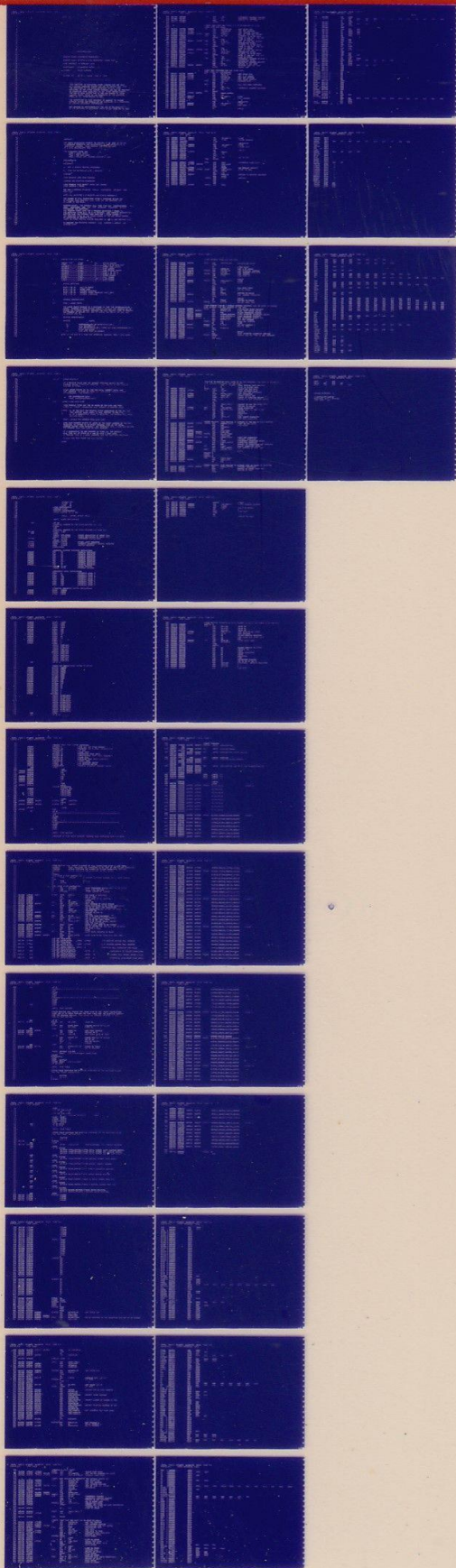


BM792YA-H,K,L

BOOTSTRAP LOADER TEST
MD-11-DZBMA-E

EP-DZBMA-E-DL
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MAY 1978
digital
MADE IN USA



.REPT 0

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZBMA-E-0

PRODUCT NAME: BM792VA-M,K,SL BOOTSTRAP LOADER TEST

DATE CREATED: 13 FEBRUARY 1973

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: BRUCE BURGESS

REVISED BY: DAVID L. ADAMS JUNE 3, 1975

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1. ABSTRACT

THE DZDMA DIAGNOSTIC PROGRAM IS WRITTEN TO BE USED AS AN AID TO HARDWARE DEBUGGING AND MAINTENANCE OF THE DM792YA-M,K,SL BOOTSTRAP LOADERS. THIS PROGRAM MAY ALSO BE USED AS A DATA RELIABILITY TEST.

THE AVAILABLE TESTS ARE
PRG0 - LOGIC TESTS
PRG1 - ROM DATA DUMP
PRG2 - SINGLE ROM ADDRESS READ DATA LOOP

2. REQUIREMENTS

2.1 EQUIPMENT

A. PDP 11 FAMILY CENTRAL PROCESSOR
B. M792 AND DM792YA-M,K,OR L MODULES

2.2 STORAGE

THIS PROGRAM USES CORE 8-ENDAD

3. LOADING AND STARTING PROCEDURE

LOAD PROGRAM INTO MEMORY USING ABS LOADER,
LOAD ADDRESS = 00200

SET SWR = DESIRED STANDARD PDP-11 DIAGNOSTIC OPTIONS (SEE SECT 4.0)

NOTE: ALL SWITCHES = 0 SELECTS AND STARTS PROGRAM 0

THE NUMBER OF FILL CHARACTERS AFTER A CARRIAGE RETURN MAY BE PATCHED INTO LOCATION 1101. NINE (9) ARE REQUIRED FOR AN LA308 AT 300 BAUD.

DEPRESS START. THE PROGRAM WILL THEN TYPE OUT INSTRUCTIONS. ALL USER RESPONSES ARE VIA THE KEYBOARD (CARRIAGE RETURN TERMINATES THE RESPONSE)

THE PROGRAM FIRST ASKS FOR A PROGRAM SELECTION " PRG0 = ".
THE OPERATOR TYPES 0,1, OR 2 AS DESIRED. (SEE PROGRAM DESCRIPTION SECTION 5.0) THE PROGRAM THEN ASKS FOR " IMAGE NUMBER ".
THE OPERATOR TYPES IN THE IMAGE NUMBER OF THE ROM BEING TESTED AS INDICATED IN SECTION 3.1.
THERE IS OTHER SPECIAL DIALOG REQUIRED IN PRG 2. SEE SECTION 5.3.

TO RESTART THE SELECTED PROGRAM LOAD ADDRESS = 000210 AND DEPRESS START

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3.1 MODULE TYPE AND IMAGE

MODULE TYPE	IMAGE	NO.	OPTION BOOTED
M792.....	IMAG1.....	0.....	(ALL 1'S NO DATA CUT)
M792YA.....	IMAG2.....	1.....	PAPER TAPE LOADER
M792YB.....	IMAG3.....	2.....	DISK LOADER
M792YC.....	IMAG4.....	3.....	CARD READER LOADER
M792YD.....	IMAG5.....	4.....	CARD 1 OF MR 11
M792YE.....	IMAG6.....	5.....	CARD 2 OF MR 11
M792YF.....	IMAG7.....	6.....	DS500 LOADER
M792YH.....	IMAG8.....	7.....	TA11 LOADER
M792YK.....	IMAG9.....	10.....	V120 LOADER
M792YL.....	IMAG10.....	11.....	RA11 LOADER

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5.1.2 ERROR PRINTOUT

IF A ROUTINE FAILS AND THE INHIBIT PRINTOUT SWITCH IS NOT
ENABLED (SW13) A PRINTOUT RESULTS. I.E. THE PC AT THE TIME OF
FAILURE IS TYPED.

IF AN ERROR OCCURS IN T4, THE ROM DATA, CORRECT DATA, AND
THE ADDRESS OF EACH IS TYPED OUT (THE ERROR TYPEOUT CANNOT
BE DISABLED). THE FORMAT IS

ROM ADDRESS/ROM DATA
IMAGE ADDRESS-CORRECT DATA

5.2 PRG1 - ROM DATA DUMP

THIS PROGRAM TYPES OUT THE 32 WORDS OF ROM DATA AND THEN
TYPES OUT 'PRG00' REQUESTING WHAT PROGRAM TO PERFORM NEXT.

NOTES: 1. IF YOU HALT THE PROGRAM AFTER COMPLETION OF PRG 01, AND
THEN RESTART (LOC. 210), IT WILL RESTART TO PRG 0 0.
2. IF A NONEXISTANT IMAGE IS SELECTED, THE PROGRAM WILL THAP
OUT AND HALT.

5.3 PRG2 - SINGLE ROM ADDRESS READ DATA LOOP

WHEN THIS PROGRAM STARTS IT LOOPS ON THE FIRST ADDRESS OF THE ROM
SELECTED. TO CHANGE TO AN OTHER ADDRESS, TYPE IN THE OCTAL
ADDRESS WANTED (MUST BE EVEN), AND TERMINATE WITH A CARRIAGE RETURN.
THE PROGRAM WILL THEN LOOP ON THAT ADDRESS.

IF A NONEXISTANT OR ODD ADDRESS IS TYPED IN, THE PROGRAM
WILL TYPE OUT AN ERROR PC 0 AND GO INTO A WAIT LOOP.
TO RECOVER TYPE IN A LEGAL ADDRESS, AND THE TEST WILL CONTINUE.

TO HALT THE TEST PRESS THE HALT SWITCH.

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192          .ENABLE ABS
193          .NLIST MC
194          .LIST ME
195          !LOAD ADDRESS=0200
196          !DEPRESS START
197          !RESTART ADDRESS=0210
198          !STACK POINTER IS AT 500
199
200          .MCALL .STYPE,.SIRAP,.EQUAT
201
(1)          .DBTTL BASIC DEFINITIONS
(1)
(1)          001          .IF NB
(1)          !INITIAL ADDRESS OF THE STACK POINTER *** ***
(1)          STACK=
(1)          .IFF
(1)          !INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
(1)          001100      STACK= 1100
(1)          000
(1)          .ENDC
(1)          .EQUIV EMT,ERROR          !BASIC DEFINITION OF ERROR CALL
(1)          .EQUIV IOT,SCOPE          !BASIC DEFINITION OF SCOPE CALL
(1)          177776      PS= 177776          !PROCESSOR STATUS WORD
(1)          .EQUIV PS,PSW
(1)          177774      STKLMT= 177774          !STACK LIMIT REGISTER
(1)          177772      PIR= 177772          !PROGRAM INTERRUPT REQUEST REGISTER
(1)          177570      SHR= 177570          !SWITCH REGISTER
(1)          177570      DISPLAY=SHR
(1)
(1)          !GENERAL PURPOSE REGISTER DEFINITIONS
(1)          000000      R0= 0          !GENERAL REGISTER
(1)          000001      R1= 1          !GENERAL REGISTER
(1)          000002      R2= 2          !GENERAL REGISTER
(1)          000003      R3= 3          !GENERAL REGISTER
(1)          000004      R4= 4          !GENERAL REGISTER
(1)          000005      R5= 5          !GENERAL REGISTER
(1)          000006      R6= 6          !GENERAL REGISTER
(1)          000007      R7= 7          !GENERAL REGISTER
(1)          .EQUIV R6,SP          !STACK POINTER
(1)          .EQUIV R7,PC          !PROGRAM COUNTER
(1)
(1)          !PRIORITY LEVEL DEFINITIONS
(1)          000000      PH0= 0          !PRIORITY LEVEL 0
(1)          000040      PH1= 40          !PRIORITY LEVEL 1
(1)          000100      PH2= 100          !PRIORITY LEVEL 2
(1)          000140      PH3= 140          !PRIORITY LEVEL 3
(1)          000200      PH4= 200          !PRIORITY LEVEL 4
(1)          000
```

(1)	010000	SW12=	10000
(1)	004000	SW11=	4000
(1)	002000	SW10=	2000
(1)	001000	SW09=	1000
(1)	000400	SW08=	400
(1)	000200	SW07=	200
(1)	000100	SW06=	100
(1)	000040	SW05=	40
(1)	000020	SW04=	20
(1)	000010	SW03=	10
(1)	000004	SW02=	4
(1)	000002	SW01=	2
(1)	000001	SW00=	1
(1)		.EQUIV	SW09,SW9
(1)		.EQUIV	SW08,SW8
(1)		.EQUIV	SW07,SW7
(1)		.EQUIV	SW06,SW6
(1)		.EQUIV	SW05,SW5
(1)		.EQUIV	SW04,SW4
(1)		.EQUIV	SW03,SW3
(1)		.EQUIV	SW02,SW2
(1)		.EQUIV	SW01,SW1
(1)		.EQUIV	SW00,SW0
(1)	001	.IF 0 <>	
(1)			
(1)			

```

(1)
(1)
(1)      000004      J*BASIC "CPU" TRAP VECTOR ADDRESSES
(1)      000010      ENRVEC= 4      JTIME OUT AND OTHER ERRORS
(1)      000014      RESVEC= 10     JRESERVED AND ILLEGAL INSTRUCTIONS
(1)      000014      T0ITVEC=14    J"Y" BIT
(1)      000014      TMTVEC= 14    JTRACE TRAP
(1)      000014      BPTVEC= 14    JBREAKPOINT TRAP (BPT)
(1)      000020      IOTVEC= 20     JINPUT/OUTPUT TRAP (IOT) **SCOPE**
(1)      000024      PHRVEC= 24     JPOWER FAIL
(1)      000030      EMTVEC= 30     JEMULATOR TRAP (EMT) **EMTOR**
(1)      000034      THAPVEC=34    J"TRAP" TRAP
(1)      000060      TAVEC= 60      JTY KEYBOARD VECTOR
(1)      000064      TPVEC= 64      JTY PRINTER VECTOR
(1)      000240      PIQVEC=240     JPROGRAM INTERRUPT REQUEST VECTOR
(1)      000      .ENDC
209      000020      .=20
210      000020      002606      .SCOPE
211      000022      000240      240
212      000030      000030      .=30
213      000030      002730      .MLT
214      000032      000340      340
215      000034      001000      TYP
216      000036      000000      0
217      000046      000046      .=46
218      000046      002310      LOGIC
219      EQUATE STATEMENTS
220      000500      STKPTR= 500
221      177564      TPS=177564
222      177566      TPB=177566
223      177560      TKS=177560
224      177562      TKB=177562
225
226      000200      .=200
227      000200     
```



```

233      001      .IF B
(2)      .IF .....
(2)      .NLIST
(2)      .NEPT
(2)      .LIST
(2)      .NLIST
(2)      .ENDR
(2)      .LIST
(2)      .ENDC
(1)      000
(1)
(1)      .BTTL TRAP DECODER
(1)
(1)      ;THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
(1)      ;AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
(1)      ;OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
(1)      ;GO TO THAT ROUTINE.
(1)
(1)      001
(1) 001116 010046 .IF B
(1)      STRAP: MOV      RB, -(SP)      ;SAVE RB
(1)      .IF
(1)      STRAP: MOV      2(SP), 00P0    ;ASSUME STATUS OF CALLER
(1)      MOV      RB, -(SP)      ;SAVE RB
(1)      .ENDC
(1)      MOV      2(SP), RB      ;GET TRAP ADDRESS
(1)      TST      -(RB)          ;BACKUP BY 2
(1)      MOVB     (RB), RB      ;GET RIGHT BYTE OF TRAP
(1)      .IF NB
(1)      CMP      00TERM, RB      ;CHECK FOR OUT OF BOUNDS
(1)      BGT      .+6            ;BR IF OK
(1)      HALT     ;OUT OF BOUNDS
(1)      BR       .-2            ;HANGUP
(1)      .ENDC
(1)      MOV      STRPAD(RB), RB    ;INDEX TO TABLE
(1)      RTS      RB             ;GO TO ROUTINE
(1)
(1)      .MACRO SETTRAP A,B,MSG
(1)      SSSET     A,B,\<TRAP+STRP>,\STRP,<MSG>
(1)
(1)      .NLIST
(1)      STRP=STRP+2
(1)      .LIST
(1)      .ENDM SETTRAP
(1)      .MACRO SSSET A,B,C,D,CUMNT
(1)      .IF EQ STRP
(1)
(1)      .BTTL TRAP TABLE
(1)
(1)      ;THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
(1)      ;BY THE "TRAP" INSTRUCTION.
(1)
(1)      / ROUTINE
(1)      / -----
(1)      STRPAD
```


.MAIN. MACY11 27(657) 6-JUN-75 15144 PAGE 6-2
DZBMAE.P11 THAP TABLE

578	002744	003070	
579	002746	011667	000022
580	002752	004767	000020
581	002756	005737	177570
582	002762	100001	
583	002764	000000	
584	002766	104400	
585	002770	003124	
586	002772	000002	
587			

ERRORM
MOV (6),D2BTYP
JSR 7,02A
TST 003WR
BPL ,+4
HALT
TYPE
MO
RTI

I'PC= '
I'YPE PROGRAM COUNTER
I'HALT ON ERROR?
I
I'YES HALT

I'RETURN TO TEST

