# Software Product Description

**PRODUCT NAME:  RSX-11M-PLUS, Version 3.0**

## DESCRIPTION

RSX-11M-PLUS is a disk-based, multiuser operating system that provides a multiprogramming environment and real-time capabilities using a priority structured, event-driven scheduler. It is a superset of the RSX-11M Operating System designed to maximize performance of large memory and general purpose PDP-11 processors.

Time-shared program development and interactive processing, real-time tasks, and batch streams can execute concurrently. The system's software priority levels enable the user to compile or assemble, debug, install and execute tasks, and run batch streams without significantly affecting real-time response.

The system 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 activated or it can reside on disk while it is dormant, making memory available to other tasks. Task checkpointing allows tasks to be displaced from memory to enable higher priority, nonresident tasks to execute.

Memory sizes from 512K bytes to 3,840K bytes are supported. Memory is logically divided into partitions in which tasks are loaded and executed. The system controls the placement of tasks within a partition, and automatic memory compaction minimizes memory fragmentation within a partition.

A multiuser program development facility is provided. RSX-11M-PLUS supports the traditional MCR command interface, the easy-to-use Digital Command Language (DCL) and user-written command interpreters. LOGIN/LOGOUT with passwords, device, and file access protection, a round-robin scheduler (running under the real-time executive), and concurrent execution of equal priority tasks via executive level swapping provide a time-sharing environment. In addition, accounting information is logged to a disk file. This information includes, among other things, per user connect time, CPU time, and pages printed. The system keeps passwords in an encrypted form, using a one-way encryption algorithm.

Tasks can be written in the supplied MACRO-11 assembly language or in optionally available languages, such as FORTRAN-77, COBOL-81, DIBOL-83, PASCAL, and BASIC-PLUS-2. User libraries and shareable libraries are supported. On MicroPDP-11/73, MicroPDP-11/83, PDP-11/44, PDP-11/70, and PDP-11/84 systems, supervisor mode mapping can be used to map libraries, thus increasing the effective size of a user task.

On the MicroPDP-11/73, MicroPDP-11/83, PDP-11/44, PDP-11/70 or PDP-11/84 hardware mapping facilities are available to user tasks to separate instructions and data into separate 64KB address spaces, doubling the address space available to tasks. Tasks can be written so that the system will automatically load a single, reentrant code section of a multiuser task and an impure section for each invocation of the task.

**NOTE:**   Not all of the available languages support the Instruction and Data Space and Supervisor Mode of operation available on the MicroPDP-11/73, MicroPDP-11/83, PDP-11/44, PDP-11/70, or PDP-11/84. Check the Software Product Description (SPD) for the specific language in question.

An extensive set of utilities is provided to facilitate file and system maintenance, error analysis, and program debugging. EDT, the DIGITAL standard editor, is supplied as well as RSX EDI. EDT supports advanced editing features including DEFINE KEY, which permits user defined key functions, and journalling which permits the recovery of most of the keystrokes of an editing session in the event of an abnormal exit from the editor.

The file system provides file structures for block structured devices. It also provides automatic space allocation, multiuser file protection, device independence, and logical device assignment.

Files are logically grouped into directories, which can be labelled by a name or by a pair of numbers conventionally denoting a user and a group to which the user belongs. A file is denoted by a file specification, which includes the file's device, directory and version as well as the file's name, and may include other elements. But typically all or part of a file specification can be replaced with a logical name or appropriate system-determined defaults. Multiple versions of a file may be retained. For most purposes, the user may omit specific reference to the file's version, and the system will automatically select the most recent version or, if appropriate, create a new one.

Two file access facilities are available: File Control Services (FCS) and Record Management Services (RMS-11).

RMS-11 supports three file organizations – Sequential, Relative and Multikeyed Index Sequential (ISAM), and provides sequential and direct access modes.

FCS supports sequential and direct access to sequentially and randomly organized files.

The use of the File Control Services (FCS) will increase the task size by approximately 2K to 8K bytes, depending on the number of open files and services desired. The Record Management System (RMS) requires at least 8K bytes per task.

A powerful, multi-stream BATCH facility is provided with RSX-11M-PLUS indirect command file processing capabilities. The batch commands are in DCL or MCR format, making this capability easy to use. Status is returned to the batch processor as each step is completed, allowing for conditionalized branching. The batch processor collects all print files from a batch stream and spools them along with the log file. The queue manager gives the system manager control over the multiple batch streams and print queues.

### Features

- Overlapped disk seek for RK06/07, RA60/80/81, RP04/05/06, RM02/03/05/80 disks

- Request queue optimization, which reduces average seek times on disks

- Disk Data Caching, which, for many applications, significantly reduces actual disk I/O operations, thereby increasing system performance.

- Dynamic dual pathing support for RK06/07, RP04/05/06, and RM02/03/05/80 disks

- Software addressing of up to 256 terminals

- Support for Ethernet Terminal Servers using the Local Area Transport (LAT) protocol. RSX-11M-PLUS DECnet software is needed for this feature.

- Terminal Services Architecture (TSA). Terminals on an RSX-11M-PLUS system with DECnet can function as remote command terminals on other RSX or VAX/VMS systems in the network that also have TSA capability. Likewise, terminals on those remote systems can function as command terminals on the RSX-11M-PLUS system.

- Support for the DIGITAL Multinational Character Set and for user-written translation routines for other character sets.

- Upward compatibility for most nonprivileged tasks with RSX-11M-PLUS Versions 2.0 and 2.1, RSX-11M Versions 4.0 and 4.1, and Micro/RSX Versions 1.0 and 1.1. Task rebuilding is usually not required.

- Capability to transfer files to and from a Micro/RSX system over a serial asynchronous communications link. This basic file transfer facility is provided by the two operating systems and requires no added software.

- Shadowed disk support, which allows one of two disks of the same type to be designated as a shadowed backup of the other disk mounted as a Files-11 volume. All writes to the primary drive are automatically written to the secondary. In the event of a read failure on the primary drive, the system will automatically read the data from the secondary drive.

- Powerfail/restart, which allows the system to continue executing upon power restoration, restarting all interrupted I/O activities and notifying any active task through a powerfail asynchronous system trap entry point.

- Host for RSX-11S program development and system building

- Error logging capabilities

### R'.02 Distribution

A subset RSX-11M-PLUS system is provided on RL02 distribution. Most, but not all, RSX-11M-PLUS features and device support (including error logging) are provided on the kit. Mass storage device support includes: RA60, RA80, RA81, RC25, RD53, RD52, RD51, RX02, RX50, RL01, RL02, TU58, TS11, TU80, TQK25, TK50, and TSV05.

The RL02 distribution is a disk pack distribution that neither requires nor permits system generation. Executive and privileged task sources ARE NOT included in the RL02 distribution.

For the MicroPDP-11/73, MicroPDP-11/83, PDP-11/44, PDP-11/70 and PDP-11/84 processors supporting separate Instruction and Data spaces, a pregenerated system is provided that utilizes these features. A non-I and D space system which does not support Supervisor mode is provided for the Micro/PDP-11/23, the PDP-11/23-PLUS, and the PDP-11/24. An automated procedure deletes one of the pregenerated systems if it is not required in order to recover some disk space.

For the RL02 distribution, support for Shadow Recording and Console Logging is provided only in the I-and-D space system.

For a complete list of device support provided in the RL02 distribution, refer to the discussion of the "RL02 distribution" in the MINIMUM HARDWARE REQUIRED section of this SPD.

### SOURCE CODE INFORMATION

With the exception of the RL02 pregenerated kit, source code for the RSX-11M-PLUS Executive and most privileged code modules are provided in the binary kit options on 800 BPI Magtape, 1600 BPI Magtape, TK50 cartridge tape, and RK07 disk cartridge. This source code is included in order to generate the RSX-11M-PLUS system.

A separate source license is required for the RSX-11M-PLUS utilities and nonprivileged modules. A kit for these sources is available on 800 BPI Magtape, 1600 BPI Magtape, and TK50 Cartridge Tape.

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

## HARDWARE RESTRICTIONS

In some cases, **not all hardware features of the options in the following MINIMUM HARDWARE and OPTIONAL HARDWARE sections are supported.** Hardware restrictions can limit the number of devices that a system can support, and there may be some combinations of devices that are mutually exclusive.

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.

The TK50 is supported only on MicroPDP-11/23, MicroPDP-11/73, and MicroPDP-11/83.

Due to hardware restrictions, errors may be experienced when the DLVJ1 (formerly DLV11-J) is configured with and RQDX1 or additional DLVJ1 modules.

## MINIMUM HARDWARE REQUIRED

All RSX-11M-PLUS systems, whether for system generation or just system execution or for the pregenerated RL02-based system, require the following basic hardware:

*Processor:*

PDP-11/23-PLUS, PDP-11/24, PDP-11/44, PDP-11/70, PDP-11/84, MicroPDP-11/23, MicroPDP-11/73, MicroPDP-11/83, or LSI-11/73

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

*Configuration 1:* (NOT supported with RQDX1 controller)

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

*Configuration 2:*

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

*Console Terminal:*

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

**NOTE:** If the Console Terminal is using a DLVJ1 (formerly DLV11-J) Interface, Console baud rates must not exceed 1200 baud.

*Clock:*

KW11-L, KW11-P, DL11-W or equivalent

*Memory:*

512K bytes, KT24 for PDP-11/24

Further minimum requirements depend upon the use of the system. There is also a maximum configuration for the pregenerated RL02-based system. These requirements and constraints are detailed in the following sections.

### For System Generation

Disk: RA60/80/81, RP04/05/06, RM02/03/05/80, RD53, dual RD52, dual RK07, or dual RC25 subsystems. A dual RC25 configuration consists of two devices, which comprise four units.

Tape: Except for the dual RK07-based system, a 9-track tape drive from the optional hardware list or a TK50 cartridge tape drive is required.

System Generation for RSX-11M-PLUS can also be accomplished on a VAX/VMS system with VAX-11 RSX.

### For System Execution

*Disk:*

RD51, RD52, RD53, RC25, RL01/02, RK06/07, RA60/80/81, RM02/03/05/80 or RP04/05/06

### For RL02 Distribution

*Disk:*

Dual RL02

### Maximum Configuration for RL02 Distribution

*Memory:*

3840K bytes

*Disk:*

Four RL01/RL02 controllers with four units each, one RX11 controller with two RX01 units or one RX211 or RXV21 controller with two RX02 units, and any four of the following controllers or subsystems:

1. RQDX1, RQDX2, or RQDX3 controller – Each controller may have four units, which may be: RX50 (dual device -counts as two units), RD51, RD52, or RD53. RQDX1 cannot be used with RD53 and supports no more than two RD5x units (plus one RX50 dual floppy drive). RQDX1 requires version 9 microcode or later to support the RD52. There can be no more than one RQDX1 on a system.

2. RUX50 controller – Each controller may have four RX50 units (i.e., two dual units).

3. RC25 subsystem, including a UNIBUS or Q-BUS controller – The controller supports two drives (four units).

4. UDA50 or KDA50 controller – Each controller may have four units, which may be: RA60, RA80, or RA81.

*Terminals and Serial Printers:*

Up to 64 lines using DL, DLV, DZ, DZV, DZQ, DH, DHV or DHU controllers with a maximum of 16 controllers

*Line Printer:*

One LP11 series printer or equivalent

*Tape:*

Two TU58, one TK50, and one of the following: TS11, TU80, TSV05, or TQK25

*Laboratory Peripherals:*

K-Series devices, LPA11

*Communications (QIO Interface):*

One DEUNA Ethernet Controller

*Floating Point Processors:*

FP11, KEF11-AA, FPF11, FPJ11

**NOTE:** The RL02 distribution does not include a system generation capability. However, loadable driver support is included so that customers can write their own device drivers. Executive and privileged module sources are not included on the RL02 distribution.

**OPTIONAL HARDWARE**

- Additional memory up to a maximum of 3840K bytes
- FP11 Floating Point Processor
- KEF11-AA Floating Point Processor
- FPF11 Floating Point Processor
- FPJ11 Floating Point Processor
- KEF11-BB Commercial Instruction Set Microcode

*I/O Peripherals*

- PR11 paper tape reader and PC11 paper tape reader/punch CR11 and CM11-E card reader
- LA50, LA100, LA180, LA210, LN01, LN03, LQP02, LQP03, LP11 series printers (LP01/02/04/05/06/07/14/25/26/27), LS11 and LV01 (Plotter support for printers is not included in RSX-11M-PLUS, but may be included in optional, layered software.)

*9-Track Magnetic Tape Drives*

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

*Other Magnetic Tape Devices*

- TU58 DECtape cartridge tape subsystem

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

- TQK25 8" cartridge tape drive
- TK50 cartridge tape drive

*Hard Disk Devices*

- RK05 and RK05F cartridge disk drives (with RK11 controller)
- RL01 and RL02 cartridge disk drives (with appropriate RL controller)
- RK06 and RK07 cartridge disk drives (with appropriate RK controller)
- RP04, RP05, and RP06 disk pack drives (with appropriate RH controller)
- RM02/03/05 disk pack drives (with appropriate RH controller)

- RM80 disk drive (with RH70 controller)
- RS03 and RS04 fixed head disks (with appropriate RH controller)
- ML11 semiconductor disk emulator (with RH70 controller)
- RA60/80/81 disk drives (with UDA50 or KDA50 controller)
- RD51, RD52, and RD53 disk drives with RQDX1, RQDX2, or RQDX3 controller. RQDX1 cannot be used with RD53 and supports no more than two RD5x units (plus one RX50 dual floppy drive). RQDX1 requires version 9 microcode or later to support the RD52. There can be no more than one RQDX1 on a system.
- RC25 fixed/removable disk subsystem

*Soft Disk Devices*

- RX11, RX211 and RXV21 floppy disk systems
- RX50 floppy disk subsystem (with RQDX1, RQDX2, RQDX3, or RUX50 controller)

*Terminals*

- Hardcopy Terminals – LA12, LA34, LA36, LA38, LA120, LT33, and LT35
- Standard Video Terminals – VT52, VT100, VT101, VT102, VT131 (in VT100/102 character mode only), and VT220
- Graphics Display Terminals – VT55, 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 DH11 (with or without DM11-BB), DHU11, DHV11, DL11-A, B, C, D, E or W, DLV11, DLV11-E or F, or DLVJ1 (formerly DLV11-J), DZ11, DZV11, DZQ11, or DZS11 (first terminal must be VT1xx with DZS11).

  Console baud rates must not exceed 1200 baud with DLVJ1. Due to hardware restrictions, errors may be experienced when the DLVJ1 (formerly DLV11-J) is configured with an RQDX1 or additional DLVJ1 modules.

**NOTE:** A maximum of 256 terminals is supported.

*Communications (QIO Interface)*

- DMC11
- DMR11
- PCL11-B
- DUP11
- DEUNA Ethernet controller

*Laboratory/Industrial Control*

- LPA11-K Laboratory Peripheral Accelerator
- Laboratory I/O Subsystem configured using the following options:
  - ADK11-KT 12-bit A/D converter with 16-channel multiplexer; one per subsystem
  - AD11-K 12-bit A/D converter with 16-channel multiplexer, 16 per subsystem (15 if ADK11-KT is part of same subsystem)
  - KW11-K Dual real-time clock with Schmitt triggers: one per subsystem (clock already included in ADK11-KT, noKW11-K required if one is present)
  - AM11-K 48 channel A/D mulitiplexer with gain ranging: one per AD11-K or ADK11-KT
  - DR11-K 16-bit digital I/O option: 16 per subsystem
  - AA11-K 4-channel 12-bit D/A converter with scope control; 16 per subsystem
  - AAV11-A, ADV11-A, KWV11-A, and DRV11 real-time options

Support for the IP11 and IPV11 Process Control Susbystems, contained in previous versions of RSX-11M-PLUS, is now available in a separate optional software product for RSX-11M-PLUS.

## PREREQUISITE SOFTWARE

If support for Ethernet Terminal Servers is required, then RSX-11M-PLUS DECnet (at a minimum of Version 3.0) is needed. This is true even if only the Local Area Transport (LAT) protocol is to be used.

## OPTIONAL SOFTWARE

Refer to the RSX-11M-PLUS Optional Software Cross Reference Table (20.99.XX) for 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 RSX-11M, RSX-11D, and 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 RSX-11M, RSX-11D, and 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 this software product. 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. It gives 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 Update Distribution Option

This option provides you with the revised version of the machine-readable source code for this software product. You must have purchased the Source License and Source Distribution Option to obtain this option.

### Sources Update Listings Option

This option provides you with listings of source code for the revised version of the software product. You must have purchased the Source License and Source Listings Option to obtain this option.

# SOFTWARE OPTIONS CHART

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. QR500-HD = binaries on 9-track 800 BPI Magtape (NRZI).

5 = TK50 Tape Cartridge
D = 9-track 800 BPI Magtape (NRZI)
H = RL02 Disk Cartridge
M = 9-track 1600 BPI Magtape (PE)

R = Microfiche
V = RK07 Disk Cartridge
Z = No hardware dependency

**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 Non-RL02 Based Systems* | ORDER NUMBER For RL02 Based Systems |
|---|---|---|
| **LICENSE OPTIONS:** A LICENSE IS REQUIRED FOR EACH CPU. | | |
| Single-Use License (Class H)[1] | QR500-UZ | QR503-UZ |
| Single-Use License (Class L)[1] | QY505-UZ | QY503-UZ |
| Migration Option from RT-11, RSX-11D and IAS | QR510-UZ | QR513-UZ |
| **MATERIALS AND SERVICE OPTIONS:** | | |
| Start-Up Service Package, Level III | QR500-B5 QR500-BD QR500-BM QR500-BV | QR503-BH |
| Start-Up Service Package, Level II | QR500-75 QR500-7D QR500-7M QR500-7V | QR503-7H |
| Start-Up Service Package, Level I | QR500-55 QR500-5D QR500-5M QR500-5V | QR503-5H |
| Distribution and Documentation Option | QR500-H5 QR500-HD QR500-HM QR500-HV | QR503-HH |
| Software Revision Right-To-Copy Option | QR500-HZ | QR503-HZ |
| Documentation Only Option | QR500-GZ | QR503-GZ |
| Installation Service Option | QR500-I5 QR500-ID QR500-IM QR500-IV | QR503-IH |
| DECsupport Service | QR500-95 QR500-9D QR500-9M QR500-9V | QR503-9H |

# SOFTWARE OPTIONS CHART (Cont.)

| OPTIONS | ORDER NUMBER For Non-RL02 Based Systems* | ORDER NUMBER For RL02 Based Systems |
|---|---|---|
| Basic Service | QR500-85 QR500-8D QR500-8M QR500-8V | QR503-8H |
| Self-Maintenance Service | QR500-35 QR500-3D QR500-3M QR500-3V | QR503-3H |
| **SOURCE MATERIALS OPTIONS (See Note 5)** | | |
| Source License and Source Distribution for RSX-11M-PLUS Utilities | QR520-E5 QR520-ED QR520-EM | (See Note 2) |
| Source Update Distribution for RSX-11M-PLUS Utilities | QR520-N5 QR520-ND QR520-NM | (See Note 2) |
| Source License and Source Listings for RSX-11M-PLUS Utilities | QR520-FR (See Notes 4 & 5) | QR520-FR (See Notes 3 & 4) |
| Source Listings Update for RSX-11M-PLUS Utilities | QR520-NR (See Notes 4 & 5) | QR520-NR (See Notes 3 & 4) |
| Source License and Source Listings for RSX-11M-PLUS Executive and I/O Drivers | QR500-FR (See Notes 4 & 5) | QR500-FR (See Notes 3 & 4) |
| Source Listings Update for RSX-11M-PLUS Executive and I/O Drivers | QR500-NR (See Notes 4 & 5) | QR500-NR (See Notes 3 & 4) |

\* Non-RL02 Based Systems include: RK07, RA60/80/81, RM02/03/05/80, RP04/05/06/07, RD52, RD53, and RC25 Based Systems.

**NOTES**

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

(2) The RL02 kit is pregenerated. It can NOT be system generated and therefore the Source License and Source Options are not applicable for the RL02 Kit.

(3) Since System Generation is not possible on the RL02 kit, the use of Source License and Listing Options is for information purposes only.

(4) The Source License and Listing Options for RSX-11M-PLUS are divided into two separate kits. One is for the Executive and I/O drivers sources that are included on all but the RL02 distribution and documentation kits. The second listing kit is for the RSX-11M-PLUS Utility Sources which are provided on the Source License and Source Kits.

(5) The combination of Executive and Utilities sources does not necessarily comprise all the sources used by DIGITAL to build the binary kits.