DTELDR
**Load/Dump Utility for PDP–11 from
DECsystem–10 over DTE20**

October 1981

DTELDR Version 4(40)
Edition 2

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document   requests   the   user's   critical   evaluation   to assist us in
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CONTENTS

FIGURES

TABLES

.

1.0 INTRODUCTION

DTELDR is a communications utility program used to load programs from the TOPS-10 file system into a front end, and to dump front-end memory into a file on disk. DTELDR loads and dumps through the DTE20 (Data Ten-to-Eleven interface). This program runs in user mode under normal timesharing; its user must be logged in as [1,2], and have TRPSET and LOCK privileges. To use DTELDR, the TOPS-10 monitor must have been assembled with MSGSER.

2.0 COMMAND FORMAT

The format for commands to DTELDR is:

        dev:filename.ext[p,pn, SFD, SFD, ...]/switch/switch...

where all entries except /switch are optional.

3.0 FILE SPECIFICATIONS

The default name for a file to load into the PDP-11 front end is:

        DSK:DTELxy.BIN

where x = CPU number (0 to (n-1), where n is the number of CPUs in
            your system)
      y = DTE number (0 to 3).

The file on which a dump is written is called:

        DSK:DTEDxy.BIN

where x and y are as defined above.

Once the DTEDxy.BIN file exists, new generations .B00,.B01,...,B99 are created automatically.

There are three allowable formats for files loaded or dumped by DTELDR, packed mode, image mode and diagnostics mode. Packed mode (typically generated by MACY11/P for a PDP-11) is as follows:

| Bits	0	1			18	19		35
Contents	0	0	8-bit byte #2	8-bit byte #1	0	0	8-bit byte #4	8-bit byte #3

Half-word 1   Half-word 2
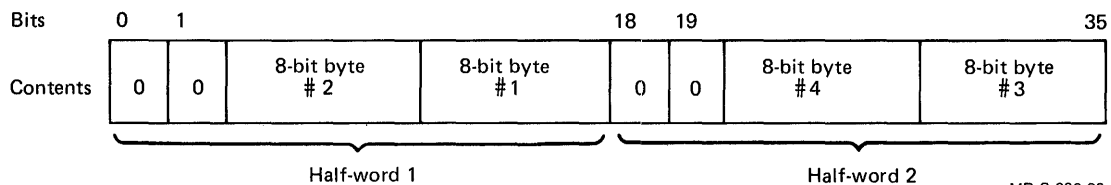
MR-S-896-80

Figure 1   Packed Mode .BIN Format

1

Image mode is as follows:

Bits	0	1			18	19		24	35
Contents	0	0	0	0	0	0	0	8-bit byte #1	
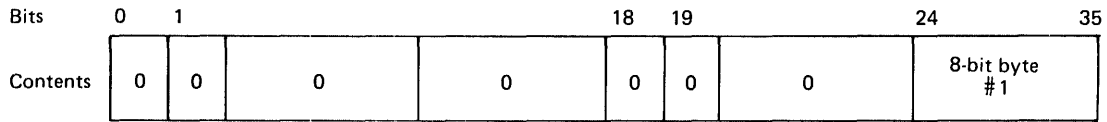
MR-S-897-80

Figure 2 Image Mode Format

Bytes are stored one byte/word as follows:

Bits	28	29	30	31	32	33	34	35
Contents								
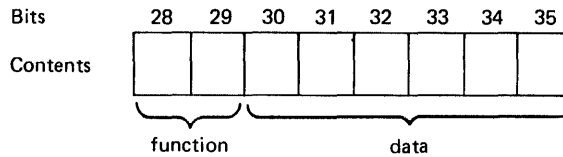
function   data

Function Bits:	Indicate that the Data Bits Contain:
00	Data or checksum
01	Starting address for loading memory
10	Leader
11	Memory field (for extended addressing)

MR-S-899-80

Figure 3 Eight-Bit Image-Mode Byte

Diagnostics mode format is as follows:

E or ;	Space	0 = start block P1		Address of location in PDP-11 T1		Checksum	

E or ;	Space	word count of data words P1		Address of location in PDP-11		Data		Data		...	Check-sum	CR LF

16 bits
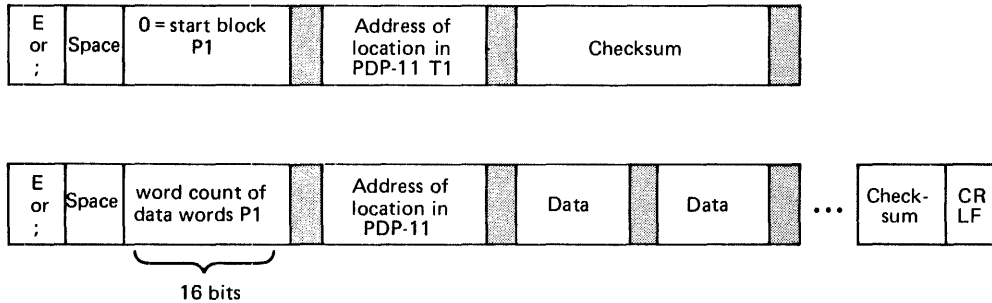
• ▢ specifies end of word: a character less than ASCII octal 75
•   data blocks can be up to four characters long
•   the word count specifies the number of data words only
•   the checksum must be zero or an error message is returned
•   ; specifies comment

MR-S-898-80

Figure 4 .All Diagnostics Format

2

4.0 DTELDR SWITCHES

DTELDR switches fall into two groups: those that initiate action such as loading or dumping, and those that modify action switches. Switches are listed below in the two groups. Switches in brackets [] are modification switches that can optionally be used with the switch specified.

Action switches are:

```
/ASWITCH
/AUTOMATIC [/DUMP, /IMAGE, /All, /NOLOG, /NODUMP, [/SELECT
    /SWITCH], /TALK]
/DDT
/DUMP [/NOLOG, /IMAGE, /All]
/EXIT
/HELP
/IGNORE
/INITIALIZE
/NOLISTEN
/RELOAD [/NOLOG, /NODUMP, /All]
/TALK
/TERMINATE
```

Modification switches are:

```
/All
/IMAGE
/NODUMP
/NOLOG
/SELECT /SWITCH
/SWITCH
```

The function of each DTELDR switch is described below (switches are listed alphabetically).

Switch	Function
/All	Specifies that the binary file is in .All format encoded by diagnostics (see Section 3.0, "File Specifications").
/ASWITCH: xy:value	Uses octal value when reloading given front end automatically.
/AUTOMATIC	Automatically reloads a front end from an implied file. The file for the reload is taken from SYS:DTELxy.BIN where x, y are as defined above. The file must exist or an error message is returned.
/DDT	Enters loaded DDT, returns with CPOPJ$G.
/DUMP:xy	Dumps specified front end, placing dumped file on XPN:DTEDxy.BIN (or later generations .B00, .B01, etc.). x can be omitted. File extension generation numbers are automatically increased to the maximum .B99. If an attempt is made to create an additional file past this maximum, an error message is returned.
/EXIT	Exits to monitor.

Switch	Function
/HELP	Outputs the DTELDR HELP file.
/IGNORE: xy:xy:...:xy	In automatic mode, does nothing to the given front end.
/IMAGE	Specifies that the .BIN file is in image format. The default format for a .BIN file is /PACKED.
/INITIALIZE:xy	Starts primary protocol on the specified front end. The primary protocol is used until the DECsystem-10 CPU is reloaded or a /TERMINATE command is issued; x and y are as defined above.
/NODUMP	Turns off the /DUMP switch and /RELOAD dump activity for dumping the PDP-11.
/NOLISTEN: xy:xy:...:xy	Does not listen to CTY of given front end except when reloading.
/NOLOG	Turns off the automatic error logging that is normally invoked with /RELOAD.
/RELOAD:xy	Takes dump, reloads the specified front end, starts primary protocol, and starts error logging. Dumps and error logging can be eliminated by using the /NODUMP and /NOLOG switches.
/SELECT:dev	Specifies source device from which to reload the front end.

For	Dev	Reloads over
KL10	10	DTE20
PDP-11[1]	11	

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[1] With SELECT:11, the /SWITCH switch must be used and no filespec can be given.

Switch	Function
/SWITCH:o	Specifies (with an octal value o) the loading procedure on the unit that contains the reload file. Use this switch with /SELECT. You can use DTELDR to load any front end in your system connected over a DTE20, by giving the front end number with /RELOAD. When you load RSX20F into front-end 0, the value you give to /SWITCH specifies how KLINIT and primary protocol will be used. When you load some other front end, use /SELECT and /SWITCH to give the device and unit number of the device that contains the reload file. Use the octal values given below. Shading in Table 1 shows the functional divisions and indicates which bits are being described under "Meaning."

Table 1
Octal Value to use with /SWITCH

	Switch Enable
	Load Select
	Line Speed
	Boot Device
DH11 or Boot Unit	
Console Line No.	
Retry	

Switches/Bits →	17 16 15	14 13 12	11 10 9	8 7 6	5 4 3	2 1 0	
Octal Value	**Binary Equivalent**						**Meaning**
000001	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 [1]	Do a complete reload, as specified by bits 1 to 17 below. Bits 1 and 2 must be zero to run CHK11.
000005	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	[1 0] 1	Load RSX20F without communicating with the central processor. KL10 is assumed up. This reloads and starts the −11, does not use KLINIT.
000007	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	[1 1] 1	Load RSX20F, load and start KLINIT dialog to control loading.
000001	0 0 0	0 0 0	0 0 0	0 0 [0	0 0 0]	0 0 1	To use software implementations of console speed and fill class, set these bits to zero. To use these bits to specify a physical line for the CTY, give the line speed with these bits (from Table 2), give the DH11 unit number in bits 10 to 8, and give the hardware line number within the DH11 in bits 14 to 11. You can also use these bits to give the line speed for a DL11 line specified in bits 14 to 11.
000001	0 0 0	0 0 0	0 0 0	0 [0] 0	0 0 0	0 0 1	Use as available, floppy (for 1091) or DECtape (for all but 1091).
000201	0 0 0	0 0 0	0 0 0	0 [1] 0	0 0 0	0 0 1	Use disk unit selected in bits 10 to 8.
000201	0 0 0	0 0 0	0 [0 0 0]	1 0	0 0 0	0 0 1	Use unit 0 as the boot device.
000601	0 0 0	0 0 0	0 [0 0 1]	1 0	0 0 0	0 0 1	Use unit 1 as the boot device.
001201	0 0 0	0 0 0	0 [0 1 0]	1 0	0 0 0	0 0 1	Use unit 2 as the boot device.
001601	0 0 0	0 0 0	0 [0 1 1]	1 0	0 0 0	0 0 1	Use unit 3 as the boot device.
002201	0 0 0	0 0 0	0 [1 0 0]	1 0	0 0 0	0 0 1	Use unit 4 as the boot device.
002601	0 0 0	0 0 0	0 [1 0 1]	1 0	0 0 0	0 0 1	Use unit 5 as the boot device.
003201	0 0 0	0 0 0	0 [1 1 0]	1 0	0 0 0	0 0 1	Use unit 6 as the boot device.
003601	0 0 0	0 0 0	0 [1 1 1]	1 0	0 0 0	0 0 1	Use unit 7 as the boot device.
000001	0 0 0	[0 0 0	0] 0 0	0 0 0	0 0 0	0 0 1	For software implementations of console line number (as for RSX20F and TOPS–10) these bits must always be zero. These bits can also give a line number for the CTY. To do so, set the line speed with bits 6 to 3, above, and give the DH11 unit number in bits 10 to 8.
000001	0 0 [0]	0 0 0	0 0 0	0 0 0	0 0 0	0 0 1	Retry 10 times when an I/O error occurs during booting.
100001	0 0 [1]	0 0 0	0 0 0	0 0 0	0 0 0	0 0 1	Retry indefinitely when an I/O error occurs during booting. Abort with manual intervention.
000001	[0 0] 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 1	Always zero.

Table 2
Speed Table (Bits 6 to 3)

Octal Value	Bits 6 5 4 3	Baud Rate
0	0 0 0 0	zero
1	0 0 0 1	50
2	0 0 1 0	75
3	0 0 1 1	110
4	0 1 0 0	134.5
5	0 1 0 1	150
6	0 1 1 0	200
7	0 1 1 1	300
10	1 0 0 0	600
11	1 0 0 1	1200
12	1 0 1 0	1800
13	1 0 1 1	2400
14	1 1 0 0	4800
15	1 1 0 1	9600

MR-S-1694-81

```
+------------------------------------------+
|                   NOTE                    |
|                                           |
| These switches can be used  together  in  |
| combination.    To   combine  functions,  |
| first form the binary value, then derive  |
| the octal value to use with /SWITCH.      |
+------------------------------------------+
```

Switch	Function
/TALK: xy:xy:...:xy	Talk to the CTY of the given front ends.
/TERMINATE:xy	Shuts down the specified front end.

5

5.0 RUNNING DTELDR

To run DTELDR, you must be logged in as [1,2], have the appropriate TRPSET and LOCK privileges, and have a file containing the appropriate .BIN software. You can then enter:

    .R DTELDR

The program prompts for input with a star (*):

Enter the file specification and the necessary switches. For example, to load a DN87S over DTE20 number 2 from DSK:DN8721.BIN and suppress automatic dumping, respond as follows:

    DN8721.BIN/RELOAD:2/NODUMP

Once loading is complete and the -11 tells the -10 that its initialization is complete, primary protocol starts and the star (*) prompt reappears.

For automatic execution of DTELDR, the appropriate commands are normally put in the OPR.ATO file to be run by OPSER.

For example, the following sequence of commands placed in the OPR.ATO file provides for both the automatic loading of a front end at system initialization time, and for subsequent automatic reloading if the front end crashes.

:SLOG	log in a subjob
:DEF DTE=	call it DTE
DTE-R DTELDR	load and start DTELDR
DTE-/RELOAD:2/NODUMP	load over DTE20 number 2, suppress automatic dumping
DTE-/AUTO	do automatic reload (the default file called DTEL02.BIN that is to be loaded must exist on SYS:)

6.0 ERROR MESSAGES

Messages output by DTELDR occur because of hardware, software, or user error.

<u>Message</u>	<u>Cause and Corrective Action</u>
All retries failed	Hardware - verify configuration or call Field Service.
Ambiguous switch--type /H for help	User - reenter command.
Bad All format	Software or user - input file is wrong. Use another file.
Cannot specify both /All and /IMAGE	User - reenter command.
Cannot specify filespec if /SELECT:11 used	User - reenter command.
Cannot use /AUTOMATIC with /RELOAD	User - reenter command.

6

Message	Cause and Corrective Action
Cannot use /INITIALIZE with /RELOAD	User - reenter command.
Cannot use /TERMINATE with /RELOAD	User - reenter command.
Can't OPEN the input device	Software or user - reenter command.
Can't OPEN the output device	Software or user - reenter command.
Checksum failure	Hardware - call Field Service.
Command error--type /H for help	User - reenter command.
DAEMON CALL failure, no entry made in ERROR.SYS	Hardware - call Field Service.
DATA Checksum failure	Hardware - call Field Service.
DTE number too large	User - reenter command.
DTE. UUO failed to set reload job	Hardware - call Field Service.
ENTER failed	Hardware or user - try again. You may not have the right privileges to run DTELDR.
EOF after file constant 1	Software - use another file.
EOF at start of file group	Software - use another file.
EOF during data in file group	Software - use another file.
EOF during first byte of a word	Software - use another file.
EOF during second byte of a word	Software - use another file.
EOF found when looking for checksum	Software - use another file.
ERROR CODE FROM DTE. UUO	Hardware or user - call Field Service.
ERROR CODE 0 -- DTE. UUO NOT IMPLEMENTED IN THIS MONITOR	Software - you cannot use DTELDR. You must obtain a monitor that supports networks.
ERROR CODE 1 -- MUST HAVE PRIVILEGES TO RUN DTELDR	User - obtain operator privileges to run DTELDR.
ERROR CODE 2 -- INTERNAL ERROR - DTE. UUO CALLED WITH BAD FUNCTION NUMBER	Hardware - call Field Service.
ERROR CODE 3 -- BAD FRONT END NUMBER	User - reenter command.
ERROR CODE 4 -- PRIMARY PROTOCOL STILL RUNNING	Hardware - call Field Service.

7

Message	Cause and Corrective Action
ERROR CODE 5 -- -11 POWER FAIL DID NOT SET	Hardware - call Field Service.
ERROR CODE 6 -- -11 ROM PROGRAM FAILED TO START - CHECK HALT SWITCH	Hardware - check and reset HALT switch or call Field Service.
ERROR CODE 7 -- TO-10 ERROR DURING BOOTSTRAP SEQUENCE	Hardware - call Field Service.
ERROR CODE 10 -- -11 OBJECT PROGRAM FAILED TO SEND TO-10 DOORBELL	Hardware - call Field Service.
ERROR CODE 11 -- INTERNAL ERROR - BAD JOB NUMBER GIVEN TO DTE. UUO	Hardware - call Field Service.
ERROR CODE 12 -- BAD ERROR CODE FROM DTE. UUO	Hardware - call Field Service.
ERROR CODE 13 -- BAD ERROR CODE FROM DTE. UUO	Hardware - call Field Service.
ERROR CODE 14 -- BAD ERROR CODE FROM DTE. UUO	Hardware - call Field Service.
ERROR CODE 15 -- BAD ERROR CODE FROM DTE. UUO	Hardware - call Field Service.
ERROR CODE 16 -- BAD ERROR CODE FROM DTE. UUO	Hardware - call Field Service.
ERROR CODE 17 -- FAILED TO START PRIMARY PROTOCOL	Hardware - call Field Service.
ERROR DURING BOOTSTRAP SEQUENCE	Hardware - call Field Service.
ERROR DURING DUMP	Hardware - call Field Service.
ERROR - BAD JOB NUMBER GIVEN TO DTE. UUO	Hardware - call Field Service.
ERROR - DTE. UUO CALLED WITH BAD FUNCTION NUMBER	Hardware - call Field Service.
error after To-11 byte transfer	Hardware - call Field Service.
error for dump file	Hardware - call Field Service.
error while dumping	Hardware - call Field Service.
error--type /H for help	User - reenter command.
File group byte count less than 6	Hardware - call Field Service.
File group has junk instead of constant n	Hardware - call Field Service.
File zero byte count -- trying again in /IMAGE mode	Hardware, software, or user - either use another file, reenter your command, or call Field Service.

Message	Cause and Corrective Action
HIBER failure	Hardware or software – use another file or call Field Service.
Illegal address for /START	User – reenter command.
Illegal switch or switches used with /TERMINATE	User – reenter command.
Illegal switch or switches used with /INITIALIZE	User – reenter command.
Input file read error	Hardware or user – reenter command, use another file or call Field Service.
Junk after start group	Hardware – call Field Service.
Junk bits in input file	Hardware or software – use another file or call Field Service.
Junk in input file--may not be /IMAGE mode	User or software – use another file or reenter command.
LOCK failure m	System software – verify privileges.
LOCKUP failed	System software – verify privileges.
Must specify address for /START	User – reenter command.
Must specify either 10 or 11 for /SELECT	User – reenter command.
Must specify front end in /RELOAD	User – reenter command.
Must specify front end in /TERMINATE	User – reenter command.
Must specify front end number for /INITIALIZE	User – reenter command.
Must specify switch value	User – reenter command.
Only legal values for /SELECT are 10, 11	User – reenter command.
Output error for dump file	Hardware – call Field Service.
Reload source is -10, /SWITCH ignored	User – no action needed.
START BLOCK Checksum failure	Hardware – call Field Service.
STRING OUTPUT TO OPR FAILED	Hardware or software.
Timeout waiting for 11 program to start	Hardware or software – try again.

Message	Cause and Corrective Action
Timeout while doing To-11 byte transfer	Hardware - call Field Service.
Timeout while waiting for dump transfer to complete	Hardware - call Field Service.
To-10 error while dumping	Hardware - call Field Service.
To-11 error after To-11 byte transfer	Hardware - call Field Service.
TRPSET failed	Software - verify your privileges.
UNKNOWN DTE. ERROR CODE	Hardware - call Field Service.
Unexpected EOF	Hardware or software - call Field Service or use another file.
Unknown switch--type /H for help	User - reenter command.
Value for /SWITCH must not exceed 177777	User - reenter command.

INDEX