

FEPOM

CHECK UTILITY
CZFPCAO

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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-AO 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$DEPO::      ;0
      002011      060      .ASCII /O/
      002012      L$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 #
 .BYTE C\$REVISION
 .BYTE C\$EDIT
 L\$EF:: .WORD 0 ;DIAG. EVENT FLAGS
 .WORD 0
 L\$SPC:: .WORD 0
 L\$DEVP:: .WORD L\$DVTYP ; POINTER TO DEVICE TYPE LIST
 L\$REPP:: .WORD 0 ;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 L\$DESC ;POINTER TO DIAG. DESCRIPTION
 L\$LOAD:: EMT E\$LOAD ;GENERATE SPECIAL AUTOLOAD EMT
 L\$ETP:: .WORD 0 ;POINTER TO ERR_TBL
 L\$ICP:: .WORD L\$INIT ;PTR. TO INIT CODE
 L\$CCP:: .WORD L\$CLEAN ;PTR. TO CLEAN-UP CODE
 L\$ACP:: .WORD L\$AUTO ;PTR. TO AUTO CODE
 L\$PRT:: .WORD L\$PROT ;PTR. TO PROTECT TABLE
 L\$TEST:: .WORD 0 ;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      .SBTTL  DEFAULT HARDWARE P-TABLE
66
67      ;**
68      ; THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
69      ; THE TEST-DEVICE PARAMETERS.  THE STRUCTURE OF THIS TABLE
70      ; IS IDENTICAL TO THE STRUCTURE OF THE HARDWARE P-TABLES,
71      ; AND IS USED AS A "TEMPLATE" FOR BUILDING THE P-TABLES.
72      ;--
73
74      002126      BGNHW      DFPTBL
      002126      .WORD      L10000-L$HW/2
      002130      L$HW::
      002130      DFPTBL::
75
76      002130      .WORD      0
77      002132      ENDHW
78      002132      L10000:
      002132

```

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
	002132	000001		.WORD
	002134			SFPTBL
	002134			L10001-L\$SW/2
90			L\$SW::	
91	002134	000000	SFPTBL::	
92				.WORD
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      SECT3::
43
44      ;**
45      ; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
46      ; ARE USED IN MORE THAN ONE TEST.
47      ;**
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
      ;
      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

```

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          .EVEN
103
104          ;
105          ; NAMES OF DEVICES SUPPORTED BY PROGRAM
106          ;
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          .EVEN
109
110          ;
111          ; 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          .EVEN
114          .EVEN
115
116          ;
117          ; FORMAT STATEMENTS USED IN PRINT CALLS
118          ;

```

GLOBAL ERROR REPORT SECTION

```
120 .SBTTL GLOBAL ERROR REPORT SECTION
121
122 ;++
123 ; THE GLOBAL ERROR REPORT SECTION CONTAINS MESSAGE PRINTING AREAS
124 ; USED BY MORE THAN TEST TO OUTPUT ADDITIONAL ERROR INFORMATION. PRINTB
125 ; (BASIC) AND PRINTX (EXTENDED) CALLS ARE USED TO CALL PRINT SERVICES.
126 ;--
127
128 002302 BGNMSG
129
130 002302 EXIT MSG
    002302 .WORD J$JMP
    002304 .WORD L10002-2-.
131
132 002306 ENDMMSG
    002306 L10002:
    002306 104423 TRAP C$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      R0,REG0          ;SAVE R0
148      010037 002162
149 002314      200$:   INC      TRPFLG          ;SET TRAP FLAG
150      005237 002154
151 002320      MOV      REG0,R0          ;RESTORE R0
152 002324      ENDSRV          ;AND RETURN
153 002324      L10003:      RTI
      000002

```

HELP FILE DUMP ROUTINE

```

155      .SBTTL  HELP FILE DUMP ROUTINE
156 002326 STARS
157      ;;*****
158      ;;
159      ;;      SUBROUTINE TO DUMP DOS HELP FILE TO CONSOLE
160      ;;
161      ;;      INPUT:          R1 =  POINTER TO "FILNAM.EXT"
162      ;;                      R5 =  RETURN ADDRESS
163      ;;
164      ;;      OUTPUT:         PRINTS 72 CHARACTER BUFFER TO CONSOLE
165      ;;
166      ;;      REGISTER USAGE: R1 =  POINTER TO LINE TEXT BUFFER
167      ;;                      R2 =  TAB POSITION COUNTER
168      ;;                      R4 =  CHARACTER FROM FILE
169      ;;                      R5 =  LINK REGISTER
170      ;;
171      ;;      CALLING SEQ:    MOV    #FILNAM,R1
172      ;;                      JSR    R5,DMP
173      ;;
174      ;;      FUNCTION:       DMP WILL OPEN, READ AND CLOSE THE SELETED FILE
175      ;;                      USING THE DIAG SUPERVISOR MACROS.  CHARACTERS
176      ;;                      ARE READ ONE AT A TIME AND TRANSFERRED TO THE
177      ;;                      LINE BUFFER, WHICH IS DUMPED TO THE CONSOLE
178 002326 STARS
179      ;;*****
180      000040      BLK      =      40      ;BLANK CHAR
181      000015      CR       =      15      ;CARRAGE RETURN CHAR
182      000012      LF       =      12      ;LINE FEED CHAR
183      000011      TAB      =      11      ;TAB CHAR
184

```

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				:			

HELP FILE DUMP ROUTINE

229 002462

230

231

232

233 002462

234

235

236

237 002462 110421

238 002464 001403

239 002466 022701 002646

240 002472 001012

241

242

243

244 002474

002474 012746 002554

002500 012746 000001

002504 010600

HELP FILE DUMP ROUTINE

265 002554

STARS

266

;;*****

267

;;

268 002554

;;

BUFFER STORAGE AREA

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

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

PROTECTION TABLE

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

002656
002656

177777
177777
177777

002664

.SBTTL PROTECTION TABLE

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

INITIALIZE SECTION

```

73      .SBTTL  INITIALIZE SECTION
74 002664 STARS
75      ;*****
76      ;
77      ;       INITIALIZATION SECTION:
78      ;
79      ;       (0)  MANDATORY CALL "GPWARD" EACH PASS
80      ;
81      ;       (1)  EVENT FLAGS
```

INITIALIZE SECTION

118	:	TST	HELP2	:	TEST IF QUESTION ASKED
119	:	BNE	4008	:	YES: CONTINUE
120	:				

INITIALIZE SECTION

```

129      ;      DETERMINE AND PRINT AVAILABLE MEMORY IN WORDS
130      ;
131      ;      HIGH PAGE ADDRESS IS IN L$HIMEM, IN PAGE ADDRESS
132      ;      FORM (64-BYTE PAGES). DISPLAYED VALUE IS IN
133      ;      2048-BYTE PAGES, SO THE PAGE ADDRESS IS DIVIDED
134      ;      BY 32, AND BUMPED TO SHOW ABSOLUTE MEMORY SIZE.
135
136 002716 005237 002204      4006: INC      HELP2      ;SET FLAG FOR SECOND QUESTION
137
138 002722 013701 002120      MOV      L$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
```

INITIALIZE SECTION

148			:	READ BUS TO DETERMINE WHAT TYPE	
149					

INITIALIZE SECTION

SEQ 0030

003132 104432
003134 000274
171

TRAP C\$EXIT
.WORD L10006-

