Software Product Description

PRODUCT NAME: RSX-11M, Version 4.2
Real-Time Operating System

SPD 14.35.24

DESCRIPTION

RSX-11M is a disk-based, real-time operating system that runs on any UNIBUS PDP-11 processor and on most Q-BUS PDP-11 and MicroPDP-11 processors. It provides an environment for the development and execution of multiple real-time tasks (program images) using a priority-structured, event-driven scheduler. System generation on either a host PDP-11 or VAX processor allows the user to tailor the software for systems ranging in size from small 32K-byte systems to large 3840K-byte systems.

Program development and real-time tasks can execute concurrently in systems with at least 48K bytes of memory. The system's software priority levels enable the user to compile, assemble, debug, install, and execute tasks without affecting real-time task response.

A multiuser program-development facility is available for systems with a recommended minimum of 64K bytes of memory. LOGIN, LOGOUT, password protection, device access protection, a round-robin scheduler (running under the real-time Executive), and concurrent execution of equal priority tasks via Executive-level swapping are provided. All systems have the MCR command interface. Mapped systems can select the easier-to-use DIGITAL Command Language (DCL), with MCR or DCL selectable on a per-terminal basis.

Tasks can be written in MACRO-11 assembly language, or in optionally available high-level languages including BASIC-PLUS-2, COBOL-81, FORTRAN-77, and PASCAL. Shareable libraries and system support for user-created libraries are provided. The EDT and EDI editors, program development utilities, a symbol cross-reference processor, an interactive debugger, and task memory dump facilities are provided to assist task development and checkout.

The RSX-11M file system provides automatic space allocation and file structures for all block-structured devices. Features include file protection, device independence, and logical device assignment. Multiheader file support is provided, which enables file size to be limited only by the capacity of the volume on which it resides. During system generation, the user can select a minimum 4K-byte version of the resident file system to conserve space.

Two file access facilities are available: Record Management Services (RMS-11) and File Control Services (FCS). RMS-11 supports three file organizations – sequential, relative, and multikeyed indexed sequential (ISAM) – and provides sequential and direct access modes. FCS supports sequential and direct access to sequentially and randomly organized files. RMS requires at least 8K bytes per task. Using FCS will increase the user task by approximately 2K to 8K bytes, depending on the number of open files and the services desired.

Indirect command file support provides extremely powerful batch-like facilities. A user can create a file containing system commands. The system can then be instructed to execute the commands in the files without user intervention. The Indirect Command Processor can be executing command files concurrent with real-time task execution.

Most PDP-11 processors have Memory Management available, which provides logical to physical memory mapping. If the configuration does not include hardware memory management, the system can support between 32K and 56K bytes of memory. If the configuration includes hardware memory management, RSX-11M can support between 56K and 3840K bytes of memory. RSX-11M provides the same primary services in mapped and unmapped systems; however, some supplied optional features and separately-licensed software options require hardware configurations larger than the minimum supported systems.

Memory is logically divided into partitions in which tasks are loaded and executed. Activity in a partition can either be user-controlled or system-controlled; the user determines the placement of tasks in the former and the system controls the placement of tasks in the latter. Automatic memory compaction minimizes fragmentation of a system-controlled partition. Unmapped systems support only user-controlled partitions. Mapped systems support both user-controlled and system-controlled partitions.

Real-time interrupt response is provided by the system's task scheduler, which recognizes 250 software priority levels. The user-specified task priority determines the task's eligibility to execute. A task can be fixed in a partition to ensure immediate execution when it is activated or it can

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reside on disk while it is dormant to make memory available to other tasks. Task checkpointing enables tasks to be displaced from a partition to enable a higher priority, non-resident task to execute.

Software-supported Reliability Features

- Processor error logging
- Disk and magnetic tape error logging
- Power fail restart
- On-line device exerciser (IOX) to verify correct operation of disks and tapes

Other Available RSX-11M Features

- Terminal Services Architecture (TSA) support – Terminals connected to an RSX-11M system in a DECnet-based network can function as remote command terminals on other RSX or VAX/VMS systems that also support TSA. Likewise, terminals on those remote systems can function as command terminals on the RSX-11M system.
- Micro/RSX File Transfer support – With the MFT utility, file interchange with Micro RSX systems is supported without the need for DECnet. Communication with the Micro RSX system is via a standard terminal line. File transfer is initiated on the Micro/RSX system, but files can be transferred in either direction.
- Logical device assignments
- Magnetic tape character set translation
- Line printer spooling
- Loadable device drivers
- Postmortem and snapshot dump facility
- Crash Dump Analyzer facility
- Ability to perform an RSX-11M system generation on a host RSX-11M-PLUS system and on a host VAX/VMS system running VAX-11 RSX.
- Host for RSX-11S system generation and program development
- Full-duplex terminal driver that supports advanced features and additional devices not supported by the half-duplex terminal driver
- Direct connecting of a user task to hardware interrupts
- Memory management facilities

SOURCE CODE INFORMATION

Source code modules for the RSX-11M Executive and other privileged code are included in the binary kit options on all available distribution media. These source code modules are included because they are required to generate the RSX-11M system. A separate source license and kit are provided for the RSX-11M utilities modules on 800 bpi magtape or 1600 bpi magtape.

This source code is provided on an "**AS IS**" basis without any warranty of any kind either express or implied.

MINIMUM HARDWARE REQUIRED

For System Generation

VAX/VMS systems:

Any valid VAX/VMS system configuration

PDP-11 and MicroPDP-11 systems:

Processor – Any UNIBUS PDP-11 processor, PDP-11/70, PDP-11/23, PDP-11/23S, PDP-11/23-PLUS, MicroPDP-11/23, MicroPDP-11/73, MicroPDP-11/83 or LSI-11/73.

NOTE: The LSI-11/73 (KDJ11-A) processor module is ONLY supported when used in the following two configurations with the noted restrictions. Configuration 1 is recommended wherever possible

Configuration 1: (NOT supported with the RQDX1 controller)

- KDJ11-A processor module
- MRV11-D memory module with MXV11-B2 boot ROM set
- DLVJ1 four-line terminal interface

Configuration 2: (supports only ONE DL11-type interface when using half-duplex terminal driver)

- KDJ11-A processor module
- MXV11-BF multifunction module with MXV11-B2 boot ROM set

Memory – 196K bytes if the distribution medium is TK50 tape cartridge; 128K bytes for all other distribution media

Console – DL11, DLV11, or compatible interface with an appropriate terminal from the list of supported hardcopy, standard video, or graphics display terminals

Clock – KW11-L, KW11-P, or DL11-W if not provided by processor or bootstrap

Disk – RA60/80/81, RC25, RD52/53, dual RK06/07, dual RL01/RL02, RM02/03/05/80, or RP04/05/06

NOTE: RC25 is NOT a software distribution device for RSX-11M.

Tape – For all RA60/80/81, RC25, RD52/53, RM02/03/05/80, and RP04/05/06 systems, a 9-track tape drive (except TS03) from the optional hardware list or a TK50 tape drive is required.

For System Execution

Processor – Any UNIBUS PDP-11 processor, PDP-11/70, PDP-11/23, PDP-11/23S, PDP-11/23-PLUS, MicroPDP-11/23, MicroPDP-11/73, MicroPDP-11/83 or LSI-11/73 (Refer to LSI-11/73 NOTE above)

Memory – 32K bytes WITHOUT SUPPORT for RA60/80/81, RC25, RD51/52/53, and RX50 disk drives and TK50 tape drive; 128K bytes WITH SUPPORT for any of these devices

Console – DL11, DLV11, or compatible interface with an appropriate terminal from the list of supported hardcopy, standard video, or graphics display terminals

Clock – KW11-L, KW11-P, or DL11-W if not provided by processor or bootstrap

Disk – A hard disk from the optional hardware list

The basic 32K-byte RSX-11M system provides approximately 16K bytes of memory for user tasks and 16K bytes of memory for system space. Additional Executive services and device drivers can be selectively incorporated into the system at increased memory space usage. The following are contained in the basic system memory space:

- Executive
- File System Primitives (4K version)
- Operator Interface Task (MCR)
- Task Loader
- Space for three device drivers:
  1. One system disk driver
  2. A small terminal driver supporting a single DL11 or DLV11 line
  3. One other driver (excluding ICS11/ICR11)

A minimum of 56K bytes is required for mapped systems or where it is desired to perform concurrent program development and application execution.

Although magnetic tape drives are supported in a 32K-byte system, the recommended memory for tape support is 56K bytes.

HARDWARE RESTRICTIONS

In some cases, **not all hardware features of the following options are supported**. Hardware and software restrictions can limit the number of devices that a given system can support. Some combinations of devices may be mutually exclusive.

For example, due to hardware restrictions, errors may be experienced when the DLVJ1 is configured with an RQDX1 or additional DLVJ1 modules. Similarly, only one RQDX1 is supported per system.

OPTIONAL HARDWARE

Processor Options

- Additional memory to a system total of 56K bytes on systems that do not include the hardware memory management unit, or 3840K bytes on systems that include the hardware memory management unit.
- FP11 Floating Point Processor
- FPF11 Floating Point Processor
- FPJ11 Floating Point Processor
- KE11-A,B Extended Arithmetic Element (supported only on systems that do not include a memory management unit)
- KE11-E Extended Instruction Set
- KE11-F Floating Instruction Set
- KEF11-AA Floating Point Processor
- KEF11-BB Commercial Instruction Set
- KW11-Y Watch-dog Timer Clock
- KT11 Memory Management Unit (requires a minimum of 56K bytes of memory)
- KT24 PAX Module (required on the PDP-11/24 to support more than 248K bytes of memory)

9-Track Magnetic Tape Drives

- TE10, TS03, TU10, and TU10W 800 bpi tape drives
- TE16, TU16, TU45, and TU77 800/1600 bpi tape drives
- TS11, TSV05, and TU80 1600 bpi tape drives

Other Magnetic Tape Devices

- TU58 dual-drive DECtape II cartridge tape subsystem (with DL11 or DLV11 controller)

NOTE: The TU58 should be used only in a stand-alone, lightly-loaded environment. If used as a file device on a heavily-loaded system, it can degrade system performance.

- TU60 dual-drive cassette tape system (with TA11 controller)
- TK25 cartridge tape drive (with appropriate Q-BUS controller)
- TK50 cartridge tape drive (with appropriate Q-BUS controller and 128K bytes memory minimum – supported only on MicroPDP-11 23 73 83)

NOTE: If the TK50 is used with utilities other than BRU or is used with the verify pass of BRU, degraded performance and or capacity of the TK50 should be expected.

Hard Disk Devices

- ML11 semiconductor disk emulator (with RH70 controller)
- RA60, RA80, and RA81 disk drives (with UDA50 or KDA50 controller and 128K bytes memory minimum)
- RC25 fixed removable disk subsystem (with appropriate UNIBUS or Q-BUS controller and 128K bytes memory minimum)
- RD51 and RD52 disk drives (with RQDX1, RQDX2, or RQDX3 controller and 128K bytes memory minimum)

NOTE: The RQDX1 requires Version 9 microcode or later to support the RD52 disk drive.

- RD53 disk drive (with RQDX2 or RQDX3 controller and 128K bytes memory minimum)
- RK05 and RK05F cartridge disk drives (with RK11 controller)
- RK06 and RK07 cartridge disk drives (with appropriate RK controller)
- RL01 and RL02 cartridge disk drives (with appropriate RL controller)
- RM02, RM03, RM05, and RM80 disk drives (with appropriate RH controller)
- RPR02 RP02 and RP03 disk pack drives (with RP11 controller)
- RP04, RP05, and RP06 disk pack drives (with appropriate RH controller)

- RS03 and RS04 fixed-head disk drives (with appropriate RH controller)

NOTE: With this software product, serious data corruption and or performance degradation can occur if, in a disk drive with the dual port option, the port select switch is placed in the programmable position.

Soft Disk Devices

- RX11, RX211, RXV12, and RXV21 floppy disk systems
- RX50 floppy disk system (with RQDX1, RQDX2, RQDX3, or RUX50 controller and 128K bytes memory minimum)

Terminals

- Hardcopy Terminals – LA12, LA30S P, LA34, LA36, LA38, LA120, LA180S, LT33, and LT35
- Standard Video Terminals – VT05B, VT50, VT52, VT100, VT101, VT102, VT131 (in VT100 102 character mode only), and VT220
- Graphics Display Terminals – VT55, VT105, VT125, VT240, and VT241

Other Terminal Devices

- DTC01 DECtalk
- The PC100 (Rainbow 100) is supported as a terminal in VT102 mode
- The PC278 (DECmate II) is supported as a terminal in VT102 mode
- The Professional 300 series personal computers are supported as VT102 VT125s in emulation mode
- RT02 Alphanumeric Display
- RT02-C Alphanumeric Display and Badge Reader
- Terminal Interfaces – The terminals listed above are supported when connected to a DH11 (with or without DM11-BB), DHU11, DHV11, DL11-A,B,C,D,E, or W, DLV11, DLV11-E or F, DLVJ1 (console baud rates must not exceed 1200 baud with DLVJ1 – see other DLVJ1 disclaimers in the HARDWARE RESTRICTIONS section), DZ11, DZV11, DZQ11, or DZS11 (first terminal must be VT1xx with DZS11).

NOTE: A maximum of 64 terminals is supported.

Communications Devices

- DA11-B DMA UNIBUS link
- DEUNA Ethernet controller
- DL11 and DLVE1 asynchronous single-line interfaces
- DMC11-E interprocessor link
- DMR11 interprocessor link
- DP11 and DPV11 synchronous single-line interfaces
- DQ11 DMA synchronous single-line interface
- DU11 and DUV11 synchronous single-line interfaces
- DUP11 synchronous single-line interface

Laboratory/Industrial Control Devices

- AD01-D A/D Converter
- AFC11 A/D Converter
- AR11 Analog Real-Time System with DR11-K 16-bit digital I/O option; one per subsystem (bit interrupt capability not supported)
- DRS11/DSS11 Industrial Control System Modules
- ICS11/ICR11 Industrial Control Subsystem
- LPA11-K Laboratory Peripheral Accelerator
- LPS11 Laboratory Peripheral System
- UDC11 Universal Digital Controller
- Laboratory I/O Subsystem configured using the following options:
- AA11-K 4-channel 12-bit D A converter with scope control, 16 per subsystem
- AAV11-A, ADV11-A, DRV11, and KWV11-A real-time options
- AD11-K 12-bit A D converter with 16-channel multiplexer; 16 per subsystem (15 if ADK11 is part of the same subsystem)
- ADK11-KT 12-bit A/D converter with 16-channel multiplexer; one per subsystem
- AM11-K 48-channel A D multiplexer with gain ranging; one per AD11-K or ADK11-KT
- DR11-K 16-bit digital I O option; 16 per subsystem
- KW11-K dual real-time clock with Schmitt triggers one per subsystem

NOTE: Support for the IP11 and IPV11 Process Control Subsystems, bundled in previous versions of RSX-11M, is now available as a separate optional software product for RSX-11M.

Other Peripherals

- PR11 paper tape reader and PC11 paper tape reader punch
- CR11 and CM11-E card reader
- VT11 VS60 Graphics Display processor and scope
- Printers – LA50, LA100, LA180, LA210, LN01, LN03, LP11 Series (LP01 02 04 05 06 07 14 25 26 27), LQP02, LQP03, LS11, and LV01

NOTE: Plotter support for DIGITAL printer plotters is provided by optional software.

- KMC11-A auxiliary processor as a line printer DMA interface

PREREQUISITE SOFTWARE

For System Generation

For Stand-alone Generation:

None

For On-Line Generation:

One of the following Operating Systems:

RSX-11M*

RSX-11M-PLUS**

VAX/VMS running VAX-11 RSX***

* Refer to the RSX-11M Optional Software Cross Reference Table (SPD 20.98.xx) for the required version.

** Refer to the RSX-11M-PLUS Optional Software Cross Reference Table (SPD 20.99.xx) for the required version.

*** Refer to the VAX VMS Optional Software Cross Reference Table (SPD 25.99.xx) for the required versions.

For System Execution

None

OPTIONAL SOFTWARE

Refer to the RSX-11M Optional Software Cross Reference Table (SPD 20.98.xx) for all available optional software.

SOFTWARE WARRANTY

Warranty for this software product is provided by DIGITAL with the purchase of a license for the product. There is no additional charge. This software product is warranted to conform to the Software Product Description (SPD). This means that DIGITAL will remedy any nonconformance when it is reported to DIGITAL by the customer during the warranty period.

The warranty period is ninety (90) days. It begins when the software is installed or thirty (30) days after delivery to the end user, whichever occurs first and expires ninety (90) days later. All warranty related support for this software will end 180 days after release of the subsequent version.

Warranty is provided in the country of purchase. DIGITAL will provide a service location which will accept reporting (in a format prescribed by DIGITAL) of a nonconformance problem caused when using the licensed software under normal conditions as defined by the SPD. DIGITAL will remedy a nonconformance problem in the current unaltered release of the licensed software by issuing correction information such as: correction documentation, corrected code, or notice of availability of corrected code; or a restriction or a bypass. The customer will be responsible for the preparation and submission of the problem report to the service location.

Warranty Exclusion

DIGITAL DOES NOT WARRANT THAT THE SOFTWARE LICENSED TO CUSTOMER SHALL BE ERROR FREE, THAT THE SOFTWARE SHALL OPERATE WITH ANY HARDWARE AND SOFTWARE OTHER THAN AS SPECIFIED IN THIS SPD, THAT THE SOFTWARE SHALL SATISFY CUSTOMER'S OWN SPECIFIC REQUIREMENTS, OR THAT COPIES OF THE SOFTWARE OTHER THAN THOSE PROVIDED OR AUTHORIZED BY DIGITAL SHALL CONFORM TO THE SPD.

DIGITAL MAKES NO WARRANTIES WITH RESPECT TO THE FITNESS AND OPERABILITY OF MODIFICATIONS NOT MADE BY DIGITAL.

IF THE SOFTWARE FAILS TO FUNCTION FOR REASONS STATED ABOVE, THE CUSTOMER'S WARRANTY WILL BE INVALIDATED AND ALL SERVICE CALLS WILL BE BILLABLE AT THE PREVAILING PER CALL RATES.

INSTALLATION

Only experienced customers should attempt installation of this product. DIGITAL recommends that all other customers purchase DIGITAL's Installation Services. These services provide for installation of the software product by an experienced DIGITAL Software Specialist.

DIGITAL's Installation Services can be purchased as part of a Packaged Service Option or bought separately.

ORDERING INFORMATION

Single-Use licensed software is furnished under the licensing provisions of DIGITAL's Standard Terms and Conditions of Sale, which provide in part that the software and any part thereof may be used on only the single CPU on which the software is first installed, and may be copied, in whole or in part (with the proper inclusion of DIGITAL's copyright notice and any proprietary notices on the software) for use on such CPU.

You will need a separate license for each CPU on which you will be using the software product (except as otherwise specified by DIGITAL). Then you will select the Materials and Service Options you need to utilize the product effectively. You can order these options individually. But, to ensure that you get the set of services you need and to simplify ordering, DIGITAL offers Startup Service Packages designed for your environment and experience level. **IF YOU ARE ALREADY FAMILIAR WITH THESE OPTIONS, YOU MAY OBTAIN THE ORDERING INFORMATION DIRECTLY FROM THE SOFTWARE OPTIONS CHART.** In most cases, you will want to review the following descriptions to determine what options you require.

LICENSE OPTIONS

Single-Use License Option

The Single-Use License is your right to use the software product on a single CPU and it includes your 90 day warranty.

You purchase a Single-Use License according to the category to which your CPU belongs:

- Class H Single-Use License (for high end systems)
  - All UNIBUS models and systems
  - MicroPDP-11/83
- Class L Single-Use License (for low end systems)
  - All Q-BUS models and systems except MicroPDP-11/83
  - KD11, KDF11, KDJ11 CPU modules
  - DCT11, DCF11, DCJ11 microprocessor chips

For your first installation of this software product you must purchase as a **minimum**:

- Single-Use License Option, and
- Distribution and Documentation Option

The license gives you the right to use the software on a single CPU and the Distribution and Documentation Option provides the machine-readable software and related documentation.

To use this software product on additional CPUs, you must purchase for each CPU as a **minimum**:

- Single-Use License Option

In addition to the right to use, the license gives you the one-time right to copy the software from your original CPU installation to the additional CPU. Therefore, the Distribution and Documentation Option is not required, but optional.

Migration Option

Current licensed users of RT-11, RSX-11D, or IAS are eligible for the migration option. This is a Single-Use License offered at a reduced price and provides all of the License rights described above.

For your first installation of this software product you must purchase as a **minimum**:

- Migration Option, and
- Distribution and Documentation Option

To use this software product on additional CPUs currently licensed for RT-11, RSX-11D, or IAS, you must purchase for each CPU as a **minimum**:

- Migration Option

MATERIALS AND SERVICE OPTIONS

Startup Service Packages

To meet the first year software support needs of your new computer system, DIGITAL offers comprehensive Startup Service Packages. For a fixed price, each Package includes the distribution media, documentation and one year of software service for this product and all concurrently purchased qualified DIGITAL dependent products. Additional service components, such as: installation, orientation and training, are included at various Package levels.

For more information on what is included in each Startup Service Package level, please obtain the appropriate Service Description from your local DIGITAL Office.

Distribution and Documentation Option

The Distribution and Documentation option provides the machine-readable software in binary form and the basic documentation. You must have, or order, a Single-Use License to obtain this option. You will need this option to install the software for the first time. When revised versions of this software product become available, they may also be obtained by purchasing this option again.

If you prefer to receive automatic distribution of revised versions for this product, you must purchase a Software Product Service Agreement.

Software Revision Right-To-Copy Option

The Right-To-Copy Option allows a customer with multiple CPUs to copy a revised version of a software product from one CPU to another. Each CPU must be licensed for that product. You first install the revised software on one CPU; then you can make copies for additional CPUs by purchasing the Right-To-Copy Option for each additional CPU.

If you prefer to automatically obtain the right-to-copy, you must purchase a Service Right-to-Copy for each additional CPU; this is a service added to a Software Product Service Agreement.

Documentation-Only Option

You can obtain one copy of the basic documentation by purchasing the Documentation-Only Option.

Installation Service Option

DIGITAL's Installation Service is provided by a DIGITAL Software Specialist and accelerates your productive use of this product. For more information on what is included in this service, please obtain the appropriate Service Description from your local DIGITAL office.

Software Product Service Agreements

DIGITAL offers licensed customers annual Software Product Service Agreements to maintain their software:

DECsupport Service is the most comprehensive level of service offering critical problem on-site assistance and scheduled preventative maintenance. You receive telephone support that gives you timely answers and solves most software problems. In addition, you get revised versions of the software and documentation, and system newsletters or dispatches.

BASIC Service is ideal for customers who have a staff whose experience and expertise enables them to analyze and communicate a software problem to DIGITAL remote support centers. You receive telephone support that gives you timely answers and solves most software problems. In addition, you get revised versions of the software and documentation, and system newsletters or dispatches.

Self-Maintenance Service is designed for customers who require revised versions of the software and documentation from DIGITAL. In addition, you get system newsletters or dispatches and may submit software performance questions.

A variety of service options may be added to an existing Software Product Service Agreement, such as service for multiple-like systems. Contact your DIGITAL representative for additional information and ordering details.

For more information on what is included in these agreements, please obtain the appropriate Service Description from your local DIGITAL office.

Training From Educational Services

To ensure customer success with DIGITAL products, Educational Services sells training for the installation, maintenance and/or management of DIGITAL software. Course formats vary from seminars to packaged training materials that include self-paced instruction and computer-based instruction to traditional lecture/labs at DIGITAL's worldwide Training Centers.

For a complete listing of course schedules and prices, refer to the *DIGEST*, Educational Services' quarterly publication. For curriculum-specific information, training recommendations and assistance in planning training programs, please contact your Educational Services Representative.

Professional Software Services

DIGITAL Software Specialists are available on a per-call or resident contract basis to help in all phases of software development or implementation. Specialists are available to serve as technical consultants, decision support consultants or business systems analysts. Resources are available to:

- Supplement your programming staff
- Assume project management responsibility
- Develop software
- Augment a system start-up service package with tailored services to meet specific needs

Contact your DIGITAL representative for additional information and ordering details.

SOURCE MATERIALS OPTIONS

You can obtain optional source materials for this software product by signing DIGITAL's Software Program Sources License Agreement and then purchasing the source option(s) you want. The agreement entitles you to use the source materials at one customer facility or location which is specified in the agreement.

Most users do not require source materials. They are used primarily to make modifications to the software product. Source kits provided by DIGITAL do not necessarily contain all source files used by DIGITAL to build binary kits.

Source License and Sources Distribution Option

This option provides you with the machine-readable source code for the RSX-11M utilities. (Source code for the RSX-11M Executive and other privileged code is included in the Distribution and Documentation option.) It gives you the right to use the source code on any CPU at the facility/location specified in the agreement which has a Single-Use License for the object code.

Source License and Sources Listings Option

This option provides you with listings of the source programs for this software product. Two options are available one to obtain listings of the RSX-11M Executive and other privileged code, and one to obtain listings of RSX-11M utilities. These options give you the right to use the listings for any CPU at the facility/location specified in the agreement which has a Single-Use License for the object code.

Sources Distribution Update Option

This option provides you with the revised version of the machine-readable source code for the RSX-11M utilities (The revised version of the machine-readable source code for the RSX-11M Executive and other privileged code is included in the Distribution and Documentation option.) You must have purchased the Source License and Source Distribution Option to obtain this option.

Sources Listings Update Option

This option provides you with listings of source code for the revised version of the software product. Two options are available: one to obtain listings of the the revised version of the RSX-11M Executive and other privileged code, and one to obtain listings of the revised version of the RSX-11M utilities. You must have purchased the Source License and Source Listings Option to obtain this option.

SOFTWARE OPTIONS CHARTS

The distribution Media Codes used in the Software Options Chart are described below. You specify the desired Media Code at the end of the Order Number, e.g. QJ738-H5 = binaries for RL01/RL02-based systems on TK50 Tape Cartridge.

5 = TK50 Tape Cartridge
D = 9-track 800 BPI Magtape (NRZI)
H = RL02 Disk Cartridge
M = 9-track 1600 BPI Magtape (PE)
Q = RL01 Disk Cartridge
R = Microfiche
T = RK06 Disk Cartridge (Note 1)
V = RK07 Disk Cartridge
Z = No hardware dependency

NOTE 1: Version 4.2 is the last release to be distributed on RK06 Disk Cartridges.

CHART I

NOTE: The availability of these software product options and services may vary by country. Customers should contact their local DIGITAL office for information on availability.

OPTIONS	ORDER NUMBER FOR RL01/RL02 BASED SYSTEMS	ORDER NUMBER FOR RK06/RK07 BASED SYSTEMS
LICENSE OPTIONS: A LICENSE IS REQUIRED FOR EACH CPU.		
Single-Use License (Class H)*	QJ628-UZ	QJ628-UZ
Single-Use License (Class L)*	QY628-UZ	QY628-UZ
Migration Option from RT-11, RSX-11D and IAS	QJ740-UZ	QJ740-UZ
MATERIALS AND SERVICE OPTIONS:		
Start-Up Service Package, Level III	QJ738-B5 QJ738-BD QJ738-BH QJ738-BM QJ738-BQ	QJ629-B5 QJ629-BD QJ629-BM QJ629-BT QJ629-BV
Start-Up Service Package, Level II	QJ738-75 QJ738-7D QJ738-7H QJ738-7M QJ738-7Q	QJ629-75 QJ629-7D QJ629-7M QJ629-7T QJ629-7V
Start-Up Service Package, Level I	QJ738-55 QJ738-5D QJ738-5H QJ738-5M QJ738-5Q	QJ629-55 QJ629-5D QJ629-5M QJ629-5T QJ629-5V
Distribution and Documentation Option	QJ738-H5 QJ738-HD QJ738-HH QJ738-HM QJ738-HQ	QJ629-H5 QJ629-HD QJ629-HM QJ629-HT (Note 1) QJ629-HV
Software Revision Right-To-Copy Option	QJ628-HZ	QJ628-HZ
Documentation Only Option	QJ628-GZ	QJ628-GZ

* Refer to the descriptions of Class H and Class L single-use licenses in the License Option section of this SPD.

NOTE 1: Version 4.2 is the last release to be distributed on RK06 Disk Cartridges.

CHART I (Cont.)

OPTIONS	ORDER NUMBER FOR RL01/RL02 BASED SYSTEMS	ORDER NUMBER FOR RK06/RK07 BASED SYSTEMS
Installation Service Option	QJ738-I5 QJ738-ID QJ738-IH QJ738-IM QJ738-IQ	QJ629-I5 QJ629-ID QJ629-IM QJ629-IT QJ629-IV
DECsupport Service	QJ738-95 QJ738-9D QJ738-9H QJ738-9M QJ738-9Q	QJ629-95 QJ629-9D QJ629-9M QJ629-9T QJ629-9V
Basic Service	QJ738-85 QJ738-8D QJ738-8H QJ738-8M QJ738-8Q	QJ629-85 QJ629-8D QJ629-8M QJ629-8T QJ629-8V
Self-Maintenance Service	QJ738-35 QJ738-3D QJ738-3H QJ738-3M QJ738-3Q	QJ629-35 QJ629-3D QJ629-3M QJ629-3T QJ629-3V
SOURCE MATERIALS OPTIONS: (Note 2)		
Source License and Sources Distribution for Utilities	QJ638-E5 QJ638-ED QJ638-EM	QJ638-E5 QJ638-ED QJ638-EM
Source License and Sources Listings for Utilities	QJ638-FR	QJ638-FR
Source License and Sources Listings for Executive	QJ628-FR	QJ628-FR
Sources Distribution Update for Utilities	QJ638-N5 QJ638-ND QJ638-NM	QJ638-N5 QJ638-ND QJ638-NM
Sources Listings Update for Utilities	QJ638-NR	QJ638-NR
Sources Listings Update for Executive	QJ628-NR	QJ628-NR

NOTE 2: The combination of Executive and Utilities sources does not necessarily comprise all the sources used by DIGITAL to build binary kits.

CHART II

NOTE: The availability of these software product options and services may vary by country. Customers should contact their local DIGITAL office for information on availability.

OPTIONS	ORDER NUMBER FOR RP04/05/06 BASED SYSTEMS	ORDER NUMBER FOR RM02/03/05/80 BASED SYSTEMS	ORDER NUMBER FOR RA60/80/81 RC25/RD52/53 BASED SYSTEMS
LICENSE OPTIONS: A LICENSE IS REQUIRED FOR EACH CPU.			
Single-Use License (Class H)*	QJ628-UZ	QJ628-UZ	QJ628-UZ
Single-Use License (Class L)*	QY628-UZ	QY628-UZ	QY628-UZ
Migration Option from RT-11, RSX-11D and IAS	QJ740-UZ	QJ740-UZ	QJ740-UZ
MATERIALS AND SERVICE OPTIONS:			
Start-Up Service Package, Level III	QJ637-B5 QJ637-BD QJ637-BM	QJ737-B5 QJ737-BD QJ737-BM	QJ676-B5 QJ676-BD QJ676-BM
Start-Up Service Package, Level II	QJ637-75 QJ637-7D QJ637-7M	QJ737-75 QJ737-7D QJ737-7M	QJ676-75 QJ676-7D QJ676-7M
Start-Up Service Package, Level I	QJ637-55 QJ637-5D QJ637-5M	QJ737-55 QJ737-5D QJ737-5M	QJ676-55 QJ676-5D QJ676-5M
Distribution and Documentation Option	QJ637-H5 QJ637-HD QJ637-HM	QJ737-H5 QJ737-HD QJ737-HM	QJ676-H5 QJ676-HD QJ676-HM
Software Revision Right-To-Copy Option	QJ628-HZ	QJ628-HZ	QJ628-HZ
Documentation Only Option	QJ628-GZ	QJ628-GZ	QJ628-GZ
Installation Service Option	QJ637-I5 QJ637-ID QJ637-IM	QJ737-I5 QJ737-ID QJ737-IM	QJ676-I5 QJ676-ID QJ676-IM
DECsupport Service	QJ637-95 QJ637-9D QJ637-9M	QJ737-95 QJ737-9D QJ737-9M	QJ676-95 QJ676-9D QJ676-9M
Basic Service	QJ637-85 QJ637-8D QJ637-8M	QJ737-85 QJ737-8D QJ737-8M	QJ676-85 QJ676-8D QJ676-8M
Self-Maintenance Service	QJ637-35 QJ637-3D QJ637-3M	QJ737-35 QJ737-3D QJ737-3M	QJ676-35 QJ676-3D QJ676-3M

* Refer to the descriptions of Class H and Class L single-use licenses in the License Option section of this SPD.

CHART II (Cont.)

OPTIONS	ORDER NUMBER FOR RP04/05/06 BASED SYSTEMS	ORDER NUMBER FOR RM02/03/05/80 BASED SYSTEMS	ORDER NUMBER FOR RA60/80/81/ RC25/RD52/53 BASED SYSTEMS
SOURCE MATERIALS OPTIONS: (Note 2)			
Source License and Sources Distribution for Utilities	QJ638-E5 QJ638-ED QJ638-EM	QJ638-E5 QJ638-ED QJ638-EM	QJ638-E5 QJ638-ED QJ638-EM
Source License and Sources Listings for Utilities	QJ638-FR	QJ638-FR	QJ638-FR
Source License and Sources Listings for Executive	QJ628-FR	QJ628-FR	QJ628-FR
Sources Distribution Update for Utilities	QJ638-N5 QJ638-ND QJ638-NM	QJ638-N5 QJ638-ND QJ638-NM	QJ638-N5 QJ638-ND QJ638-NM
Sources Listings Update for Utilities	QJ638-NR	QJ638-NR	QJ638-NR
Sources Listings Update for Executive	QJ628-NR	QJ628-NR	QJ628-NR

NOTE 2: The combination of Executive and Utilities sources does not necessarily comprise all the sources used by DIGITAL to build binary kits.