PRODUCT NAME: RSX-11M/2780, Version 3   **SPD 10.65.2**

DESCRIPTION:

The RSX-11M/2780 runs as a privileged task under a suitably equipped RSX-11M system (Version 3 or later), 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 of this Software Product Description.

The RSX-11M/2780 will transmit files stored on any input medium and store files on any output medium accessible through RSX-11M Files Control System (FCS) except DECtape. In addition, files can print on any line printer supported by the host operating system except the LS11 and LV11 printers. (Such printers can be used in off-line mode, however, wherein they print files temporarily stored on disk or tape).

MINIMUM HARDWARE REQUIRED:

Any valid RSX-11M system with:

● at least 16K words of memory
● DP11, DU11, or DUP11 Synchronous Line Interface
● KG11 Communications Arithmetic Element

OPTIONAL HARDWARE:

Any device supported under RSX-11M FCS except DECtape.

PREREQUISITE SOFTWARE:

RSX-11M Version 3 or later.

OPTIONAL SOFTWARE:

None

TRAINING CREDITS:

None

SUPPORT CATEGORY:

A — For initial installation, Software Support will be provided as stated in the Software Support Categories Addendum to this SPD. Subsequent licenses can be purchased with Category C support. Sources have Category C support.

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 (includes no installation). After the first year, updates, if any, will be made available according to the then prevailing DIGITAL policies.

January 1978

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. A single-use license only ("D") option is a license to copy the software product previously obtained under license, and use such software in accordance with the licensing provisions of Digital's Standard Terms and Conditions of Sales. The category of support applicable to such copied software is Category C.

Source and/or listing options are only available after the purchase of at least one supported binary license and after a source license agreement is in effect.

The following key (D, E, R, T, Z) represents the distribution media available for the product and must be specified at the end of the "Q" number, i.e., QJD68-AD = binaries on 9-track Magnetic Tape.

D = 9-track Magnetic Tape
E = RK05 Disk Cartridge
R = Microfiche
T = RK06 Disk Cartridge
Z = No hardware dependency

Standard Options

QJD68 -A— Single-use license, binaries, documentation, support services (RSX-11M not included)(media: D, E, T)

QJD68 -C— Single-use license, binaries, documentation, no support services (media: D, E, T)

QJD68 -D— Single-use license only, no documentation, no support services (media: Z)

Source/Listing Options

QJD68 -E— RSX-11M/2780 Sources (media: D, E, T)

QJD68 -F— RSX-11M/2780 Listings (media: R)

Update Options:

Users of RSX-11M/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 binary form on the appropriate medium and includes no installation or other services unless specifically stated otherwise.

AE-3435C-TC

QJD68 -H— Binaries, documentation, no support services (media: D, E, T)

Users of RSX-11M/2780 whose specified Support Category warranty has not expired may order under license the following software update for the then current media charge. The update is distributed in binary form on the appropriate medium and includes no installation or other services unless specifically stated otherwise.

QJD68 -W— Binaries, documentation, no support services(media: D, E, T)

ADDITIONAL SERVICES:

None

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), IAS, RSX-11D, RSX-11M, RT-11 and DECsystem-10[1]. In addition, a COS-310 based emulator (Model 1 only), and a LSI-11 based RT-11 (CTS-300) 2780 are available.

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.

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 bps (except the LSI-11 Based RT-11/2780 which runs at 2400 bps). 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:

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

- DP11, DU11, DUP11, or DUV11 Synchronous Line Interface
- KG11-A Communications Arithmetic Element (except the LSI-11 Based RT-11/2780)
- KW11-L or KW11-P clock (except the LSI-11 Based RT-11/2780
- 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 Communications 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 IAS	Any standard RSX-11D or RSX-11M configuration with the following memory: 11M - 16KW 11D - 56KW IAS - 72KW DU11, DP11 or DUP11, KG11	RSX-11D or RSX-11M	4800 bps	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 bps	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 bps	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
RT-11 (CTS-300) LSI-2780	Disk-based Foreground/ Background RT-11 system with 16K words of memory. DUV11, REV-11 (AORC)	RT-11 (CTS-300)	2400 bps	Line printer or any disk supported by RT-11 (CTS-300)	Any disk supported by RT11 (CTS-300)	Top of Form, Skip 1, 2, or 3 lines, Skip modulo 8, horizontal forms control	No	Same as above

ADDENDUM
SOFTWARE SUPPORT CATEGORIES

Each software product (hereinafter 'SOFTWARE') with a designated Support Category A or B in the applicable Software Product Description (SPD) existing at the time of order will be the current release at the time of delivery and will conform to the SPD. DIGITAL's sole obligation shall be to correct defects (nonconformance of the SOFTWARE to the SPD) as described below. Any SOFTWARE with a designated Support Category C will be furnished on an 'as is' basis.

For SOFTWARE with a designated Support Category A or B, DIGITAL will provide the services set forth below without additional charge.

CATEGORY A

1. Upon notification by customer to the nearest DIGITAL office that the computer system, including all required prerequisite hardware and software, is ready for the installation of the SOFTWARE, DIGITAL will install such SOFTWARE in any location within the contiguous forty-eight (48) United States, the District of Columbia, or a country in which DIGITAL or a subsidiary of DIGITAL has a software service facility. The notification must be received by DIGITAL and the system must be ready for installation within thirty (30) days after the delivery of the SOFTWARE to customer or DIGITAL will have no obligation to install. Installation will consist of: (1) verification that all components of the SOFTWARE have been received by customer, (2) loading the SOFTWARE, and (3) executing a DIGITAL sample procedure.

2. During the ninety (90) day period after installation, if the customer encounters a problem with the current unaltered release of the SOFTWARE which DIGITAL determines to be a defect in the SOFTWARE, DIGITAL will provide the following remedial service (on site where necessary): (1) if the SOFTWARE is inoperable, apply a temporary correction (TC) or make a reasonable attempt to develop an emergency by-pass, and (2) assist the customer to prepare a Software Performance Report (SPR) and submit it to DIGITAL.

3. During the one (1) year period following installation, if the customer encounters a problem with the SOFTWARE which his diagnosis indicates is caused by a SOFTWARE defect, the customer may submit an SPR to DIGITAL. DIGITAL will respond to problems reported in SPRs which are caused by defects in the current unaltered release of the SOFTWARE via the Maintenance Periodical for the SOFTWARE, which reports SPRs received, code corrections, temporary corrections, generally useful emergency by-passes and/or notice of the availability of corrected code. Software Updates, if any, released by DIGITAL during the one (1) year period, will be provided to the customer on DIGITAL's standard distribution media as specified in the applicable SPD. The customer will be charged only for the media on which such updates are provided, unless otherwise stated in the applicable SPD, at DIGITAL's then current media prices.

CATEGORY B

During the one (1) year period following delivery, the services provided to the customer will be the same as set forth in 3 above.

CATEGORY C

SOFTWARE is provided on an 'as is' basis. Any software services, if available, will be provided at the then current charges.

DIGITAL shall have the right to make additional charges for any additional effort required to provide services resulting from customer use of other than current unaltered release of the SOFTWARE operated in accordance with the SPD.