

FEPOM

FROM CHKSM CHECK DIAG
CZFPDRO

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AH-T865A-MC
FICHE 1 OF 1

APR 1984
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IDENTIFICATION
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PRODUCT CODE: AC-T864A-MC
PRODUCT NAME: CZFPDAO PROM CHKSM CHECK DIAG
PRODUCT DATE: MAY 1982
MAINTAINER: CSS GNG DIAGNOSTIC ENGINEERING
AUTHOR: DALE PROCTOR

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REVISION HISTORY

A.0 DALE PROCTOR 22-DEC 1983
CHANGED THE NAME TO CZFPD-A0 AND RELEASED TO
SDC. ALSO UPDATED ALL THE DOCUMENTATION, AND
REMOVED THE HELP FILE QUESTIONS FROM THE
INITIALIZATION SECTION.

5-NOV-1983 DALE PROCTOR V B.0
ADDED CHANGES TO ALLOW CHECKING THE 11/238 PROCESSOR
PROM. THE PRIMARY CHANGE IS THE PAGE ADDRESS TABLE
FOR THE ADDRESSING THE PROM. THE CODE NOW RESTRICTS
PROM CHECKING TO 512 WORDS.

MAY 1982 DALE PROCTOR INITIAL RELEASE

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1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

THIS DIAGNOSTIC IS TO CHECK A CHECK SUM IN MEMORY, USUALLY A ROM OR PROM. IT READS THE MEMORY AND CALCULATES A CHECK SUM VALUE. IT THEN CHECKS THE LAST ADDRESS SPECIFIED AND COMPARES IT WITH THE CALCULATED CHECK SUM. ERROR CHECKING IS ALSO DONE FOR NON-EXISTANT MEMORY.

THIS DIAGNOSTIC HAS BEEN WRITTEN FOR USE WITH THE DIAGNOSTIC RUNTIME SERVICES SOFTWARE (SUPERVISOR). THESE SERVICES PROVIDE THE INTERFACE TO THE OPERATOR AND TO THE SOFTWARE ENVIRONMENT. THIS PROGRAM CAN BE USED WITH XXDP+, ACT, APT, SLIDE AND PAPER TAPE. FOR A COMPLETE DESCRIPTION OF THE RUNTIME SERVICES, REFER TO THE XXDP+ USER'S MANUAL. THERE IS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES IN SECTION 2 OF THIS DOCUMENT.

1.2 SYSTEM REQUIREMENTS

THIS DIAGNOSTIC REQUIRES A MINIMUM OF 16K MEMORY, A CONSOLE TERMINAL, AND SOME LOAD MEDIUM.

1.3 RELATED DOCUMENTS AND STANDARDS

XXDP+ USER'S MANUAL - CHQUS.

1.4 DIAGNOSTIC HIERARCY PREREQUISITES

THE CPU IS ASSUMED TO HAVE BEEN TESTED AND FOUND WORKING.

1.5 ASSUMPTIONS

THE ONLY ASSUMPTION IS THAT A CHECK SUM VALUE IS PROVIDED IN THE LAST ADDRESS OF THE MEMORY UNDER TEST.

2.0 OPERATING INSTRUCTIONS

THIS SECTION CONTAINS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES. FOR DETAILED INFORMATION, REFER TO THE XXDP+ USER'S MANUAL (CHQUS).

2.1 COMMANDS

THERE ARE ELEVEN LEGAL COMMANDS FOR THE DIAGNOSTIC RUNTIME SERVICES (SUPERVISOR). THIS SECTION LISTS THE COMMANDS AND GIVES A VERY BRIEF DESCRIPTION OF THEM. THE XXDP+ USER'S MANUAL HAS MORE DETAILS.

COMMAND	EFFECT
-----	-----
START	START THE DIAGNOSTIC FROM AN INITIAL STATE
RESTART	START THE DIAGNOSTIC WITHOUT INITIALIZING
CONTINUE	CONTINUE AT TEST THAT WAS INTERRUPTED (AFTER ↑C)
PROCEED	CONTINUE FROM AN ERROR HALT
EXIT	RETURN TO XXDP+ MONITOR (XXDP+ OPERATION ONLY!)
ADD	ACTIVATE A UNIT FOR TESTING (ALL UNITS ARE

DROP	CONSIDERED TO BE ACTIVE AT START TIME
PRINT	DEACTIVATE A UNIT
	PRINT STATISTICAL INFORMATION (IF IMPLEMENTED
	BY THE DIAGNOSTIC - SECTION 4.0)
DISPLAY	TYPE A LIST OF ALL DEVICE INFORMATION
FLAGS	TYPE THE STATE OF ALL FLAGS (SEE SECTION 2.3)
ZFLAGS	CLEAR ALL FLAGS (SEE SECTION 2.3)

A COMMAND CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. SO YOU MAY, FOR EXAMPLE, TYPE "STA" INSTEAD OF "START".

2.2 SWITCHES

THERE ARE SEVERAL SWITCHES WHICH ARE USED TO MODIFY SUPERVISOR OPERATION. THESE SWITCHES ARE APPENDED TO THE LEGAL COMMANDS. ALL OF THE LEGAL SWITCHES ARE TABULATED BELOW WITH A BRIEF DESCRIPTION OF EACH. IN THE DESCRIPTIONS BELOW, A DECIMAL NUMBER IS DESIGNATED BY "DDDDD".

SWITCH	EFFECT
/TESTS:LIST	EXECUTE ONLY THOSE TESTS SPECIFIED IN THE LIST. LIST IS A STRING OF TEST NUMBERS, FOR EXAMPLE - /TESTS:1:5:7-10. THIS LIST WILL CAUSE TESTS 1,5,7,8,9,10 TO BE RUN. ALL OTHER TESTS WILL NOT BE RUN.
/PASS:DDDDD	EXECUTE DDDDD PASSES (DDDDD = 1 TO 64000)
/FLAGS:FLGS	SET SPECIFIED FLAGS. FLAGS ARE DESCRIBED IN SECTION 2.3.
/EOP:DDDDD	REPORT END OF PASS MESSAGE AFTER EVERY DDDDD PASSES ONLY. (DDDDD = 1 TO 64000)
/UNITS:LIST	TEST/ADD/DROP ONLY THOSE UNITS SPECIFIED IN THE LIST. LIST EXAMPLE - /UNITS:0:5:10-12 USE UNITS 0,5,10,11,12 (UNIT NUMBERS = 0-63)

EXAMPLE OF SWITCH USAGE:

START/TESTS:1-5/PASS:1000/EOP:100

THE EFFECT OF THIS COMMAND WILL BE: 1) TESTS 1 THROUGH 5 WILL BE EXECUTED, 2) ALL UNITS WILL TESTED 1000 TIMES AND 3) THE END OF PASS MESSAGES WILL BE PRINTED AFTER EACH 100 PASSES ONLY. A SWITCH CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. YOU MAY, FOR EXAMPLE, TYPE "/TES:1-5" INSTEAD OF "/TESTS:1-5".

BELOW IS A TABLE THAT SPECIFIES WHICH SWITCHES CAN BE USED BY EACH COMMAND.

	TESTS	PASS	FLAGS	EOP	UNITS
START	X	X	X	X	X
RESTART	X	X	X	X	X
CONTINUE		X	X	X	
PROCEED			X		
DROP					X
ADD					X
PRINT					
DISPLAY					X

FLAGS
ZFLAGS
EXIT

2.3 FLAGS

FLAGS ARE USED TO SET UP CERTAIN OPERATIONAL PARAMETERS SUCH AS LOOPING ON ERROR. ALL FLAGS ARE CLEARED AT STARTUP AND REMAIN CLEARED UNTIL EXPLICITLY SET USING THE FLAGS SWITCH. FLAGS ARE ALSO CLEARED AFTER A START COMMAND UNLESS SET USING THE FLAG SWITCH. THE ZFLAGS COMMAND MAY ALSO BE USED TO CLEAR ALL FLAGS. WITH THE EXCEPTION OF THE START AND ZFLAGS COMMANDS, NO COMMANDS AFFECT THE STATE OF THE FLAGS; THEY REMAIN SET OR CLEARED AS SPECIFIED BY THE LAST FLAG SWITCH.

FLAG	EFFECT
----	-----
HOE	HALT ON ERROR - CONTROL IS RETURNED TO RUNTIME SERVICES COMMAND MODE
LOE	LOOP ON ERROR
IER*	INHIBIT ALL ERROR REPORTS
IBE*	INHIBIT ALL ERROR REPORTS EXCEPT FIRST LEVEL (FIRST LEVEL CONTAINS ERROR TYPE, NUMBER, PC, TEST AND UNIT)
IXE*	INHIBIT EXTENDED ERROR REPORTS (THOSE CALLED BY PRINTX MACRO'S)
PRI	DIRECT MESSAGES TO LINE PRINTER
PNT	PRINT TEST NUMBER AS TEST EXECUTES
BOE	"BELL" ON ERROR
UAM	UNATTENDED MODE (NO MANUAL INTERVENTION)
ISR	INHIBIT STATISTICAL REPORTS (DOES NOT APPLY TO DIAGNOSTICS WHICH DO NOT SUPPORT STATISTICAL REPORTING)
IDR	INHIBIT PROGRAM DROPPING OF UNITS
ADR	EXECUTE AUTODROP CODE
LOT	LOOP ON TEST
EVL	EXECUTE EVALUATION (ON DIAGNOSTICS WHICH HAVE EVALUATION SUPPORT)

*ERROR MESSAGES ARE DESCRIBED IN SECTION 3.1

SEE THE XXDP* USER'S MANUAL FOR MORE DETAILS ON FLAGS. YOU MAY SPECIFY MORE THAN ONE FLAG WITH THE FLAG SWITCH. FOR EXAMPLE, TO CAUSE THE PROGRAM TO LOOP ON ERROR, INHIBIT ERROR REPORTS AND TYPE A "BELL" ON ERROR, YOU MAY USE THE FOLLOWING STRING:

```
/FLAGS:LOE:IER:BOE
```

2.4 HARDWARE QUESTIONS

WHEN A DIAGNOSTIC IS STARTED, THE RUNTIME SERVICES WILL PROMPT THE USER FOR HARDWARE INFORMATION BY TYPING "CHANGE HW (L)?"

YOU MUST ANSWER "Y" AFTER A START COMMAND UNLESS THE HARDWARE INFORMATION HAS BEEN "PRELOADED" USING THE SETUP UTILITY (SEE CHAPTER 6 OF THE XXDP+ USER'S MANUAL). WHEN YOU ANSWER THIS QUESTION WITH A "Y", THE RUNTIME SERVICES WILL ASK FOR THE NUMBER OF UNITS (IN DECIMAL). YOU WILL THEN BE ASKED THE FOLLOWING QUESTIONS FOR EACH UNIT.

THERE ARE TWO HARDWARE QUESTIONS.

- 1) STARTING ADDRESS TO CHECK
- 2) NUMBER OF WORDS OF MEMORY TO CHECK.

THERE ARE NO DEFAULTS

2.5 SOFTWARE QUESTIONS

THERE ARE NO SOFTWARE QUESTIONS.

2.6 EXTENDED P-TABLE DIALOGUE

WHEN YOU ANSWER THE HARDWARE QUESTIONS, YOU ARE BUILDING ENTRIES IN A TABLE THAT DESCRIBES THE DEVICES UNDER TEST. THE SIMPLEST WAY TO BUILD THIS TABLE IS TO ANSWER ALL QUESTIONS FOR EACH UNIT TO BE TESTED. IF YOU HAVE A MULTIPLEXED DEVICE SUCH AS A MASS STORAGE CONTROLLER WITH SEVERAL DRIVES OR A COMMUNICATION DEVICE WITH SEVERAL LINES, THIS BECOMES TEDIOUS SINCE MOST OF THE ANSWERS ARE REPETITIOUS.

TO ILLUSTRATE A MORE EFFICIENT METHOD, SUPPOSE YOU ARE TESTING A FICTIONAL DEVICE, THE XY11. SUPPOSE THIS DEVICE CONSISTS OF A CONTROL MODULE WITH EIGHT UNITS (SUB-DEVICES) ATTACHED TO IT. THESE UNITS ARE DESCRIBED BY THE OCTAL NUMBERS 0 THROUGH 7. THERE IS ONE HARDWARE PARAMETER THAT CAN VARY AMONG UNITS CALLED THE Q-FACTOR. THIS Q-FACTOR MAY BE 0 OR 1. BELOW IS A SIMPLE WAY TO BUILD A TABLE FOR ONE XY11 WITH EIGHT UNITS.

◆ UNITS (0) ? 8<CR>

UNIT 1
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 0<CR>
Q-FACTOR (0) 0 ? 1<CR>

UNIT 2
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 1<CR>
Q-FACTOR (0) 1 ? 0<CR>

UNIT 3
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 2<CR>
Q-FACTOR (0) 0 ? <CR>

UNIT 4
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 3<CR>
Q-FACTOR (0) 0 ? <CR>


```
UNIT 5
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 4<CR>
Q-FACTOR (0) 0 ? <CR>
```

```
UNIT 6
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 5<CR>
Q-FACTOR (0) 0 ? <CR>
```

```
UNIT 7
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 6<CR>
Q-FACTOR (0) 0 ? 1<CR>
```

```
UNIT 8
CSR ADDRESS (0) 160000<CR>
SUB-DEVICE # (0) ? 7<CR>
Q-FACTOR (0) 1 ? <CR>
```

NOTICE THAT THE DEFAULT VALUE FOR THE Q-FACTOR CHANGES WHEN A NON-DEFAULT RESPONSE IS GIVEN. BE CAREFUL WHEN SPECIFYING MULTIPLE UNITS!

AS YOU CAN SEE FROM THE ABOVE EXAMPLE, THE HARDWARE PARAMETERS DO NOT VARY SIGNIFICANTLY FROM UNIT TO UNIT. THE PROCEDURE SHOWN IS NOT VERY EFFICIENT.

THE RUNTIME SERVICES CAN TAKE MULTIPLE UNIT SPECIFICATIONS HOWEVER. LET'S BUILD THE SAME TABLE USING THE MULTIPLE SPECIFICATION FEATURE.

```
* UNITS (0) ? 8<CR>
```

```
UNIT 1
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 0,1<CR>
Q-FACTOR (0) 0 ? 1,0<CR>
```

```
UNIT 3
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 2-5<CR>
Q-FACTOR (0) 0 ? 0<CR>
```

```
UNIT 7
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 6,7<CR>
Q-FACTOR (0) 0 ? 1<CR>
```

AS YOU CAN SEE IN THE ABOVE DIALOGUE, THE RUNTIME SERVICES WILL BUILD AS MANY ENTRIES AS IT CAN WITH THE INFORMATION GIVEN IN ANY ONE PASS THROUGH THE QUESTIONS. IN THE FIRST PASS, TWO ENTRIES ARE BUILT SINCE TWO SUB-DEVICES AND Q-FACTORS WERE SPECIFIED. THE SERVICES ASSUME THAT THE CSR ADDRESS IS 160000 FOR BOTH SINCE IT WAS SPECIFIED ONLY ONCE. IN THE SECOND PASS, FOUR ENTRIES WERE BUILT. THIS IS BECAUSE FOUR SUB-DEVICES WERE SPECIFIED. THE

"-" CONSTRUCT TELLS THE RUNTIME SERVICES TO INCREMENT THE DATA FROM THE FIRST NUMBER TO THE SECOND. IN THIS CASE, SUB-DEVICES 2, 3, 4 AND 5 WERE SPECIFIED. (IF THE SUB-DEVICE WERE SPECIFIED BY ADDRESSES, THE INCREMENT WOULD BE BY 2 SINCE ADDRESSES MUST BE ON AN EVEN BOUNDARY.) THE CSR ADDRESSES AND Q-FACTORS FOR THE FOUR ENTRIES ARE ASSUMED TO BE 160000 AND 0 RESPECTIVELY SINCE THEY WERE ONLY SPECIFIED ONCE. THE LAST TWO UNITS ARE SPECIFIED IN THE THIRD PASS.

THE WHOLE PROCESS COULD HAVE BEEN ACCOMPLISHED IN ONE PASS AS SHOWN BELOW.

```

# UNITS (D) ? 8<CR>

UNIT 1
CSR ADDRESS (0) ? 160000<CR>
SUB-DEVICE # (0) ? 0-7<CR>
Q-FACTOR (0) 0 ? 0.1,0,...,1,1<CR>

```

AS YOU CAN SEE FROM THIS EXAMPLE, NULL REPLIES (COMMAS ENCLOSING A NULL FIELD) TELL THE RUNTIME SERVICES TO REPEAT THE LAST REPLY.

2.7 QUICK START-UP PROCEDURE (XXDP+)

TO START-UP THIS PROGRAM:

1. BOOT XXDP+
2. GIVE THE DATE AND ANSWER THE LSI AND 50HZ (IF THERE IS A CLOCK) QUESTIONS
3. TYPE "R NAME", WHERE NAME IS THE NAME OF THE BIN OR BIC FILE FOR THIS PROGRAM
4. TYPE "START"
5. ANSWER THE "CHANGE HW" QUESTION WITH "Y"
6. ANSWER ALL THE HARDWARE QUESTIONS
7. ANSWER THE "CHANGE SW" QUESTION WITH "N"

WHEN YOU FOLLOW THIS PROCEDURE YOU WILL BE USING ONLY THE DEFAULTS FOR FLAGS AND SOFTWARE PARAMETERS. THESE DEFAULTS ARE DESCRIBED IN SECTIONS 2.3 AND 2.5.

3.0 ERROR INFORMATION

3.1 TYPES OF ERROR MESSAGES

THERE ARE THREE LEVELS OF ERROR MESSAGES THAT MAY BE ISSUED BY A DIAGNOSTIC: GENERAL, BASIC AND EXTENDED. GENERAL ERROR MESSAGES ARE ALWAYS PRINTED UNLESS THE "IER" FLAG IS SET (SECTION 2.3). THE GENERAL ERROR MESSAGE IS OF THE FORM:

```

NAME TYPE NUMBER ON UNIT NUMBER TST NUMBER PC:XXXXXX
ERROR MESSAGE

```

.WHERE; NAME = DIAGNOSTIC NAME
TYPE = ERROR TYPE (SYS FATAL, DEV FATAL, HARD OR SOFT)
NUMBER = ERROR NUMBER
UNIT NUMBER = 0 - N (N IS LAST UNIT IN PTABLE)
TST NUMBER = TEST AND SUBTEST WHERE ERROR OCCURRED
PC:XXXXXX = ADDRESS OF ERROR MESSAGE CALL

BASIC ERROR MESSAGES ARE MESSAGES THAT CONTAIN SOME ADDITIONAL INFORMATION ABOUT THE ERROR. THESE ARE ALWAYS PRINTED UNLESS THE "IER" OR "IBE" FLAGS ARE SET (SECTION 2.3). THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL MESSAGE.

EXTENDED ERROR MESSAGES CONTAIN SUPPLEMENTARY ERROR INFORMATION SUCH AS REGISTER CONTENTS OR GOOD/BAD DATA. THESE ARE ALWAYS PRINTED UNLESS THE "IER", "IBE" OR "IXE" FLAGS ARE SET (SECTION 2.3). THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL ERROR MESSAGE AND ANY ASSOCIATED BASIC ERROR MESSAGES.

3.2 SPECIFIC ERROR MESSAGES

THERE ARE TWO ERROR MESSAGES PROVIDED. ONE IS THE RESULT OF THE CHECK SUM IF FOUND IN ERROR, AND THE SECOND IS FOR ANY NON-EXISTANT MEMORY ERRORS.

4.0 PERFORMANCE AND PROGRESS REPORTS

AT THE END OF EACH PASS, THE PASS COUNT IS GIVEN ALONG WITH THE TOTAL NUMBER OF ERRORS REPORTED SINCE THE DIAGNOSTIC WAS STARTED. THE "EOP" SWITCH CAN BE USED TO CONTROL HOW OFTEN THE END OF PASS MESSAGE IS PRINTED. SECTION 2.2 DESCRIBES SWITCHES.

5.0 DEVICE INFORMATION TABLES

6.0 TEST SUMMARIES

```

11          .TITLE PROGRAM HEADER AND TABLES
12          .SBTTL PROGRAM HEADER
38
40 000000          .ENABL ABS,AMA
41          002000          .          "          2000
43
44 002000          BGNMOD
45
46          ;**
47          ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
48          ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
49          ;--
50
51 002000          POINTER NONE
52
69
70 002000          HEADER CZFPD,A,0,1,0
          002000          L$NAME::          ;DIAGNOSTIC NAME
          002000          103          .ASCII /C/
          002001          132          .ASCII /Z/
          002002          106          .ASCII /F/
          002003          120          .ASCII /P/
          002004          104          .ASCII /D/
          002005          000          .BYTE 0
          002006          000          .BYTE 0
          002007          000          .BYTE 0
          002010          L$REV::          ;REVISION LEVEL
          002010          101          .ASCII /A/
          002011          L$DEPO::          ;0
          002011          060          .ASCII /O/
          002012          L$UNIT::          ;NUMBER OF UNITS
          002012          000000          .WORD 0
          002014          L$TIML::          ;LONGEST TEST TIME
          002014          000001          .WORD 1
          002016          L$HPCP::          ;POINTER TO H.W. QUES.
          002016          003456          .WORD L$HARD
          002020          L$SPCP::          ;POINTER TO S.W. QUES.
          002020          000000          .WORD 0
          002022          L$HPTP::          ;PTR. TO DEF. H.W. PTABLE
          002022          002130          .WORD L$HW
          002024          L$SPTP::          ;PTR. TO S.W. PTABLE
          002024          000000          .WORD 0
          002026          L$LADP::          ;DIAG. END ADDRESS
          002026          003644          .WORD L$LAST
          002030          L$STA::          ;RESERVED FOR APT STATS
          002030          000000          .WORD 0
          002032          L$CO::          .WORD 0
          002032          000000          .WORD 0
          002034          L$DTYP::          ;DIAGNOSTIC TYPE
          002034          000000          .WORD 0
          002036          L$APT::          ;APT EXPANSION
          002036          000000          .WORD 0
          002040          L$DTP::          ;PTR. TO DISPATCH TABLE
          002040          002124          .WORD L$DISPATCH
          002042          L$PRIO::          ;DIAGNOSTIC RUN PRIORITY
          002042          000000          .WORD 0
          002044          L$ENVI::          ;FLAGS DESCRIBE HOW IT WAS SETUP

```

PROGRAM HEADER

002044 000000
002046 000000
002050 003
002051 003
002052 000000
002054 000000
002056 000000
002060 002162
002062 000000
002064 000000
002066 000000
002070 000000
002072 000000
002074 000000
002076 002170
002100 104035
002102 000000
002104 003116
002106 003246
002110 003242
002112 003110
002114 000000
002116 000000
002120 000000

.WORD 0
L\$EXP1:: :EXPANSION WORD
.WORD 0
L\$MREV:: :SVC REV AND EDIT #
.BYTE C\$REVISION
.BYTE C\$EDIT
L\$EF:: :DIAG. EVENT FLAGS
.WORD 0
.WORD 0
L\$SPC:: :
.WORD 0
L\$DEVP:: : POINTER TO DEVICE TYPE LIST
.WORD L\$DVTYP
L\$REPP:: :PTR. TO REPORT CODE
.WORD 0
L\$EXP4:: :
.WORD 0
L\$EXP5:: :
.WORD 0
L\$AUT:: :PTR. TO ADD UNIT CODE
.WORD 0
L\$DUT:: :PTR. TO DROP UNIT CODE
.WORD 0
L\$LUN:: :LUN FOR EXERCISERS TO FILL
.WORD 0
L\$DESP:: : POINTER TO DIAG. DESCRIPTION
.WORD L\$DESC
L\$LOAD:: :GENERATE SPECIAL AUTOLOAD EMT
EMT E\$LOAD
L\$ETP:: : POINTER TO ERR TBL
.WORD 0
L\$ICP:: :PTR. TO INIT CODE
.WORD L\$INIT
L\$CCP:: :PTR. TO CLEAN-UP CODE
.WORD L\$CLEAN
L\$ACP:: :PTR. TO AUTO CODE
.WORD L\$AUTO
L\$PRT:: :PTR. TO PROTECT TABLE
.WORD L\$PROT
L\$TEST:: :TEST NUMBER
.WORD 0
L\$DLY:: :DELAY COUNT
.WORD 0
L\$HIME:: :PTR. TO HIGH MEM
.WORD 0

DISPATCH TABLE

```

83
84
85
86
87
88
89
90 002122
   002122 000001
   002124
   002124 003266
91

```

.SBTTL DISPATCH TABLE

```

; **
; THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
; IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
; --

```

```

DISPATCH 1
.WORD 1
L$DISPATCH::
.WORD T1

```

DEFAULT HARDWARE P TABLE

99
100
101
102
103
104
105
106
107
108
109
110
111
121
122

002126
002126 000002
002130
002130
002130 173000
002132 000400
002134
002134

.SBTTL DEFAULT HARDWARE P-TABLE

; THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
; THE TEST-DEVICE PARAMETERS. THE STRUCTURE OF THIS TABLE
; IS IDENTICAL TO THE STRUCTURE OF THE HARDWARE P-TABLES.
; AND IS USED AS A "TEMPLATE" FOR BUILDING THE P-TABLES.
;--

BGNHW DFPTBL
.WORD L10000 L\$HW/2
L\$HW::
DFPTBL::

.WORD 173000 ;DEFAULT PROM STARTING ADDRESS
.WORD 256. ;DEFAULT # OF WORDS IN ROM
ENDHW
L10000:

C?

124
125
126
127
128
129
130
131
132
133 002134
002134 000000
002136
002136
134
142
143 002136
002136
144
145 002136

```
.SBTTL SOFTWARE P-TABLE  
; **  
; THE SOFTWARE TABLE CONTAINS VARIOUS DATA USED BY THE  
; PROGRAM AS OPERATIONAL PARAMETERS. THESE PARAMETERS ARE  
; SET UP AT ASSEMBLY TIME AND MAY BE VARIED BY THE OPERATOR  
; AT RUN TIME.  
; **  
          BGNSW  SFPTBL  
          .WORD  L10001-L$SW/2  
L$SW::  
SFPTBL::  
  
          ENDSW  
L10001:  
  
          ENDMOD
```


D2

SOFTWARE P TABLE

12
13
41
51
52 002136
53
54
55
56
57
58
59 002136

.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.	; START COMMAND WAS ISSUED
000037	EF.RESTART== 31.	; RESTART COMMAND WAS ISSUED
000036	EF.CONTINUE== 30.	; CONTINUE COMMAND WAS ISSUED
000035	EF.NEW== 29.	; A NEW PASS HAS BEEN STARTED
000034	EF.PWR== 28.	; A POWER-FAIL/POWER-UP OCCURRED

; PRIORITY LEVEL DEFINITIONS

000340	PRI07== 340
000300	PRI06== 300

GLOBAL EQUATES SECTION

```

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      MOE== 100000
;
;MISC EQUATES
;
60          000000      NO      == 0
61          000001      YES     == 1
62
63
64
65
66          ; PDP-11/23. PROCESSOR PAGE CONTROL REGISTER ADDRESS
67
68          177520      CS#PCR  == 177520
69

```


GLOBAL TEXT SECTION

```

91      .SBTTL GLOBAL TEXT SECTION
92
93      ;**
94      ; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
95      ; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
96      ; MORE THAN ONE TEST.
97      ;--
98
99      ;
100     ; NAMES OF DEVICES SUPPORTED BY PROGRAM
101     ;
102     002162      DEVTYP <PROM>
103     002162      L$DVTYP::
104     002162      .ASCIZ /PROM/
105     002165      120      122      117
106     002165      115      000
107
108     .EVEN
109
110     ; TEST DESCRIPTION
111     ;
112     ;
113     ;
114     ;
115     ;
116     ;
117     ;
118     ;
119     ;
120     ;
121     002170      DESCRIPT      <ROM OR PROM CHECKSUM CHECK>
122     002170      L$DESC::
123     002170      122      117      115
124     002173      040      117      122
125     002176      040      120      122
126     002201      117      115      040
127     002204      103      110      105
128     002207      103      113      123
129     002212      125      115      040
130     002215      103      110      105
131     002220      103      113      000
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133     .EVEN
134     .EVEN
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GLOBAL TEXT SECTION

	002312	105	103	113	
	002315	123	125	115	
	002320	040	101	104	
	002323	104	122	105	
	002326	123	123	040	
	002331	045	117	066	
	002334	000			
124	002335	045	116	045	FOR2:: .ASCIZ /UNABLE TO READ ADDRESS #06/
	002340	101	125	116	
	002343	101	102	114	
	002346	105	040	124	
	002351	117	040	122	
	002354	105	101	104	
	002357	040	101	104	
	002362	104	122	105	
	002365	123	123	040	
	002370	045	117	066	
	002373	000			
125					.EVEN
136					
137					
138	002374	111	116	103	MSG1:: .ASCIZ /INCORRECT CHECK SUM VALUE/
	002377	117	122	122	
	002402	105	103	124	
	002405	040	103	110	
	002410	105	103	113	
	002413	040	123	125	
	002416	115	040	126	
	002421	101	114	125	
	002424	105	000		
139	002426	124	122	101	MSG2:: .ASCIZ /TRAP 4 TIME OUT/
	002431	120	040	064	
	002434	040	124	111	
	002437	115	105	040	
	002442	117	125	124	
	002445	000			
140	002446	104	117	040	HELP1:: .ASCIZ /DO YOU WANT THE DIAGNOSTIC SUPERVISOR HELP FILE PRINTED/
	002451	131	117	125	
	002454	040	127	101	
	002457	116	124	040	
	002462	124	110	105	
	002465	040	104	111	
	002470	101	107	116	
	002473	117	123	124	
	002476	111	103	040	
	002501	123	125	120	
	002504	105	122	126	
	002507	111	123	117	
	002512	122	040	110	
	002515	105	114	120	
	002520	040	106	111	
	002523	114	105	040	
	002526	120	122	111	
	002531	116	124	105	
	002534	104	000		
141	002536	104	117	040	HELP2:: .ASCIZ /DO YOU WANT THE PROM DIAGNOSTIC HELP FILE PRINTED/
	002541	131	117	125	

GLOBAL TEXT SECTION

002544	040	127	101
002547	116	124	040
002552	124	110	105
002555	040	120	122
002560	117	115	040
002563	104	111	101
002566	107	116	117
002571	123	124	111
002574	103	040	110
002577	105	114	120
002602	040	106	111
002605	114	105	040
002610	120	122	111
002613	116	124	105
002616	104	000	

142

.EVEN

J2

GLOBAL ERROR REPORT SECTION

151
 152
 153
 154
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 157
 158
 159 002620
 002620
 160 002620
 002620 013746 002136
 002624 013746 002144
 002630 013746 002142
 002634 012746 002224
 002640 012746 000004
 002644 010600
 002646 104414
 002650 062706 000012
 161 002654
 002654
 002654 104423
 162
 163 002656
 002656
 164 002656
 002656 013746 002136
 002662 012746 002335
 002666 012746 000002
 002672 010600
 002674 104414
 002676 062706 000006
 165 002702
 002702
 002702 104423
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```
.SBTTL GLOBAL ERROR REPORT SECTION

; **
; THE GLOBAL ERROR REPORT SECTION CONTAINS MESSAGE PRINTING AREAS
; USED BY MORE THAN TEST TO OUTPUT ADDITIONAL ERROR INFORMATION. PRINTB
; (BASIC) AND PRINTX (EXTENDED) CALLS ARE USED TO CALL PRINT SERVICES.
; --

ERR1:: BGNMSG ERR1
PRINTB #FOR1,VAL,CKSUM,ADD
MOV ADD,-(SP)
MOV CKSUM,-(SP)
MOV VAL,-(SP)
MOV #FOR1,-(SP)
MOV #4,-(SP)
MOV SP,R0
TRAP C#PNTB
ADD #12,SP
ENDMSG
L10002: TRAP C#MSG

ERR2:: BGNMSG ERR2
PRINTB #FOR2,ADD
MOV ADD,-(SP)
MOV #FOR2,-(SP)
MOV #2,-(SP)
MOV SP,R0
TRAP C#PNTB
ADD #6,SP
ENDMSG
L10003: TRAP C#MSG
```

GLOBAL SUBROUTINES SECTION

```

184 .SBTTL GLOBAL SUBROUTINES SECTION
185
186 ;**
187 ; THE GLOBAL SUBROUTINES SECTION CONTAINS THE SUBROUTINES
188 ; THAT ARE USED IN MORE THAN ONE TEST.
189 ;--
190
191 002704 STARS
;*****
192 ;**
193 ; FUNCTIONAL DESCRIPTION:
194 ; SUBROUTINE TO PRINT OUT A TEXT OR HELP FILE
195 ; INPUTS:
196 ; NONE
197 ; OUTPUTS:
198 ; CONTENTS OF EITHER DRS.HLP OR DIAGNOSTIC DEVICE HELP FILE
199 ; PRINTED ON CONSOLE.
200 ; CONTENTS OF R1 AND R2 ARE DESTROYED.
201 ; CALLING SEQUENCE:
202 ; USES MACRO HLPMAC; FORMAT IS HLPMAC 'FILENAME.EXT'
203 ; MACRO IS DEFINED AT END OF SUBROUTINE.
204 ; MACRO USES FORMAT JSR R5,HLP.
205 ;--
206 002704 STARS
;*****
207
208 002704 $HLP:
209 002704 010537 003100 MOV R5,$STORE ;SAVE RETURN ADDRESS
210 002710 OPEN R5 ;OPEN FILE NAME
002710 010500 MOV R5,R0
002712 104434 TRAP C$OPEN
211 ;FIRST PRINT CR/LF
212 002714 012702 000015 MOV #15,R2 ;CARRIAGE RETURN TO R2
213 002720 004537 003002 JSR R5,60$ ;GO PRINT IT
214 002724 012702 000012 MOV #12,R2 ;LINE FEED TO R2
215 002730 004537 003002 JSR R5,60$ ;GO PRINT IT
216 002734 005001 CLR R1 ;CLEAR POSITION COUNTER
217 002736 10$ GETBYTE R2 ;GET BYTE COUNT OF RECORD
002736 104426 TRAP C$GETB
002740 110002 MOVB R0,R2
218 002742 BNCOMPLETE 50$ ;BRANCH IF END OF FILE
002742 103011 BCC 50$
219 002744 022702 000000 CMP #0,R2 ;END OF RECORDS?
220 002750 001406 BEQ 50$ ;BRANCH IF END
221 002752 022702 000011 30$ CMP #11,R2 ;IS IT TAB CHARACTER?
222 002756 001437 BEQ 80$ ;IF YES HANDLE TAB
223 002760 004537 003002 40$ JSR R5,60$ ;GO PRINT IT
224 002764 000764 BR 10$ ;GO PROCESS NEXT CHARACTER
225 ;END OF FILE OR LAST RECORD
226 002766 50$
227 002766 CLOSE ;CLOSE FILE
002766 104435 TRAP C$CLOS
228 002770 013705 003100 MOV $STORE,R5 ;RESTORE RETURN ADDRESS
229 002774 062705 000012 ADD #10.,R5 ;SKIP PAST FILE NAME
230 003000 000205 RTS R5
231 ;PRINT AND COUNT ROUTINE
232 003002 010237 003076 60$ MOV R2,$MESLNE ;GET CHARACTER TO PRINT IN R2

```


GLOBAL SUBROUTINES SECTION

```

233 003006          PRINTB  #HLPFOR          ;GO PRINT LINE
      003006 012746 003074      MOV      #HLPFOR, -(SP)
      003012 012746 000001      MOV      #1, -(SP)
      003016 010600          MOV      SP, R0
      003020 104414          TRAP     C#PNTB
      003022 062706 000004      ADD      #4, SP
234 003026 005201          INC      R1          ;INCREMENT POSITION COUNTER
235 003030 022701 000010      CMP      #8, R1          ;IS IT MAXIMUM?
236 003034 001406          BEQ      65$          ;IF MAXIMUM, BRANCH
237 003036 022702 000012      CMP      #12, R2         ;IS IT A LINE FEED?
238 003042 001403          BEQ      65$          ;IF LINE FEED, BRANCH
239 003044 022702 000015      CMP      #15, R2        ;IS IT A CARRIAGE RETURN?
240 003050 001001          BNE      70$          ;IF NOT, BRANCH
241 003052 005001          65$: CLR      R1          ;CLEAR POSITION COUNTER
242 003054 000205          70$: RTS     R5          ;FROM PRINT AND COUNT ROUTINE
243          ;TAB ROUTINE
244 003056          80$:
245 003056 012702 000040      MOV      #40, R2         ;MOVE SPACE CHARACTERS
246 003062 004537 003002      JSR      R5, 60$        ;GO PRINT SPACE
247 003066 005701          TST      R1          ;DONE YET?
248 003070 001372          BNE      80$          ;IF NOT DONE, AGAIN
249 003072 000721          BR      10$          ;RETURN FROM TAB ROUTINE
250
251          ;
252          ;STORAGE, FORMAT AND MESSAGE LINE
253 003074          ;HLPFOR::
254 003074          045      101      .ASCII  /#A/
255 003076          ;MESLNE:
256 003076          000          .BYTE   0          ;RESERVED FOR MESSAGE LINE
257 003077          000          .BYTE   0
258          .EVEN
259 003100 000000          ;STORE: .WORD  0          ;STORES MAIN SUBROUTINE RETURN ADDRESS
260
261          ;
262          ;MACRO TO INTERFACE WITH THIS SUBROUTINE
263          ;
264          .MACRO HLPMAC N
265          .LIST MEB
266          .NCHR  #SYM, N
267          JSR      R5, #HLP          ;JUMP TO SUBROUTINE
268          .ASCII  /N/          ;NAME OF FILE
269          #TEMP = 10. - #SYM
270          .REPT  #TEMP
271          .BYTE   0
272          .ENDR
          .ENDM

```

GLOBAL SUBROUTINES SECTION

274 003102

275

276

277

278

279 003102

280

281 003102

003102

282 003102 005237 002146

283 003106

003106

003106 000002

284

285 003110

286

STARS

::*****

::**

::

INTERRUPT SERVICE ROUTINE

ADDRESS TRAP SERVICE ROUTINE

::

::--

STARS

::*****

BGNSRV TRAP4

TRAP4::

INC TRPFLG

;SET TRAP FLAG

ENDSRV

L10004:

RTI

ENDMOD

GLOBAL SUBROUTINES SECTION

```

12 003110          BGNMOD
13          .TITLE MISCELLANEOUS SECTIONS
14          .SBTTL REPORT CODING SECTION
42
43          .SBTTL PROTECTION TABLE
44
45          ;**
46          ; THIS TABLE IS USED BY THE RUNTIME SERVICES
47          ; TO PROTECT THE LOAD MEDIA.
48          ;--
49
50 003110          BGNPROT
   003110          L$PROT::
51
52 003110 177777          -1          ;OFFSET INTO P-TABLE FOR CSR ADDRESS
53 003112 177777          -1          ;OFFSET INTO P-TABLE FOR MASSBUS ADDRESS
54 003114 177777          -1          ;OFFSET INTO P-TABLE FOR DRIVE NUMBER
55
56 003116          ENDPROT
57

```

INITIALIZE SECTION

```

72          .SBTTL  INITIALIZE SECTION
73
74          ;**
75          ; THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
76          ; AT THE BEGINNING OF EACH PASS.
77          ;
78
79 003116          BGNINIT
003116          L$INIT::
80
81 003116          SETPRI @PRI00          ;INITIALIZE WITH CPI ZERO PRIORITY
003116 012700 000000          MOV @PRI00,RO
003122 104441          TRAP C$SPRI
82 003124          READEF @EF.CONTINUE          ; WAS THERE A CONTINUE COMMAND
003124 012700 000036          MOV @EF.CONTINUE,RO
003130 104447          TRAP C$REFG
83 003132          BCOMPLETE ENDI          ; IF YES, DON'T SET UP NEW P-TABLE
003132 103440          BCS ENDI
84 003134          READEF @EF.NEW          ;NEW PASS OR SUB PASS?
003134 012700 000035          MOV @EF.NEW,RO
003140 104447          TRAP C$REFG
85 003142          BNCOMPLETE NEXT          ; IF NOT NEW PASS, SKIP SETUP
003142 103003          BCC NEXT
86          ;          TST HP1          ; WAS HELP FILE PRINTED
87          ;          BNE 1$          ; BRANCH IF ALREADY PRINTED
88          ;          INC HP1          ; SET HELP FILE QUESTION FLAG
89          ;          GMANIL HELP1,VAL,1,YES          ; ASK IF HELP FILE WANTED
90          ;          CMP @NO,VAL          ; DO WE WANT TO PRINT HELP FILE?
91          ;          BEQ 1$          ; IF NO, BRANCH
92          ;          HLPMAC DRS.HLP          ; PRINT OUT SUPERVISOR HELP FILE
93          ;10:          TST HP2          ; WAS HELP FILE PRINTED
94          ;          BNE SETUP          ; BRANCH IF ALREADY PRINTED
95          ;          INC HP2          ; SET HELP FILE QUESTION FLAG
96          ;20:          GMANIL HELP2,VAL,1,YES          ; ASK IF DIAGNOSTIC HELP FILE WANTED
97          ;          CMP @NO,VAL          ; DO WE WANT TO PRINT HELP FILE
98          ;          BEQ SETUP          ; IF NO, BRANCH
99          ;          HLPMAC Z0794.HLP          ; PRINT OUT DIAGNOSTIC HELP FILE
100 003144 012737 177777 002156          SETUP: MOV @-1,LOGUNIT          ; INITIALIZE LOGICAL UNIT COUNTER
101 003152 005237 002156          NEXT: INC LOGUNIT          ; POINT TO NEXT LOGICAL UNIT
102 003156 023737 002156 002012          CMP LOGUNIT,L$UNIT          ; HAVE WE PASSED MAXIMUM
103 003164 001422          BEQ ABORT          ; GO IF MAXIMUM PASSED
104 003166          GPHARD LOGUNIT,PLOC          ; GET P-TABLE ADDRESS
003166 013700 002156          MOV LOGUNIT,RO
003172 104442          TRAP C$GPHRD
003174 010037 002150          MOV RO,PLOC
105 003200          BNCOMPLETE NEXT          ; IF NOT AVAILABLE, GET NEXT UNIT
003200 103364          BCC NEXT
106 003202 013737 002156 002074          MOV LOGUNIT,L$LUN          ; STORE CURRENT LOGICAL UNIT IN HEADER
107          ;GET ALL HARDWARE TABLE ENTRIES IN STORAGE
108 003210 013700 002150          MOV PLOC,RO          ; PLACE HEADER POINTER IN RO
109 003214 016037 000000 002136          MOV 0(RO),ADD          ; BASE ADDRESS OF PROM
110 003222 016037 000002 002140          MOV 2(RO),WORDS          ; NUMBER OF WORDS IN THE ROM
111 003230 000401          BR ENDI          ; SKIP ABORT INSTRUCTION
112 003232          ABORT: DOCLN          ; DO CLEANUP AND ABORT THE PASS
003232 104444          TRAP C$DCLN
113 003234          ENDI: EXIT INIT          ; THAT'S ALL TO INITIALIZE PASS
003234 104432          TRAP C$EXIT

```

C3

INITIALIZE SECTION

137 003236 000002
138
150
151
152
153 003240
003240
003240 104411

.WORD L10006 .

.EVEN
ENDINIT
L10006: TRAP C3INIT

D3

AUTODROP SECTION

155
 156
 157
 158
 159
 160
 161
 162
 163
 164 003242
 003242
 165
 166 003242 000240
 173
 174 003244
 003244
 003244 104461

```
.SBTTL AUTODROP SECTION
;
; THIS CODE IS EXECUTED IMMEDIATELY AFTER THE INITIALIZE CODE IF
; THE "ADR" FLAG WAS SET. THE UNIT(S) UNDER TEST ARE CHECKED TO
; SEE IF THEY WILL RESPOND. THOSE THAT DON T ARE IMMEDIATELY
; DROPPED FROM TESTING.
;
      BGNAUTO
L$AUTO::
      NOP                ;NO SPECIAL CODE NEEDED
      ENDAUTO
L10007: TRAP C$AUTO
```

CLEANUP CODING SECTION

176
 177
 178
 179
 180
 181
 182
 183 003246
 003246
 184
 185 003246
 003246 012700 000004
 003252 104436
 194
 195
 207
 208
 209 003254
 003254
 003254 104412

```
.SBTTL  CLEANUP CODING SECTION
;***
; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
; AFTER THE HARDWARE TESTS HAVE BEEN PERFORMED.
;---
          BGNCLN
L$CLEAN::
          CLRVEC  #4           ;RESTORE TRAP VECTOR
          MOV     #4,R0
          TRAP   C$CVEC

          ENDCLN
L10010:  TRAP   C$CLEAN
```

DROP UNIT SECTION

```

211          .SBTTL  DROP UNIT SECTION
212
213          ;**
214          ; THE DROP UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
215          ; TO NO LONGER BE TESTED.
216          ;--
217
218 003256          BGNDU
003256          L#DU::
219
220 003256 000240          NOP          ;NO SPECIAL CODE NEEDED
229
230
242
243
244 003260          ENDDU
003260          L10011:
003260 104453          TRAP  C#DU

```


ADD UNIT SECTION

```

246          .SBTTL  ADD UNIT SECTION
247
248          ;**
249          ; THE ADD-UNIT SECTION CONTAINS ANY CODE THE PROGRAMMER WISHES
250          ; TO BE EXECUTED IN CONJUNCTION WITH THE ADDING OF A UNIT BACK
251          ; TO THE TEST CYCLE.
252          ;--
253
254 003262          BGNAU
003262          L$AU::
255
256 003262 000240          NOP                      ;NO SPECIAL CODE NEEDED
265
266
278
279
280 003264          ENDAU
003264          L10012:
003264 104452          TRAP      C$AU
281
282 003266          ENDMOD
283

```

H3

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SEQ 0033

ADD UNIT SECTION

1
2
13
49
50 003266

.TITLE HARDWARE TESTS
.ENABL AMA

BGNMOD

TEST 1:

```

52          .SBTTL TEST 1:
53 003266   STARS
           ;*****
54          ;**
55          ;TEST DESCRIPTION
56          ; DOES A CHECKSUM CHECK ON A PROM
57          ; EXPECTS A CHECK SUM VALUE TO BE IN THE LAST ADDRESS OF THE PROM
58          ;TEST STEPS
59          ; SET UP FOR BAD ADDRESS TRAP, ABORT IF BAD ADDRESS OCCURS
60          ; READ THE PROM FROM STARTING ADDRESS EXCEPT LAST ADDRESS
61          ; SUM EACH PROM VALUE TO PREVIOUS TOTAL FOR CALCULATING CHECK SUM
62          ; COMPARE CHECK SUM VALUE WITH CONTENTS OF LAST ADDRESS
63          ;--
64 003266   STARS
           ;*****
65
66 003266   BGNTST
           T1::
           SETVEC  #4,#TRAP4,#PRI07      ; SET FOR BAD ADDRESS TRAP
           MOV     #PRI07,-(SP)
           MOV     #TRAP4,-(SP)
           MOV     #4,-(SP)
           MOV     #3,-(SP)
           TRAP   C#SVEC
           ADD     #10,SP
68          ;
69          ; FIRST SET UP PROM MAPPING.
70          ; IF ITS A 11/23A WE PROBABLY WILL GET A BAD ADDRESS
71          ; TRAP AND IGNORE IT.
72          ;
73 003314   005037   002146
74 003320   012737   000400   177520
75 003326   013737   002146   002160
           CLR     TRPFLG                ; CLEAR TRAP INDICATOR
           MOV     #400,#CS#PCR          ; MAP TO PROM PAGES 0 AND 1
           MOV     TRPFLG,CPUTYP        ; STORE RESULT OF BAD ADDRESS TRAP
76          ;
77          ; 0 = LSI 11/23B
78          ; 1 = LSI 11/23A
79          ;
80          ; SET UP TO READ PROM
81          ;
82          MOV     ADD,R1                ; GET STARTING ADDRESS IN R1
83          MOV     WORDS,R2             ; NUMBER OF WORDS TO CHECK IN R2
84          DEC     R2                   ; SKIP LAST ROM ADDRESS
85          CLR     R3                   ; CLEAR R3 AS ACCUMULATOR
86          CLR     TRPFLG               ; CLEAR TRAP INDICATOR
87          LOOP:  MOV     (R1)+,R4       ; READ PROM
88          TST     TRPFLG               ; DID INTERRUPT OCCUR?
89          BNE     BADADD                ; IF YES, BRANCH
90          ADD     R4,R3                 ; ADD VALUE TO ACCUMULATOR
91          DEC     R2                     ; SUBTRACT COUNTER
92          BNE     LOOP                  ; IF NOT DONE, LOOP
93          ;
94          ; NOW READ CHECK SUM VALUE
95          ;
96 003372   011137   002144
97 003376   010337   002142
98 003402   023737   002144   002142
           MOV     (R1),CKSUM            ; MOVE ACCUMULATED CHECK SUM TO VAL
           MOV     R3,VAL                 ; ARE THEY THE SAME?
           CMP     CKSUM,VAL
           BEQ     END                     ; IF YES, END TEST
99 003410   001420

```

TEST 1:

```

100
101
102
103 003412 010137 002136
104 003416
    003416 104456
    003420 000001
    003422 002374
    003424 002620
105 003426
    003426 104432
    003430 000022
106
107
108
109 003432
110 003432 162701 000002
111 003436 010137 002136
112 003442
    003442 104455
    003444 000002
    003446 002426
    003450 002656
113 003452
    003452
    003452 104401
114
115 003454
116

```

```

;
; ERROR, CKSUM IS NOT RIGHT
;
MOV R1,ADD ; ADDRESS OF CHECK SUM IN ADD
ERRHRD 1,MSG1,ERR1 ; TELL OPERATOR ERROR
TRAP C#ERRHRD
.WORD 1
.WORD MSG1
.WORD ERR1
EXIT TST ; END OF TEST
TRAP C#EXIT
.WORD L10013-.

;
; ERROR, NON EXISTENT MEMORY
;
BADADD:
SUB #2,R1 ; CORRECT ADDRESS
MOV R1,ADD ; PLACE ADDRESS IN MEMORY FOR MESSAGE
ERRDF 2,MSG2,ERR2 ; TELL OPERATOR BAD ADDRESS
TRAP C#ERRDF
.WORD 2
.WORD MSG2
.WORD ERR2
END:
L10013: TRAP C#ETST

ENDMOD

```

TEST 1:

1
12
13
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59

003454
003454 000011
003456
003456 000031
003460 003500
003462 000000
003464 177776
003466
003466 001052
003470 003550
003472 177777
003474 000000
003476 000400
003500
003500
003503
003506
003511
003514
003517
003522
003525
003530
003533
003536
003541
003544
003547
003550
003553
003556
003561
003564
003567
003572
003575
003600
003603

```
.TITLE PARAMETER CODING
.SBTTL  HARDWARE PARAMETER CODING SECTION
      BGNMOD
; **
; 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
      .WORD L10014-L#HARD/2
L#HARD::
      GPRMA  G1,0,0,0,177776,YES      ;BASE ADDRESS
      .WORD  T#CODE
      .WORD  G1
      .WORD  T#LOLIM
      .WORD  T#HILIM
      GPRMD  G2,2,D,-1,0,256.,YES    ;NUMBER OF WORDS
      .WORD  T#CODE
      .WORD  G2
      .WORD  -1
      .WORD  T#LOLIM
      .WORD  T#HILIM
      ENDRD
      .EVEN
L10014:
G1::  .ASCIZ  /WHAT IS THE STARTING ADDRESS OF THE ROM/
G2::  .ASCIZ  /NUMBER OF WORDS IN THE ROM /
```

HARDWARE PARAMETER CODING SECTION

	003606	040	040	040	
	003611	040	040	040	
	003614	040	040	040	
	003617	000			
60					.EVEN
61					
68					
69					
70	003620				\$PATCH::
71	003620				.BLKW 10
72					
79					
80	003640				LASTAD
	003640	000000			.EVEN
	003642	000000			.WORD 0
	003644				.WORD 0
81	003644				L\$LAST::
					ENDMOD

M3

PARAMETER CODING MACRO M1200 09-JAN-84 12:23 PAGE 30

SEQ 0038

HARDWARE PARAMETER CODING SECTION

83
84
97

000001

.END

SYMBOL TABLE

ABORT	003232	C#ESEG=	000005	F#MOD	=	000000	I#SRV	=	000041	L#TIML	002014	G	
ADD	002136	C#ESUB=	000003	F#MSG	=	000011	I#SUB	=	000041	L#UNIT	002012	G	
ADR	=	000020	C#ETST=	000001	F#PROT=	000021	I#TST	=	000041	L10000	002134		
ASSEMB=	000010	C#EXIT=	000032	F#PWR	=	000017	J#JMP	=	000167	L10001	002136		
BADADD	003432	C#GETB=	000026	F#RPT	=	000012	LOE	=	040000	L10002	002654	G	
BIT0	=	000001	C#GETW=	000027	F#SEG	=	000003	LOGUNI	002156	L10003	002702	G	
BIT00	=	000001	C#GMAN=	000043	F#SOFT=	000005	LOOP	003354	L10004	003106			
BIT01	=	000002	C#GPHR=	000042	F#SRV	=	000010	LOT	=	000010	003240	G	
BIT02	=	000004	C#GPLO=	000030	F#SUB	=	000002	L#ACP	002110	L10007	003244	G	
BIT03	=	000010	C#GPRI=	000040	F#SW	=	000014	L#APT	002036	L10010	003254	G	
BIT04	=	000020	C#INIT=	000011	F#TEST=	000001	L#AU	003262	L10011	003260			
BIT05	=	000040	C#INLP=	000020	G#CNT0=	000200	L#AUT	002070	L10012	003264			
BIT06	=	000100	C#MANI=	000050	G#DELM=	000372	L#AUTO	003242	L10013	003452			
BIT07	=	000200	C#MEM	=	000031	G#DISP=	000003	L#CCP	002106	L10014	003500		
BIT08	=	000400	C#MSG	=	000023	G#EXCP=	000400	L#CLEA	003246	MSG1	002374	G	
BIT09	=	001000	C#OPEN=	000034	G#HILI=	000002	L#CO	002032	MSG2	002426	G		
BIT1	=	000002	C#PNTB=	000014	G#LOLI=	000001	L#DEPO	002011	NEXT	003152			
BIT10	=	002000	C#PNTF=	000017	G#NO	=	000000	L#DESC	002170	NO	=	000000	G
BIT11	=	004000	C#PNTS=	000016	G#OFFS=	000400	L#DESP	002076	ONEFIL=	000001			
BIT12	=	010000	C#PNTX=	000015	G#OFFSI=	000376	L#DEVP	002060	O#APTS=	000000			
BIT13	=	020000	C#QIO	=	000377	G#PRMA=	000001	L#DISP	002124	O#AU	=	000000	
BIT14	=	040000	C#RDBU=	000007	G#PRMD=	000002	L#DLY	002116	O#BGNR=	000000			
BIT15	=	100000	C#REFG=	000047	G#PRML=	000000	L#DTP	002040	O#BGNS=	000000			
BIT2	=	000004	C#RESE=	000033	G#RADA=	000140	L#DTP	002034	O#DU	=	000000		
BIT3	=	000010	C#REVI=	000003	G#RADB=	000000	L#DUT	003256	O#ERRT=	000000			
BIT4	=	000020	C#RFLA=	000021	G#RADD=	000040	L#DUT	002072	O#GNSW=	000000			
BIT5	=	000040	C#RPT	=	000025	G#RADL=	000120	L#DVTY	002162	O#POIN=	000001		
BIT6	=	000100	C#SEFG=	000046	G#RADO=	000020	L#EF	002052	O#SETU=	000000			
BIT7	=	000200	C#SPRI=	000041	G#XFER=	000004	L#ENVI	002044	PLOC	002150	G		
BIT8	=	000400	C#SVEC=	000037	G#YES	=	000010	L#ETP	002102	PNT	=	001000	G
BIT9	=	001000	C#TPRI=	000013	G1	003500	G	L#EXP1	002046	PRI	=	002000	G
BOE	=	000400	DFPTBL	002130	G2	003550	G	L#EXP4	002064	PRI00	=	000000	G
CKSUM	002144	DIAGMC=	000000	HELP	=	000000	L#EXP5	002066	PRI01	=	000040	G	
CPUTYP	002160	EF.CON=	000036	HELP1	002446	G	L#HARD	003456	PRI02	=	000100	G	
CS#PCR=	177520	EF.NEW=	000035	HELP2	002536	G	L#HIME	002120	PRI03	=	000140	G	
C#AU	=	000052	EF.PWR=	000034	HOE	=	100000	L#HPCP	002016	PRI04	=	000200	G
C#AUTO=	000061	EF.RES=	000037	HP1	002152	G	L#HPTP	002022	PRI05	=	000240	G	
C#BRK	=	000022	EF.STA=	000040	HP2	002154	G	L#HW	002130	PRI06	=	000300	G
C#BSEG=	000004	END	003452	IBE	=	010000	G	L#ICP	002104	PRI07	=	000340	G
C#BSUB=	000002	ENDI	003234	IDU	=	000040	G	L#INIT	003116	SETUP	003144		
C#CEFG=	000045	ERR1	002620	IER	=	020000	G	L#LADP	002026	SFPTBL	002136	G	
C#CLCK=	000062	ERR2	002656	ISR	=	000100	G	L#LAST	003644	SVCGBL=	000000		
C#CLEA=	000012	EVL	=	IXE	=	004000	G	L#LOAD	002100	SVCINS=	000000		
C#CLOS=	000035	E#END	=	I#AU	=	000041		L#LUN	002074	SVCSUB=	000000		
C#CLP1=	000006	E#LOAD=	000035	I#AUTO=	000041		L#MREV	002050	SVCTAG=	000000			
C#CVEC=	000036	FOR1	002224	I#CLN	=	000041	L#NAME	002000	SVCTST=	000000			
C#DCLN=	000044	FOR2	002335	I#DU	=	000041	L#PRIO	002042	S#LSYM=	010000			
C#DODU=	000051	F#AU	=	I#HRD	=	000041	L#PROT	003110	TRAP4	003102	G		
C#DRPT=	000024	F#AUTO=	000020	I#INIT=	000041		L#PRT	002112	TRPFLG	002146	G		
C#DU	=	000053	F#BGN	=	000041		L#REPP	002062	T#ARGC=	000001			
C#EDIT=	000003	F#CLEA=	000007	I#MOD	=	000041	L#REV	002010	T#CODE=	001052			
C#ERDF=	000055	F#DU	=	I#MSG	=	000041	L#SPC	002056	T#ERRN=	000002			
C#ERHR=	000056	F#END	=	I#PROT=	000040		L#SPCP	002020	T#EXCP=	000000			
C#ERRO=	000060	F#HARD=	000004	I#PTAB=	000041		L#SPTP	002024	T#FLAG=	000040			
C#ERSF=	000054	F#HW	=	I#PWR	=	000041	L#STA	002030	T#GMAN=	000000			
C#ERSO=	000057	F#INIT=	000006	I#RPT	=	000041	L#SW	002136	T#HILI=	000400			
C#ESCA=	000010	F#JMP	=	I#SEG	=	000041	L#TEST	002114	T#LAST=	000001			

SYMBOL TABLE

T%LOLI= 000000	T%SUBN= 000000	T%%CLE= 010010	T%%SW = 010001	X%OFFS= 000400
T%LSYM= 010000	T%TAGL= 177777	T%%DU = 010011	T%%YES= 010013	X%TRUE= 000020
T%LTNO= 000001	T%TAGN= 010015	T%%MAR= 010014	T1 = 003266 G	YES = 000001 G
T%NEST= 177777	T%TEMP= 000000	T%%HW = 010000	UAM = 000200 G	%MLP = 002704 G
T%NSO = 000000	T%TEST= 000001	T%%INI= 010006	VAL = 002142 G	%MLPFO 003074 G
T%NS1 = 000004	T%TSTM= 177777	T%%MSG= 010003	WORDS 002140 G	%MESLN 003076
T%PTNU= 000000	T%TSTS= 000001	T%%PRO= 010005	X%ALWA= 000000	%PATCH 003620 G
T%SAVL= 177777	T%%AU = 010012	T%%SRV= 010004	X%FALS= 000040	%STORE 003100
T%SEGL= 177777	T%%AUT= 010007			

. ABS. 003644 000
 000000 001

ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 28504 WORDS (112 PAGES)

DYNAMIC MEMORY: 20060 WORDS (77 PAGES)

ELAPSED TIME: 00:01:36

ZFPDA0.BIC,CZFPDA0/ SP=SVC/ML,ZFPDA01,ZFPDA02,ZFPDA03,ZFPDA04,ZFPDA05,ZFPDA06