLR ERRTY ;CLEAR DEVICE ERR
4430 031152 004737 003034 CALL XERPRT ;CALL MOD U.PRT.B - PRINT ERR CODE
4431 031156 005737 002300 IFD25: TST HARDER ;IF NOT A
4432 031162 001002 BNE ELD25 ;HARDER, THEN
4433 031164 004737 031676 CALL PTRTY ;CALL 2.5.1 - PRINT RETRY #
4434 031170 005037 002300 ELD25: CLR HARDER ;CLEAR HARD ERROR FLAG
4435 031174 000207 EIA25: RTS PC ;RETURN
4436 -----

```



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MOD 2.5 - OUTPUT ERROR TYPE

```

4437
4438 031176      040      123      105  ERT1:  .ASCIZ  / SEEK ERR/
4439 031210      040      103      122  ERT2:  .ASCIZ  / CRC ERR/
4440 031221      040      103      113  ERT3:  .ASCIZ  / CK SUM ERR/
4441 031235      040      104      101  ERT4:  .ASCIZ  / DATA ERR/
4442 031247      040      125      116  ERT5:  .ASCIZ  / UNASSG ERR/
4443 031263      040      104      105  ERT6:  .ASCIZ  / DEL. DATA UNEXPECTED ERR/
4444 031315      040      104      105  ERT7:  .ASCIZ  / DEL. DATA MISSING ERR/
4445 031344      040      125      116  ERT8:  .ASCIZ  / UNASSG ERR/
4446 031360      040      125      116  ERT9:  .ASCIZ  / UNK ERR/
4447 031371      040      106      111  ERT10: .ASCIZ  / FILL OR EMPTY BUFFER ERR/
4448 031423      040      122      105  ERT11: .ASCIZ  / READ ERR/
4449 031435      040      127      122  ERT12: .ASCIZ  / WRITE ERR/
4450 031450      040      111      116  ERT13: .ASCIZ  / INTERRUPT BUT NO DONE BIT ERR/
4451 031507      040      104      117  ERT14: .ASCIZ  / DONE BIT BUT NO INTERRUPT ERR/
4452 031546      040      105      122  ERT15: .ASCIZ  / ERROR, BUT NO ERR BIT SET/
4453 031601      040      105      122  ERT16: .ASCIZ  / ERR BIT SET/
4454
4455 031616      031176  ET1:   .WORD   ERT1
4456 031620      031210      .WORD   ERT2
4457 031622      031221      .WORD   ERT3
4458 031624      031235      .WORD   ERT4
4459 031626      031247      .WORD   ERT5
4460 031630      031263      .WORD   ERT6
4461 031632      031315      .WORD   ERT7
4462 031634      031344      .WORD   ERT8
4463 031636      031360      .WORD   ERT9
4464 031640      031371      .WORD   ERT10
4465 031642      031423      .WORD   ERT11
4466 031644      031435      .WORD   ERT12
4467 031646      031450      .WORD   ERT13
4468 031650      031507      .WORD   ERT14
4469 031652      031546      .WORD   ERT15
4470 031654      031601      .WORD   ERT16
4471
4472
4473
4474 031656      001      ETCLAS: .BYTE   1      :ERROR
4475 031657      001      .BYTE   1      :SEEK
4476 031660      002      .BYTE   2      :CRC
4477 031661      001      .BYTE   1      :CKSUM
4478 031662      000      .BYTE   0      :DATA
4479 031663      002      .BYTE   2      :UNASSIGNED
4480 031664      002      .BYTE   2      :DEL. DATA UNEX
4481 031665      000      .BYTE   0      :DEL. DATA MISSING
4482 031666      002      .BYTE   2      :UNASSIGNED
4483 031667      002      .BYTE   2      :UNK ERR
4484 031670      001      .BYTE   1      :FILL/EMPTY BUFFER
4485 031671      001      .BYTE   1      :READ
4486 031672      002      .BYTE   2      :WRITE
4487 031673      002      .BYTE   2      :INTER-BUT NO DONE
4488 031674      002      .BYTE   2      :DONE-BUT NO INTER
4489 031675      002      .BYTE   2      :ERR-BUT NO ERR BIT
4490
4491
:MOD 2.5 ----- END MODULE -----

```

:ERROR		- TYPE - ERR#	
:SEEK	- SOFT -	0	-32
:CRC	- SOFT -	1	-33
:CKSUM	- HARD -		-34
:DATA	- SOFT -	3	-35
:UNASSIGNED	-		
:DEL. DATA UNEX	- HARD -		-37
:DEL. DATA MISSING	- HARD -		-38
:UNASSIGNED	-		
: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

HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 133  
MOD 2.5 - OUTPUT ERROR TYPE

```

4494
4495
4496
4497
4498 031676 000240
4499 031700 005737 002304
4500 031704 001500
4501 031706 032737 000001 002304
4502 031714 001405
4503 031716 013702 002306
4504 031722 012701 032110
4505 031726 000465
4506 031730 032737 000002 002304
4507 031736 001427
4508 031740 032737 000030 002304
4509 031746 001416
4510 031750 032737 000010 002304
4511 031756 001405
4512 031760 013702 002316
4513 031764 012701 032134
4514 031770 000444
4515 031772 013702 002314
4516 031776 012701 032270
4517 032002 000437
4518 032004 013702 002326
4519 032010 012701 032166
4520 032014 000432
4521 032016 032737 000004 002304
4522 032024 001430
4523 032026 032737 000030 002304
4524 032034 001416
4525 032036 032737 000010 002304
4526 032044 001405
4527 032046 013702 002316
4528 032052 012701 032213
4529 032056 000411
4530 032060 013702 002314
4531 032064 012701 032321
4532 032070 000404
4533 032072 013702 002324
4534 032076 012701 032244
4535 032102 004737 004536
4536 032106 000207
4537
4538 032110 045 101 040
4539 032134 045 101 040
4540 032166 045 101 040
4541 032213 045 101 040
4542 032244 045 101 040
4543 032270 045 101 040
4544 032321 045 101 040
4545
4546

.SBTTL MOD 2.5.1 - PRINT RETRY
-----
PTRTY: NOP
IFA251: TST RETRY ;IF RETRY
BEQ END251 ;NOT=0, THEN
IFB251: BIT #1,RETRY ;IF RETRY
BEQ IFC251 ;IS SEEK, THEN
MOV SEEKRT,R2 ;SET SEEK RT COUNT
MOV #MSKRT,R1 ;SET SEEK RT MSG
BR EIB251 ;BR TO END IF 'B'
IFC251: BIT #2,RETRY ;IF RETRY
BEQ IFE251 ;IS WRT, THEN
IFD251: BIT #30,RETRY ;IF RETRY
BEQ ELD251 ;IS DATA OR CRC, THEN
IFG251: BIT #10,RETRY ;IF RETRY
BEQ ELG251 ;IS DATA, THEN
MOV DATART,R2 ;SET DATA RT COUNT
MOV #MDWTRT,R1 ;SET DATA WRT MSG
BR EIB251 ;BR TO END IF 'B'
ELG251: MOV CRCRT,R2 ;SET CRC RETRY COUNT
MOV #MCWTRT,R1 ;SET CRC WRT MSG
BR EIB251 ;BR TO END IF 'B'
ELD251: MOV WTRT,R2 ;SET WRT RT COUNT
MOV #MWTRT,R1 ;SET WRT RT MSG
BR EIB251 ;BR TO END IF 'B'
IFE251: BIT #4,RETRY ;IF RETRY
BEQ END251 ;IS READ, THEN
IFF251: BIT #30,RETRY ;IF RETRY
BEQ ELF251 ;IS DATA OR CRC, THEN
IFH251: BIT #10,RETRY ;IF RETRY
BEQ ELH251 ;IS DATA, THEN
MOV DATART,R2 ;SET DATA RT COUNT
MOV #MDRDRT,R1 ;SET DATA READ RT MSG
BR EIB251 ;BR TO END IF 'B'
ELH251: MOV CRCRT,R2 ;SET CRC RETRY COUNT
MOV #MCRDRT,R1 ;SET CRC READ MSG
BR EIB251 ;BR TO END IF 'B'
ELF251: MOV READRT,R2 ;SET READ RT COUNT
MOV #MRDRT,R1 ;SET READ RT MSG
EIB251: CALL PRTB1S ;PRINT RETRY # & TYPE
END251: RTS PC ;RETURN
-----
MSKRT: .ASCIZ /%A SEEK RETRY#%D2%N/
MDWTRT: .ASCIZ /%A DATA WRITE RETRY#%D2%N/
MWTRT: .ASCIZ /%A WRITE RETRY#%D2%N/
MDRDRT: .ASCIZ /%A DATA READ RETRY#%D2%N/
MRDRT: .ASCIZ /%A READ RETRY#%D2%N/
MCWTRT: .ASCIZ /%A CRC WRITE RETRY#%D2%N/
MCRDRT: .ASCIZ /%A CRC READ RETRY#%D2%N/
.EVEN
;MOD 2.5.1 ----- END MODULE -----

```

HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 135  
 MOD 2.6 - SET DRIVES DONE

```

4549          .SBTTL  MOD 2.6 - SET DRIVES DONE
4550          :-----
4551
4552 032352 000240          STDVDN: NOP          ;
4553 032354 005737 021442  IFA26: TST          DVDNCK          ; IF DRV DONE CK
4554 032360 001430          BEQ          END26          ; IS SET, THEN
4555 032362 000240          NOP          ;
4556 032364 005037 021442          CLR          DVDNCK          ; CLEAR DRV DONE CK
4557 032370 032737 000001 002234  IFB26: BIT          #1,UUT          ; IF DRV#1 DONE
4558 032376 001404          BEQ          ELB26          ; THEN
4559 032400 052737 000002 021432          BIS          #2,BTHDRV          ; SET DRV#1 DONE FLAG
4560 032406 000403          BR          EIB26          ; BR TO END
4561 032410 052737 000001 021432  ELB26: BIS          #1,BTHDRV          ; SET DRV#0 DONE FLAG
4562 032416 005001          EIB26: CLR          R1          ; CLEAR TEMP DRV DONE REG
4563 032420 013703 002234          MOV          UUT,R3          ; GET UNIT UNDER TEST
4564 032424 000261          SEC          ; SET CARRY BIT
4565 032426 006101          BDA26: ROL          R1          ; MOVE DRV BIT
4566 032430 005303          DEC          R3          ; DECREMENT UNIT UNDER TEST
4567 032432 005703          TST          R3          ; DO UNTIL UNIT UNDER TST
4568 032434 002374          DUA26: BGE          BDA26          ; EQUALS -1
4569 032436 050137 021444          BIS          R1,DRVDN          ; THEN SET THIS DRV DONE
4570 032442 000207          END26: RTS          PC          ; RETURN
4571          :MOD 2.6 ---- END MODULE -----

```



HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 137  
MOD 3.0 - OUTPUT EXERCISE COMPLETE

```

4574
4575      .SBTTL  MOD 3.0 - OUTPUT EXERCISE COMPLETE
4576 032444 000240      :-----
4577 032446 023737 002232 002230 0TEXCM: NOP
4578 032454 001003      CMP      SUT,SDD      :IF ALL SCHEDULED
4579 032456 012737 000001 014020 BNE      END30      :DRIVE DONE
4580 032464 000207      MOV      #1,EXCMP   :SET EXERCISE COMPLETE
4581      END30: RTS      PC      :RETURN
      ;MOD 3.0 ----- END MODULE -----

```

HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 139  
MOD 4.0 - OUTPUT SYSTEM ERROR

```

4584
4585
4586 032466 013701 002274
4587 032472 000241
4588 032474 006201
4589 032476 000241
4590 032500 006201
4591 032502 006201
4592 032504 005002
4593 032506 000240
4594 032510 032701 000001
4595 032514 001405
4596 032516 010204
4597 032520 006304
4598 032522 062704 033416
4599 032526 000406
4600 032530 006201
4601 032532 005202
4602 032534 022702 000017
4603 032540 001362
4604 032542 000452
4605 032544 010205
4606 032546 062705 033450
4607 032552 111503
4608 032554 032703 000002
4609 032560 001415
4610 032562 010205
4611 032564 052705 000100
4612 032570 010537 002376
4613 032574 011437 002400
4614 032600 012737 000001 002374
4615 032606 004737 002354
4616 032612 000417
4617 032614 032703 000004
4618 032620 001414
4619 032622 010205
4620 032624 052705 000200
4621 032630 010537 002376
4622 032634 011437 002400
4623 032640 012737 000000 002374
4624 032646 004737 002354
4625 032652 013737 002274 002604
4626 032660 004737 002404
4627 032664 004737 003034
4628 032670 000240
4629 032672 005037 002274
4630 032676 000207
4631

.SBTTL MOD 4.0 - OUTPUT SYSTEM ERROR
-----
OTSYER: MOV ERRSY,R1 ;GET SYSTEM ERR
        CLC ;CLEAR CARRY BIT
        ASR R1 ;SHIFT
        CLC ;
        ASR R1 ;FUNCTION
        ASR R1 ;OUT
        CLR R2 ;CLEAR ERR # COUNT
BDA40: NOP ;
IFA40: BIT #1,R1 ;IF BIT #1
        BEQ ELA40 ;EQUALS 1, THEN
        MOV R2,R4 ;SAVE ERROR # COUNT
        ASL R4 ;DOUBLE ERR # COUNT FOR ADDRESSING
        ADD #SE1,R4 ;SET ADDR FOR ERR MSG PRINT
        BR THA40 ;BR TO THEN 'A'
ELA40: ASR R1 ;SHIFT ERR TYPE RIGHT
        INC R2 ;INCREMENT ERROR # COUNT
        CMP #17,R2 ;DO UNTIL ERR # COUNT
        BNE BDA40 ;EQUALS 15, THEN
        BR THA40 ;BR TO END IF 'A'
THA40: MOV R2,R5 ;GET ERR#
        ADD #ESCLAS,R5 ;CAL. ERR# CLASSIFICATION ADR
        MOVB (R5),R3 ;GET ERR# CLASSIFICATION
        BIT #2,R3 ;IF DEVICE FATAL
        BEQ IFC40 ;ERROR, THEN
        MOV R2,R5 ;GET ERR#
        BIS #100,R5 ;SET ERR CLASS=SYS
        MOV R5,ERRNBR ;SET ERR#
        MOV (R4),ERRMSG ;SET ERR MSG
        MOV #DVFT,ERRTYP ;SET DEVICE FATAL ERROR
        CALL ERROR ;CALL ERROR
        BR THA40 ;BR TO END IF 'C'
IFC40: BIT #4,R3 ;IF SYSTEM FATAL
        BEQ EIC40 ;ERROR, THEN
        MOV R2,R5 ;GET ERR#
        BIS #200,R5 ;SET ERR CLASS=SYS
        MOV R5,ERRNBR ;SET ERR#
        MOV (R4),ERRMSG ;SET ERR MSG
        MOV #SYFT,ERRTYP ;SET ERR TYP=SYS FATAL
        CALL ERROR ;CALL ERROR
EIC40: MOV ERRSY,ERRREG ;SET SYS ERR FOR PRINT OUT
        CALL PRERR ;CALL U.P.ERR - PRINT ERR INFO
        CALL XERPRT ;CALL MOD U.PRT.B - PRINT ERROR CODE
EIA40: NOP ;
        CLR ERRSY ;CLEAR SYS ERRORS
END40: RTS PC
-----

```

HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 141  
MOD 4.0 - OUTPUT SYSTEM ERROR

```

4634
4635
4636 032700      040      116      117  SYSE4:  .ASCIZ  / NO DONE BIT ON INITIALIZE/
4637 032733      040      116      117  SYSE5:  .ASCIZ  / NO DONE BIT ON FUNCTION/
4638 032764      040      116      117  SYSE6:  .ASCIZ  / NO DRIVE READY BIT/
4639 033010      040      116      117  SYSE7:  .ASCIZ  / NO SIDE READY BIT/
4640 033033      040      116      117  SYSE8:  .ASCIZ  / NO DONE BIT AFTER READ STATUS/
4641 033072      040      127      122  SYSE9:  .ASCIZ  / WRONG DRIVE RESPONDING/
4642 033122      040      127      122  SYSE10: .ASCIZ  / WRONG SIDE RESPONDING/
4643 033151      040      125      116  SYSE11: .ASCIZ  / UNUSED/
4644 033161      040      125      116  SYSE12: .ASCIZ  / UNUSED/
4645 033171      040      104      111  SYSE13: .ASCIZ  / DISKETTE WRONG DENSITY ERR/
4646 033225      040      104      105  SYSE14: .ASCIZ  / DENSITY ERR/
4647 033242      040      124      111  SYSE15: .ASCIZ  / TIME OUT ON "TR" OR "DONE" BIT/
4648 033302      040      125      116  SYSE16: .ASCIZ  / UNCLASSIFIED SYSTEM ERROR/
4649 033335      045      116      045  FUNCT:  .ASCIZ  /%N%AFUNCTION CODE:%O3/
4650 033363      045      116      045  ERRORS: .ASCIZ  /%N%ASYSTEM ERROR REG=%B%N/

```

```

4651
4652 033416 032700      SE1:  .WORD  SYSE4
4653 033420 032733      .WORD  SYSE5
4654 033422 032764      .WORD  SYSE6
4655 033424 033010      .WORD  SYSE7
4656 033426 033033      .WORD  SYSE8
4657 033430 033072      .WORD  SYSE9
4658 033432 033122      .WORD  SYSE10
4659 033434 033151      .WORD  SYSE11
4660 033436 033161      .WORD  SYSE12
4661 033440 033171      .WORD  SYSE13
4662 033442 033225      .WORD  SYSE14
4663 033444 033242      .WORD  SYSE15
4664 033446 033302      .WORD  SYSE16

```

```

4665
4666
4667
4668 033450      004      ESCLAS: .BYTE  4      :ERROR
4669 033451      002      .BYTE  2      :NO DONE ON INIT          - SYS FATAL - 128
4670 033452      002      .BYTE  2      :NO DONE ON FUNCTION     - DEV FATAL - 65
4671 033453      002      .BYTE  2      :NO DRIVE RDY            - DEV FATAL - 66
4672 033454      004      .BYTE  4      :NO SIDE RDY             - DEV FATAL - 67
4673 033455      004      .BYTE  4      :NO DONE AFTER RD STA    - DEV FATAL - 68
4674 033456      000      .BYTE  0      :WRG DRV RESPOND         - SYS FATAL - 133
4675 033457      000      .BYTE  0      :WRG SIDE RESPOND        - SYS FATAL - 134
4676 033460      002      .BYTE  2      :UNUSED                  - 0
4677 033461      002      .BYTE  2      :UNUSED                  - 0
4678 033462      004      .BYTE  4      :DISKETT WRG DEN         - DEV FATAL - 73
4679 033463      004      .BYTE  4      :DENSITY ERR             - DEV FATAL - 74
4680 033464      004      .BYTE  4      :T.O. ON "TR" OR "DONE" - SYS FATAL - 139
4681
4682

```

:MOD 4.0 ----- END MODULE -----



HARDWARE TESTS MACRO M1200 15-DEC-82 13:50 PAGE 143  
 - MOD INTR.1 - INTERRUPT HANDLER #0

```

4685 .SBTTL - MOD INTR.1 - INTERRUPT HANDLER #0
4686 -----
4687 033466 013737 002220 033542 INTH0: MOV U0ADR,INCSAD ;SET UNIT #0 ADDRESS
4688 033474 004737 033516          CALL SVUTRG ;CALL MOD U.INTR.U - SAVE UNIT REG
4689 033500 000002          RTI ;
4690 ;MOD U.INTR.1 ----- END MODULE -----
4691
4692 .SBTTL - MOD INTR.2 - INTERRUPT HANDLER #1
4693 -----
4694 033502 013737 002222 033542 INTH1: MOV U1ADR,INCSAD ;SET UNIT #1 ADDRESS
4695 033510 004737 033516          CALL SVUTRG ;CALL MOD U.INTR.U - SAVE UNIT REG
4696 033514 000002          RTI ;
4697 ;MOD U.INTR.2 ----- END MODULE -----
4698
4699 .SBTTL MOD U.INTR.U - SAVE UNIT REG
4700 -----
4701 033516 012737 000001 025226 SVUTRG: MOV #1,DNFLAG ;SET DONE FLAG
4702 033524 013701 033542          MOV INCSAD,R1 ;SAVE UUT ADDRESS
4703 033530 012137 002246          MOV (R1)+,CSRUUT ;SAVE UUT CSR
4704 033534 011137 002250          MOV (R1),ESRUUT ;SAVE UUT ESR
4705 033540 000207          RTS PC ;RETURN
4706 -----
4707 033542 000000          INCSAD: 0 ;INTERRUPTING UNIT CSR ADDRESS
4708 ;MOD U.I.U ----- END MODULE -----
4709
4710 .SBTTL - READ ERROR CODE BUFFER
4711 -----
4712 033544 000          XERUUT: .BYTE 0 ;ERROR CODE UUT
4713 033545 000          WC: .BYTE 0 ;WORD COUNT UUT
4714 033546 000          CTK0: .BYTE 0 ;CUR TRK DRV#0
4715 033547 000          CTK1: .BYTE 0 ;CUR TRK DRV#1
4716 033550 000          TTRK: .BYTE 0 ;TARGET TRK
4717 033551 000          TSEC: .BYTE 0 ;TARGET SEC
4718 033552 000          SFTSTS: .BYTE 0 ;MICRO CODE SOFT STATUS
4719 033553 000          BTRK: .BYTE 0 ;BAD TRK ADR
4720 -----
4721
4722 .SBTTL - TRACK TABLE
4723 -----
4724 033554 000232          TRKTBL: .REPT 154. ;TRACK TABLE
4727 -----
4728
4729 .SBTTL - DATA BUFFERS
4730 -----
4731 034006 000400          DATPAT: .REPT 256. ;DATA PATTERN
4734 034406 000400          DATBUF: .REPT 256. ;DATA BUFFER
4737 -----
4738 035006          ENDTST
    
```

PARAMETER CODING  
- DATA BUFFERS

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4741  
4752  
4753  
4789  
4790  
4791  
4792  
4793  
4794  
4795  
4796  
4797  
4798  
4799 035010  
4800  
4801 035012  
4802 035022  
4803 035032  
4804 035044  
4805  
4806 035056  
4807  
4813 035060  
4814  
4815 035060  
4816 035073  
4817 035106  
4818 035121  
4819  
4820

.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.  
:--

BGNHRD

GPRMA MSG1,0,0,0,177777,YES  
GPRMA MSG2,2,0,0,177777,YES  
GPRMD MSG3,4,0,177777,0.,1.,YES  
GPRMD MSG4,6,0,177777,0.,1.,YES

EXIT HRD

ENDHRD

-----  
MSG1: .ASCIZ /RX BUS ADR/  
MSG2: .ASCIZ /VECTOR ADR/  
MSG3: .ASCIZ /DRIVE # /  
MSG4: .ASCIZ /EXP WRD-CR/  
-----

.EVEN

122 130 040  
126 105 103  
104 122 111  
105 130 120

PARAMETER CODING      MACRO M1200    15-DEC-82 13:50    PAGE 147  
 SOFTWARE PARAMETER CODING SECTION

4829  
 4830  
 4831  
 4832  
 4833  
 4834  
 4835  
 4836  
 4837  
 4838  
 4839  
 4840 035134  
 4841  
 4842 035136  
 4843 035144  
 4844 035146  
 4845 035154  
 4846 035166  
 4847 035200  
 4848 035212  
 4849 035224  
 4850 035232  
 4851 035240  
 4852 035246  
 4853 035250  
 4854 035256  
 4855 035264  
 4856 035272  
 4857 035300  
 4858 035306  
 4859 035310  
 4860 035322  
 4861 035334  
 4862 035342  
 4863 035344  
 4864 035356  
 4865 035370  
 4866 035376  
 4867  
 4874  
 4875  
 4876  
 4877 035400

.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.
:--

```

BGNSFT

```

GPRML MSG6,2,1,YES
XFERF 1$
GPRML MSG7,2,2,YES
1$: GPRMD MSG8,4,0,177777,0,6,YES
GPRMD MSG11,6,0,177777,0,6,YES
GPRMD MSG14,10,0,177777,0,6,YES
GPRMD MSG9,24,D,177777,1,,10000,,YES
GPRML MSG15,12,1,YES
GPRML MSG16,12,2,YES
GPRML MSG17,2,100,YES
XFERF 4$
GPRML MSG18,12,4,YES
GPRML MSG19,12,10,YES
GPRML MSG20,12,20,YES
GPRML MSG21,12,40,YES
4$: GPRML MSG22,2,200,YES
XFERF 5$
GPRMD MSG23,14,D,177777,0,,76,,YES
GPRMD MSG24,16,D,177777,0,,76,,YES
5$: GPRML MSG25,2,400,YES
XFERF 6$
GPRMD MSG26,20,D,177777,1,,26,,YES
GPRMD MSG27,22,D,177777,1,,26,,YES
6$: GPRML MSG5,0,177777,YES
EXIT SFT

```

.EVEN

ENDSFT



PARAMETER CODING      MACRO M1200    15-DEC-82 13:50    PAGE 149  
SOFTWARE PARAMETER CODING SECTION

```

4880
4881      000015
4882      000012
4883 035400      122      130      130  MSG5:  CR==15      :CARRIAGE RETURN
4884 035432      110      105      114  MSG6:  LF==12      :LINE FEED
4885 035453      105      130      105  MSG7:  .ASCIZ /RXXX EXPANSION TYPE <CR> /
4886 035475      040      040      040  .ASCII / EXERCISE OPTIONS/<CR><LF>
4887 035547      040      040      040  / 0 = WRITE-READ-DATA CK & READ-DATA CK/<CR><LF>
4888 035572      040      040      040  .ASCII / 1 = WRITE ONLY/<CR><LF>
4889 035615      040      040      040  .ASCII / 2 = WRITE-READ/<CR><LF>
4890 035653      040      040      040  .ASCII / 3 = WRITE-READ-DATA CHECK/<CR><LF>
4891 035710      040      040      040  .ASCII / 4 = READ-DATA CHECK ONLY/<CR><LF>
4892 035746      040      040      040  .ASCII / 5 = READ ONLY (CRC CHECK)/<CR><LF>
4893 036030      104      101      124  .ASCII / 6 = WRITE-READ-DATA CHECK ON ALTERNATE DRIVES/<CR><LF>
4894 036056      040      040      040  .ASCII /DATA PATTERN OPTIONS/<CR><LF>
4895 036075      040      040      040  .ASCII / 0 = RANDOM/<CR><LF>
4896 036113      040      040      040  .ASCII / 1 = ZEROS/<CR><LF>
4897 036130      040      040      040  .ASCII / 2 = ONES/<CR><LF>
4898 036156      040      040      040  .ASCII / 3 = FLOATING ZERO/<CR><LF>
4899 036203      040      040      040  .ASCII / 4 = FLOATING ONE/<CR><LF>
4900 036217      040      040      040  .ASCII / 5 = 125/<CR><LF>
4901 036233      124      122      101  .ASCII / 6 = 333/<CR><LF>
4902 036263      040      040      040  .ASCII /TRACK SEQUENCE OPTIONS/<CR><LF>
4903 036302      040      040      040  .ASCII / 0 = RANDOM/<CR><LF>
4904 036331      040      040      040  .ASCII / 1 = INCREMENT O.D./<CR><LF>
4905 036360      040      040      040  .ASCII / 2 = DECREMENT I.D./<CR><LF>
4906 036426      040      040      040  .ASCII / 3 = INCREMENT O.D.-DECREMENT I.D./<CR><LF>
4907 036471      040      040      040  .ASCII / 4 = BOUNCE BETWEEN I.D. & O.D./<CR><LF>
4908 036550      040      040      040  .ASCII / 5 = BOUNCE BETWEEN INCR. O.D. & DECR. I.D./<CR><LF>
4909 036621      040      040      040  .ASCII / 6 = BOUNCE BETWEEN O.D. & DECR. I.D./<CR><LF>
4910 036703      055      076      104  .ASCII / (O.D. = OUTSIDE DIA. & I.D. = INSIDE DIA.)/<CR><LF>
4911 037016      040      040      111  .ASCII /->DEVICE FATAL THRESHOLD LVL=NO. OF HARD ERRS THAT CAUSE DEVICE FATAL ERR/<
4912 037126      040      040      124  .ASCII / IF DRS "EVL" FLAG IS SET, BUT HARD ERR WILL STILL LOG AS A HARD ERR./<CR>
4913 037235      124      131      120  .ASCIZ / THE "EVL" FLAG WILL CAUSE 10 RETRIED SOFT ERRS TO BECOME A HARD ERR/<CR><
4914 037263      105      130      105  .ASCIZ /TYPE "CR" TO CONTINUE/
4915 037312      104      101      124  MSG8:  .ASCIZ /EXERCISE # (0-6)/
4916 037341      124      122      101  MSG11: .ASCIZ /DATA PATTERN # (0-6)/
4917 037370      104      105      126  MSG14: .ASCIZ /TRACK SEQUENCE # (0-6)/
4918 037425      122      125      116  MSG9:  .ASCIZ /DEVICE FATAL THRESHOLD LEVEL/
4919 037463      122      125      116  MSG15: .ASCIZ /RUN TEST IN DOUBLE DENSITY /
4920 037521      101      116      131  MSG16: .ASCIZ /RUN TEST IN DELETED DATA MODE/
4921 037557      040      040      040  MSG17: .ASCIZ /ANY PROGRAM CONTROL FLAGS /
4922 037627      040      040      040  MSG18: .ASCIZ / REPLY ON ERROR, LOG SOFT & HARD ERRS/
4923 037677      040      040      040  MSG19: .ASCIZ / RECALIBRATE ON SEEK ERRORS /
4924 037747      040      040      040  MSG20: .ASCIZ / PRINT ONLY 10 DATA ERRORS & CONTINUE/
4925 040017      115      117      104  MSG21: .ASCIZ / CLEAR STATISTICAL TABLES NEXT PASS /
4926 040055      040      040      040  MSG22: .ASCIZ /MODIFY TRACK ADDRESS LIMITS /
4927 040105      040      040      040  MSG23: .ASCIZ / OUTER DIAMETER ADR #/
4928 040135      115      117      104  MSG24: .ASCIZ / INNER DIAMETER ADR #/
4929 040173      040      040      040  MSG25: .ASCIZ /MODIFY SECTOR ADDRESS LIMITS /
4930 040220      040      040      040  MSG26: .ASCIZ / MIN. SECTOR ADR #/
4931
4932      .EVEN

```

PARAMETER CODING  
- PATCH AREA

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4935  
 4936  
 4937 040246 000000  
 4938 040450  
 4939  
 4940  
 4947  
 4948  
 4949 040450  
 040454  
 4950 040454  
 4951  
 4952 040454  
 4953 040454  
 4954 040460 177170  
 4955 040462 000264  
 4956 040464 000000  
 4957 040466 000000  
 4958 040470  
 4959 040470  
 4960 040474 177170  
 4961 040476 000264  
 4962 040500 000001  
 4963 040502 000000  
 4964 040504  
 4965 040504  
 4966 000001

```

.SBTTL - PATCH AREA
-----
PATCH: 0 ;PATCH AREA
.=.+200
-----

L$LAST:: LASTAD
          ENDMOD
          BGNSETUP      2
          BGNPTAB
          177170
          264
          0
          0
          ENDPTAB
          BGNPTAB
          177170
          264
          1
          0
          ENDPTAB
          ENDSETUP

.END

```



PARAMETER CODING  
SYMBOL TABLE

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ABORT	002270		BYTNUM	026052		C\$GPHR=	000042		DUC20	021000		EF09	=	000011	G		
ADR	=	000020	G	CKDVAV	014742		C\$GPLO=	000030		DUMSG1	013442		EF10	=	000012	G	
ADRS		025024		CKSML	007354		C\$GPRI=	000040		DUMSG2	013503		EF11	=	000013	G	
ADRTST		012774		CKSMRT	002310		C\$INIT=	000011		DVDNCK	021442		EF12	=	000014	G	
ADVTRK		021440		CLASWD	027620		C\$INLP=	000020		DVFT	=	000001	G	EF13	=	000015	G
ASSEMB=		000010		CLRSTA	020656		C\$MANI=	000050		DVTST	024404		EF14	=	000016	G	
BAU234		025122		CMD	002332		C\$MEM =	000031		DX	025222		EF15	=	000017	G	
BC00		013706		CNSCLC	023316		C\$MSG =	000023		EA1211	016004		EF16	=	000020	G	
BDAU23		025246		CNTKLC	023320		C\$OPEN=	000034		EA243	027264		EG1211		015526		
BDA121		014756		CONTRL	013564		C\$PNTB=	000014		EA2433	030210		EH1211		015750		
BDA133		020666		CR	=	000015	G	C\$PNTF=	000017	EA2434	030274		EIA11		014126		
BDA241		025514		CRC	007434		C\$PNTS=	000016		EB24U1	030452		EIA12		014374		
BDA25		030716		CRCBAD	007444		C\$PNTX=	000015		EB243	027406		EIA121		015232		
BDA26		032426		CRCBRT	002312		C\$QIO =	000377		EB2433	030160		EIA24		025374		
BDA40		032506		CRCERT	002314		C\$RDBU=	000007		ECCLAS	030624		EIA25		031174		
BDBU23		025252		CSADR	025034		C\$REFG=	000047		ECL0G	007604		EIA40		032670		
BDB20		021014		CSEC	023276		C\$RESE=	000033		ECTAB	003116		EIB121		015050		
BDB241		026034		CSRADR	025332		C\$REVI=	000003		EC1	003170		EIB20		021354		
BDVSCD		021434		CSREV	027072		C\$RFLA=	000021		EC10	003555		EIB23		022646		
BF243		027322		CSRUUT	002246		C\$RPT =	000025		EC11	003603		EIB234		025012		
BG00		013566		CTKO	033546		C\$SEFG=	000046		EC12	003660		EIB251		032102		
BIT0	=	000001	G	CTK1	033547		C\$SPRI=	000041		EC13	003714		EIB26		032416		
BIT00	=	000001	G	CTRK	023306		C\$SVEC=	000037		EC14	003773		EIC11		011756		
BIT01	=	000002	G	CURSEC	023710		C\$TPRI=	000013		EC15	004021		EIC11		014212		
BIT02	=	000004	G	CURTRK	024240		DAERCT	026054		EC16	004107		EIC121		015212		
BIT03	=	000010	G	CVSTUT	004756		DARDRT	002320		EC17	004153		EIC20		021106		
BIT04	=	000020	G	CVUNIT	004752		DATA	007474		EC2	003236		EIC25		031126		
BIT05	=	000040	G	CVUTST	004654		DATART	002316		EC20	004207		EIC40		032652		
BIT06	=	000100	G	C\$AU =	000052		DATASB	026056		EC21	004254		EID121		015226		
BIT07	=	000200	G	C\$AUTO=	000061		DATAWS	026060		EC22	004311		EID23		023032		
BIT08	=	000400	G	C\$BRK =	000022		DATA0	017520		EC23	004360		EID232		024162		
BIT09	=	001000	G	C\$BSEG=	000004		DATA1	017536		EC24	004413		EID233		024366		
BIT1	=	000002	G	C\$BSUB=	000002		DATBUF	034406		EC2432	030064		EIE12		014564		
BIT10	=	002000	G	C\$CEFG=	000045		DATBYT	017746		EC25	004442		EIE21		022146		
BIT11	=	004000	G	C\$CLCK=	000062		DATPAT	034006		EC3	003304		EIE22		022456		
BIT12	=	010000	G	C\$CLEA=	000012		DAWTRT	002322		EC4	003332		EIE23		023134		
BIT13	=	020000	G	C\$CLOS=	000035		DBADR	025032		EC5	003400		EIF11		012224		
BIT14	=	040000	G	C\$CLP1=	000006		DDERCT	002330		EC6	003451		EIF20		021154		
BIT15	=	000040	G	C\$CVEC=	000036		DELAY	025230		EC7	003477		EIF21		022122		
BIT2	=	000004	G	C\$DCLN=	000044		DEL DAT	002244		EDB241	026042		EIF241		025742		
BIT3	=	000010	G	C\$DODU=	000051		DEN	002242		EDC20	021404		EIF25		031116		
BIT4	=	000020	G	C\$DRPT=	000024		DFPTBL	002160	G	ED00	013746		EH20		021232		
BIT5	=	000040	G	C\$DU =	000053		DFTL	002216		ED1211	016000		EH232		024012		
BIT6	=	000100	G	C\$EDIT=	000003		DIAGMC=	000000		ED2341	025102		EH234		024712		
BIT7	=	000200	G	C\$ERDF=	000055		DL DTER	007504		EF.CON=	000036	G	EI121		022116		
BIT8	=	000400	G	C\$ERHR=	000056		DLY	025224		EF.NEW=	000035	G	EI1231		023370		
BIT9	=	001000	G	C\$ERRO=	000060		DMSG1	026064		EF.PWR=	000034	G	EIJ23		023200		
BK243		027550		C\$ERSF=	000054		DMSG2	026161		EF.RES=	000037	G	EIK234		024560		
BOE	=	000400	G	C\$ERSO=	000057		DNBIT =	000040	G	EF.STA=	000040	G	EIM241		025702		
BRONPT		017462		C\$ESCA=	000010		DNFLAG	025226		EF01	=	000001	G	EI243		027576	
BRONTK		020126		C\$ESEG=	000005		DRIVEN	015270		EF02	=	000002	G	ELA10		014054	
BTHDRV		021432		C\$ESUB=	000003		DRVDN	021444		EF03	=	000003	G	ELA11		014120	
BTRK		033553		C\$ETST=	000001		DRVFN	023332		EF04	=	000004	G	ELA12		014270	
BTRP4	=	000004	G	C\$EXIT=	000032		DRVST	023324		EF05	=	000005	G	ELA20		020774	
BTRP6	=	000006	G	C\$GETB=	000026		DUA121	015246		EF06	=	000006	G	ELA231		023462	
BUFERL		007364		C\$GETW=	000027		DUA26	032434		EF07	=	000007	G	ELA241		025500	
BYTCNT		026050		C\$GMAN=	000043		DUB20	021370		EF08	=	000010	G	ELA25		030740	



PARAMETER CODING  
SYMBOL TABLE

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ELA40	032530	ENDST	011240	ETTAB	027630	GETSEC	023334	IB1211	015334
ELB11	014162	ENDTKS	020632	ET1	031616	GETTRK	023742	IB24U1	030400
ELB12	014342	ENDUP	002576	EVCMD	027066	GETTST	021454	IB243	027330
ELB121	015036	ENDXER	003112	EVDATA	025412	GPSUN0	014626	IB2432	027734
ELB20	021276	END00	014012	EVDVRE	027076	GPSUN1	014702	IB2433	030132
ELB22	022352	END121	015260	EVDVST	026206	GTDRV	022320	IB2434	030250
ELB231	023622	END13	017374	EVL	= 000004 G	GTDFVN	024254	ICATDP	012632
ELB232	024206	END131	017702	EVTSTR	025334	GTEX	017302	ICU234	025134
ELB241	025744	END133	020674	EVUTEC	030476	GTEXCD	014076	IC1211	015372
ELB25	031036	END20	021420	EXADR	022154	GTSYEX	014022	IC243	027370
ELB26	032410	END22	022500	EXADTB	022164	GTSYS	014216	IC2432	030022
ELC11	014206	END231	023642	EXCMP	014020	GTTK	020062	IC2434	030260
ELC22	022400	END232	024214	EXHCP	021430	G\$CNT0=	000200	ID	020652
ELC231	023620	END233	024402	EXMSG	003114	G\$DELM=	000372	IDATDP	012676
ELC233	024340	END234	025016	EXN	021424	G\$DISP=	000003	IDCOMP	020512
ELC242	026306	END241	026016	EX1	022204	G\$EXCP=	000400	IDENT1	002606
ELC244	030614	END242	027064	EX2	022214	G\$HILI=	000002	IDU	= 000040 G
ELD11	012300	END243	027604	EX3	022230	G\$LOLI=	000001	ID00	013714
ELD22	022422	END244	030620	EX4	022244	G\$NO	= 000000	ID1211	015424
ELD231	023610	END251	032106	EX5	022254	G\$OFFS=	000400	ID243	027304
ELD233	024362	END26	032442	EX6	022264	G\$OFFSI=	000376	IEATDP	012720
ELD234	024714	END30	032464	EX7	022300	G\$PRMA=	000001	IER	= 020000 G
ELD25	031170	END40	032676	E\$END	= 002100	G\$PRMD=	000002	IEU234	025164
ELD251	032004	ERRBLK	002402 G	E\$LOAD=	000035	G\$PRML=	000000	IE00	013726
ELE12	014556	ERRMSG	002400 G	FCKMSG	017223	G\$RADA=	000140	IE1211	015444
ELE22	022450	ERRNBR	002376 G	FIN	011520	G\$RADB=	000000	IFA11	011670
ELE23	023130	ERROR	002354	FIRST	014074	G\$RADD=	000040	IFATDP	012756
ELE234	024764	ERRORS	033363	FLAGS	002266	G\$RADL=	000120	IFAUP	002444
ELE244	030604	ERRREG	002604	FLGDRS	002264	G\$RADO=	000020	IFAU23	025232
ELF12	014546	ERRSAV	027610	FLOAT0	017546	G\$XFER=	000004	IFA10	014040
ELF20	021134	ERRSY	002274	FLOAT1	017614	G\$YES	= 000010	IFA11	014100
ELF231	023602	ERRTY	002276	FNEV4	030622	HARD	= 000002 G	IFA12	014244
ELF232	024100	ERRTYP	002374 G	FORMCK	015304	HARDER	002300	IFA121	014760
ELF251	032072	ERSTAT	025026	FUNCT	033335	HCRC	007524	IFA20	020750
ELG11	012022	ERSVCT	027612	FUNEV	027070	HCRCBD	007534	IFA21	021520
ELG12	014622	ERTSAV	021452	FUNTY	030342	HDATA	007564	IFA22	022322
ELG21	021736	ERT1	031176	F\$AU	= 000015	HDD	007574	IFA23	022516
ELG251	031772	ERT10	031371	F\$AUTO=	000020	HDERCT	002302	IFA231	023410
ELH11	012066	ERT11	031423	F\$BGN=	000040	HELP	= 000000	IFA232	024024
ELH12	014412	ERT12	031435	F\$CLEA=	000007	HOE	= 100000 G	IFA233	024262
ELH20	021224	ERT13	031450	F\$DU	= 000016	HRD	007544	IFA234	024450
ELH231	023452	ERT14	031507	F\$END	= 000041	HSEK	007514	IFA24	025360
ELH234	024622	ERT15	031546	F\$HARD=	000004	HWRT	007554	IFA241	025456
ELH251	032060	ERT16	031601	F\$HW	= 000013	IAATDP	012552	IFA242	026232
ELI11	012250	ERT2	031210	F\$INIT=	000006	IAREC	005112	IFA244	030506
ELJ21	022064	ERT3	031221	F\$JMP	= 000050	IA00	013666	IFA25	030720
ELK11	012146	ERT4	031235	F\$MOD	= 000000	IA1211	015324	IFA251	031700
ELK20	020744	ERT5	031247	F\$MSG	= 000011	IA24U1	030360	IFA26	032354
ELK234	024552	ERT6	031263	F\$PROT=	000021	IA243	027242	IFA40	032510
ELI1	012210	ERT7	031315	F\$PWR	= 000017	IA2431	027672	IFB11	011710
ELL20	021270	ERT8	031344	F\$RPT	= 000012	IA2432	027724	IFB10	014024
ELM242	026650	ERT9	031360	F\$SEG	= 000003	IA2433	030114	IFB12	014316
ELN21	021704	ESCLAS	033450	F\$SOFT=	000005	IA2434	030234	IFB121	015010
ENDCVT	004750	ESREV	027074	F\$SRV	= 000010	IBATDP	012574	IFB13	017342
ENDI1	012324	ESRUUT	002250	F\$SUB	= 000002	IBE	= 010000 G	IFB20	021036
ENDLD	017742	ETCLAS	031656	F\$SW	= 000014	IBU234	025126	IFB21	021546
ENDRPT	005406	ETSAV	027606	F\$TEST=	000001	IB00	013700	IFB22	022332

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SYMBOL TABLE

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IFB23	022606	IFE251	022016	IFM20	021356	ITER2	017116	LOE	=	040000	G			
IFB231	023504	IFE251	011772	IFM21	021654	ITER3	017200	LOGOFF		027622				
IFB232	024120	IFF12	014502	IFM241	025634	ITMSG	016130	LOT	=	000010	G			
IFB233	024314	IFF121	015174	IFM242	026622	ITMSG1	016334	LSACP		002110	G			
IFB242	026326	IFF20	021122	IFN21	021664	ITMSG2	016357	LSAPT		002036	G			
IFB244	030524	IFF21	021510	IFN242	026702	ITMSG3	016401	LSAU		013562	G			
IFB25	030770	IFF23	023072	IFO21	022076	ITMSG4	016454	LSAUT		002070	G			
IFB251	031706	IFF231	023552	IFO242	026742	ITMSG5	016521	LSAUTO		012552	G			
IFB26	032370	IFF232	024064	IFP242	026750	ITMSG6	016576	LSCCP		002106	G			
IFB40	032554	IFF241	025614	IFQ242	026770	ITMSG7	016652	LSCLEA		012522	G			
IFC11	011724	IFF242	026722	IFR242	027006	ITMSG8	016704	LSCO		002032	G			
IFC11	014166	IFF25	031060	IFS242	027050	ITMSG9	016753	L\$DEPO		002011	G			
IFC12	014420	IFF251	032026	IFU242	027024	ITPRNT	016102	L\$DESC		002122	G			
IFC121	015116	IFG11	011776	IFV242	027032	IXE	=	004000	G	L\$DESP	002076	G		
IFC13	017350	IFG12	014576	IFX242	026424	ISAU	=	000041	G	L\$DEVP	002060	G		
IFC20	021052	IFG20	021142	IF00	013776	ISAUTO	=	000041	G	L\$DISP	002154	G		
IFC21	021570	IFG21	021714	IF1211	015464	ISCLN	=	000041	G	LSDLY	002116	G		
IFC22	022360	IFG23	023040	IGATDP	012602	ISDU	=	000041	G	LSDTP	002040	G		
IFC23	022714	IFG231	023422	IG1211	015502	ISHRD	=	000041	G	LSDTYP	002034	G		
IFC231	023526	IFG232	024102	IG243	027422	ISINIT	=	000041	G	LSDU	013274	G		
IFC232	024136	IFG242	026506	IHATDP	012616	ISMOD	=	000041	G	LSDUT	002072	G		
IFC233	024322	IFG251	031750	IH1211	015554	ISMSG	=	000041	G	LSDVTY	002346	G		
IFC234	024602	IFH11	012040	IH243	027456	ISPROT	=	000040	G	LSEF	002052	G		
IFC241	025560	IFH12	014400	IATATDP	012644	ISPTAB	=	000041	G	LSEVI	002044	G		
IFC242	026266	IFH121	015076	I11211	015662	ISPWR	=	000041	G	LSERRT	002374	G		
IFC244	030536	IFH20	021210	I1243	027516	ISRPT	=	000041	G	LSETP	002102	G		
IFC25	031030	IFH21	021752	IJATDP	012660	ISSEG	=	000041	G	LSEXP1	002046	G		
IFC251	031730	IFH23	023154	IJ1211	015672	ISSETU	=	000041	G	LSEXP4	002064	G		
IFC40	032614	IFH231	023432	IJ243	027530	ISSFT	=	000041	G	LSEXP5	002066	G		
IFD11	011744	IFH232	023756	IKATDP	012726	ISSRV	=	000041	G	LSHARD	035012	G		
IFD12	014430	IFH234	024474	ILATDP	012742	ISSUB	=	000041	G	LSHIME	002120	G		
IFD121	015156	IFH242	026536	INCSAD	033542	ISTST	=	000041	G	LSHPCP	002016	G		
IFD21	021622	IFH251	032036	INCTRK	021436	JSJMP	=	000167	G	LSHPTP	002022	G		
IFD22	022402	IFI11	012104	INDITK	002210	LAREC		005130		LSHW	002160	G		
IFD23	022742	IFI121	015136	INIT	011250	LA2432		030006		LSICP	002104	G		
IFD231	023544	IFI20	021064	INITER	011470	LA2433		030176		LSINIT	011250	G		
IFD232	024146	IFI21	021774	INITL	014016	LBU234		025154		LSLADP	002026	G		
IFD233	024344	IFI23	022552	INITTK	024252	LB1211		015366		LSLAST	040454	G		
IFD234	024612	IFI231	023346	INMSG2	012332	LB24U1		030424		LSLOAD	002100	G		
IFD241	025570	IFI241	025462	INMSG3	012432	LB2432		027762		LSLUN	002074	G		
IFD242	026444	IFI242	026516	INTCMD	015266	LB2433		030152		LSMREV	002050	G		
IFD244	030544	IFJ11	012114	INTER	007414	LB2434		030270		LSNAME	002000	G		
IFD25	031156	IFJ21	022030	INTER1	011606	LC243		027402		LSPRIO	002042	G		
IFD251	031740	IFJ23	022706	INTER2	016167	LC2432		030050		LSPROT	011242	G		
IFE11	011764	IFJ241	025762	INTER3	016235	LD00		013742		LSPRT	002112	G		
IFE12	014444	IFJ242	026546	INTER4	016305	LD1211		015772		LSREPP	002062	G		
IFE121	015164	IFK11	012124	INTHO	033466	LEU234		025204		LSREV	002010	G		
IFE21	022136	IFK20	020700	INTH1	033502	LE1211		015762		LSRPT	005140	G		
IFE22	022430	IFK21	021576	INTLV	023706	LF	=	000012	G	LSSOFT	035136	G		
IFE23	023064	IFK234	024532	ISR	=	000100	G	LF00		014010		LSSPC	002056	G
IFE232	024170	IFK241	025770	ITCSAD		015272		LH1211		015742		LSSPCP	002020	G
IFE233	024302	IFK242	026574	ITDBAD		015274		LINCT		005636		LSSPTP	002024	G
IFE234	024744	IFL11	012164	ITDROP		016064		LINES		005640		LSSTA	002030	G
IFE241	025604	IFL20	021246	ITERMG		016132		LINTYP		005642		LSSW	002172	G
IFE242	026460	IFL21	021476	ITERR		016016		LI1211		015732		LSTEST	002114	G
IFE244	030564	IFL241	026000	ITERUT		016153		LI243		027572		LSTIML	002014	G
IFE25	031074	IFL242	026656	ITER1		017032		LOAD		017704		LSUNIT	002012	G



PARAMETER CODING  
SYMBOL TABLE

MACRO M1200 15-DEC-82 13:50 PAGE 151-4

L10000	002170	NSEC	023674	PRI02 =	000100	G	SDD	002230	SYSE8	033033	
L10001	002220	NXSCSA	023656	PRI03 =	000140	G	SECADR	025040	SYSE9	033072	
L10002	004506	OD	020650	PRI04 =	000200	G	SECDN	002262	S\$LSYM=	010000	
L10003	004514	ODCOMP	020524	PRI05 =	000240	G	SECTOR	002256	TARGET	020640	
L10004	005406	ONEFIL=	000001	PRI06 =	000300	G	SEEK	023322	TBPRCT	022160	
L10006	011602	OTDITK	002206	PRI07 =	000340	G	SEEKCK	026046	THA234	024464	
L10007	012550	OTDVFN	024406	PRNUM	005644		SEEKRT	002306	THA25	030756	
L10010	012772	OTERTP	030702	PRTBOS	004516		SEK	007424	THA40	032544	
L10011	013434	OTEXCM	032444	PRTB1	004510	G	SEQUEN	020654	THB231	023514	
L10012	013562	OTSYER	032466	PRTB1S	004536		SEQ1	020164	THC13	017366	
L10013	035006	OUTSWD	025042	PRTCTR	005646		SEQ2	020220	THD23	022772	
L10014	013664	OSAPTS=	000000	PRTDAT	005510		SEQ3	020254	THE22	022440	
L10015	013750	OSAU =	000001	PRTECD	002272		SEQ4	020272	THE234	024754	
L10016	035060	OSBGNR=	000001	PRTERR	002404		SEQ5	020340	THF231	023560	
L10017	035400	OSBGNS=	000001	PRTHDR	005414		SEQ6	020422	THF241	025624	
L10020	040460	OSDU =	000001	PRT1	005504		SEQ7	020476	TKTBPT	020634	
L10021	040474	OSERRT=	000001	PRT2	005506		SETUP	011364	TKTL	024242	
L10022	040470	OSGNSW=	000001	PTDAT1	006243		SE1	033416	TKXX	010070	
L10024	040504	OSPOIN=	000001	PTEC	006200		SFERLG	030344	TRACK	002254	
MAXSEC	002214	OSSE TU=	000001	PTECN	006327		SFERR	021446	TRAP	013260	
MAXTRK	024234	PAR	006026	PTFMN1	006315		SFPTBL	002172	TRBIT =	000200	G
MCRDRT	032321	PAT	017750	PTHEAD	026062		SFTSTS	033552	TRKADR	025036	
MCWTRT	032270	PATCH	040246	PTRDSC	006116		SOFT =	000003	TRKCNT	020636	G
MDRDRT	032213	PAT125	017622	PTRTY	031676		SSEC	023664	TRKDN	002260	
MDWTRT	032134	PAT333	017646	PTTK	006225		STCNTR	027616	TRKDNF	024230	
MINSEC	002212	PG	017524	PTTKN	006343		STDVDN	032352	TRKINC	024236	
MINTRK	024232	PLOC	011604	PTUNT1	006253		STERRG	027614	TRKSEQ	002202	
MRDRT	032244	PNT =	001000	PTUNT2	006274		STKSEQ	017752	TRKTBL	033554	
MSG1	035060	POWERF=	000001	PTWTSC	006147		STSCDN	023712	TRPMS1	013144	
MSG11	037312	PREPT1	006002	PT19SP	006105		STSCFG	023662	TSVCT	022162	
MSG14	037341	PREPT2	006030	PT20SP	006074		STSTPA	017376	TSEC	033551	
MSG15	037425	PREPT3	006050	RANDAT	017656		SUM	017744	TST	021422	
MSG16	037463	PRESCK	020536	RANGEN	004560		SUT	002232	TSTCK	027626	
MSG17	037521	PRESTK	020642	RANUM	004652		SUTCV	004754	TSTEV	025410	
MSG18	037557	PRI =	002000	RAN1	004646		SUTDRP	013440	TSTN	002176	
MSG19	037627	PRIDXX	006360	RAN2	004650		SUTPOS	015302	TSTPAT	002200	
MSG2	035073	PRID01	006426	RD	007454		SUTPTR	021426	TSTPTR	022152	
MSG20	037677	PRID02	006455	RDERCD	005026		SVCGBL=	000000	TSTSUT	022502	
MSG21	037747	PRID03	006504	RDYWD	025330		SVCINS=	177777	TSTWD	022156	
MSG22	040017	PRID04	006533	READRT	002324		SVCSUB=	177777	TTRK	033550	
MSG23	040055	PRID05	006562	READSC	007314		SVCTAG=	177777	TSARGC=	000004	
MSG24	040105	PRID06	006611	RECCMD	005136		SVCTST=	177777	TSCODE=	001004	
MSG25	040135	PRID07	006640	REFCMD	015264		SVUTRG	033516	TSERRN=	000000	
MSG26	040173	PRID08	006667	REFDRV	015306		SWREG	002204	TSEXCP=	000000	
MSG27	040220	PRID09	006716	REPORT	005140		SYFT =	000000	TSFLAG=	000041	
MSG3	035106	PRID10	006745	RESTAR=	000002	G	SYSERR=	004000	TSFREE=	040504	
MSG4	035121	PRID11	006774	RESTK	021450		SYSE10	033122	TSGMAN=	000000	
MSG5	035400	PRID12	007023	RETRY	002304		SYSE11	033151	TSHILI=	000032	
MSG6	035432	PRID13	007052	RTMASK	030474		SYSE12	033161	T\$LAST=	000001	
MSG7	035453	PRID14	007101	RTOFF	027624		SYSE13	033171	T\$LOLI=	000001	
MSG8	037263	PRID15	007130	RXXX	002172		SYSE14	033225	T\$LSYM=	010000	
MSG9	037370	PRID16	007157	RX2BIT=	004000	G	SYSE15	033242	T\$LTNO=	000001	
MSKRT	032110	PRID17	007206	RYDLY	025326		SYSE16	033302	T\$NEST=	177777	
MWTRT	032166	PRID18	007235	RYDX	025324		SYSE4	032700	T\$NSO =	000000	
NEWTRK	020572	PRID19	007264	SAVDLY	016014		SYSE5	032733	T\$NS1 =	000005	
NOERL	007374	PRI00 =	000000	SCPSCT	023660		SYSE6	032764	T\$NS2 =	000003	
NONE	004506	PRI01 =	000040	SCSYEX	020676	G	SYSE7	033010	T\$PCNT=	000000	



PARAMETER CODING  
SYMBOL TABLE

MACRO M1200 15-DEC-82 13:50 PAGE 151-5

TSPTAB= 010023	TSSINI= 010006	UDU234 025156	UT11 002344	XERUUT 033544
TSPTHV= 000002	TSSMSG= 010003	UF243 027412	UUT 002234	XER1 002663
TSPTNU= 000002	TSSPC = 000002	UG00 013766	UUTADR 002236	XER2 002744
TSSAVL= 177777	TSSPRO= 010005	UKINT 007404	UUTOFF 002240	XID 020646
TSSEGL= 177777	TSSPTA= 010023	UK243 027554	UOADR 002220	XOD 020644
TSSEKO= 010003	TSSRPT= 010004	UNIT 002334	UOJECT 002224	XPG 017554
TSSIZE= 000014	TSSSEG= 010003	UNITDP 013436	U1ADR 002222	XPSUN0 014700
TSSUBN= 000002	TSSSOF= 010017	UNITST 005024	U1VECT 002226	XPSUN1 C14740
TSTAGL= 177777	TSSSUB= 010015	UNPKHP 011656	VALWD 025030	XREC 005134
TSTAGN= 010025	TSSSW = 010001	UNT 012330	WATCH 025104	XUP SCT 030340
TSTEMP= 000000	TSSTES= 010013	UNTCB 015300	WC 033545	XU23 025322
TSTEST= 000001	TOMSG 013124	UNTCNT 015276	WDCNT 002252	XU234 025212
TSTSTM= 177777	T1 013564 G	UNTCOD 012326	WDCT 023326	XXPG 017630
TSTSTS= 000001	T1.1 013566	UPDVST 027230	WDOT 023330	XSALWA= 000000
TSSAU = 010012	T1.2 013706	UPSECT 030216	WRDS 025022	XSALS= 000040
TSSAUT= 010010	UAM = 000200 G	UTCNT 005412	WRITSC 007334	XSOFFS= 000400
TSSCLE= 010007	UAU234 025162	UTSCDN 023704	WRT 007464	XSTRUE= 000020
TSSDAT= 010024	UC00 013752	UTTST 005410	WRTRT 002326	X1211 016012
TSSDU = 010011	UDCRST 027722	UT00 002336	XATDP 012766	X24U1 030470
TSSHAR= 010016	UDHDST 027670	UT01 002340	XDVTST 022504	X2431 027720
TSSHW = 010000	UDSFST 030072	UT10 002342	XERPRT 003034	X2433 030214

. ABS. 040504 000  
 ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 28641 WORDS ( 112 PAGES)

DYNAMIC MEMORY: 19748 WORDS ( 75 PAGES)

ELAPSED TIME: 00:03:13

CNRXDA.BIN/DS:GBL/EN:AMA:ABS,CNRXDA.LST/CR/-SP/NL:CND:MD:BEX=SVC34/MLB,CNRXDA.MAC

CNRXDA SYMBOL	CREATED BY	MACRO	ON 15-DEC-82 AT 13:51	PAGE 1						
SYMBOL	CROSS REFERENCE	VALUE	REFERENCES	CREF	V01					
ABORT		002270	#21-1115 *50-1914 *50-1929 56-2097 56-2120 *56-2131 *58-2154 58-2158 *60-2194 *67-2339 67-2356 67-2363 67-2370 67-2376 *71-2500							
ADR	=	000020 G	#19-983							
ADRS		025024	*107-3681 *107-3692 *107-3700 *107-3710 *107-3715 *107-3720 *107-3729 #107-3736 107-3757							
ADRTST		012774	56-2096 56-2119 #58-2153							
ADVTRK		021440	*87-3076 *87-3097 87-3100 *87-3108 #87-3129							
ASSEMB	=	000010	16-786 16-786							
BAU234		025122	#109-3768 109-3778							
BC00		013706	#67-2358 67-2373							
BDAU23		025246	#109-3799 109-3805							
BDA121		014756	#73-2541 73-2589							
BDA133		020666	#85-3025 85-3027							
BDA241		025514	#113-3859 113-3888							
BDA25		030716	#131-4385 131-4396							
BDA26		032426	#135-4565 135-4568							
BDA40		032506	#139-4593 139-4603							
BDBU23		025252	#109-3800 109-3803							
BDB20		021014	87-3052 #87-3057 87-3117							
BDB241		026034	#113-3900 113-3903							
BDVSCD		021434	*87-3043 87-3094 *87-3096 #87-3127 *99-3560 *99-3562							
BF243		027322	119-4084 #119-4086 119-4106							
BG00		013566	#67-2337 67-2375							
BIT0	=	000001 G	#19-983 #19-1014 19-1065 52-1994 52-2017							
BIT00	=	000001 G	#19-983 19-983 #19-1003 19-1014							
BIT01	=	000002 G	#19-983 19-983 #19-1002 19-1013							
BIT02	=	000004 G	#19-983 19-983 #19-1001 19-1012 89-3155 95-3386 121-4221 127-4295							
BIT03	=	000010 G	#19-983 19-983 #19-1000 19-1011 95-3393 121-4204							
BIT04	=	000020 G	#19-983 19-983 #19-999 19-1010 121-4217 121-4220							
BIT05	=	000040 G	#19-983 19-983 19-1009							
BIT06	=	000100 G	#19-983 19-983 #19-997 19-1008							
BIT07	=	000200 G	#19-983 19-983 #19-996 19-1007							
BIT08	=	000400 G	#19-983 19-983 #19-995 19-1006							
BIT09	=	001000 G	#19-983 19-983 #19-994 19-1005							
BIT1	=	000002 G	#19-983 #19-1013 19-1064 52-2003 52-2025 121-4218							
BIT10	=	002000 G	#19-983 #19-993							
BIT11	=	004000 G	#19-983 #19-992 19-1057 19-1066							
BIT12	=	010000 G	#19-983 #19-991 109-3773 121-4215 123-4240							
BIT13	=	020000 G	#19-983 #19-990 109-3781 121-4202							
BIT14	=	040000 G	#19-983 #19-989 69-2400 109-3783							
BIT15	=	000040 G	#19-983 #19-988 #19-998							
BIT2	=	000004 G	#19-983 #19-1012 52-1997 52-2020							
BIT3	=	000010 G	#19-983 #19-1011 52-2006 52-2028							
BIT4	=	000020 G	#19-983 #19-1010 77-2639							
BIT5	=	000040 G	#19-983 #19-1009							
BIT6	=	000100 G	#19-983 #19-1008							
BIT7	=	000200 G	#19-983 #19-1007							
BIT8	=	000400 G	#19-983 #19-1006 77-2621							
BIT9	=	001000 G	#19-983 #19-1005 77-2644							
BK243		027550	#119-4134 119-4137							
BOE	=	000400 G	#19-983							
BRONPT		017462	*83-2782 *83-2790 #83-2796							
BRONTK		020126	*85-2900 *85-2907 #85-2908 85-3003							

CNRXDA SYMBOL	CREATED BY	MACRO ON 15-DEC-82 AT 13:51	PAGE 2	CREF	V01					
SYMBOL	CROSS REFERENCE	REFERENCES								
VALUE										
BTHDRV	= 021432	*87-3042	87-3067	87-3069	*87-3070	*87-3084	#87-3126	*135-4559	*135-4561	
BTRK	= 033553	27-1261	#143-4719							
BTRP4	= 000004	#19-1062	58-2155	58-2157						
BTRP6	= 000006	#19-1063								
BUFERL	= 007364	#48-1837								
BYTCNT	= 026050	*113-3858	*113-3886	113-3887	#113-3907					
BYTNUM	= 026052	*113-3856	113-3861	113-3862	113-3868	113-3870	113-3883	*113-3885	#113-3908	
CKDVAV	= 014742	71-2464	71-2489	#73-2538						
CKSML	= 007354	38-1626	#48-1836	121-4190						
CKSMRT	= 002310	#21-1125								
CLASWD	= 027620	*119-4092	#119-4150	121-4187	123-4230	123-4236				
CLRSTA	= 020656	81-2759	#85-3023							
CMD	= 002332	#23-1138	27-1257	*67-2348	*77-2667	*95-3433				
CNSCLC	= 023316	*95-3379	95-3380	95-3422	95-3424	95-3429	95-3436	#97-3456		
CNTKLC	= 023320	*95-3375	95-3376	95-3418	95-3428	95-3435	#97-3457			
CONTRL	= 013564	#67-2336								
CR	= 000015	#149-4881	149-4885	149-4886	149-4887	149-4888	149-4889	149-4890	149-4891	149-4892
		149-4893	149-4894	149-4895	149-4896	149-4897	149-4898	149-4899	149-4900	149-4901
		149-4902	149-4903	149-4904	149-4905	149-4906	149-4907	149-4908	149-4909	149-4910
		149-4911	149-4912							
CRC	= 007434	#48-1842								
CRCBAD	= 007444	#48-1843								
CRCBRT	= 002312	#21-1126								
CRCERT	= 002314	#21-1127	133-4515	133-4530						
CSADR	= 025034	*95-3400	*95-3437	107-3676	107-3681	#107-3740	107-3752	107-3755	109-3771	109-3779
CSEC	= 023276	95-3364	95-3377	#97-3447						
CSRADR	= 025332	*37-1540	*71-2444	*71-2453	*71-2481	*73-2557	*77-2646	*77-2655	*107-3752	109-3800
		109-3807	*109-3808	109-3809	#109-3815	*115-3929	*115-3951			
CSREV	= 027072	*115-3923	115-3926	115-3969	115-3973	115-4024	#115-4031			
CSRUT	= 002246	#21-1104	27-1257	*67-2345	*77-2661	*109-3807	115-3923	*143-4703		
CTKO	= 033546	27-1260	#143-4714							
CTK1	= 033547	27-1260	#143-4715							
CTRK	= 023306	95-3358	95-3373	#97-3451						
CURSEC	= 023710	*95-3380	*95-3422	95-3424	*99-3487	*99-3499	#99-3550			
CURTRK	= 024240	*95-3376	95-3418	*101-3580	*101-3593	101-3600	*101-3602	101-3603	101-3605	*101-3613
		*101-3618	#103-3630							
CVSTUT	= 004756	#35-1511	87-3050							
CVUNIT	= 004752	35-1489	35-1491	35-1497	#35-1504	*62-2225				
CVUTST	= 004654	#35-1487	62-2226							
C\$AU	= 000052	#16-786	64-2272							
C\$AUTO	= 000061	#16-786	56-2132							
C\$BRK	= 000022	#16-786								
C\$BSEG	= 000004	#16-786	73-2544	77-2614	87-3057					
C\$BSUB	= 000002	#16-786	67-2337	67-2358						
C\$CEFG	= 000045	#16-786								
C\$CLCK	= 000062	#16-786								
C\$CLEA	= 000012	#16-786	54-2072							
C\$CLOS	= 000035	#16-786								
C\$CLP1	= 000006	#16-786	67-2368							
C\$CVEC	= 000036	#16-786	54-2067	54-2070	58-2157					
C\$DCLN	= 000044	#16-786	50-1930	52-2038	56-2130	67-2378				
C\$DODU	= 000051	#16-786	56-2101	56-2104	56-2110	56-2113	56-2124	56-2127	79-2706	



CNRXDA		CREATED BY MACRO ON 15-DEC-82 AT 13:51		PAGE 3											
SYMBOL	CROSS REFERENCE	VALUE	REFERENCES	CREF	V01										
CSDRPT	=	000024	#16-786	67-2380											
CSDU	=	000053	#16-786	62-2232											
CSEDIT	=	000003	#16-786	16-829											
CSERDF	=	000055	#16-786												
CSEHR	=	000056	#16-786												
CSERO	=	000060	#16-786	27-1249	58-2170	79-2698									
CSEPSF	=	000054	#16-786												
CSESO	=	000057	#16-786												
CSESCA	=	000010	#16-786												
CSESEG	=	000005	#16-786	73-2580	77-2682	87-3116									
CSESUB	=	000003	#16-786	67-2352	67-2369										
CSETST	=	000001	#16-786	143-4738											
CSEXIT	=	000032	#16-786	67-2381											
CSGETB	=	000026	#16-786												
CSGETW	=	000027	#16-786												
CSGMAN	=	000043	#16-786	77-2632											
CSGPHR	=	000042	#16-786	50-1923											
CSGPLO	=	000030	#16-786												
CSGPRI	=	000040	#16-786												
CSINIT	=	000011	#16-786	50-1935											
CSINLP	=	000020	#16-786	89-3150	95-3381										
CSMANI	=	000050	#16-786	77-2630											
CSMEM	=	000031	#16-786												
CSMSG	=	000023	#16-786	31-1349	31-1369										
CSOPEN	=	000034	#16-786												
CSPNTB	=	000014	#16-786	27-1257	31-1371	31-1374	113-3882	113-3883							
CSPNTF	=	000017	#16-786	50-1928	52-2037	52-2040	62-2222	62-2230							
CSPNTS	=	000016	#16-786	44-1744	44-1756	44-1766									
CSPNTX	=	000015	#16-786	27-1260	27-1261	29-1289									
CSQIO	=	000377	#16-786												
CSRDBU	=	000007	#16-786												
CSREFG	=	000047	#16-786	50-1898	50-1902	50-1911									
CSRESE	=	000033	#16-786	#16-786	54-2071	71-2441									
CSREVI	=	000003	#16-786	16-829											
CSRFLA	=	000021	#16-786	50-1897											
CSRPT	=	000025	#16-786	38-1650											
CSSEFG	=	000046	#16-786												
CSSPRI	=	000041	#16-786	109-3766	109-3784										
CSSVEC	=	000037	#16-786	50-1931	50-1934	58-2155									
CSTPRI	=	000013	#16-786												
DAERCT		026054	*113-3841	*113-3865	113-3873	#113-3909									
DARDRT		002320	#21-1129												
DATA		007474	#48-1846												
DART		002316	#21-1128	133-4512	133-4527										
DATASB		026056	*113-3877	113-3883	#113-3910										
DATAWS		026060	*113-3878	113-3883	#113-3911										
DATAO		017520	83-2797	#83-2805											
DAT1		017536	83-2798	#83-2811											
DATBUF		034406	107-3698	113-3848	113-3860	113-3898	#143-4734								
DATBYT		017746	*83-2805	*83-2811	*83-2814	*83-2826	*83-2829	*83-2832	*83-2836	*83-2839	*83-2843				
			83-2853	83-2854	#83-2865										
DATPAT		034006	83-2791	83-2794	95-3427	107-3696	113-3847	113-3859	#143-4731						

CNRXDA SYMBOL	CREATED BY	MACRO	ON 15-DEC-82 AT 13:51	PAGE 4	CREF	V01					
SYMBOL	CROSS REFERENCE	VALUE	REFERENCES								
DAWTRT		002322	#21-1130								
DBADR		025032	*107-3678	107-3692	107-3700	107-3710	107-3715	107-3720	107-3729	#107-3739	
DDERCT		002330	#21-1133								
DELAY		025230	37-1542	71-2445	71-2454	71-2482	73-2559	77-2648	77-2659	107-3754	#109-3795
			115-3931	115-3953							
DELDT		002244	#21-1103	*69-2423	*69-2425	87-3086	*87-3088	*87-3090	105-3651	115-4007	
DEN		002242	#21-1102	37-1536	*69-2428	*69-2430	105-3664	115-3949	115-4019		
DFPTBL		002160	#18-866								
DFTL		002216	#18-903	131-4420							
DIAGMC	=	000000	16-786	16-786							
DLDTER		007504	#48-1847								
DLY		025224	109-3768	#109-3788							
DMSG1		026064	113-3882	#113-3914							
DMSG2		026161	113-3883	#113-3915							
DNBIT	=	000040	#19-1056	71-2443	71-2446	71-2452	71-2455	71-2477	71-2480	71-2483	73-2558
			77-2656	107-3679	109-3771	109-3779	115-3930	115-3952			
DNFLAG		025226	*109-3765	109-3769	#109-3789	*143-4701					
DRIVEN		015270	*73-2552	*73-2555	#75-2598						
DRVDN		021444	*87-3045	*87-3069	87-3080	*87-3091	#87-3131	*135-4569			
DRVFN		023332	95-3399	95-3433	95-3434	#97-3462	*105-3666				
DRVTST		023324	*87-3101	87-3103	95-3405	95-3425	95-3431	#97-3459			
DUA121		015246	#73-2587								
DUA26		032434	#135-4568								
DUB20		021370	87-3112	#87-3114							
DUC20		021000	#87-3054								
DUMSG1		013442	62-2230	#62-2237							
DUMSG2		013503	62-2222	#62-2238							
DVDNCK		021442	*87-3044	#87-3130	*89-3170	*89-3176	135-4553	*135-4556			
DVFT	=	000001	#19-1060	131-4422	139-4614						
DVTST		024404	*95-3397	*95-3430	*95-3431	105-3643	#105-3669				
DX		025222	109-3767	#109-3787							
EA1211		016004	77-2677	#77-2682							
EA243		027264	119-4076	#119-4080							
EA2433		030210	123-4247	#123-4250							
EA2434		030274	125-4266	#125-4272							
EB24U1		030452	127-4304	#127-4311							
EB243		027406	119-4088	119-4102	#119-4104						
EB2433		030160	123-4243	#123-4245							
ECCLAS		030624	129-4331	#129-4354							
ECLOG		007604	38-1636	#48-1855	119-4112						
ECTAB		003116	29-1287	#29-1297							
EC1		003170	29-1297	#31-1322							
EC10		003555	29-1304	#31-1329							
EC11		003603	29-1305	#31-1330							
EC12		003660	29-1306	#31-1331							
EC13		003714	29-1307	#31-1332							
EC14		003773	29-1308	#31-1333							
EC15		004021	29-1309	#31-1334							
EC16		004107	29-1310	#31-1335							
EC17		004153	29-1311	#31-1336							
EC2		003236	29-1298	#31-1323							
EC20		004207	29-1312	#31-1337							

CNRXDA CREATED BY MACRO ON 15-DEC-82 AT 13:51

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SYMBOL	CROSS REFERENCE	VALUE	REFERENCES						
EC21		004254	29-1313	#31-1338					
EC22		004311	29-1314	#31-1339					
EC23		004360	29-1315	#31-1340					
EC24		004413	29-1316	#31-1341					
EC2432		030064	121-4219	#121-4222					
EC25		004442	29-1317	#31-1342					
EC3		003304	29-1299	#31-1324					
EC4		003332	29-1300	#31-1325					
EC5		003400	29-1301	#31-1326					
EC6		003451	29-1302	#31-1327					
EC7		003477	29-1303	#31-1328					
EDB241		026042	#113-3903						
EDC20		021404	87-3056	#87-3118					
ED00		013746	67-2364	67-2366	#67-2368				
ED1211		016000	77-2679	#77-2681					
ED2341		025102	107-3756	#107-3758					
EF.CON	=	000036	G	#19-983	#19-1021				
EF.NEW	=	000035	G	#19-983	#19-1022				
EF.PWR	=	000034	G	#19-983	#19-1023	50-1898			
EF.RES	=	000037	G	#19-983	#19-1020	50-1911			
EF.STA	=	000040	G	#19-983	#19-1019	50-1902			
EF01	=	000001	G	#19-1040					
EF02	=	000002	G	#19-1039					
EF03	=	000003	G	#19-1038					
EF04	=	000004	G	#19-1037					
EF05	=	000005	G	#19-1036					
EF06	=	000006	G	#19-1035					
EF07	=	000007	G	#19-1034					
EF08	=	000010	G	#19-1033					
EF09	=	000011	G	#19-1032					
EF10	=	000012	G	#19-1031					
EF11	=	000013	G	#19-1030					
EF12	=	000014	G	#19-1029					
EF13	=	000015	G	#19-1028					
EF14	=	000016	G	#19-1027					
EF15	=	000017	G	#19-1026					
EF16	=	000020	G	#19-1025					
EG1211		015526	77-2641	77-2643	#77-2645				
EH1211		015750	77-2671	77-2673	#77-2675				
EIA11		014126	69-2417	#69-2419					
EIA12		014374	71-2450	71-2459	#71-2466				
EIA121		015232	73-2543	73-2582	#73-2584				
EIA24		025374	111-3828	#111-3830					
EIA25		031174	131-4397	#131-4435					
EIA40		032670	139-4604	#139-4628					
EIB121		015050	73-2553	#73-2556					
EIB20		021354	87-3093	87-3099	#87-3110				
EIB23		022646	95-3363	#95-3373					
EIB234		025012	107-3717	107-3722	107-3726	#107-3731			
EIB251		032102	133-4505	133-4514	133-4517	133-4520	133-4529	133-4532	#133-4535
EIB26		032416	135-4560	#135-4562					
EIC11		011756	52-1982	#52-1986					



CNRXDA SYMBOL	CREATED BY	MACRO	ON	DATE	TIME	PAGE	CREF	V01									
SYMBOL	VALUE	REFERENCES															
EIC11	014212	69-2429	#69-2431														
EIC121	015212	73-2563	73-2567	73-2571	#73-2579												
EIC20	021106	87-3066	#87-3071														
EIC25	031126	131-4410	131-4412	#131-4426													
EIC40	032652	139-4616	139-4618	#139-4625													
EID121	015226	73-2573	73-2575	73-2577	#73-2583												
EID23	023032	95-3396	#95-3403														
EID232	024162	101-3609	#101-3613														
EID233	024366	105-3662	#105-3664														
EIE12	014564	71-2492	#71-2494														
EIE21	022146	89-3223	#89-3225														
EIE22	022456	93-3317	93-3327	#93-3329													
EIE23	023134	95-3420	#95-3422														
EIF11	012224	52-1994	52-1999	52-2005	52-2008	52-2019	52-2022	52-2027	#52-2030								
EIF20	021154	87-3075	#87-3080														
EIF21	022122	89-3152	89-3163	89-3177	89-3179	89-3183	89-3185	89-3190	89-3193	89-3198							
		89-3214	89-3217	#89-3219													
EIF241	025742	113-3876	#113-3884														
EIF25	031116	131-4418	131-4421	#131-4424													
EIH20	021232	87-3089	#87-3091														
EIH232	024012	101-3573	#101-3581														
EIH234	024712	107-3702	#107-3717														
EII21	022116	89-3204	89-3210	#89-3218													
EII231	023370	99-3473	#99-3479														
EIJ23	023200	95-3383	95-3404	95-3426	#95-3430												
EIK234	024560	107-3697	#107-3699														
EIM241	025702	113-3880	#113-3883														
EI243	027576	119-4131	119-4140	#119-4142													
ELA10	014054	69-2397	#69-2399														
ELA11	014120	69-2415	#69-2418														
ELA12	014270	71-2447	#71-2451														
ELA20	020774	87-3049	#87-3053														
ELA231	023462	99-3486	#99-3499														
ELA241	025500	113-3852	113-3854	#113-3856													
ELA25	030740	131-4387	#131-4392														
ELA40	032530	139-4595	#139-4600														
ELB11	014162	69-2422	#69-2425														
ELB12	014342	71-2456	#71-2460														
ELB121	015036	73-2550	#73-2554														
ELB20	021276	87-3062	#87-3100														
ELB22	022352	93-3310	#93-3313														
ELB231	023622	99-3504	#99-3529														
ELB232	024206	101-3604	101-3616	#101-3618													
ELB241	025744	113-3864	#113-3885														
ELB25	031036	131-4405	#131-4413														
ELB26	032410	135-4558	#135-4561														
ELC11	014206	69-2427	#69-2430														
ELC22	022400	93-3315	#93-3318														
ELC231	023620	99-3510	#99-3528														
ELC233	024340	105-3655	#105-3658														
ELC242	026306	115-3933	#115-3936														
ELC244	030614	129-4338	#129-4349														

CNRXDA SYMBOL	CREATED BY CROSS REFERENCE VALUE	MACRO ON 15-DEC-82 AT 13:51	PAGE 7 CREF	V01	REFERENCES
ELD11	012300				52-1984 #52-2040
ELD22	022422				93-3320 #93-3323
ELD231	023610				99-3515 #99-3526
ELD233	024362				105-3660 #105-3663
ELD234	024714				107-3706 #107-3718
ELD25	031170				131-4432 #131-4434
ELD251	0320C4				133-4509 #133-4518
ELE12	014556				71-2478 #71-2493
ELE22	022450				93-3325 #93-3328
ELE23	023130				95-3413 95-3415 #95-3421
ELE234	024764				107-3724 #107-3727
ELE244	030604				129-4344 #129-4347
ELF12	014546				71-2484 #71-2491
ELF20	021134				87-3074 #87-3076
ELF231	023602				99-3517 #99-3523
ELF232	024100				101-3596 #101-3599
ELF251	032072				133-4524 #133-4533
ELG11	012022				52-1993 #52-1997
ELG12	014622				71-2497 #71-2501
ELG21	021736				89-3187 #89-3191
ELG251	031772				133-4511 #133-4515
ELH11	012066				52-2002 #52-2006
ELH12	014412				71-2467 #71-2470
ELH20	021224				87-3087 #87-3090
ELH231	023452				99-3491 #99-3496
ELH234	024622				107-3689 #107-3707
ELH251	032060				133-4526 #133-4530
ELI11	012250				52-2011 #52-2037
ELJ21	022064				89-3206 #89-3211
ELK11	012146				52-2016 #52-2020
ELK20	020744				87-3039 #87-3047
ELK234	024552				107-3695 #107-3698
ELI11	012210				52-2024 #52-2028
ELL20	021270				87-3095 #87-3098
ELM242	026650				115-3990 #115-3993
ELN21	021704				89-3181 #89-3184
ENDCVT	004750				35-1494 35-1496 #35-1500 #35-1502
ENDI1	012324				52-2036 52-2039 #52-2041
ENDLD	017742				83-2857 #83-2862
ENDRPT	005406				#38-1650
ENDST	011240				#48-1858 85-3024
ENDTKS	020632				85-2898 85-3001 #85-3004
ENDUP	002576				27-1259 #27-1263
ENDXER	003112				29-1282 #29-1291
END00	014012				67-2379 #67-2381
END121	015260				73-2588 #73-2590
END13	017374				81-2757 #81-2761
END131	017702				83-2808 83-2821 83-2835 83-2846 #83-2849
END133	020674				#85-3028
END20	021420				87-3085 87-3115 #87-3120
END22	022500				#93-3334
END231	023642				99-3522 99-3525 99-3527 99-3528 #99-3533







CNRXDA		CREATED BY MACRO ON 15-DEC-82 AT 13:51		PAGE 10									
SYMBOL	CROSS REFERENCE	VALUE	REFERENCES	REF	V01								
F\$HW	=	000013	#16-786	18-866	18-879								
F\$INIT	=	000006	#16-786	50-1891	50-1935								
F\$JMP	=	000050	#16-786	67-2381	145-4806	147-4866							
F\$MOD	=	000000	#16-786	16-812	18-914	19-976	37-1553	38-1606	151-4950				
F\$MSG	=	000011	#16-786	31-1348	31-1349	31-1367	31-1369						
F\$PROT	=	000021	#16-786	48-1876	48-1880								
F\$PWR	=	000017	#16-786										
F\$RPT	=	000012	#16-786	38-1614	38-1650								
F\$SEG	=	000003	#16-786	73-2544	73-2580	77-2614	77-2682	87-3057	87-3116				
F\$SOFT	=	000005	#16-786	147-4840	147-4843	147-4852	147-4858	147-4862	147-4866	147-4866	147-4866	147-4877	
F\$SRV	=	000010	#16-786										
F\$SUB	=	000002	#16-786	67-2337	67-2352	67-2358	67-2369						
F\$SW	=	000014	#16-786	18-891	18-912								
F\$TEST	=	000001	#16-786	67-2335	143-4738								
GETSEC		023334	95-3423	#99-3469									
GETTRK		023742	95-3417	#101-3570									
GETTST		021454	87-3059	#89-3141									
GPSUNO		014626	71-2442	#71-2507									
GPSUN1		014702	71-2476	71-2518	#71-2524								
GTDRV		022320	87-3098	#93-3306									
GTDVFN		024254	95-3398	95-3432	#105-3642								
GTEX		017302	69-2399	#81-2748									
GTEXCD		014076	69-2395	#69-2413									
GTSYEX		014022	67-2351	#69-2392									
GTSYS		014216	69-2398	#71-2441									
GITK		020062	85-2896	#85-2899									
G\$CNTO	=	000200	#16-786										
G\$DELM	=	000372	#16-786										
G\$DISP	=	000003	#16-786										
G\$EXCP	=	000400	#16-786										
G\$HILI	=	000002	#16-786										
G\$LOLI	=	000001	#16-786										
G\$NO	=	000000	#16-786										
G\$OFFS	=	000400	#16-786	77-2632	145-4801	145-4802	145-4803	145-4804	147-4842	147-4844	147-4845		
				147-4846	147-4847	147-4848	147-4849	147-4850	147-4851	147-4853	147-4854	147-4855	
				147-4856	147-4857	147-4859	147-4860	147-4861	147-4863	147-4864	147-4865		
G\$OF SI	=	000376	#16-786	77-2632	145-4801	145-4802	145-4803	145-4804	147-4842	147-4844	147-4845		
				147-4846	147-4847	147-4848	147-4849	147-4850	147-4851	147-4853	147-4854	147-4855	
				147-4856	147-4857	147-4859	147-4860	147-4861	147-4863	147-4864	147-4865		
G\$PRMA	=	000001	#16-786	145-4801	145-4802								
G\$PRMD	=	000002	#16-786	145-4803	145-4804	147-4845	147-4846	147-4847	147-4848	147-4859	147-4860		
				147-4863	147-4864								
G\$PRML	=	000000	#16-786	77-2632	147-4842	147-4844	147-4849	147-4850	147-4851	147-4853	147-4854		
				147-4855	147-4856	147-4857	147-4861	147-4865					
G\$RADA	=	000140	#16-786										
G\$RADB	=	000000	#16-786										
G\$RADD	=	000040	#16-786	147-4848	147-4859	147-4860	147-4863	147-4864					
G\$RADL	=	000120	#16-786	77-2632	147-4842	147-4844	147-4849	147-4850	147-4851	147-4853	147-4854		
				147-4855	147-4856	147-4857	147-4861	147-4865					
G\$RADO	=	000020	#16-786	145-4801	145-4802	145-4803	145-4804	147-4845	147-4846	147-4847			
G\$XFER	=	000004	#16-786	145-4806	147-4843	147-4852	147-4858	147-4862	147-4866				
G\$YES	=	000010	#16-786	77-2632	145-4801	145-4802	145-4803	145-4804	147-4842	147-4844	147-4845		





CNRXDA SYMBOL	CREATED BY	MACRO	ON	DATE	TIME	PAGE	NO.
SYMBOL	CROSS REFERENCE	VALUE	REFERENCES			CREF	V01
IEATDP		012720	#56-2120				
IER	=	020000 G	#19-983				
IEU234		025164	#109-3779				
IE00		013726	#67-2363				
IE1211		015444	#77-2633				
IFA11		011670	#52-1969				
IFATDP		012756	56-2116	56-2126	#56-2128		
IFAUP		002444	#27-1258				
IFAU23		025232	#109-3796				
IFA10		014040	69-2394	#69-2396			
IFA11		014100	#69-2414				
IFA12		014244	#71-2446				
IFA121		014760	#73-2542				
IFA20		020750	#87-3048	87-3055			
IFA21		021520	89-3148	89-3151	#89-3153		
IFA22		022322	#93-3307				
IFA23		022516	#95-3347				
IFA231		023410	#99-3485				
IFA232		024024	#101-3584				
IFA233		024262	#105-3644				
IFA234		024450	#107-3683				
IFA24		025360	#111-3827				
IFA241		025456	#113-3851				
IFA242		026232	#115-3926				
IFA244		030506	#129-4327				
IFA25		030720	#131-4386				
IFA251		031700	#133-4499				
IFA26		032354	#135-4553				
IFA40		032510	#139-4594				
IFB11		011710	52-1970	#52-1974			
IFB10		014024	#69-2393				
IFB12		014316	#71-2455				
IFB121		015010	#73-2549				
IFB13		017342	#81-2754				
IFB20		021036	#87-3061				
IFB21		021546	89-3154	#89-3159			
IFB22		022332	#93-3309				
IFB23		022606	95-3355	#95-3362			
IFB231		023504	#99-3503				
IFB232		024120	101-3601	#101-3603			
IFB233		024314	105-3645	105-3650	#105-3652		
IFB242		026326	115-3927	#115-3940			
IFB244		030524	#129-4333				
IFB25		030770	#131-4402				
IFB251		031706	#133-4501				
IFB26		032370	#135-4557				
IFB40		032554	#139-4608				
IFC11		011724	52-1975	#52-1978			
IFC11		014166	69-2424	#69-2426			
IFC12		014420	71-2465	71-2469	#71-2471		
IFC121		015116	73-2561	#73-2564			
IFC13		017350	#81-2756				

CNRXDA SYMBOL	CREATED BY CROSS REFERENCE VALUE	MACRO ON 15-DEC-82 AT 13:51 REFERENCES	PAGE 13 CREF V01
IFC20	021052	#87-3064	
IFC21	021570	89-3160 #89-3164	
IFC22	022360	93-3312 #93-3314	
IFC23	022714	95-3382 #95-3384	
IFC231	023526	99-3495 99-3498 #99-3509	
IFC232	024136	#101-3607	
IFC233	024322	#105-3654	
IFC234	024602	107-3687 #107-3703	
IFC241	025560	#113-3868	
IFC242	026266	#115-3932	
IFC244	030536	129-4334 #129-4337	
IFC25	031030	131-4403 #131-4411	
IFC251	031730	133-4502 #133-4506	
IFC40	032614	139-4609 #139-4617	
IFD11	011744	52-1979 #52-1983	
IFD12	014430	71-2472 #71-2474	
IFD121	015156	73-2569 #73-2572	
IFD21	021622	#89-3171	
IFD22	022402	93-3308 #93-3319	
IFD23	022742	95-3387 #95-3390	
IFD231	023544	#99-3514	
IFD232	024146	101-3608 #101-3610	
IFD233	024344	105-3653 105-3657 #105-3659	
IFD234	024612	#107-3705	
IFD241	025570	#113-3870	
IFD242	026444	115-3955 #115-3958	
IFD244	030544	#129-4339	
IFD25	031156	#131-4431	
IFD251	031740	#133-4508	
IFE11	011764	52-1973 52-1977 #52-1987	
IFE12	014444	#71-2477	
IFE121	015164	#73-2574	
IFE21	022136	#89-3222	
IFE22	022430	93-3322 #93-3324	
IFE23	023064	95-3408 95-3410 #95-3412	
IFE232	024170	101-3611 #101-3615	
IFE233	024302	#105-3649	
IFE234	024744	107-3704 #107-3723	
IFE241	025604	113-3869 113-3871 #113-3873	
IFE242	026460	115-3959 #115-3961	
IFE244	030564	129-4340 #129-4343	
IFE25	031074	#131-4420	
IFE251	032016	133-4507 #133-4521	
IFF11	011772	#52-1989	
IFF12	014502	#71-2483	
IFF121	015174	#73-2576	
IFF20	021122	#87-3073	
IFF21	021510	#89-3150	
IFF23	023072	#95-3414	
IFF231	023552	#99-3516	
IFF232	024064	#101-3595	
IFF241	025614	#113-3875	

CNRXDA SYMBOL	CREATED BY CROSS REFERENCE VALUE	MACRO ON 15-DEC-82 AT 13:51	PAGE 14 CREF	V01
IFF242	026722	REFERENCES		
IFF25	031060	115-3999	#115-4002	
IFF251	032026	#131-4417		
IFG11	011776	#133-4523		
IFG12	014576	#52-1991		
IFG20	021142	71-2473	71-2475	71-2490 #71-2496
IFG21	021714	#87-3077		
IFG23	023040	89-3165	89-3167	#89-3186
IFG231	023422	95-3385	95-3389	#95-3405
IFG232	024102	#99-3488		
IFG242	026506	101-3585	#101-3600	
IFG251	031750	115-3942	#115-3967	
IFH11	012040	#133-4510		
IFH12	014400	52-1990	#52-2000	
IFH121	015076	#71-2467		
IFH20	021210	#73-2560		
IFH21	021752	87-3078	#87-3086	
IFH23	023154	89-3156	89-3158	#89-3194
IFH231	023432	95-3411	#95-3425	
IFH232	023756	#99-3490		
IFH234	024474	#101-3572		
IFH242	026536	#107-3688		
IFH251	032036	115-3968	#115-3973	
IFI11	012104	#133-4525		
IFI121	015136	52-1988	#52-2009	
IFI20	021064	73-2565	#73-2568	
IFI21	021774	87-3065	#87-3067	
IFI23	022552	89-3195	89-3197	#89-3199
IFI231	023346	95-3352	#95-3354	
IFI241	025462	#99-3472		
IFI242	026516	#113-3853		
IFJ11	012114	#115-3969		
IFJ21	022030	52-2012	#52-2012	
IFJ23	022706	89-3200	#89-3205	
IFJ241	025762	#95-3381		
IFJ242	026546	#113-3889		
IFK11	012124	115-3970	#115-3975	
IFK20	020700	#52-2015		
IFK21	021576	#87-3038		
IFK234	024532	#89-3166		
IFK241	025770	#107-3694		
IFK242	026574	#113-3891		
IFL11	012164	115-3978	#115-3981	
IFL20	021246	52-2014	#52-2023	
IFL21	021476	87-3068	#87-3094	
IFL241	026000	#89-3147		
IFL242	026656	#113-3893		
IFM20	021356	115-3972	115-3980	115-3986 115-3992 #115-3994
IFM21	021654	#87-3111		
IFM241	025634	89-3172	89-3174	#89-3178
IFM242	026622	#113-3879		
IFN21	021664	115-3984	#115-3987	
		#89-3180		



CNRXDA SYMBOL	CREATED BY CROSS REFERENCE VALUE	MACRO ON 15-DEC-82 AT 13:51 REFERENCES	PAGE 15 CREF	VO1					
IFN242	026702	115-3964	115-3974	115-3995	#115-3998				
IFO21	022076	#89-3213							
IFO242	026742	#115-4007							
IFP242	026750	#115-4009							
IFQ242	026770	115-4008	#115-4013						
IFR242	027006	115-4010	115-4012	115-4014	#115-4016				
IFS242	027050	115-3966	115-4001	115-4004	115-4006	115-4020	115-4022	#115-4024	
IFU242	027024	115-4017	#115-4019						
IFV242	027032	#115-4021							
IFX242	026424	#115-3954							
IF00	013776	67-2371	#67-2376						
IF1211	015464	#77-2637							
IGATDP	012602	#56-2099							
IG1211	015502	77-2638	#77-2640						
IG243	027422	119-4079	#119-4107						
IHATDP	012616	56-2100	#56-2102						
IH1211	015554	#77-2649							
IH243	027456	119-4110	#119-4116						
IIATDP	012644	#56-2108							
II1211	015662	#77-2663							
II243	027516	119-4119	#119-4127						
IJATDP	012660	56-2109	#56-2111						
IJ1211	015672	#77-2665							
IJ243	027530	#119-4130							
IKATDP	012726	#56-2122							
ILATDP	012742	56-2123	#56-2125						
INCSAD	033542	*143-4687	*143-4694	143-4702	#143-4707				
INCTRK	021436	*87-3100	*87-3107	#87-3128	95-3414	95-3416			
INDITK	002210	#18-900	69-2420	81-2752	101-3570				
INIT	011250	#50-1892							
INITER	011470	50-1910	#50-1928						
INITL	014016	*67-2340	#67-2383	87-3038	*87-3109	89-3147	95-3362	99-3472	
INITTK	024252	*87-3040	101-3572	*101-3574	#103-3635				
INMSG2	012332	52-2037	#52-2046						
INMSG3	012432	52-2040	#52-2047						
INTCMD	015266	*73-2551	*73-2554	73-2556	#75-2597				
INTER	007414	#48-1840							
INTER1	011606	50-1928	#50-1958						
INTER2	016167	71-2448	71-2493	#79-2724					
INTER3	016235	71-2457	71-2491	#79-2725					
INTER4	016305	71-2498	#79-2726						
INTHO	033466	50-1931	#143-4687						
INTH1	033502	50-1934	#143-4694						
INTLV	023706	99-3488	99-3496	99-3506	#99-3549				
ISR	= 000100	#19-983							
ITCSAD	015272	*73-2538	73-2556	73-2557	73-2568	#75-2599	77-2645	77-2646	77-2655
		77-2663	77-2665	77-2668					
		*73-2540	73-2560	73-2564	73-2576	#75-2600	77-2617	77-2624	77-2651
		73-2581	77-2683	#79-2705					
ITDBAD	015274	*73-2540	73-2560	73-2564	73-2576	#75-2600	77-2617	77-2624	77-2651
ITDROP	016064	73-2581	77-2683	#79-2705					
ITERMG	016132	79-2694	#79-2722						
ITERR	016016	71-2449	71-2458	71-2494	73-2579	77-2675	77-2681	#79-2693	
ITERUT	016153	79-2714	#79-2723						

CNRXDA SYMBOL	CREATED BY	MACRO	ON	15-DEC-82	AT	13:51	PAGE	16	CREF	V01	
SYMBOL	CROSS REFERENCE	VALUE	REFERENCES								
ITER1		017032	77-2670	#79-2736							
ITER2		017116	77-2672	#79-2737							
ITER3		017200	73-2562	#79-2738							
ITMSG		016130	*71-2448	*71-2457	*71-2491	*71-2493	*73-2562	*73-2566	*73-2570	*73-2578	*77-2619
			*77-2627	*77-2670	*77-2672	*77-2674	*77-2678	*77-2680	79-2716	#79-2720	
ITMSG1		016334	73-2566	#79-2727							
ITMSG2		016357	73-2578	#79-2728							
ITMSG3		016401	77-2619	#79-2729							
ITMSG4		016454	77-2674	#79-2730							
ITMSG5		016521	73-2570	#79-2731							
ITMSG6		016576	77-2627	#79-2732							
ITMSG7		016652	77-2678	#79-2733							
ITMSG8		016704	77-2680	#79-2734							
ITMSG9		016753	77-2653	#79-2735							
ITPRNT		016102	77-2620	77-2628	79-2699	#79-2713					
IXE	=	004000	G	#19-983							
ISAU	=	000041	#16-786	#64-2264	#64-2272						
ISAUTO	=	000041	#16-786	#56-2091	#56-2132						
ISCLN	=	000041	#16-786	#54-2059	#54-2072						
ISDU	=	000041	#16-786	#62-2212	#62-2232						
ISHRD	=	000041	#145-4799	#145-4813							
ISINIT	=	000041	#16-786	#50-1891	#50-1935						
ISMOD	=	000041	#16-786	16-812	#16-812	18-914	#18-914	19-976	#19-976	37-1553	#37-1553
			38-1606	#38-1606	151-4950	#151-4950					
ISMSG	=	000041	#16-786	#31-1348	#31-1349	#31-1367	#31-1369				
ISPROT	=	000040	#16-786	#48-1876							
ISPTAB	=	000041	#16-786	151-4953	#151-4953	151-4958	#151-4958	151-4959	#151-4959	151-4964	#151-4964
ISPWR	=	000041	#16-786								
ISRPT	=	000041	#16-786	#38-1614	#38-1650						
ISSEG	=	000041	#16-786	67-2335	67-2337	67-2358	#73-2544	#73-2580	#77-2614	#77-2682	#87-3057
			#87-3116								
ISSETU	=	000041	#16-786	151-4952	#151-4952	151-4953	151-4959	151-4965	#151-4965		
ISSFT	=	000041	#147-4840	#147-4877							
ISSRV	=	000041	#16-786								
ISSUB	=	000041	#16-786	67-2335	67-2337	#67-2337	67-2352	#67-2352	#67-2352	67-2358	#67-2358
			67-2369	#67-2369	#67-2369						
ISTST	=	000041	#16-786	67-2335	#67-2335	67-2337	67-2358	67-2381	143-4738	#143-4738	#143-4738
JSJMP	=	000167	#16-786								
LAREC		005130	37-1544	#37-1547							
LA2432		030006	121-4203	#121-4213							
LA2433		030176	123-4239	#123-4248							
LBU234		025154	109-3770	#109-3775							
LB1211		015366	77-2618	#77-2623							
LB24U1		030424	127-4298	127-4300	#127-4305						
LB2432		027762	121-4205	#121-4209							
LB2433		030152	123-4241	#123-4244							
LB2434		030270	125-4268	#125-4271							
LC243		027402	119-4100	#119-4103							
LC2432		030050	121-4216	#121-4220							
LD00		013742	67-2361	#67-2367							
LD1211		015772	77-2631	#77-2680							
LEU234		025204	109-3780	#109-3783							





CNRXDA	CREATED BY	MACRO	ON 15-DEC-82 AT 13:51	PAGE 18			
SYMBOL	CROSS REFERENCE	VALUE	REFERENCES	REF	V01		
L\$LOAD	002100	G	#16-829				
L\$LUN	002074	G	#16-829	*27-1248	*58-2161	*58-2163	*58-2165 *79-2697
L\$MREV	002050	G	#16-829				
L\$NAME	002000	G	#16-829				
L\$PRIO	002042	G	#16-829				
L\$PROT	011242	G	16-829	#48-1876			
L\$PRT	002112	G	#16-829				
L\$REPP	002062	G	#16-829				
L\$REV	002010	G	#16-829				
L\$RPT	005140	G	16-829	#38-1614			
L\$SOFT	035136	G	16-829	147-4840	#147-4840		
L\$SPC	002056	G	#16-829				
L\$SPCP	002020	G	#16-829				
L\$SPTP	002024	G	#16-829				
L\$STA	002030	G	#16-829				
L\$SW	002172	G	16-829	18-891	#18-891		
L\$TEST	002114	G	#16-829				
L\$TIML	002014	G	#16-829				
L\$UNIT	002012	G	#16-829	50-1909	50-1921		
L10000	002170		18-866	#18-879			
L10001	002220		18-891	#18-912			
L10002	004506		#31-1349				
L10003	004514		#31-1369				
L10004	005406		#38-1650				
L10006	011602		#50-1935				
L10007	012550		#54-2072				
L10010	012772		#56-2132				
L10011	013434		#62-2232				
L10012	013562		#64-2272				
L10013	035006		67-2381	#143-4738			
L10014	013664		#67-2352				
L10015	013750		#67-2369				
L10016	035060		145-4799	145-4806	#145-4813		
L10017	035400		147-4840	147-4866	#147-4877		
L10020	040460		#151-4953				
L10021	040474		151-4953	#151-4959			
L10022	040470		151-4953	#151-4958			
L10024	040504		151-4959	#151-4964			
MAXSEC	002214		#18-902	99-3503	99-3509	99-3514	99-3516
MAXTRK	024234		*101-3570	101-3600	101-3607	101-3610	101-3615 #103-3628
MCRDRT	032321		133-4531	#133-4544			
MCWTRT	032270		133-4516	#133-4543			
MDRDRT	032213		133-4528	#133-4541			
MDWTRT	032134		133-4513	#133-4539			
MINSEC	002212		#18-901	99-3485	99-3499	99-3500	99-3501 99-3503
MINTRK	024232		*101-3571	101-3580	101-3602	101-3603	101-3615 101-3618 #103-3627
MRDRT	032244		133-4534	#133-4542			
MSG1	035060		145-4801	#145-4815			
MSG11	037312		147-4846	#149-4915			
MSG14	037341		147-4847	#149-4916			
MSG15	037425		147-4849	#149-4918			
MSG16	037463		147-4850	#149-4919			







CNRXDA SYMBOL	CREATED BY	MACRO	ON	AT	PAGE	21					
CROSS REFERENCE	VALUE	REFERENCES			CREF	V01					
PTHEAD	026062	*113-3843	113-3879	*113-3881	#113-3912						
PTRDSC	006116	42-1717	#44-1771								
PTRTY	031676	131-4433	#133-4498								
PTTK	006225	38-1641	#44-1774								
PTTKN	006343	38-1648	#44-1780								
PTUNT1	006253	38-1621	38-1631	38-1642	#44-1776						
PTUNT2	006274	38-1617	#44-1777								
PTWTSC	006147	42-1736	#44-1772								
PT19SP	006105	38-1620	#44-1770								
PT20SP	006074	38-1616	#44-1769								
RANDAT	017656	83-2803	#83-2842	83-2847							
RANGEN	004560	#33-1460	83-2842	85-2980							
RANUM	004652	*33-1475	#33-1480	83-2843	*85-2981	85-2982	85-2985	85-2988	85-2990		
RAN1	004646	33-1461	*33-1467	33-1472	#33-1478						
RAN2	004650	33-1462	33-1469	*33-1474	#33-1479						
RD	007454	#48-1844									
RDERCD	005026	#37-1532	77-2669	115-4026							
RDYWD	025330	*37-1541	*71-2443	*71-2452	*71-2480	*73-2558	*77-2647	*77-2656	*107-3679	*107-3690	
		*107-3699	*107-3707	*107-3714	*107-3718	*107-3727	107-3753	*107-3753	107-3755	109-3796	
		109-3800	#109-3814	*115-3930	*115-3952						
READRT	002324	#21-1131	133-4533								
READSC	007314	42-1716	#48-1834	85-3023	*125-4274	*125-4276	*125-4278	*125-4280	*125-4282		
RECCMD	005136	*37-1535	*37-1536	37-1537	#37-1550						
REFCMD	015264	#75-2596	*77-2621	*77-2629	*77-2636	*77-2639	*77-2644	77-2645	77-2667		
REFDRV	015306	73-2583	#77-2611								
REPORT	005140	#38-1615									
RESTAR	= 000002	#19-1064	50-1913								
RESTK	021450	*87-3071	*87-3072	*87-3082	*87-3083	#87-3133	95-3354	95-3356	*95-3361		
RETRY	002304	#21-1123	*67-2341	89-3153	89-3194	89-3196	89-3199	*89-3202	89-3205	*89-3208	
		*89-3215	95-3384	95-3390	*95-3403	*119-4139	*127-4302	*127-4308	133-4499	133-4501	
		133-4506	133-4508	133-4510	133-4521	133-4523	133-4525				
RTMASK	030474	*121-4210	*121-4217	*121-4218	*121-4220	*121-4221	*123-4242	*123-4244	*123-4248	127-4302	
		127-4308	#127-4318								
RTOFF	027624	#119-4152	*121-4207	*121-4211	*121-4214	*123-4235	*123-4245	127-4293			
RXXX	002172	#18-893	52-1987	56-2105	71-2466	71-2471	71-2516	73-2572	77-2640	95-3347	
		105-3652	117-4044								
RX2BIT	= 004000	#19-1057	73-2568								
RYDLY	025326	109-3799	#109-3813								
RYDX	025324	77-2657	*77-2658	*77-2660	109-3798	#109-3812					
SAVDLY	016014	*77-2657	77-2660	#77-2686							
SCPSCT	023660	99-3488	*99-3502	*99-3513	*99-3521	*99-3531	#99-3538				
SCSYEX	020676	67-2359	#87-3037								
SDD	002230	#21-1097	*62-2229	*67-2342	*87-3080	137-4577					
SECADR	025040	*95-3436	95-3440	107-3708	#107-3742						
SECDN	002262	#21-1111	89-3164	*95-3360	95-3412	*99-3533					
SECTOR	002256	#21-1109	*95-3440	113-3882							
SEEK	023322	*95-3395	*95-3402	*95-3419	*95-3421	#97-3458					
SEEKCK	026046	*113-3842	*113-3872	113-3889	#113-3906						
SEEKRT	002306	#21-1124	119-4132	127-4294	133-4503						
SEK	007424	#48-1841	127-4312								
SEQUEN	020654	*81-2750	*85-2899	85-2901	*85-2903	85-2904	#85-3014				
SEQ1	020164	85-2909	#85-2917	85-2938							





CNRXDA CREATED BY MACRO ON 15-DEC-82 AT 13:51  
SYMBOL CROSS REFERENCE  
SYMBOL VALUE

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CREF V01

REFERENCES	16-829	16-829	16-829	16-829	16-829	16-829	16-829	16-829	16-829
16-829	16-829	16-829	16-829	16-829	16-829	16-829	16-829	16-829	16-829
16-829	16-829	16-829	16-829	16-829	16-829	16-829	16-829	16-829	16-829
16-829	16-829	16-829	16-829	16-829	16-837	16-837	16-848	16-848	18-866
18-891	25-1209	25-1209	25-1209	27-1249	27-1257	27-1257	27-1257	27-1257	27-1257
27-1257	27-1257	27-1257	27-1257	27-1257	27-1260	27-1260	27-1260	27-1260	27-1260
27-1260	27-1260	27-1260	27-1260	27-1260	27-1260	27-1260	27-1260	27-1260	27-1261
27-1261	27-1261	27-1261	27-1261	27-1261	27-1261	27-1261	27-1261	27-1261	27-1261
27-1261	27-1261	27-1261	27-1261	29-1289	29-1289	29-1289	29-1289	29-1289	31-1349
31-1369	31-1371	31-1371	31-1371	31-1371	31-1371	31-1371	31-1374	31-1374	31-1374
31-1374	31-1374	31-1374	31-1374	38-1650	44-1744	44-1744	44-1744	44-1744	44-1744
44-1744	44-1756	44-1756	44-1756	44-1756	44-1756	44-1756	44-1766	44-1766	44-1766
44-1766	44-1766	44-1766	44-1766	44-1766	50-1897	50-1897	50-1898	50-1898	50-1899
50-1902	50-1902	50-1903	50-1911	50-1911	50-1912	50-1923	50-1923	50-1923	50-1923
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52-2040	52-2040	52-2040	52-2040	52-2040	52-2040	54-2067	54-2067	54-2067	54-2070
54-2070	54-2071	54-2072	56-2101	56-2101	56-2104	56-2104	56-2110	56-2110	56-2110
56-2113	56-2113	56-2124	56-2124	56-2127	56-2127	56-2130	56-2132	58-2155	58-2155
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62-2230	62-2230	62-2232	64-2272	67-2337	67-2352	67-2358	67-2368	67-2369	67-2369
67-2378	67-2380	67-2381	67-2381	71-2441	73-2544	73-2580	77-2614	77-2630	77-2630
77-2631	77-2632	77-2632	77-2632	77-2632	77-2632	77-2632	77-2682	79-2698	79-2698
79-2706	79-2706	87-3057	87-3116	89-3150	89-3151	95-3381	95-3382	109-3766	109-3766
109-3766	109-3784	109-3784	113-3882	113-3882	113-3882	113-3882	113-3882	113-3882	113-3882
113-3882	113-3882	113-3883	113-3883	113-3883	113-3883	113-3883	113-3883	113-3883	113-3883
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147-4856	147-4856	147-4856	147-4857	147-4857	147-4857	147-4858	147-4859	147-4859	147-4859
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	50-1935	50-1935	54-2072	54-2072	54-2072	56-2132	56-2132	56-2132	62-2232
	62-2232	62-2232	64-2272	64-2272	64-2272	67-2352	67-2352	67-2352	67-2369
	67-2369	67-2369	73-2580	73-2580	73-2580	77-2632	77-2632	77-2632	77-2682
	77-2682	77-2682	87-3116	87-3116	87-3116	143-4738	143-4738	143-4738	145-4813
	145-4813	145-4813	147-4877	147-4877	147-4877	151-4953	151-4953	151-4953	151-4958
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CNRXDA SYMBOL	CREATED BY CROSS REFERENCE VALUE	MACRO ON 15-DEC-82 AT 13:51	REFERENCES	PAGE 25 CREF	V01	111-3827	111-3830	#111-3834	115-3975	115-3981	115-3987	
TSTEV	025410		*87-3103 111-3823 115-4002 117-4040			111-3825	111-3827	111-3830	#111-3834	115-3975	115-3981	115-3987
TSTN	002176		#18-895 87-3058									
TSTPAT	002200		#18-896 81-2748									
TSTPTR	022152		*89-3149 89-3159 *89-3207 *89-3212 *93-3311 *93-3313			*89-3161 89-3219 89-3219 *89-3224	*89-3168 *89-3224 *89-3182 #89-3228	*89-3184 *89-3184	*89-3189 *89-3189	*89-3192 *89-3192	*89-3201 *89-3201	
TSTSUT	022502		87-3060 89-3171 27-1261 #143-4716			89-3178 89-3180	89-3180 *89-3221	#89-3230	93-3324 #93-3336			
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			44-1766 #50-1928			50-1928 50-1928	50-1928 #52-2037	52-2037 #52-2037	52-2037 52-2037	52-2037 52-2037	52-2037 52-2037	52-2037 52-2037
			#52-2040 52-2040			#52-2040 52-2040	52-2040 #62-2222	62-2222 #62-2222	62-2222 62-2222	62-2222 62-2222	62-2222 62-2222	62-2222 62-2222
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			#147-4851 147-4851			#147-4851 147-4851	147-4851 #147-4852	147-4852 #147-4852	147-4852 147-4852	147-4852 147-4852	147-4852 147-4852	147-4852 147-4852
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CNRXDA SYMBOL	CREATED BY CROSS REFERENCE VALUE	MACRO ON 15-DEC-82 AT 13:51 REFERENCES	PAGE 26 CREF	V01
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T\$GMAN	= 000000	151-4949 #151-4965		
T\$HILI	= 000032	#16-786		
		#145-4801 145-4801 #145-4802 145-4802 #145-4803 145-4803 #145-4804 145-4804 #147-4845		
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		#147-4860 147-4860 #147-4863 147-4863 #147-4864 147-4864		
T\$LAST	= 000001	#16-786 #151-4949 151-4952		
T\$LOLI	= 000001	#145-4801 145-4801 #145-4802 145-4802 #145-4803 145-4803 #145-4804 145-4804 #147-4845		
		147-4845 #147-4846 147-4846 #147-4847 147-4847 #147-4848 147-4848 #147-4859 147-4859		
		#147-4860 147-4860 #147-4863 147-4863 #147-4864 147-4864		
T\$LSYM	= 010000	#16-786 16-786 18-879 18-912 31-1349 31-1369 38-1650 50-1935 54-2072		
		56-2132 62-2232 64-2272 67-2352 67-2369 143-4738		
T\$LTNO	= 000001	#151-4949		
T\$NEST	= 177777	#16-786 16-812 #16-812 16-812 18-866 #18-866 18-866 18-879 18-879		
		18-879 #18-879 18-891 #18-891 18-891 18-912 18-912 18-912 #18-912		
		18-914 18-914 18-914 #18-914 19-976 #19-976 19-976 31-1348 #31-1348		
		31-1348 31-1349 31-1349 31-1349 #31-1349 31-1367 #31-1367 31-1367 31-1369		
		31-1369 31-1369 #31-1369 37-1553 37-1553 #37-1553 37-1553 38-1606 #38-1606		
		38-1606 38-1614 #38-1614 38-1614 38-1650 38-1650 38-1650 #38-1650 48-1876		
		#48-1876 48-1876 48-1880 48-1880 48-1880 #48-1880 50-1891 #50-1891 50-1891		
		50-1935 50-1935 50-1935 #50-1935 54-2059 #54-2059 54-2059 54-2072 54-2072		
		54-2072 #54-2072 56-2091 #56-2091 56-2091 56-2132 56-2132 56-2132 #56-2132		
		62-2212 #62-2212 62-2212 62-2212 62-2232 62-2232 #62-2232 64-2264 #64-2264		
		64-2264 64-2272 64-2272 64-2272 #64-2272 67-2335 #67-2335 67-2335 67-2337		
		#67-2337 67-2337 67-2352 67-2352 67-2352 #67-2352 67-2358 #67-2358 67-2358		
		67-2369 67-2369 67-2369 #67-2369 73-2544 #73-2544 73-2544 73-2580 73-2580		
		73-2580 #73-2580 77-2614 #77-2614 77-2614 77-2682 77-2682 77-2682 #77-2682		
		87-3057 #87-3057 87-3057 87-3116 87-3116 87-3116 #87-3116 143-4738 143-4738		
		143-4738 #143-4738 145-4799 #145-4799 145-4799 145-4806 145-4806 145-4813 145-4813		
		145-4813 #145-4813 147-4840 #147-4840 147-4840 147-4843 147-4852 147-4858 147-4862		
		147-4866 147-4866 147-4877 147-4877 147-4877 #147-4877 151-4950 151-4950 151-4950		
		#151-4950		
T\$NSO	= 000000	#16-812 18-914 #19-976 37-1553 #38-1606 151-4950		
T\$NS1	= 000005	#18-866 18-879 #18-891 18-912 #31-1348 31-1349 #31-1367 31-1369 #38-1614		
		38-1650 #48-1876 48-1880 #50-1891 50-1935 #54-2059 54-2072 #56-2091 56-2132		
		#62-2212 62-2232 #64-2264 64-2272 #67-2335 143-4738 #145-4799 145-4806 145-4806		
		145-4813 #147-4840 147-4843 147-4852 147-4858 147-4862 147-4866 147-4866 147-4877		
		#67-2337 67-2352 #67-2358 67-2369 #73-2544 73-2580 #77-2614 77-2682 #87-3057		
		87-3116		
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T\$PTAB	= 010023	#151-4953 151-4953 151-4953 #151-4959 151-4959		
T\$PTHV	= 000002	16-829 #151-4965		
T\$PTNU	= 000002	#16-786 151-4953 #151-4953 151-4959 #151-4959 151-4965 151-4965		
T\$SAVL	= 177777	#16-786		
T\$SEGL	= 177777	#16-786 73-2544 #73-2544 73-2544 73-2580 73-2580 73-2580 #73-2580 73-2580		
		77-2614 #77-2614 77-2614 77-2682 77-2682 77-2682 #77-2682 77-2682 87-3057		
		#87-3057 87-3057 87-3116 87-3116 87-3116 #87-3116 87-3116		
		#73-2544 73-2580 #77-2614 77-2682 #87-3057 87-3116		
T\$SEKO	= 010003	#73-2544 73-2580 #77-2614 77-2682 #87-3057 87-3116		
T\$SIZE	= 000014	151-4949 #151-4965		
T\$SUBN	= 000002	#16-786 #67-2335 67-2337 #67-2337 67-2337 67-2358 #67-2358 67-2358		
T\$TAGL	= 177777	#16-786		
T\$TAGN	= 010025	#16-786 18-866 18-866 #18-866 18-891 18-891 #18-891 31-1348 31-1348		



CNRXDA      CREATED BY      MACRO      ON 15-DEC-82 AT 13:51      PAGE 27  
 SYMBOL      CROSS REFERENCE                     CREF      V01  
 SYMBOL      VALUE      REFERENCES

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		#56-2091	62-2212	62-2212	#62-2212	64-2264	64-2264	#64-2264	67-2335	67-2335
		#67-2335	67-2337	67-2337	#67-2337	67-2358	67-2358	#67-2358	145-4799	145-4799
		#145-4799	147-4840	147-4840	#147-4840	151-4952	151-4952	#151-4952	151-4953	151-4953
		#151-4953	151-4953	151-4953	#151-4953	151-4959	151-4959	#151-4959	151-4959	151-4959
		#151-4959								
T\$TEMP	= 000000	#16-848	16-848	16-848	#16-848	#18-879	18-879	#18-912	18-912	#18-914
		18-914	#31-1349	31-1349	#31-1369	31-1369	#37-1553	37-1553	#38-1650	38-1650
		#48-1880	48-1880	#50-1935	50-1935	#54-2072	54-2072	#56-2132	56-2132	#62-2232
		62-2232	#64-2272	64-2272	#67-2352	67-2352	#67-2369	67-2369	#67-2381	67-2381
		#73-2580	73-2580	#77-2632	77-2632	#77-2632	77-2632	#77-2632	77-2632	#77-2682
		77-2682	#87-3116	87-3116	#143-4738	143-4738	#145-4801	145-4801	#145-4801	145-4801
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		#147-4851	147-4851	#147-4851	147-4851	#147-4851	147-4851	#147-4853	147-4853	#147-4853
		147-4853	#147-4853	147-4853	#147-4854	147-4854	#147-4854	147-4854	#147-4854	147-4854
		#147-4855	147-4855	#147-4855	147-4855	#147-4855	147-4855	#147-4856	147-4856	#147-4856
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		#147-4859	147-4859	#147-4859	147-4859	#147-4859	147-4859	#147-4860	147-4860	#147-4860
		147-4860	#147-4860	147-4860	#147-4861	147-4861	#147-4861	147-4861	#147-4861	147-4861
		#147-4863	147-4863	#147-4863	147-4863	#147-4863	147-4863	#147-4864	147-4864	#147-4864
		147-4864	#147-4864	147-4864	#147-4865	147-4865	#147-4865	147-4865	#147-4865	147-4865
		#147-4866	147-4866	#147-4877	147-4877	#151-4950	151-4950			
T\$TEST	= 000001	#16-786	67-2335	#67-2335	67-2335	67-2337	67-2358	151-4949		
T\$TSTM	= 177777	#16-786	27-1249	27-1257	27-1260	27-1261	29-1289	31-1349	31-1369	31-1371
		31-1374	38-1650	44-1744	44-1756	44-1766	50-1897	50-1898	50-1902	50-1911
		50-1923	50-1928	50-1930	50-1931	50-1934	50-1935	52-2037	52-2038	52-2040
		54-2067	54-2070	54-2071	54-2072	56-2101	56-2104	56-2110	56-2113	56-2124
		56-2127	56-2130	56-2132	58-2155	58-2157	58-2170	62-2222	62-2230	62-2232
		64-2272	67-2337	67-2352	67-2358	67-2368	67-2369	67-2378	67-2380	67-2381
		71-2441	73-2544	73-2580	77-2614	77-2630	77-2632	77-2682	79-2698	79-2706
		87-3057	87-3116	89-3150	95-3381	109-3766	109-3784	113-3882	113-3883	143-4738
T\$TSTS	= 000001	#16-786	#67-2335							
T\$SAU	= 010012	#64-2264	64-2272							
T\$SAUT	= 010010	#56-2091	56-2132							
T\$SCLE	= 010007	#54-2059	54-2072							
T\$SDAT	= 010024	#151-4953	151-4953	151-4958	#151-4959	151-4959	151-4964			
T\$SDU	= 010011	#62-2212	62-2232							
T\$SHAR	= 010016	#145-4799	145-4799	145-4806	145-4813					
T\$SHW	= 010000	#18-866	18-866	18-879						
T\$SINI	= 010006	#50-1891	50-1935							
T\$SMG	= 010003	#31-1348	31-1349	#31-1367	31-1369					
T\$SPC	= 000002	#151-4952	151-4965							
T\$SPRO	= 010005	#48-1876								
T\$SPTA	= 010023	#151-4952	151-4953	#151-4953	151-4959	#151-4959				

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SYMBOL	CROSS REFERENCE	VALUE	REFERENCES								
TSSRPT	=	010004	#38-1614	38-1650							
TSSSEG	=	010003	#73-2544	73-2544	#73-2580	73-2580	#77-2614	77-2614	#77-2682	77-2682	#87-3057
			87-3057	#87-3116	87-3116						
TSSSOF	=	010017	#147-4840	147-4840	147-4866	147-4877					
TSSSUB	=	010015	#67-2337	67-2352	#67-2358	67-2369					
TSSSW	=	010001	#18-891	18-891	18-912						
TSSSES	=	010013	#67-2335	67-2381	143-4738						
TOMSG		013124	58-2167	#58-2173							
T1		013564	16-848	#67-2335							
T1.1		013566	#67-2337								
T1.2		013706	#67-2358								
UAM	=	000200	#19-983								
UAU234		025162	#109-3778								
UCOO		013752	#67-2370								
UDCRST		027722	119-4077	#121-4201							
UDHDST		027670	119-4103	#121-4186							
UDSFST		030072	119-4101	#123-4230							
UDU234		025156	#109-3776								
UF243		027412	#119-4105								
UGOO		013766	67-2357	#67-2374							
UKINT		007404	#48-1839								
UK243		027554	#119-4136								
UNIT		002334	#23-1139	27-1248	27-1257	*35-1522	*50-1915	*50-1920	50-1921	50-1923	52-1969
			52-2034	52-2037	52-2040	*71-2507	*71-2510	*71-2514	*71-2524	*71-2527	*71-2531
			*73-2548	77-2652	79-2697	79-2706	79-2713	*93-3333	113-3882		
UNITDP		013436	*62-2214	62-2217	62-2222	62-2230	#62-2234				
UNITST		005024	*35-1518	#35-1525	87-3051						
UNPKHP		011656	50-1926	#52-1966							
UNT		012330	*52-1967	*52-1986	52-2015	52-2023	#52-2044				
UNTCO		015300	*71-2462	*71-2487	73-2545	73-2549	73-2574	*73-2586	#75-2602	77-2637	77-2642
UNTCNT		015276	*71-2460	*71-2486	*73-2585	73-2587	#75-2601				
UNTCOD		012326	*52-1995	*52-1998	*52-2004	*52-2007	*52-2018	*52-2021	*52-2026	*52-2029	52-2031
			#52-2043								
UPDVST		027230	111-3831	#119-4073							
UPSECT		030216	119-4074	#125-4259							
UTCNT		005412	#38-1653	*40-1663	*40-1670	*40-1690	*40-1697	*42-1720	*42-1730		
UTSCDN		023704	*99-3469	*99-3518	*99-3529	99-3533	#99-3548				
UTTST		005410	#38-1652	*40-1662	40-1664	40-1666	*40-1669	*40-1689	40-1692	*40-1696	*42-1719
			42-1721	*42-1728							
UT00		002336	#23-1140	35-1521	40-1662	40-1689	42-1719	*50-1916	52-2030	56-2094	56-2099
			56-2101	62-2216	71-2508	71-2510	73-2547	93-3332			
UT01		002340	#23-1141	*50-1917	56-2102	56-2104	71-2512	71-2514			
UT10		002342	#23-1142	*50-1918	56-2107	56-2108	56-2110	56-2117	56-2122	56-2124	71-2525
			71-2527								
UT11		002344	#23-1143	*50-1919	56-2111	56-2113	56-2125	56-2127	71-2529	71-2531	
UUT		002234	#21-1099	*87-3051	87-3071	87-3082	93-3307	93-3309	*93-3316	93-3319	*93-3326
			*93-3328	93-3329	95-3349	99-3470	99-3558	101-3581	105-3654	105-3659	115-3943
			117-4046	117-4056	125-4259	135-4557	135-4563				
UUTADR		002236	#21-1100	37-1533	37-1538	37-1540	*77-2668	*95-3351	*95-3353	95-3400	95-3437
			115-3922	115-3929	115-3951	115-3961					
UUTOFF		002240	#21-1101	*35-1520	*93-3331	95-3346	119-4114	119-4125	121-4191	127-4306	127-4313
UOADR		002220	#21-1092	*50-1904	*52-1971	52-1974	56-2092	56-2095	56-2128	71-2444	71-2446







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MACRO NAME	CROSS REFERENCE	REFERENCES					
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BGNAUT		56-2091					
BGNCLN		54-2059					
BGNDU		62-2212					
BGNHRD		145-4799					
BGNHW		18-866					
BGNINI		50-1891					
BGNMOD		16-812	19-976	38-1606			
BGNMSG		31-1348	31-1367				
BGNPRO		48-1876					
BGNPTA		151-4953	151-4959				
BGNRPT		38-1614					
BGNSEG		73-2544	77-2614	87-3057			
BGNSET		151-4952					
BGNSFT		147-4840					
BGNSUB		67-2337	67-2358				
BGNSW		18-891					
BGNTST		67-2335					
BNCOMP		50-1899	50-1903	50-1912	50-1924	77-2631	89-3151 95-3382
BRESET		54-2071	71-2441				
CKLOOP		67-2368					
CLRVEC		54-2067	54-2070	58-2157			
DESCRI		16-837					
DEVTYP		25-1209					
DISPAT		16-848					
DOCLN		50-1930	52-2038	56-2130	67-2378		
DODU		56-2101	56-2104	56-2110	56-2113	56-2124	56-2127 79-2706
DORPT		67-2380					
ENDAU		64-2272					
ENDAUT		56-2132					
ENDCLN		54-2072					
ENDDU		62-2232					
ENDHRD		145-4813					
ENDHW		18-879					
ENDINI		50-1935					
ENDMOD		18-914	37-1553	151-4950			
ENDMSG		31-1349	31-1369				
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ENDPTA		151-4958	151-4964				
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ENDSEG		73-2580	77-2682	87-3116			
ENDSET		151-4965					
ENDSFT		147-4877					
ENDSUB		67-2352	67-2369				
ENDSW		18-912					
ENDTST		143-4738					
EQUALS		19-983					
ERROR		27-1249	58-2170	79-2698			
ERRTBL		27-1252					
EXIT		67-2381	145-4806	147-4866			
GMANIL		77-2632					
GPHARD		50-1923					









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MACRO CROSS REFERENCE CREF V01  
MACRO NAME REFERENCES

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#147-4856	147-4856	147-4856	147-4856	#147-4857	147-4857	147-4857	147-4857	#147-4858	147-4858
#147-4859	147-4859	147-4859	147-4859	147-4859	147-4859	#147-4860	147-4860	147-4860	147-4860
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MSGNLS  
MSGNSU  
MSGNTA

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MACRO CROSS REFERENCE  
MACRO NAME

REFERENCES

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