

## Using the TRS-80 as a terminal for the PDP-11

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**Using the TRS-80 as a Terminal for the PDP-11.** This article describes a terminal program for the TRS-80 microcomputer that has been designed for use at the PDP-11 minicomputer with the RSX-11 operating system. The program supports the transfer of text files between both computers. This allows the user to prepare source files on the TRS-80 and to transmit them to the PDP-11, and vice versa. In addition, the user may execute DOS commands while he is in the terminal program.

**Program Description.** The terminal program basically consists of a polling routine adapted from Howe (1982) that has been vastly expanded to include special features of the PDP-11 full duplex terminal driver, text file transfer between both computers, and execution of DOS library commands. These DOS commands comprise listing a diskette's directory, killing or renaming of files, etc., and may be utilized without leaving the terminal program. File transfer is handled via a storage buffer (located from 6000H to top of memory) and is executed by the PIP commands PIP>TI:=filename or PIP>filename=TI: on the PDP-11. The reading and writing of files on the TRS-80 is done by logical sector I/O. The program uses the PDP-11 XON/XOFF synchronization scheme for file transfers from the TRS-80 to the PDP-11. No synchronization is necessary in the opposite direction, because the TRS-80 can keep up with any baud rate that is admissible for the terminal program and yet still fill its buffer.

The program supports the full ASCII character set. Some of the control characters are used to create ASCII characters that cannot be accessed from the keyboard, and some are reserved for special functions of the terminal program itself. The codes of the 32 control characters are defined in an index table. The user may redefine them according to his or her needs.

**Operation.** During transmission from PDP-11 to TRS-80, the normal screen output routine is bypassed, and the transmitted characters are displayed in the upper four screen lines in the fashion of a circular buffer. This display format combines speed with suf-

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ficient information to identify PDP-11 error messages, which may, for example, be caused by illegal file names. Moreover, the characters are prompted at the end of the fifth screen line. The steady appearance of a ">" in this position (PDP-11 MCR prompt) indicates the end of a transmission or of an error message. It is more easily recognized here than in the circular buffer. Pressing the BREAK key initiates the transfer to the TRS-80 disk.

The same display format is used during transmission from the TRS-80 to the PDP-11, but this time the echoed characters, instead of the transmitted ones, are displayed. Again, this helps the user to detect PDP-11 error messages, which may be caused by illegal file names or by copying onto the same file version number.

At 4800 bauds, the transfer of a file of 40-KB length takes about 2 min, at the least. Because the speed of the transmission depends on the response time of the PDP-11, no upper limits can be given.

The program has been used extensively, both on TRS-80 Model I and Model III computers and has proved to be useful and reliable. The baud rate may be set up to 4800 bauds with normal CPU speed, and up to 9600 bauds with CPU speed-ups.

**System Requirements.** A TRS-80 Model I or Model III computer with at least one disk drive, 32 or 48 KB of memory, an RS-232C board, and the NEWDOS/80 V.2 operating system are needed for this program. If disk operating systems that differ in EOF-handling from the NEWDOS/80 are used, the source code has to be modified and reassembled. The program checks for top of memory, so no reassembling is necessary for 32 or 48 KB of memory. File length is restricted to 40 KB for a 48K and 24 KB for a 32K system, if no memory is reserved. Files exceeding these limits are truncated and partially transferred.

**Availability.** An assembler source listing and a user's guide may be obtained from the author free of charge. If 10 International Reply Coupons are provided, a copy of the program will be supplied on a 40-track 5.25-in. diskette containing the assembler source files and machine language files for both models. Please specify single or double density.

### REFERENCE

HOWE, H. S. JR. RS-232-C communications. *The Original Magazine for the TRS-80 Owners*, 1982, 46, 16-22.

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