

PDP11

LGOPBACK PROGRAM
MD-11-DZVTK-A

EP-DZVTK-A-DL-A

NOV 1976

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MADE IN USA

IDENTIFICATION

PRODUCT CODE: MD-11-DZVTK-A-D
PRODUCT NAME: VT INPUT LINE LOOP BACK PROGRAM
DATE: JULY, 1976
MAINTAINER: DIAGNOSTIC ENGINEERING
AUTHOR: DAVID L. ADAMS

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1. OBJECT:

THE OBJECT OF THIS PROGRAM IS TO RESIDE IN THE REMOTE TERMINAL AND MONITOR THE SERIAL LINES COMING FROM THE DHSE. UPON DETECTING DATA THE PROGRAM WILL SEND THE SAME DATA BACK TO THE SAME SERIAL LINE UNIT INTERFACE THAT SENT IT OUT. THE PROGRAM WILL HANDLE UP TO 4 SERIAL LINE INTERFACE OPTIONS.

THIS LOOP BACK INSURES THAT ALL LINE CONNECTIONS BETWEEN THE DHSE AND THE REMOTE TERMINAL ARE FUNCTIONAL.

THE PROGRAM IS SELF STARTING WHEN LOADED BY THE ABSLDR.

2. REQUIREMENTS:

THE ONLY REQUIREMENTS ARE IN THE ADDRESS SELECTION OF THE VT SERIAL LINE DEVICES. THEY MUST BE SET TO ADDRESS MULTIPLES OF 10, IE. 175610, 175620, 175630, ETC. THEY MUST ALSO HAVE THEIR VECTOR ADDRESSES SET TO 300 THROUGH 336.

3. OPERATION:

UPON STARTING THE PROGRAM (LOC. 200 JUMPES TO 1200) IT SETS UP THE STACK POINTER THEN SETS THE INTERUPT ENABLE BIT FOR EACH SERIAL LINE DEVICE. THEN IT CLEARS A LOCATION IN THE STACK AND DOES A "RTI" THUS SETTING TO ZERO THE INTERUPT LEVEL OF THE PSW.

NOW IT SETS IN A "WAIT" INSTRUCTION FOR AN INTERUPT CAUSED BY ONE OF THE RECIEVER LINES GETTING DATA. IT THEN ADJUSTS THE INTERNAL DEVICE CODE FOR THE DEVICE JUST INTERRUPTING, LOOKS FOR THE TRANSMIT READY FLAG, AND THEN MOVES THE DATA FROM THE RECIEVE BUFFER TO THE TRANSMIT BUFFER OF THAT DEVICE. FINALLY IT DOES A "RTI" BACK TO THE "WAIT" INSTRUCTION TO ACCEPT THE NEXT INTERUPT.

NOTE: THE PROGRAM IS SELF STARTING AND WILL, AFTER IT'S INITIAL SET UP START SENDING ANYTHING IT SEES ON THE RECIEVE LINE BACK DOWN THE TRANSMIT LINE. THE PROGRAM IN THE DHSE MUST BE AWARE THAT IT WILL START GETTING DATA BACK AT IT'S RECIEVER WHEN THIS LOOP BACK PROGRAM IS RUNNING.

THE MD-11-DZVTK MUST BE RUNNING BEFORE THE KLBA DIAGNOSTIC IS STARTED IN THE DHSE.

4. LISTING

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.TITLE MAINDEC-11-DZVTK-A
:VT INPUT LINE LOOP BACK PROGRAM
:
: COPYRIGHT (C) JULY, 1976
: DIGITAL EQUIPMENT CORPORATION
: MAYNARD, MASS. 01754
:
: PROGRAM BY DAVID L. ADAMS
:
: THIS TEST RUNS IN THE PDP 11 PROCESSOR OF THE VT'S WHILE THE KLBA
: LINE TEST DIAGNOSTIC IS BEING RUN IN THE B/A.
: THIS PROGRAM MUST BE RUNNING BEFORE THE KLBA TEST IS STARTED.

```

.ENABL ABS,AMA

```

RO = %0
SP = %6
PSW = 177776
.=4
.+2
0 ;HALT ON A TRAP

```

```

000000
000006
177776
000004
000006
000006

```

```

000200
000200 000137 001200
001200

```

```

.=200
JMP START
.=1200

```

```

30 001200 012706 001200
31 001204 012737 001224 000004
32 001212 013700 001342
33 001216 005001
34 001220 012710 000100
35 001224 062700 000010
36 001230 005201
37 001232 020127 000004
38 001236 001370
39 001240 012737 000006 000004
40 001246 005046
41 001250 012746 001256
42 001254 000002
43 001256 000001
001260 000776

```

```

START: MOV #1200,SP
MOV #3$,4 ;SET UP THE TIME OUT VECTOR
MOV DL0DE,RO
CLR R1
2$: MOV #100,(RO) ;SET THE INTERUPT ENABLE
3$: ADD #10,RO ;GO TO NEXT DL11
INC R1
CMP R1,#4
BNE 2$
MOV #6,4
CLR -(SP)
MOV #1$,-(SP) ;CLEAR THE PSW
RTI
1$: WAIT ;WAIT FOR THE INTERUPT
BR 1$

```

```
45
46 001262 013700 001342      SERVO:  MOV DLCODE,RO          ;GET ADDR. OF INTERRUPTING DL11
47 001266 000416              BR LOOPBK
48 001270 013700 001342      SERV1:  MOV DLCODE,RO          ;ADD 10 TO OFFSET ADDR. TO
49 001274 062700 000010              ADD #10,RO                    ;INTERUPTING DEVICE
50 001300 000411              BR LOOPBK
51 001302 013700 001342      SERV2:  MOV DLCODE,RO          ;ADD 20 TO OFFSET ADDR.
52 001306 062700 000020              ADD #20,RO                    ;
53 001312 000404              BR LOOPBK
54 001314 013700 001342      SERV3:  MOV DLCODE,RO          ;ADD 30 TO OFFSET ADDR.
55 001320 062700 000030              ADD #30,RO                    ;WAIT FOR XMIT FLAG
56 001324 105760 000004      LOOPBK: TSTB 4(RO)
57 001330 100375              SPL LOOPBK
58 001332 016060 000002 000006      MOV 2(RO),6(RO)              ;SEND THE DATA BACK
59 001340 000002              RTI
60 001342 175610      DLCODE: 175610              ;TO CHANGE DEVICE CODES CHANGE THIS LOCATION
61
62                                ;BUT ALL DEVICES MUST BE SET TO 17XX10, 17XX20, 17XX30, 17XX40.
63
64                                .=300
65
66 000300 001262      SERVO          ;INTERUPT ADDRESS FOR DL11 17XX10
67 000302 000340      340          ;PRI LEVEL 7
68 000304 000306      .+2          ;NO INTERUPT ON TRANSMIT LINE
69 000306 000000      0          ;ACCEPTED
70 000310 001270      SERV1          ;INTERUPT ADDRESS FOR DL11 17XX20
71 000312 000340      340
72 000314 000316      .+2
73 000316 000000      0
74
75 000320 001302      SERV2          ;INTERUPT ADDRESS FOR DL11 17XX30
76 000322 000340      340
77 000324 000326      .+2
78 000326 000000      0
79 000330 001314      SERV3          ;INTERUPT ADDRESS FOR DL11 17XX40
80 000332 000340      340
81 000334 000336      .+2
82 000336 000000      0
83
84                                001200      .END START
```

| | | | | | | | | | | | | | | |
|--------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|
| DLCODE | 001342 | 31 | 46 | 48 | 51 | 54 | 60# | | | | | | | |
| LOOPBK | 001324 | 47 | 50 | 53 | 56# | 57 | | | | | | | | |
| PSW | = 177776 | 19# | | | | | | | | | | | | |
| RO | =%000000 | 17# | 31* | 33* | 34* | 46* | 48* | 49* | 51* | 52* | 54* | 55* | 56 | 58* |
| RI | =%000001 | 32* | 35* | 36 | | | | | | | | | | |
| SERVO | 001262 | 46# | 66 | | | | | | | | | | | |
| SERV1 | 001270 | 48# | 70 | | | | | | | | | | | |
| SERV2 | 001302 | 51# | 75 | | | | | | | | | | | |
| SERV3 | 001314 | 54# | 79 | | | | | | | | | | | |
| SP | =%000006 | 18# | 29* | 39* | 40* | | | | | | | | | |
| START | 001200 | 25 | 29# | 84 | | | | | | | | | | |
| | = 000340 | 20# | 21 | 24# | 27# | 64# | 68 | 72 | 77 | 81 | | | | |

GO1

MAINDEC-11-DZVTK-A MACY11 27(732) 03-JUN-76 14:56 PAGE 4
DZVTKA.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

| | | | | | | | | | | | |
|--------|----|----|----|----|----|----|----|----|----|----|----|
| ADD | 34 | 49 | 52 | 55 | | | | | | | |
| BNE | 52 | | | | | | | | | | |
| BPL | 57 | | | | | | | | | | |
| BR | 43 | 47 | 50 | 53 | | | | | | | |
| CLR | 22 | 39 | | | | | | | | | |
| CMP | 36 | | | | | | | | | | |
| INC | 35 | | | | | | | | | | |
| JMP | 55 | | | | | | | | | | |
| MOV | 29 | 30 | 31 | 33 | 38 | 40 | 46 | 49 | 51 | 54 | 58 |
| RTI | 41 | 59 | | | | | | | | | |
| TSTB | 56 | | | | | | | | | | |
| WAIT | 42 | | | | | | | | | | |
| .ENABL | 15 | | | | | | | | | | |
| .END | 84 | | | | | | | | | | |
| .TITLE | 2 | | | | | | | | | | |

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

*DZVTKA.DZVTKA/CRF+DZVTKA
RUN-TIME: .4 .4 .1 SECONDS
RUN-TIME RATIO: 9/1=8.5
CORE USED: 6K (11 PAGES)

H01.

Spooler runtime 1 Seconds, 9 KCS, 20 disk reads, 3 disk writes, 6 pages:

Date 14-04-75 12:11:19 Hostid 170-0 0079 (100) 000000

000111111111111111111111111111111110
00000000111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999000000000011111111112222222222333312
000111111111111111111111111111111110
00000000111111111122222222223333333333444444444455555555556666666666777777777788888888889999999999000000000011111111112222222222333312

567890123456789012 *