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Software Product Description

DESCRIPTION:

The RSTS/E-2780 Emulator runs as a user job under a suitably equipped RSTS/E or CTS-500 system, providing emulation of an IBM 2780 Remote Batch Terminal. It will support transmission and reception from/to card reader and line printer, and/or mass storage devices, such as disk and magnetic tape. General characteristics of DIGITAL's PDP-11 based 2780 products are given in Section B.

The RSTS/E-2780 transmits files stored on any medium supported by the host operating system. It stores files on any output medium supported by RSTS/E except DECtape. Magnetic tape operation may cause timeout errors, unless the tape is positioned at the start of the file when transmission or reception is about to begin. In addition, files can be printed on any line printer supported by the host operating system except the LS-11, a 60 line-per-minute printer. (Such printers can be used in off-line mode, however, wherein they print files temporarily stored on disk or tape.)

RSTS/E-2780 also supports a spooling feature, wherein users running with the RSTS/E-2780 can queue one or more files for subsequent transmission.

Due to the processing requirements of the 2780 protocol, RSTS/E (CTS-500) response time may incur perceptible degradation during transmission or reception.

MINIMUM HARDWARE REQUIRED:

- Any valid RSTS/E (CTS-500) configuration with sufficient memory for the expected number of users, plus 8K words of memory to accomodate the Emulator.
- DP11, DU11, or DUP11 Synchronous Line Interface
- KG11-A Communications Arithmetic Element

OPTIONAL HARDWARE SUPPORTED:

Any mass storage device except DECtape supported by RSTSE (or CTS-500) can be used as a source or target of transmission files.

PREREQUISITE SOFTWARE:

One of the following operating systems:
- RSTS/E Operating System, Version 6B
- CTS-500 Operating System, Version 3

OPTIONAL SOFTWARE SUPPORTED:

None

TRAINING CREDITS:

None

SUPPORT CATEGORY:

A – Software Support will be provided as listed in the Software Support Categories Addendum to this SPD.

UPDATE POLICY:

Software Updates, if any, released by DIGITAL during the one (1) year period following installation, will be provided to the customer for a media charge. After the first year, updates, if any, will be made available according to then prevailing DIGITAL policies.

ORDERING INFORMATION:

This software is furnished under a license for use on a single CPU and can be copied and modified (with inclusion of DIGITAL's copyright notice) only for use on such CPU, except as may otherwise be provided in writing by DIGITAL.

Standard options with no support services are only available after the purchase of one supported license. When a software license is ordered without support services, the category of support applicable to such software is Category C.

Source and/or listing options are only available after a source license agreement is in effect.

The following key (D, E, F, T, Y, Z) represents the distribution media for the product and must be specified at the end of the "Q" number, i.e., QPD10-AD = binaries on 9-track magnetic tape.

D = 9-track Magnetic Tape
E = RK05 Disk
F = 7-track Magnetic Tape
T = RK06 Disk
Y = Flexible Diskette
Z = No hardware dependency

Standard Options

QPD10 -A— Single-use license, binaries, documentation, support services (media: D, E, F, T) and (media: Y) for RPR02, RP04, RP05 or RP06 disk-based CTS-500 systems with RX11, no RK11 and no magnetic tape.

QPD10 -C— Single-use license, binaries, documen-
tation, no support services (media: D,
E, F, T) and (media: Y) for RPR02,
RP04, RP05 or RP06 disk-based CTS-
500 systems with RX11, no RK11 and
no magnetic tape.

QPD10 -D— Single-use license only (media: Z)

Source/Listing Options

QPD10 -E— All sources (media: D, E, T)

QPD10 -F— Listings (media: R)

Update Options

Users of RSTS/E-2780 (CTS-500/E-2780) whose
specified Support Category warranty has expired may
order under license the following software update at
the then current charge for such update. The update
is distributed in source or binary form on the appro-
priate medium and includes no installation or other
services unless specifically stated otherwise.

QPD10 -H— Binaries, documentation (media: D, E,
F, Y)

QPD10 -N— Source update (media: D, E)

Users of RSTS/E-2780 (CTS-500/E-2780) whose
specified Support warranty has not expired may order
under license the following software update for the
then current media charge. The update is distributed
in source or binary form on the appropriate medium
and includes no installation or other services unless
specifically stated otherwise.

QPD10 -W— Binaries, documentation (media: D, E,
F, Y)

ADDITIONAL SERVICES:
None

D10.50.2

SECTION B: 2780 Emulator GENERAL DESCRIPTION

2780 Emulator is the collective name for the set of software products that allows various DIGITAL operating systems to emulate the operation of an IBM 2780 Model 1 or 2 Data Transmission Terminal with the multiple record option. Emulation of the 2780 permits communication between such DIGITAL systems and (1) the following IBM Remote Job Entry programs supporting the device: OS/HASP, OS/ASP, DOS-POWER and OS/RJE, or (2) a second DIGITAL supplied 2780 Emulator.

The following DIGITAL operating systems support the Emulator for the 2780 Model 2: RSTS/E (CTS-500), RSX-11D, RSX-11M, RT-11 and DECsystem-10[1]. In addition, a COS-310 based emulator is available which emulates the Model 1 2780. Section A gives the distinguishing features of the particular 2780 Emulator described by this SPD. The remainder of this section describes items common to all PDP-11 2780 emulators.

OPERATION:

After the system operator starts the 2780 Emulator, it solicits and responds to console command input.

Transmission: All 2780 Emulators can transmit data from card readers, if they are present in the system, and transmit data files from disk storage devices. The RSTS/E 2780 Emulator has the added capability of spooling or queueing transmission requests from timesharing users.

All 2780 Emulators transmit EBCDIC and binary data. Since the host systems use the ASCII character set, however, they accept ASCII characters for transmission and then perform automatic character conversion. No conversion is performed on binary data.

The physical units of data that are transmitted are called blocks. Blocks are divided into logical units called records. Maximum block size is 400 characters; maximum record size when transmitting to IBM operating systems is 80 characters, and when communicating with other 2780's or 2780 Emulators, the record size is variable up to 132 characters. Records that are less than maximum allowable are either extended to the maximum by blank filling, or transmitted as is, at the user's option. Up to seven (7) records can be transmitted per block.

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[1]Limited to 2780 mode only for PDP-11 communication.

Reception: All 2780 Emulators can print received character data on a line printer, if one is present in the system. In most cases, the software simulates limited-function vertical format control (VFC) by providing Top of Form (Skip to Channel 1), Print-and-Space-1, -2, or -3 line(s) functions, and skip to channels 2 through 8, all of which cause modulo 8 line space operation--i.e., skip to the next line which is an even multiple of 8 from Top-of-Form. Both 64- and 96-character line printers are supported. However, support of line printers which are too slow to keep up with the speed of the communications link (i.e., LS11 and LV11) is limited to "off-line" or DIGITAL-to-DIGITAL usage, because their speed can cause time-out errors in an IBM system.

All Emulators write files onto disk storage devices. In such cases, a separate file is created for each received file.

All 2780 Emulators receive EBCDIC or binary data. They can automatically convert EBCDIC data to ASCII upon reception, or EBCDIC data can be written to a file by the use of the binary mode.

Maximum receive block size is four hundred (400) characters. The maximum receive record size is a two-character escape code, plus one hundred thirty-two (132) data characters. Up to seven (7) records can be received per block.

All Emulators provide automatic answer to dial-in rings.

Modems and Data Links: All 2780 Emulators support operation over synchronous data links, in Point-to-Point Contention mode only, at speeds up to 4800 baud. Bell 201 or 208 modems or equivalent are specified. Operation with other modems is not precluded, but warranted support does not apply in these cases.

Data link control characters are supplied automatically by the Emulators. On transmission errors, the Emulators will re-try up to seven (7) times before declaring the link dead.

Configuring PDP-11 2780 Emulator Systems: Configuration requirements for each Emulator are defined in Section A. Briefly, the PDP-11 2780 Emulators require the following hardware beyond the standard operating system configurations:

- DP11, DU11 or DUP11 Synchronous Line Interface
- KG11-A Communications Arithmetic Element
- KW11-L or KW11-P clock
- 8K words of additional memory beyond the minimum may be required (refer to Section A)

TRAINING CREDITS:

No training credits are included in the 2780 Emulator Software License charges. Training courses are not required in order to operate the product.

SUPPORT CATEGORY:

The initial binary package carries Category A support. Sources have Category C support.

Installation will be deemed complete in the case of connection with IBM when:

- The customer's 360/370 configuration includes a 2701 Data Adapter, a 2703 Transmission Control Unit, a 3704 or 3705 Transmission Controller, or a System/370 Model 135 Integrated ommunications Adapter.
- A DIGITAL sample procedure included with the software has been successfully executed.

Installation in DIGITAL-to-DIGITAL operation will be deemed complete when DIGITAL supplied files can be successfully transmitted in both directions.

CUSTOMER RESPONSIBILITIES:

BEFORE installation of the SOFTWARE, the customer must:

1. Obtain, install, and demonstrate operational to DIGITAL's satisfaction any modems and other equipment and facilities necessary to interface to DIGITAL's communications line interfaces and terminals.
2. Install or have installed all hardware, including terminals, to be used on the system.
3. Generate for terminal support any and all IBM systems that will be communicating with the Emulator, to DIGITAL's satisfaction.
4. Make available to DIGITAL personnel all hardware, including communications facilities and terminals, to be used during installation and acceptance testing for a reasonable period of time each day as mutually agreed upon by DIGITAL and customer, until acceptance criteria are satisfied.
5. Provide access privileges and machine time on any and all IBM systems on which the installation is to be performed.
6. When communicating with IBM, make available to DIGITAL personnel an IBM 360/370 job stream with data, to run via the 2780 Emulator on-line to a 360/370 in accordance with the configuration specifications outlined above.

Delays caused by any failure to meet these responsibilites will be charged at the then prevailing rate for time and materials.

The following table summarizes some of the features of the PDP-11 2780 Emulators.

CHARACTERISTIC EMULATOR NAME	MINIMUM CONFIGURATION SUMMARY (see Section A)	HOST OPERATING SYSTEM	MAXIMUM SPEED	OUTPUT DEVICES SUPPORTED	INPUT DEVICES SUPPORTED	FORMS CONTROL SUPPORTED	SPOOLING SUPPORTED	MODEMS AND IBM OPERATING SYSTEMS SUPPORTED
RSX-11D/2780 RSX-11M/2780 DUP11, KG11	Any standard RSX-11D or RSX-11M configuration with at least 16K words of memory (for 11M), at least 56K words of memory (for 11D), DU11, DP11 or	RSX-11D orRSX-11M	4800 baud	Line printer or any Files-11 device except DECtape and paper tape punch	Card reader or any other Files-11 device except DECtape	Top of Form, Skip 1, 2, or 3 lines, Skip modulo 8, Horizontal forms control	Yes on reception, No on transmission	Bell 208 or 201 or equivalent; OS/RJE, OS/HASP, DOS/POWER, OS/ASP
RSTS/2780 (CTS-500/2780)	Minimal RSTS/E or CTS-500 system consistent with number of users and expected application, plus 8K words of memory, DU11, DUP11, or DP11, KG11	RSTS/E (CTS-500)	4800 baud	Line printer or any disk except flexible diskette, magnetic tape (limited)	Card reader or any disk, magnetic tape (limited)	Top of Form, Skip 1, 2, or 3 lines, Horizontal forms control	Yes	Same as above
RT-11/2780 (COS-350/2780)	Disk-based Foreground/Background RT-11 or COS-350 system with 16K words of memory, DU11 or DP11 or DUP11, KW11-L, KG11-A	RT-11 (COS-350)	4800 baud	Line printer or any disk supported by RT-11 (COS-350)	Card reader, paper tape reader, or any disk supported by RT-11 (COS-350)	Top of Form, Skip 1, 2, or 3 lines, Skip modulo 8, Horizontal forms control	No	Same as above