

FEPOM

CHECK UTILITY
CZFPCAO

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AH-T863A-MC
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The left side of the page contains a grid of 20 small, illegible data tables or charts arranged in 5 rows and 4 columns. Each table appears to contain various data points, possibly related to system performance or utility metrics, but the text is too small to read. The tables are organized in a structured layout, with some containing what looks like bar charts or graphs.

.REM 6

IDENTIFICATION

PRODUCT CODE: AC-T862A-MC
PRODUCT NAME: CZFPCAO CHECK UTILITY
PRODUCT DATE: NOVEMBER 25, 1981
MAINTAINER: CSS GNG DIAGNOSTIC ENGINEERING
AUTHOR: H. PAUL HOLSINGER
MODIFIED: MAY 5, 1982
P-TABLE SETUP CODE ADDED

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

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1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

THIS UTILITY WAS DESIGNED TO TEST ALL UNIBUS AND Q-BUS DEVICES WHICH ARE MAPPED INTO A PDP-11 OR LSI-11 SYSTEM I/O PAGE. THE UTILITY WILL ADDRESS ALL WORD LOCATIONS IN THE PAGE, AND TEST EACH LOCATION FOR A BUS TIME-OUT, WHICH TRAPS THE INSTRUCTION TO THE VECTOR ADDRESS AT LOCATION 4.

THE UTILITY WILL PRINT A MESSAGE IDENTIFYING THE SYSTEM BUS TYPE FOLLOWED BY THE AVAILABLE MEMORY IN WORDS. A SUMMARY IS PRINTED FOR EACH DEVICE PRESENT ON THE BUS. EACH DEVICE LOCATION OR REGION IS LISTED FROM THE START WORD ADDRESS THROUGH THE LAST WORD ADDRESS FOLLOWED BY THE REGION SIZE, IN WORDS.

NOTE THAT TO MAINTAIN PROCESSOR INDEPENDENCE THE UTILITY WILL LIST ONLY THE REGIONS WHICH ARE MAPPED INTO THE THE I/O PAGE, WHICH MAY CONSIST OF ONE OR MORE DEVICE CONTROLLERS MAPPED INTO CONSECUTIVE MEMORY LOCATIONS. IT IS LEFT TO THE USER TO DETERMINE FROM THE SUMMARY GENERATED WHICH DEVICES ARE PRESENT ON THE BUS.

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+ AND PAPERTAPE. 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

ANY PDP-11 OR LSI-11 SYSTEM WITH A CONSOLE DEVICE AND AT LEAST 16K WORDS MEMORY ARE REQUIRED.

1.3 RELATED DOCUMENTS AND STANDARDS

REFER TO THE PERIPHERALS HANDBOOK FOR SPECIFIC DEVICE ASSIGNMENTS.

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

NO ADDITIONAL PREREQUISITES ARE NECESSARY FOR THIS UTILITY.

1.5 ASSUMPTIONS

IT IS ASSUMED THAT THE CPU AND MEMORY ARE FUNCTIONING PROPERLY.

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 CONSIDERED TO BE ACTIVE AT START TIME)
* DROP	DEACTIVATE A UNIT
* PRINT	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".

* THESE COMMANDS ARE NOT IMPLEMENTED IN THIS UTILITY.

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)
•	THESE SWITCHES HAVE NO MEANINGFUL USE WITH THIS UTILITY.

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
-----	-----
MOE	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).

THIS UTILITY REQUIRES THE MINIMUM OF ONE UNIT, AND HAS NO ADDITIONAL HARDWARE TABLE REQUIREMENTS.

2.5 SOFTWARE QUESTIONS

NO SOFTWARE TABLES OR QUESTIONS ARE REQUIRED.

2.6 EXTENDED P-TABLE DIALOGUE

THIS UTILITY HAS NO PTABLE DIALOGUE.

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 THE "# UNITS" QUESTION WITH "1"

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).

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.

THERE ARE NO ERROR MESSAGES GENERATED BY THIS UTILITY.

3.2 SPECIFIC ERROR MESSAGES

ANY ERROR MESSAGES GENERATED ARE PRODUCED BY THE SUPERVISOR, AND INDICATE A SYSTEM CPU OR MEMORY PROBLEM.

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.

NO ADDITIONAL STATISTICS ARE PRODUCED.

5.0 DEVICE INFORMATION TABLES

THE PTABLE ENTRY IS SPECIFIED ONLY TO MEET THE MINIMUM REQUIREMENTS OF THE SUPERVISOR.

6.0 TEST SUMMARIES

REFER TO THE PROGRAM ABSTRACT (SECTION 1.1) FOR TEST DETAILS.


```

10      .TITLE PROGRAM HEADER AND TABLES
11      .SBTTL PROGRAM HEADER
37
39      000000          .ENABL ABS,AMA
40      002000          "          =          2000
42
43      002000          BGNMOD SECT2
002000
44      SECT2::
45
46      ;**
47      ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
48      ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
49      ;--
50
51      POINTER BGNSETUP
52      002000          HEADER CZFPC,A,0,0,1
002000          L$NAME::          ;DIAGNOSTIC NAME
002000          103          .ASCII /C/
002001          132          .ASCII /Z/
002002          106          .ASCII /F/
002003          120          .ASCII /P/
002004          103          .ASCII /C/
002005          000          .BYTE 0
002006          000          .BYTE 0
002007          000          .BYTE 0
002010          L$REV::          ;REVISION LEVEL
002010          101          .ASCII /A/
002011          L$DEPO::          ;0
002011          060          .ASCII /0/
002012          L$UNIT::          ;NUMBER OF UNITS
002012          000001          .WORD T$PTHV
002014          L$TIML::          ;LONGEST TEST TIME
002014          000000          .WORD 0
002016          L$HPCP::          ;POINTER TO H.W. QUES.
002016          004052          .WORD L$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$LADP::          ;DIAG. END ADDRESS
002026          004100          .WORD L$LAST
002030          L$STA::          ;RESERVED FOR APT STATS
002030          000000          .WORD 0
002032          L$CO::          .WORD 0
002032          000000          .WORD 0
002034          L$DTYP::          ;DIAGNOSTIC TYPE
002034          000001          .WORD 1
002036          L$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 002230
002062 000000
002064 000000
002066 000000
002070 000000
002072 000000
002074 000000
002076 002250
002100 104035
002102 000000
002104 002664
002106 003434
002110 003432
002112 002656
002114 000000
002116 000000
002120 000000

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

DISPATCH TABLE

55
56
57
58
59
60
61
62 002122
002122 000001
002124
002124 003456
63

```
.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

65
66
67
68
69
70
71
72
73
74 002126
002126 000001
002130
002130
75
76 002130 000000
77
78 002132
002132

.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 0
ENDHW
L10000:

SOFTWARE P-TABLE

```

80          .SBTTL  SOFTWARE P-TABLE
81
82          ;**
83          ; THE SOFTWARE TABLE CONTAINS VARIOUS DATA USED BY THE
84          ; PROGRAM AS OPERATIONAL PARAMETERS.  THESE PARAMETERS ARE
85          ; SET UP AT ASSEMBLY TIME AND MAY BE VARIED BY THE OPERATOR
86          ; AT RUN TIME.
87          ;--
88
89 002132          BGNSW  SFPTBL
002132          .WORD  L10001-L$SW/2
002134          L$SW::
002134          SFPTBL::
90
91 002134          .WORD
92
93 002136          ENDSW
002136          L10001:
94
95 002136          ENDMOD
96          .SBTTL

```

```

11      .TITLE GLOBAL AREAS
12      .SBTTL GLOBAL EQUATES SECTION
42 002136      BGNMOD SECT3
002136
43      SECT3::
44
45      ;**
46      ; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
47      ; ARE USED IN MORE THAN ONE TEST.
48      ;--
49      177776      PSWADR  ==      177776      ;PROCESSOR STATUS WORD
50      177766      CPUADR  ==      177766      ;CPU ERROR REGISTER
51
52      160000      IOPADR  ==      160000      ;I/O PAGE START ADDRESS
53
54      000020      BUSTMO  ==      000020      ;BUS TIME-OUT MASK
55      000002      OVRFLO  ==      000002      ;OVERFLOW STATUS
56
57 002136      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
          ;
          BIT9== BIT09
          BIT8== BIT08
          BIT7== BIT07
          BIT6== BIT06
          BIT5== BIT05
          BIT4== BIT04
          BIT3== BIT03
          BIT2== BIT02
          BIT1== BIT01
          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
    
```


GLOBAL EQUATES SECTION

```

000034 EF.PWR== 28. ; A POWER-FAIL/POWER-UP OCCURRED
;
; PRIORITY LEVEL DEFINITIONS
;
000340 PRI07== 340
000300 PRI06== 300
000240 PRI05== 240
000200 PRI04== 200
000140 PRI03== 140
000100 PRI02== 100
000040 PRI01== 40
000000 PRI00== 0
;
; 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

```

GLOBAL DATA SECTION

```

59          .SBTTL GLOBAL DATA SECTION
60
61          ;**
62          ; THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
63          ; IN MORE THAN ONE TEST.
64          ;--
65
66 002136 000000 PLOC::          .WORD 0          ;PTR TO CURRENT HARDWARE P-TABLE
67 002140 000000 UNIT::          .WORD 0          ;CURRENT LOGICAL UNIT NUMBER
68 002142 000000 MPTR::          .WORD 0          ;PTR TO FIRST WORD OF FREE MEMORY
69 002144 000000 MSIZ::          .WORD 0          ;SIZE OF SYSTEM MEMORY
70
71 002146 000000 BASADR::          .WORD 0          ;DEVICE BASE ADDRESS
72 002150 000000 LSTADR::          .WORD 0          ;DEVICE LAST ADDRESS
73 002152 000000 COUNTR::          .WORD 0          ;DEVICE LOCATION COUNTER
74 002154 000000 TRPFLG::          .WORD 0          ;ADDRESS TRAP FLAG
75 002156 000000 TABFLG::          .WORD 0          ;TAB ACTIVE FLAG
76 002160 000000 HLPFLG::          .WORD 0          ;HELP FILE FLAG
77
78 002162 000000 REG0::           .WORD 0          ;R0 SAVE AREA
79 002164 000000 REG1::           .WORD 0          ;R1 SAVE AREA
80 002166 000000 REG2::           .WORD 0          ;R2 SAVE AREA
81 002170 000000 REG3::           .WORD 0          ;R3 SAVE AREA
82 002172 000000 REG4::           .WORD 0          ;R4 SAVE AREA
83 002174 000000 REG5::           .WORD 0          ;R5 SAVE AREA
84 002176 000000 REG6::           .WORD 0          ;SP SAVE AREA
85 002200 000000 REG7::           .WORD 0          ;PC SAVE AREA
86
87 002202 000000 HELP1::          .WORD 0          ;FLAG FOR SUPERVISOR HELP INFO
88 002204 000000 HELP2::          .WORD 0          ;FLAG FOR DIAGNOSTIC HELP INFO
89

```

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 002206    104    122    123  HPFIL1::      .ASCIZ  /DRS.HLP/          ;SUPERVISOR HELP FILE
   002211    056    110    114
   002214    120    000
100
101 002216    132    060    067  HPFIL2::      .EVEN
   002221    071    063    056  .ASCIZ  /Z0793.HLP/      ;DIAGNOSTIC HELP FILE
   002224    110    114    120
   002227    000
102
103          .EVEN
104
105          ;
106          ; NAMES OF DEVICES SUPPORTED BY PROGRAM
107          ;
107 002230          DEVTYP  <UNIBUS OR Q-BUS>
   002230          L#DVTYP::
   002230    125    116    111  .ASCIZ  /UNIBUS OR Q-BUS/
   002233    102    125    123
   002236    040    117    122
   002241    040    121    055
   002244    102    125    123
   002247    000
108
109          .EVEN
110
111          ;
112          ; TEST DESCRIPTION
112          ;
112 002250          DESCRIPT  <BUS ADDRESS TEST UTILITY>
   002250          L#DESC::
   002250    102    125    123  .ASCIZ  /BUS ADDRESS TEST UTILITY/
   002253    040    101    104
   002256    104    122    105
   002261    123    123    040
   002264    124    105    123
   002267    124    040    125
   002272    124    111    114
   002275    111    124    131
   002300    000
113
114          .EVEN
115          .EVEN
116
117          ;
118          ; FORMAT STATEMENTS USED IN PRINT CALLS
118          ;

```


GLOBAL ERROR REPORT SECTION

120
 121
 122
 123
 124
 125
 126
 127
 128 002302
 129
 130 002302
 002302 000167
 002304 000000
 131
 132 002306
 002306
 002306 104423

.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.
 ;--

BGNMSG

EXIT MSG
 .WORD J\$JMP
 .WORD L10002-2-.

ENDMSG

L10002:
 TRAP C\$MSG

INTERRUPT SERVICE ROUTINE

```

134          .SBTTL  INTERRUPT SERVICE ROUTINE
135 002310  STARS
136          ;;*****
137          ;;
138          ;;      TRAP4 WILL TRAP ANY BUS TIME-OUTS ON THE UNIBUS AND
139          ;;      INCREMENT TRPFLG, THE GLOBAL TRAP FLAG.
140          ;;
141          ;;      INPUT:          NONE
142          ;;
143          ;;      OUTPUT:         TRPFLG := TRPFLG + 1;
144 002310  STARS
145          ;;*****
146 002310  BGNSRV  TRAP4
147 002310  TRAP4::  MOV      RO,REGO          ;SAVE RO
148          002310  010037 002162
149 002314  005237 002154 200#:  INC      TRPFLG          ;SET TRAP FLAG
150          002320 013700 002162
151 002320  MOV      REGO,RO          ;RESTORE RO
152 002324  ENDSRV          ;AND RETURN
153 002324  L10003:  RTI
002324  000002

```

HELP FILE DUMP ROUTINE

155
156 002326

157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178 002326

179
180 000040
181 000015
182 000012
183 000011
184

```

.SBTTL HELP FILE DUMP ROUTINE
STARS
;*****
;
; SUBROUTINE TO DUMP DOS HELP FILE TO CONSOLE
;
; INPUT:          R1 = POINTER TO "FILNAM.EXT"
;                R5 = RETURN ADDRESS
;
; OUTPUT:         PRINTS 72 CHARACTER BUFFER TO CONSOLE
;
; REGISTER USAGE: R1 = POINTER TO LINE TEXT BUFFER
;                R2 = TAB POSITION COUNTER
;                R4 = CHARACTER FROM FILE
;                R5 = LINK REGISTER
;
; CALLING SEQ:   MOV  #FILNAM,R1
;                JSR  R5,DMP
;
; FUNCTION:      DMP WILL OPEN, READ AND CLOSE THE SELETED FILE
;                USING THE DIAG SUPERVISOR MACROS.  CHARACTERS
;                ARE READ ONE AT A TIME AND TRANSFERRED TO THE
;                LINE BUFFER, WHICH IS DUMPED TO THE CONSOLE
;                WHEN FULL.
;
STARS
;*****
BLK   =   40      ;BLANK CHAR
CR    =   15      ;CARRAGE RETURN CHAR
LF    =   12      ;LINE FEED CHAR
TAB   =   11      ;TAB CHAR

```


HELP FILE DUMP ROUTINE

186	002326	010137	002164	DMP::	MOV	R1,REG1		;SAVE POINTER TO FILE NAME
187	002332	010537	002174		MOV	R5,REG5		;SAVE RETURN ADDRESS
188	002336	005037	002156		CLR	TABFLG		;CLEAR TAB ACTIVE FLAG
189								
190				:				OPEN FILE AND PRINT NULL LINE
191								
192	002342			100\$:	OPEN	R1		;OPEN FILE
	002342	010100			MOV	R1,R0		
	002344	104434			TRAP	C#OPEN		
193	002346	012701	002556		MOV	#LINBUF,R1		;AND LOAD POINTER TO BUFFER
194	002352	112721	000015		MOVB	#CR,(R1)+		;MOVE CARRAGE RETURN
195	002356	112721	000012		MOVB	#LF,(R1)+		;AND LINE FEED TO BUFFER
196	002362	112704	000000		MOVB	#0,R4		;FOLLOWED BY NULL
197	002366	004537	002462		JSR	R5,600\$;PRINT BUFFER, RESET R1
198								
199				:				GET NEXT CHARACTER FROM SUPERVISOR, AND TEST FOR END OF FILE
200								
201	002372			200\$:	GETBYTE	R4		;GET NEXT CHAR IN R4
	002372	104426			TRAP	C#GETB		
	002374	110004			MOVB	R0,R4		
202	002376				BNCOMPLETE	400\$;EOF IF INCOMPLETE
	002376	103013			BCC	400\$		
203	002400	001412			BEQ	400\$;OR IF CHARACTER = ZERO
204								
205				:				TEST AND PROCESS TAB CHARACTER
206								
207	002402	122704	000011	300\$:	CMPB	#TAB,R4		;COMPARE WITH TAB
208	002406	001004			BNE	350\$;NO: CONTINUE
209	002410	112704	000040		MOVB	#BLK,R4		;YES: LOAD R4 WITH A BLANK
210	002414	005237	002156		INC	TABFLG		;AND SET TAB ACTIVE
211								
212	002420	004537	002462	350\$:	JSR	R5,600\$;PRINT SPACES FOR TAB
213	002424	000762			BR	200\$;AND RETRIEVE NEXT CHARACTER
214								
215				:				LAST CHAR OR END OF FILE
216								
217	002426	004537	002462	400\$:	JSR	R5,600\$;EMPTY BUFFER
218	002432	112721	000015		MOVB	#CR,(R1)+		;OUTPUT CARRAGE RETURN
219	002436	112721	000012		MOVB	#LF,(R1)+		;AND LINE FEED
220	002442	112704	000000		MOVB	#0,R4		;FOLLOWED BY NULL
221	002446	004537	002462		JSR	R5,600\$;PRINT
222								
223				:				CLOSE FILE AND RETURN TO MAIN
224								
225	002452			500\$:	CLOSE			;CLOSE FILE
	002452	104435			TRAP	C#CLOS		
226	002454	013705	002174		MOV	REG5,R5		;RESTORE RETURN ADDRESS
227	002460	000205			RTS	R5		;AND RETURN

HELP FILE DUMP ROUTINE

```

229 002462          STARS
230                ;;*****
231                ;;
232                ;;      SUBROUTINE TO TRANSFER CHARACTERS TO PRINT BUFFER AND DUMP
233 002462          STARS
234                ;;*****
235                ;      MOVE CHAR TO BUFFER, TEST FOR NULL CHAR OR END OF BUFFER
236                ;
237 002462 110421    600$:  MOVB    R4,(R1)+      ;MOVE CHAR TO BUFFER
238 002464 001403    BEQ     700$           ;PRINT BUFFER IF NULL
239 002466 022701 002646  CMP     @EOL,R1      ;TEST FOR END OF BUFFER
240 002472 001012    BNE     800$           ;NO: CONTINUE
241
242                ;      PRINT BUFFER AND RESET POINTER
243                ;
244 002474          700$:  PRINTB  @LINE          ;PRINT LINE AT CONSOLE
245 002474 012746 002554  MOV     @LINE,-(SP)
246 002500 012746 000001  MOV     @1,-(SP)
247 002504 010600      MOV     SP,R0
248 002506 104414      TRAP   C#PNTB
249 002510 062706 000004  ADD     @4,SP
250 002514 012701 002556  MOV     @LINBUF,R1      ;AND RESET POINTER
251
252                ;      TEST FOR CONTROL CHARS, TAB ACTIVE OR RETURN
253                ;
254 002520 120427 000040  800$:  CMPB   R4,@BLK      ;COMPARE CHAR WITH BLANK
255 002524 100406      BMI     850$           ;BRANCH IF CONTROL CHAR
256
257                ;
258                ;
259                ;
260 002542 012702 000010  DEC     R2           ;DEC TAB COUNTER
261 002546 005037 002156  BEQ     850$           ;BRANCH TO RESET
262 002552 000205      TST    TABFLG        ;NOW TEST TAB FLAG
263                BNE     600$           ;ACTIVE: MOVE ANOTHER BLANK
264                RTS     R5           ;NO: JUST RETURN
265
266                ;      RESET TAB COUNTER, TAB ACTIVE FLAG AND RETURN
267                ;
268                ;
269                ;
270 002542 012702 000010  850$:  MOV     @8.,R2      ;RESET TAB
271 002546 005037 002156  CLR     TABFLG        ;CLEAR TAB ACTIVE FLAG
272 002552 000205      RTS     R5           ;AND RETURN

```

HELP FILE DUMP ROUTINE

265 002554

STARS

::*****

266

::

267

::

BUFFER STORAGE AREA

268 002554

STARS

::*****

269

270 002554 045 101

LINE: .ASCII /#A/

;ALPHA NUMERIC BUFFER FLAG

271 002556

LINBUF: .BLKB 70

;SEVENTY CHARACTER BUFFER

272 002646 000000

EOL: .WORD 0

;END OF LINE

273

274 002650

ENDMOD

275

276

.SBTTL


```
1  
12  
13  
41  
42 002650  
002650  
43  
44  
45  
46  
47  
48  
49 002650  
002650  
50  
51 002650  
002650 000167  
002652 000000  
52  
53  
54  
55 002654  
002654  
002654 104425  
  
      .TITLE MISCELLANEOUS SECTIONS  
      .SBTTL REPORT CODING SECTION  
  
      BGNMOD SECT4  
SECT4::  
  
      ;**  
      ; THE REPORT CODING SECTION CONTAINS THE  
      ; "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.  
      ;--  
  
      BGNRPT  
L#RPT::  
  
      EXIT RPT  
      .WORD J#JMP  
      .WORD L10004-2-  
  
      .EVEN  
  
      ENDRPT  
L10004:  
      TRAP C#RPT
```

PROTECTION TABLE

57
58
59
60
61
62
63
64
65
66
67
68
69
70
71

002656
002656
002656 177777
002660 177777
002662 177777
002664

.SBTTL PROTECTION TABLE

;++
; THIS TABLE IS USED BY THE RUNTIME SERVICES
; TO PROTECT THE LOAD MEDIA.
;--

BGNPROT
L\$PROT::

-1
-1
-1

;OFFSET INTO P-TABLE FOR CSR ADDRESS
;OFFSET INTO P-TABLE FOR MASSBUS ADDRESS
;OFFSET INTO P-TABLE FOR DRIVE NUMBER

ENDPROT

INITIALIZE SECTION

```

73          .SBTTL INITIALIZE SECTION
74 002664   STARS
           ;;*****
           ;;
           ;;      INITIALIZATION SECTION:
           ;;
           ;;      (0)  MANDATORY CALL "GPHARD" EACH PASS
           ;;
           ;;      (1)  EVENT FLAGS CHECKED TO BYPASS FIRST TIME INIT
           ;;      (2)  MANUAL INPUT REQUEST FOR HELP FILE
           ;;      (3)  COMPUTATION OF AVAILABLE MEMORY
           ;;      (4)  PRINT TITLE AND COLUMN HEADINGS
           ;;      (5)  SET TRAP VECTOR
           ;;
85 002664   STARS
           ;;*****
86
87 002664   BGNINIT
           L$INIT::
88
89          ;      MANDATORY CALL TO RETRIEVE PTABLE ADDRESS
90
91 002664   GPHARD UNIT,PLOC          ;RETRIEVE PTABLE ADDRESS
           002664 013700 002140
           002670 104442
           002672 010037 002136
           MOV UNIT,RO
           TRAP C$GPHRD
           MOV RO,PLOC
92
93          ;      TEST EVENT FLAGS
94
95 002676   100$: READEF #EF.CONTINUE      ;TEST FOR CONTINUE FLAG
           002676 012700 000036
           002702 104447
           TRAP C$REFG
           BCOMPLETE 800$          ;YES: JUST SET VECTOR
           BCS 800$
           READEF #EF.NEW          ;TEST FOR NEW PASS
           002704 103477
           002706 012700 000035
           002712 104447
           TRAP C$REFG
           BNCOMPLETE 400$        ;YES: NO HELP
           002714 103000
           BCC 400$
96
97
98
99
100         ;      PROCESS SUPERVISOR HELP FILE DUMP
101         ;
102         ;200$: TST HELP1          ;TEST IF HELP FILE QUESTION ASKED
103         ;      BNE 300$          ;YES: CONTINUE
104         ;
105         ;      GMANIL HPMMSG1,HLPFLG,1,YES ;ASK OPERATOR
106         ;      TST HLPFLG        ;TEST HELP REQUESTED
107         ;      BEQ 300$          ;NO: CONTINUE
108         ;
109         ;      CALL DMP TO DISPLAY HELP FILE "DRS.HLP"
110         ;
111         ;250$: MOV #HPFIL1,R1     ;LOAD POINTER TO FILE NAME
112         ;      JSR R5,DMP        ;AND DISPLAY FILE
113         ;
114         ;      PROCESS DIAGNOSTIC HELP FILE DUMP
115         ;
116         ;300$: INC HELP1         ;SET FLAG FOR FIRST QUESTION
117         ;

```


INITIALIZE SECTION

```
118      ;      TST      HELP2      ;TEST IF QUESTION ASKED
119      ;      BNE      4008      ;YES: CONTINUE
120      ;
121      ;      GMANIL  HPMSG2,MLPFLG,1,YES ;GET OPERATOR RESPONSE
122      ;      TST      MLPFLG      ;TEST RESPONSE
123      ;      BEQ      4008      ;NO HELP: CONTINUE
124      ;
125      ;3508:  MOV      @MPFIL2,R1      ;LOAD POINTER TO FILE NAM.
126      ;      JSR      R5,DMP      ;AND DISPLAY FILE
127
```

INITIALIZE SECTION

```

129      ;      DETERMINE AND PRINT AVAILABLE MEMORY IN WORDS
130      ;
131      ;
132      ;      HIGH PAGE ADDRESS IS IN L#HIMEM, IN PAGE ADDRESS
133      ;      FORM (64-BYTE PAGES). DISPLAYED VALUE IS IN
134      ;      2048-BYTE PAGES, SO THE PAGE ADDRESS IS DIVIDED
135      ;      BY 32, AND BUMPED TO SHOW ABSOLUTE MEMORY SIZE.
136 002716 005237 002204      4006:  INC      HELP2      ;SET FLAG FOR SECOND QUESTION
137
138 002722 013701 002120      MOV      L#HIMEM,R1      ;MOV HIGH PAGE ADDRESS TO R1
139 002726 000241      CLC      ;AND CLEAR CARRY BIT FOR FIRST SHIFT
140 002730 006001      ROR      R1      ;SHIFT RIGHT AND CLEAR SIGN
141 002732 006201      ASR      R1      ;ARITH SHIFT RIGHT
142 002734 006201      ASR      R1      ;HIGH PAGE
143 002736 006201      ASR      R1      ;TO INDICATE
144 002740 006201      ASR      R1      ;SIZE IN K WORDS
145 002742 005201      INC      R1      ;INCREMENT TO ABSOLUTE SIZE
146 002744 010137 002144      MOV      R1,MSIZ      ;AND SAVE FOR MESSAGE

```

INITIALIZE SECTION

```

148 ; READ BUS TO DETERMINE WHAT TYPE
149
150 002750 600$: READBUS ;READ BUS TYPE
151 002750 104407 TRAP C#RDBU
152 002752 103012 BNCOMPLETE 620$ ;BRANCH IF UNIBUS
153 002752 103012 BCC 620$
154 002754 PRINTB #BUS1 ;PRINT Q-BUS TTL
155 002754 012746 003136 MOV #BUS1,-(SP)
156 002760 012746 000001 MOV #1,-(SP)
157 002764 010600 MOV SP,RO
158 002766 104414 TRAP C#PNTB
159 002770 062706 000004 ADD #4,SP
160 002774 000137 003020 JMP 650$ ;AND CONTINUE
161 620$: PRINTB #BUS2 ;PRINT UNIBUS TTL
162 003000 MOV #BUS2,-(SP)
163 003000 012746 003153 MOV #1,-(SP)
164 003004 012746 000001 MOV SP,RO
165 003010 010600 TRAP C#PNTB
166 003012 104414 ADD #4,SP
167 003014 062706 000004
168 ; PRINT TITLE AND HEADINGS
169
170 003020 650$: PRINTB #TTL1 ;PRINT HEADER
171 003020 012746 003170 MOV #TTL1,-(SP)
172 003024 012746 000001 MOV #1,-(SP)
173 003030 010600 MOV SP,RO
174 003032 104414 TRAP C#PNTB
175 003034 062706 000004 ADD #4,SP
176 161 ;AND SYSTEM MEMORY SIZE
177 003040 PRINTB #TTL2,MSIZ
178 003040 013746 002144 MOV MSIZ,-(SP)
179 003044 012746 003223 MOV #TTL2,-(SP)
180 003050 012746 000002 MOV #2,-(SP)
181 003054 010600 MOV SP,RO
182 003056 104414 TRAP C#PNTB
183 003060 062706 000006 ADD #6,SP
184 163 ;AND COLUMN HEADINGS
185 003064 PRINTB #HDR1
186 003064 012746 003271 MOV #HDR1,-(SP)
187 003070 012746 000001 MOV #1,-(SP)
188 003074 010600 MOV SP,RO
189 003076 104414 TRAP C#PNTB
190 003100 062706 000004 ADD #4,SP
191 165 ; SET TRAP VECTOR
192 166
193 167
194 168 800$: SETVEC #4,#TRAP4,#PRI07 ;SET-UP NEW SERVICE ROUTINE
195 003104 MOV #PRI07,-(SP)
196 003110 012746 002310 MOV #TRAP4,-(SP)
197 003114 012746 000004 MOV #4,-(SP)
198 003120 012746 000003 MOV #3,-(SP)
199 003124 104437 TRAP C#SVEC
200 003126 062706 000010 ADD #10,SP
201 169
202 170 1000$: EXIT INIT

```


INITIALIZE SECTION

003132 104432
003134 000274
171

TRAP C#EXIT
.WORD L10006-

TITLE AND HEADER FORMATS

173				.SBTTL	TITLE AND HEADER FORMATS
174	003136	045	116	064	BUS1: .ASCIZ /#N4#S2#A Q- /
	003141	045	123	062	
	003144	045	101	040	
	003147	040	121	055	
	003152	000			
175	003153	045	116	064	BUS2: .ASCIZ /#N4#S2#A UNI /
	003156	045	123	062	
	003161	045	101	040	
	003164	125	116	111	
	003167	000			
176					
177	003170	045	101	102	TTL1: .ASCIZ /#ABUS ADDRESS TEST UTILITY /
	003173	125	123	040	
	003176	101	104	104	
	003201	122	105	123	
	003204	123	040	124	
	003207	105	123	124	
	003212	040	125	124	
	003215	111	114	111	
	003220	124	131	000	
178	003223	045	116	062	TTL2: .ASCIZ /#N2#AAVAILABLE MEMORY: #D4#AK WORDS /
	003226	045	101	101	
	003231	126	101	111	
	003234	114	101	102	
	003237	114	105	040	
	003242	115	105	115	
	003245	117	122	131	
	003250	072	040	040	
	003253	040	045	104	
	003256	064	045	101	
	003261	113	040	127	
	003264	117	122	104	
	003267	123	000		
179					

TITLE AND HEADER FORMATS

181	003271	045	116	062	HDR1: .ASCIZ /#N2#ADEVICE ADDRESS#S4#ASIZE IN WORDS#N1/
	003274	045	101	104	
	003277	105	126	111	
	003302	103	105	040	
	003305	101	104	104	
	003310	122	105	123	
	003313	123	045	123	
	003316	064	045	101	
	003321	123	111	132	
	003324	105	040	111	
	003327	116	040	127	
	003332	117	122	104	
	003335	123	045	116	
	003340	061	000		
182					
183	003342	120	122	111	HPMSG1: .ASCIZ /PRINT SUPERVISOR HELP INFO/
	003345	116	124	040	
	003350	123	125	120	
	003353	105	122	126	
	003356	111	123	117	
	003361	122	040	110	
	003364	105	114	120	
	003367	040	111	116	
	003372	106	117	000	
184	003375	120	122	111	HPMSG2: .ASCIZ /PRINT DIAGNOSTIC HELP INFO/
	003400	116	124	040	
	003403	104	111	101	
	003406	107	116	117	
	003411	123	124	111	
	003414	103	040	110	
	003417	105	114	120	
	003422	040	111	116	
	003425	106	117	000	
185					
186					.EVEN
187					
188	003430				ENDINIT
	003430				L10006:
	003430	104411			TRAP C#INIT

AUTODROP SECTION

190
 191
 192
 193
 194
 195
 196
 197
 198
 199 003432
 003432
 200
 201 003432
 003432
 003432 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$AUTO::
          ENDAUTO
L10007:  TRAP   C$AUTO

```

CLEANUP CODING SECTION

203
 204
 205
 206
 207
 208
 209
 210 003434
 003434
 211
 212 003434
 003434 104432
 003436 000002
 213
 214
 215
 216 003440
 003440
 003440 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::
 EXIT CLN
 TRAP C\$EXIT
 .WORD L10010-.
 .EVEN
 ENDCLN
 L10010:
 TRAP C\$CLEAN

DROP UNIT SECTION

```

218          .SBTTL  DROP UNIT SECTION
219
220          ;**
221          ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
222          ; TO NO LONGER BE TESTED.
223          ;--
224
225 003442          BGNDU
003442          L#DU::
226
227 003442          EXIT      DU
003442 000167        .WORD    J#JMP
003444 000000        .WORD    L10011-2-.
228
229          .EVEN
230
231 003446          ENDDU
003446          L10011:
003446 104453        TRAP     C#DU

```


ADD UNIT SECTION

```

233      .SBTTL  ADD UNIT SECTION
234
235      ;**
236      ; THE ADD-UNIT SECTION CONTAINS ANY CODE THE PROGRAMMER WISHES
237      ; TO BE EXECUTED IN CONJUNCTION WITH THE ADDING OF A UNIT BACK
238      ; TO THE TEST CYCLE.
239      ;--
240
241 003450      BGNAU
242 003450      L$AU::
243 003450      EXIT      AU
003450 000167    .WORD     J$JMP
003452 000000    .WORD     L10012-2-.
244
245      .EVEN
246
247 003454      ENDAU
003454      L10012:
003454 104452    TRAP     C$AU
248
249 003456      ENDMOD
250
251      .SBTTL

```

```

1      .TITLE HARDWARE TESTS
12
13      .SBTTL BUS CHECK PROCESSING
14
40      .ENABL AMA
41
42 003456 STARS
43      ;;*****
44      ;;
45      ;; THIS TEST WILL REFERENCE ALL LOCATIONS OF THE I/O PAGE
46      ;; AND CHECK FOR A DEVICE TIME-OUT IN EACH CASE. ANY SINGLE
47      ;; LOCATION OR RANGE OF LOCATIONS WHICH ARE NOT TRAPPED ARE
48      ;; LISTED ALONG WITH THE SIZE OF THE REGION.
49 003456 STARS
50      ;;*****
51 003456      BGNMOD SECTS
52 003456 SECTS::
53 003456      BGNTST
54 003456 T1::
55      ; TEST INITIALIZATION: ADDRESS POINTER IS SET TO I/O PAGE
56      ;
57 003456 012701 160000      MOV #IOPADR,R1 ;LOAD I/O PAGE BASE ADDRESS
58      ;
59      ; DEVICE INITIALIZATION: DEVICE BASE ADDRESS IS RESET TO
60      ; THE CURRENT ADDRESS POINTER, AND
61      ; THE DEVICE REGION LENGTH IS CLEARED.
62      ;
63 003462 005037 002152      100#: CLR COUNTR ;INITIALIZE LOCATION COUNTER
64      ;
65 003466 010102      150#: MOV R1,R2 ;SAVE BASE ADDRESS POINTER
66      ;
67      ; ADDRESS PROCESS LOOP: DEVICE ADDRESS IS ACCESSED, TEST FOR
68      ; LAST LOCATION AND BUS TIME-OUT.
69      ;
70 003470 022701 000000      200#: CMP #0,R1 ;TEST IF PTR PAST LAST ADDRESS
71 003474 001464 ;BEQ 500# ;YES: PROCESS LAST REGION
72      ;
73 003476 005037 002154      CLR TRPFLG ;RESET TRAP FLAG BEFORE TEST
74 003502 005711 ;TST (R1) ;TEST NEXT LOCATION INDIRECT
75      ;
76 003504 062701 000002      250#: ADD #2,R1 ;AND INCREMENT POINTER
77 003510 005737 002154 ;TST TRPFLG ;TEST FOR BUS TIME-OUT
78 003514 001003 ;BNE 300# ;YES: PROCESS NEW TRAP
79      ;
80 003516 005237 002152 ;INC COUNTR ;INCREMENT LOCATION COUNTER
81 003522 000762 ;BR 200# ;AND CONTINUE
82      ;
83 003524 005737 002152      300#: TST COUNTR ;TEST FOR TRAP ON PREVIOUS LOCATION
84 003530 001756 ;BEQ 150# ;YES: RESET BASE ADDRESS POINTER
85

```

BUS CHECK PROCESSING

```

87      :      DEVICE ADDRESS REGION PROCESSING: ADDRESS AND WORD COUNT COMPUTED.
88      :
89      :      MSG1:  SINGLE ADDRESS REGION
90      :      MSG2:  MULTIPLE ADDRESS REGION
91      :
92 003532 010237 002146 400$:  MOV    R2,BASADR      ;SAVE BASE ADDRESS
93 003536 013704 002152      MOV    COUNTR,R4      ;LOAD COUNTER
94 003542 005304      DEC    R4              ;AND MAKE RELATIVE TO ZERO
95 003544 001015      BNE   450$            ;TEST COUNTER
96
97      :      SINGLE ADDRESS REGION DISPLAYED.
98
99 003546 420$:  PRINTB #DVMSG1,BASADR,COUNTR ;PRINT SINGLE ADDRESS MESSAGE
    003546 013746 002152      MOV    COUNTR,-(SP)
    003552 013746 002146      MOV    BASADR,-(SP)
    003556 012746 004000      MOV    #DVMSG1,-(SP)
    003562 012746 000003      MOV    #3,-(SP)
    003566 010600      MOV    SP,R0
    003570 104414      TRAP  C#PNTB
    003572 062706 000010      ADD   #10,SP
100
101 003576 000731      BR    100$            ;AND EXIT
102
103      :      MULTIPLE ADDRESS REGION DISPLAYED.
104
105 003600 450$:  ASL    R4              ;MULTIPLY COUNTER BY TWO
106 003602 060204      ADD   R2,R4          ;ADD BASE ADDRESS AND
107 003604 010437 002150      MOV   R4,LSTADR     ;SAVE LAST ADDRESSES FOR MESSAGE
108
109 003610      PRINTB #DVMSG2,BASADR,LSTADR,COUNTR ;PRINT MESSAGE
    003610 013746 002152      MOV   COUNTR,-(SP)
    003614 013746 002150      MOV   LSTADR,-(SP)
    003620 013746 002146      MOV   BASADR,-(SP)
    003624 012746 004016      MOV   #DVMSG2,-(SP)
    003630 012746 000004      MOV   #4,-(SP)
    003634 010600      MOV   SP,R0
    003636 104414      TRAP  C#PNTB
    003640 062706 000012      ADD   #12,SP
110
111 003644 000706      BR    100$            ;AND EXIT

```


BUS CHECK PROCESSING

```

113      :      PROCESS LAST LOCATION OR REGION:  COMPUTE REGION ADDRESS
114      :      :      AND LOCATION COUNT.
115      :      :
116      :      MSG1:  SINGLE ADDRESS REGION
117      :      MSG2:  MULTIPLE ADDRESS REGION
118
119 003646 005737 002152      500$:  TST      COUNTR      ;TEST FOR VALID ADDRESS
120 003652 001445              BEQ      1000$      ;NO:  EXIT
121
122 003654 010237 002146      MOV      R2,BASADR      ;SAVE BASE ADDRESS
123 003660 013704 002152      MOV      COUNTR,R4      ;LOAD COUNTER
124 003664 005304              DEC      R4              ;AND MAKE RELATIVE TO ZERO
125 003666 001015              BNE      550$          ;TEST COUNTER
126
127      :      SINGLE ADDRESS REGION DISPLAY.
128
129 003670      520$:  PRINTB  #DVMSG1,BASADR,COUNTR  ;PRINT SINGLE ADDRESS MESSAGE
      003670 013746 002152      MOV      COUNTR,-(SP)
      003674 013746 002146      MOV      BASADR,-(SP)
      003700 012746 004000      MOV      #DVMSG1,-(SP)
      003704 012746 000003      MOV      #3,-(SP)
      003710 010600              MOV      SP,R0
      003712 104414              TRAP    C#PNTB
      003714 C62706 000010      ADD      #10,SP
130
131 003720 000422              BR      1000$          ;AND EXIT
132
133      :      MULTIPLE ADDRESS REGION DISPLAY.
134
135 003722 006304      550$:  ASL      R4              ;MULTIPLY COUNTER BY TWO
136 003724 060204      ADD      R2,R4          ;ADD BASE ADDRESS AND
137 003726 010437 002150      MOV      R4,LSTADR      ;SAVE LAST ADDRESSES FOR MESSAGE
138
139 003732      PRINTB  #DVMSG2,BASADR,LSTADR,COUNTR  ;PRINT MESSAGE
      003732 013746 002152      MOV      COUNTR,-(SP)
      003736 013746 002150      MOV      LSTADR,-(SP)
      003742 013746 002146      MOV      BASADR,-(SP)
      003746 012746 004016      MOV      #DVMSG2,-(SP)
      003752 012746 000004      MOV      #4,-(SP)
      003756 010600              MOV      SP,R0
      003760 104414              TRAP    C#PNTB
      003762 062706 000012      ADD      #12,SP
140

```

BUS CHECK PROCESSING

```

142      ;          PROCESS TEST EXIT:      RESTORE OLD SERVICE ROUTINE.
143
144 003766      10000: CLRVEC #4              ;RESTORE OLD ISR
      003766 012700 000004      MOV #4,R0
      003772 104436      TRAP C#CVEC
145
146 003774      EXIT TST              ;AND EXIT FROM TEST
      003774 104432      TRAP C#EXIT
      003776 000050      .WORD L10013-.
147
148      .EVEN
149

```

BUS CHECK PROCESSING

```

151                                     ; TEST MESSAGE FORMATS
152
153 004000      045      116      061 DVMSG1: .ASCIZ /#N1#06#S21#D4/
      004003      045      117      066
      004006      045      123      062
      004011      061      045      104
      004014      064      000
154 004016      045      116      061 DVMSG2: .ASCIZ /#N1#06#A -> #06#S11#D4/
      004021      045      117      066
      004024      045      101      040
      004027      055      076      040
      004032      045      117      066
      004035      045      123      061
      004040      061      045      104
      004043      064      000

155                                     .EVEN
156
157 004046                                     ENDTST
      004046      104401 L10013: TRAP      C#ETST
      004046
158
159 004050                                     ENDMOD
160
161                                     .SBTTL

```

```
1          .TITLE PARAMETER CODING
12
13          .SBTTL  HARDWARE PARAMETER CODING SECTION
41
42 004050          BGNMOD  SECT6
004050          SECT6::
43
44          ;**
45          ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
46          ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
47          ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
48          ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
49          ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
50          ; WITH THE OPERATOR.
51          ;--
52
53 004050          BGNHRD
004050 000000          .WORD L10014-L#HARD/2
004052          L#HARD::
54
55 004052          ENDRD
004052          .EVEN
56          L10014:
57          .EVEN
58
```


SOFTWARE PARAMETER CODING SECTION

```

60
61
62
63
64
65
66
67
68
69
70
71 004052
   004052 000000
   004054
72
73
74
75 004054
   004054
76
77 004054
78 004054
79
80 004074
   004074 004106
   004076 000003
   004100
81
82 004100
83

```

```

.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
          .WORD L10015-L#SOFT/2
L#SOFT::
          .EVEN
          ENDSFT
          .EVEN
L10015:
#PATCH::
          .BLKW  10
          LASTAD
          .EVEN
          .WORD T#FREE
          .WORD T#SIZE
L#LAST::
          ENDMOD

```

P-TABLE SETUP SECTION

85		.SBTTL	P-TABLE SETUP SECTION	
86				
87	004100	BGNSETUP	1	;ONE P-TABLE
88				
89	004100	BGNPTAB		;P-TABLE START
	004100	.WORD	0	
	004102	.WORD	L10020-./2-1	
	004104	L10016:		
90				
91	004104	.WORD	0	;DUMMY TABLE VALUE
92				
93	004106	ENDPTAB		;P-TABLE END
	004106	L10020:		
94				
95	004106	ENDSETUP		;END OF SETUP
96				
97	000001	.END		

SYMBOL TABLE

ADR = 000020 G	C#ERSO= 000057	F#MOD = 000000	I#RPT = 000041	L#RPT = 002650 G
ASSEMB= 000010	C#ESCA= 000010	F#MSG = 000011	I#SEG = 000041	L#SOFT = 004054 G
BASADR 002146 G	C#ESEG= 000005	F#PROT= 000021	I#SETU= 000041	L#SPC = 002056 G
BIT0 = 000001 G	C#ESUB= 000003	F#PWR = 000017	I#SFT = 000041	L#SPCP = 002020 G
BIT00 = 000001 G	C#ETST= 000001	F#RPT = 000012	I#SRV = 000041	L#SPTP = 002024 G
BIT01 = 000002 G	C#EXIT= 000032	F#SEG = 000003	I#SUB = 000041	L#STA = 002030 G
BIT02 = 000004 G	C#GETB= 000026	F#SOFT= 000005	I#TST = 000041	L#SW = 002134 G
BIT03 = 000010 G	C#GETW= 000027	F#SRV = 000010	J#JMP = 000167	L#TEST = 002114 G
BIT04 = 000020 G	C#GMAN= 000043	F#SUB = 000002	LF = 000012	L#TIML = 002014 G
BIT05 = 000040 G	C#GPHR= 000042	F#SW = 000014	LINBUF 002556	L#UNIT = 002012 G
BIT06 = 000100 G	C#GPLO= 000030	F#TEST= 000001	LINE 002554	L10000 002132
BIT07 = 000200 G	C#GPRI= 000040	G#CNTD= 000200	LOE = 040000 G	L10001 002136
BIT08 = 000400 G	C#INIT= 000011	G#DELM= 000372	LOT = 000010 G	L10002 002306
BIT09 = 001000 G	C#INLP= 000020	G#DISP= 000003	LSTADR 002150 G	L10003 002324
BIT1 = 000002 G	C#INLP= 000020	G#EXCP= 000400	L#ACP 002110 G	L10004 002654
BIT10 = 002000 G	C#MANI= 000050	G#HILI= 000002	L#APT 002036 G	L10006 003430
BIT11 = 004000 G	C#MEM = 000031	G#LOLI= 000001	L#AU 003450 G	L10007 003432
BIT12 = 010000 G	C#MSG = 000023	G#ND = 000000	L#AUT 002070 G	L10010 003440
BIT13 = 020000 G	C#OPEN= 000034	G#OFFS= 000400	L#AUTO 003432 G	L10011 003446
BIT14 = 040000 G	C#PNTB= 000014	G#OFFSI= 000376	L#CCP 002106 G	L10012 003454
BIT15 = 100000 G	C#PNTF= 000017	G#PRMA= 000001	L#CLEA 003434 G	L10013 004046
BIT2 = 000004 G	C#PNTS= 000016	G#PRMD= 000002	L#CO 002032 G	L10014 004052
BIT3 = 000010 G	C#PNTX= 000015	G#PRML= 000000	L#DEPO 002011 G	L10015 004054
BIT4 = 000020 G	C#QIO = 000377	G#RADA= 000140	L#DESC 002250 G	L10016 004104
BIT5 = 000040 G	C#RDBU= 000007	G#RADB= 000000	L#DESP 002076 G	L10020 004106
BIT6 = 000100 G	C#REFG= 000047	G#RADD= 000040	L#DEVP 002060 G	MPTR 002142 G
BIT7 = 000200 G	C#RESE= 000033	G#RADL= 000120	L#DISP 002124 G	MSIZ 002144 G
BIT8 = 000400 G	C#REVI= 000003	G#RADO= 000020	L#DLY 002116 G	ONEFIL= 000001
BIT9 = 001000 G	C#RFLA= 000021	G#XFER= 000004	L#DTP 002040 G	OVRFLO= 000002 G
BLK = 000040	C#RPT = 000025	G#YES = 000010	L#DTYP 002034 G	O#APTS= 000000
BOE = 000400 G	C#SEFG= 000046	HDR1 003271	L#DU 003442 G	O#AU = 000000
BUSTMD= 000020 G	C#SPRI= 000041	HELP = 000000	L#DUT 002072 G	O#BGNR= 000000
BUS1 003136	C#SVEC= 000037	HELP1 002202 G	L#DVTY 002230 G	O#BGNS= 000000
BUS2 003153	C#TPRI= 000013	HELP2 002204 G	L#EF 002052 G	O#DU = 000000
COUNTR 002152 G	DFPTBL 002130 G	HLPFLG 002160 G	L#ENVI 002044 G	O#ERRT= 000000
CPUADR= 177766 G	DIAGMC= 000000	HOE = 100000 G	L#ETP 002102 G	O#GNSW= 000000
CR = 000015	DMP 002326 G	HPFIL1 002206 G	L#EXP1 002046 G	O#POIN= 000001
C#AU = 000052	DVMSG1 004000	HPFIL2 002216 G	L#EXP4 002064 G	O#SETU= 000001
C#AUTO= 000061	DVMSG2 004016	HPMSG1 003342	L#EXP5 002066 G	PLOC 002136 G
C#BRK = 000022	EF.CON= 000036 G	HPMSG2 003375	L#HARD 004052 G	PNT = 001000 G
C#BSEG= 000004	EF.NEW= 000035 G	IBE = 010000 G	L#HIME 002120 G	PRI = 002000 G
C#BSUB= 000002	EF.PWR= 000034 G	IDU = 000040 G	L#HPCP 002016 G	PRI00 = 000000 G
C#CEFG= 000045	EF.RES= 000037 G	IER = 020000 G	L#HPTP 002022 G	PRI01 = 000040 G
C#CLCK= 000062	EF.STA= 000040 G	IOPADR= 160000 G	L#HW 002130 G	PRI02 = 000100 G
C#CLEA= 000012	EOL 002646	ISR = 000100 G	L#ICP 002104 G	PRI03 = 000140 G
C#CLOS= 000035	EVL = 000004 G	IXE = 004000 G	L#INIT 002664 G	PRI04 = 000200 G
C#CLP1= 000006	E#END = 002100	I#AU = 000041	L#LADP 002026 G	PRI05 = 000240 G
C#CVEC= 000036	E#LOAD= 000035	I#AUTO= 000041	L#LAST 004100 G	PRI06 = 000300 G
C#DCLN= 000044	F#AU = 000015	I#CLN = 000041	L#LOAD 002100 G	PRI07 = 000340 G
C#DODU= 000051	F#AUTO= 000020	I#DU = 000041	L#LUN 002074 G	PSWADR= 177776 G
C#DRPT= 000024	F#BGN = 000040	I#HRD = 000041	L#MREV 002050 G	REG0 002162 G
C#DU = 000053	F#CLEA= 000007	I#INIT= 000041	L#NAME 002000 G	REG1 002164 G
C#EDIT= 000003	F#DU = 000016	I#MOD = 000041	L#PRIO 002042 G	REG2 002166 G
C#ERDF= 000055	F#END = 000041	I#MSG = 000041	L#PROT 002656 G	REG3 002170 G
C#ERHR= 000056	F#HARD= 000004	I#PTAB= 000041	L#PRT 002112 G	REG4 002172 G
C#ERRD= 000060	F#HM = 000013	I#PWR = 000041	L#REPP 002062 G	REG5 002174 G
C#ERSF= 000054	F#INIT= 000006		L#REV 002010 G	REG6 002176 G
	F#JMP = 000050			

SYMBOL TABLE

REG7	002200	G	TABFLG	002156	G	T#NS0	=	000000	T#TSTM	=	177777	T##RPT	=	010004	
SECT2	002000	G	TRAP4	002310	G	T#NS1	=	000005	T#TSTS	=	000001	T##SOF	=	010015	
SECT3	002136	G	TRPFLG	002154	G	T#PCNT	=	000000	T##AU	=	010012	T##SRV	=	010003	
SECT4	002650	G	TTL1	003170		T#PTAB	=	010017	T##AUT	=	010007	T##SW	=	010001	
SECT5	003456	G	TTL2	003223		T#PTHV	=	000001	T##CLE	=	010010	T##TES	=	010013	
SECT6	004050	G	T#ARGC	=	000004	T#PTNU	=	000001	T##DAT	=	010020	T1		003456	G
SFPTBL	002134	G	T#ERRN	=	000000	T#SAVL	=	177777	T##DU	=	010011	UAM	=	000200	G
SVCGBL	=	000000	T#FLAG	=	000040	T#SEGL	=	177777	T##HAR	=	010014	UNIT		002140	G
SVCINS	=	000000	T#FREE	=	004106	T#SIZE	=	000003	T##HW	=	010000	X#ALWA	=	000000	
SVCSUB	=	000000	T#GMAN	=	000000	T#SUBN	=	000000	T##INI	=	010006	X#FALS	=	000040	
SVCTAG	=	000000	T#LAST	=	000001	T#TAGL	=	177777	T##MSG	=	010002	X#OFFS	=	000400	
SVCTST	=	000000	T#LSYM	=	010000	T#TAGN	=	010021	T##PC	=	000001	X#TRUE	=	000020	
S#LSYM	=	010000	T#LTND	=	000001	T#TEMP	=	000000	T##PRO	=	010005	\$PATCH		004054	G
TAB	=	000011	T#NEST	=	177777	T#TEST	=	000001	T##PTA	=	010017				

. ABS. 004106 000
 000000 001

ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 28352 WORDS (111 PAGES)
 DYNAMIC MEMORY: 20060 WORDS (77 PAGES)
 ELAPSED TIME: 00:02:02
 ZFPCA0.BIC,CZFPCA0/-SP=SVC/ML,ZFPCA01,ZFPCA02,ZFPCA03,ZFPCA04,ZFPCA05,ZFPCA06