

BM792YB

DECTAPE + DISK BOOTSTRAP
MD-11-DZBMB-A
LOADER

EP-DZBMB-A-DL
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FICHE 1 OF 1

MAY 1978
digital
MADE IN USA

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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DEKMB-A-D
REPLACES: MAINDEC-11-DIKA-D

PRODUCT NAME: BM792YH DECTAPE & DISK
BOOTSTRAP LOADER

DATE CREATED: JUNE 30, 1972

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: J. ADAMS

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1. ABSTRACT

THE DZ0M9 DIAGNOSTIC PROGRAM IS WRITTEN TO BE USED AS AN AID TO HARDWARE DEBUGGING AND MAINTENANCE OF THE 0M792VB DECVAPE AND DISK BOOTSTRAP LOADER). THESE PROGRAMS 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. 0M792-VB MODULE

2.2 STORAGE

THIS PROGRAM USES CORE 0-4100(8)

3. LOADING AND STARTING PROCEDURE

LOAD PROGRAM INTO MEMORY USING ABS LOADER,

LOAD ADDRESS = 00200

SET SR = DESIRED STANDARD PDP-11 DIAGNOSTIC OPTIONS (SEE SECT 0.0)

NOTE: ALL SWITCHES AUTOMATICALLY SELECTS AND STARTS PROGRAM

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

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

4.0 SWITCH SETTINGS

SW15 1 OR UP	HALT ON ERROR
SW14 1 OR UP	SCOPE LOOP
SW13 1 OR UP	INHIBIT PRINTOUT
SW12 1 OR UP	INHIBIT TRACE TRAPPING (NOT USED)
SW11 1 OR UP	INHIBIT ITERATION

5. PROGRAM DESCRIPTIONS

5.1 PRG0 - LOGIC TESTS

THE LOGIC TESTS CONSIST OF 4 ROUTINES TO TEST THE 84792VB LOGIC

5.1.1 ROUTINE DESCRIPTIONS

ROUTINE	TESTS
T1	ADDRESSABILITY OF 84792VB
T2	DATA RELIABILITY
T3	THAT 84792VB TIMES OUT WHEN REFERENCED BY A DATA BUS CYCLE
T4	THAT DATA READ IS CORRECT

5.1.2 ERROR PRINTOUT

IF A ROUTINE FAILS AND THE INHIBIT PRINTOUT SWITCH IS NOT ENABLED (SR13) A PRINTOUT RESULTS; THE PC AT THE TIME OF FAILURE IS TYPED;

IF AN ERROR OCCURS IN T4 THE ROM DATA AND 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 HALTS.

5.3 PRG2 - SINGLE ROM ADDRESS READ DATA LOOP

THIS PROGRAM CONTINUOUSLY READS DATA FROM A TYPED IN ROM ADDRESS, TO CHANGE THE ADDRESS TYPE IN A NEW ADDRESS, (MUST BE EVEN)

1

.TITLE TEST D2BMB DECTAPE & DISK BOOT LDR
.NLIST SEQ,MC
.LIST ME
.ABS
ILOAD ADDRESS=0200
IDEPRESS START
IRESTART ADDRESS=0210
ISTACK POINTER IS AT 500

000030 000030
000032 002362
000034 000340
000036 002272
000038 000000
104000
104400
177560
177562
177564
177566
177776
177970
177970
000500
000060
000062
000200
000200 000167 000024
000210
000210 000167 000094
001000

.030
ERROR
340
SCOPEC
P
IEQUATE STATEMENTS
MLY=ENT
SCOPE=TRAP
TKCSR=177560
TKDR=177562
TPCSR=177564
TPDR=177566
PSW=177776
SR=177970
DISPLAY=177970
SYMPTR=500
TKIN7A=00
TKIN7P=02
START11 JMP PRMTRS
START31 JMP RESTART
.0200
.0210
.01000

ADDRESS OF DISPLAY REGISTER
INITIAL STACK SETTING

ITMIS PROGRAM TYPES OUT ROM DATA

001640 012786 000500
001644 004567 000214
001690 002552
001692 016701 177124
001696 016700 177136
001662 012782 000012
001666 109767 175672
001672 100375
001674 010067 000324
001700 004767 000322
001704 004567 000194
001710 002566
001712 012067 000306
001716 004767 000304
001722 109767 175636
001726 100375
001730 012767 000040 175630
001736 005301
001740 001410
001742 005302
001744 001302
001746 012782 000012
001752 004567 000100
001756 002566
001760 000745
001762 000167 177042

```

PRG1I  MOV 0BTMPTR,X6 ;INITIALIZE STACK
        JSR 9,TYPEH ;TYPE MESSAGE
        M7 ;FROM DATA
        MOV WORDS,X1 ;GET # OF WORDS
PRG1AI MOV ROMADD,X9 ;GET STARTING ADDRESS
        MOV 012,X2 ;GET ADDRESS INDICATOR
        TSTB TPCSR ;WAIT FOR
        BPL ,04 ;TELEPRINTER FLAG
PRG1BI MOV X0,DZBTYP ;GET ADDRESS
        JSR 7,02A ;AND TYPE IT
        JSR 9,TYPEH ;TYPE
        M0 ;CR/LF
PRG1CI MOV (0)+,DZBTYP ;TYPE
        JSR 7,02A ;DATA
        TSTB TPCSR ;WAIT FOR
        BPL ,04 ;TELEPRINTER FLAG
        MOV 01 ,TPDBR ;TYPE SPACE
        DEC X1 ;ALL DATA TYPED
        BEQ PRG1D ;GO TO FINISH
        DEC X2
        ONE PRG1C ;RETURN TO PRG1B
        MOV 012,X2 ;GET ADDRESS INDICATOR
        JSR 9,TYPEH ;TYPE
        M0 ;CR/LF
        BR PRG1B ;RETURN TO PRG1B
PRG1DI JMP PRMTRS ;GO GET NEXT TEST
    
```

ITMIS PROGRAM CYCLES A SINGLE ADDRESS (ADDRESS MUST BE EVEN) TO CHANGE
THE ADDRESS TYPE NEW ADDRESS ON THE TTY.

001766 012786 000500
001772 012737 002060 000004
002000 005067 175772
002004 012767 002036 176046
002012 012767 000340 176042
002020 012767 000100 175532
002026 016700 176766
002032 005710
002034 000776
002036 004567 000140
002042 000000
002044 016700 177772
002050 004567 000010
002054 002566
002056 000002
002060 104000
002062 000777

```

PRG2I  MOV 0BTMPTR,X6 ;INITIALIZE STACK POINTER
        MOV 0PRG2C,004 ;LOAD TRAP ERROR VECTOR
        CLR PSH ;CLEAR PROCESSOR STATUS
        MOV 0PRG2A,TKINTA ;LOAD KEYBOARD INTERRUPT VECTOR
        MOV 0340,TKINTP ;LOAD KEYBOARD PRIORITY
        MOV 0100,TKCSR ;SET INTERRUPT ENABLE BIT
        MOV ROMADD,X0 ;GET ROM ADDRESS
        TST (0) ;READ ROM ADDRESS
        BR ,02 ;LOOP
PRG2AI JSR 9,RECD ;GO GET ADDRESS &
PRG2BI B ;POT IT HERE
        MOV PRG2B,X0
        JSR 9,TYPEH ;TYPE
        M0 ;CR/LF
        RTI ;EXIT KEYBOARD INTERRUPT SERVICE
PRG2CI WLT ;ERROR! DID YOU TYPE AN ODD ADDRESS?
        BR ;ISIT HERE UNTIL CORRECT ADDRESS IS TYPED IN
    
```

ROUTINE TO TYPE A MESSAGE

002064 010026
002066 012500

```

TYPEHI MOV X0,(6)+ ;SAVE REGISTER 0
        MOV (5)+,X0 ;PLACE MESSAGE ADDRESS IN R0
    
```


002334 011667 000000
002340 000002
002342 000005
002344 000000
002346 000000
002350 005726
002352 012667 175420
002356 000177 177764

MOV 0X0,RETURN ;GET ADDRESS OF NEXT TEST
RTI ;EXIT
;COUNT) 5
SCOPEFI) 0 ;CONTAINS SUBTEST ITERATION COUNT
RETURN) ,WORD 0 ;CONTAINS RETURN PC FOR SCOPE
SCOPEB) TST (0), ;POP PC
MOV (0),PSW ;RESTORE CONDITION CODES
JMP @RETURN

002362 036727 175202 P20000
002370 001401
002372 000002
002374 004567 177464
002400 002532
002402 011667 000016
002406 004767 000014
002412 005767 175152
002416 100001
002420 000000
002422 000002

;ERROR ROUTINE; THIS ROUTINE IS ENTERED WHEN AN ERROR IS DETECTED;
ERROR) BIT SR,020000 ;INHIBIT PRINTOUT
;SEQ ,04 ;BRANCH IF ERROR PRINT OUT
RTI ;RETURN TO TEST
JSR X5,TYPEM ;TYPE ERROR MESSAGE
ERRORM ;IPC
MOV (0),DZBTYP ;TYPE PROGRAM COUNTER
JSR 7,02A
TST SR ;HALT ON ERROR?
BPL ,04 ;
HALT ;YES HALT
RTI ;RETURN TO TEST

002424 000000
002426 016746 175132
002432 010246
002434 010146
002436 010046
002440 016700 177760
002444 012701 000006
002450 005002
002452 006100
002454 006102
002456 062702 000260
002462 105767 175076
002466 100375
002470 010267 175072
002474 005002
002476 006100
002500 006102
002502 006100
002504 006102
002506 006100
002510 006102
002512 005301
002514 001300
002516 012600
002520 012601
002522 012602
002524 012667 175034
002530 000207

;THIS ROUTINE CONVERTS AN OCTAL NUMBER TO ASCII AND TYPES IT ON THE TTY,
DZBTYP) 0
O2A) MOV TPCSR,0(6) ;SAVE TPCSR
MOV X2,0(6) ;SAVE R2
MOV X1,0(6) ;SAVE R1
MOV X0,0(6) ;SAVE R0
MOV DZBTYP,X0 ;GET DATA TO BE TYPED
MOV 06,X1 ;GET COUNTER
CLR X2 ;CLEAR WORKING REGISTER
ROL X0 ;MOV FIRST BIT (MSB) INTO
ROL X2 ;R2
O2AA) ADD 0260,X2 ;FORM ASCII CODE
TSTB TPCSR ;TEST TELEPRINTER
BPL ,04 ;PLAC AND WAIT UNTIL DONE
MOV X2,TPDBR ;LOAD TELEPRINTER BUFFER
CLR X2 ;CLEAR WORKING REGISTER
ROL X0 ;ROTATE THE
ROL X2 ;NEXT
ROL X0 ;OCTAL CHARACTER
ROL X2 ;INTO
ROL X0 ;REGISTER
ROL X2 ;TWO
DEC X1 ;DECREMENT COUNTER
ONE O2AA ;GO TO O2AA IF NOT 0
MOV (0),X0 ;FINISHED; RESTORE REGISTERS
MOV (0),X1 ;
MOV (0),X2 ;
MOV (0),TPCSR ;AND TPCSR
RTS 7 ;AND EXIT

```

      |ASCII MESSAGES
002532 022500 050040 036503 ERRORM1 ,ASCII '0X PC0 0'
002540 040040
002542 022500 051120 021507 M61 ,ASCII '0XPRG0001'
002550 040075
002552 022500 047922 020115 M71 ,ASCII '0XROM DATA01'
002560 040504 040524 040045
002566 022500 100 M81 ,ASCII '0X0'
002571 100 051045 046517 M91 ,ASCII '0XROM ADDRESS/IMAGE ADDRESS ROM DATA01IMAGE DATA01'
002576 040440 042104 042522
002604 051523 044457 040515
002612 042507 040440 042104
002620 042522 051523 051040
002626 046517 042040 052101
002634 025101 046511 043501
002642 020105 040504 040524
002650 040045
002652 027500 100 M101 ,ASCII '0/0'
002655 100 040040 M111 ,ASCII '0 0'
002660 025100 100 M121 ,ASCII '000'

      ,03776
003776 000000 ,WORD
      ,DATA CUT INTO THE 04792-YN
004000 013701 177570 000005 013701,177570,000005,010100
004006 010100
004010 012710 177400 020027 012710,177400,020027,177344
004016 177344
004020 001007 012740 004002 001007,012740,004002,005710
004026 005710
004030 100376 005740 100363 100376,005740,100363,022020
004036 022020
004040 012740 000005 105710 012740,000005,105710,100376
004046 100376
004050 005710 100794 105010 005710,100794,105010,000139
004056 000139
004060 000000 000001 177777 000000,000001,177777,177777
004066 177777
004070 177777 177777 177777 177777,177777,177777,177777
004076 177777

      ,END
000001
```

