RSX–11M/RSX–11S

Documentation Directory

Order No. AA-2593E-TC

READ THIS FIRST

RSX-11M Version 3.2
RSX-11S Version 2.2

May 1979

This manual is a guide to the documentation set for RSX-11M V 3.2 and RSX-11S V 2.2. It includes a synopsis of each manual in the set and directs the user to information needed for particular applications. The directory also includes a guide for reading the manuals and information needed to order manuals.

A complete documentation set is shipped with the software. The exact composition of the set depends on the license you have purchased. (RSX-11S is a subset of RSX-11M. It uses the same operating-system manuals as RSX-11M and an additional manual on system generation and installation.)

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DECCOMM	DECSYSTEM-20	TMS-11
ASSIST-11	RTS-8	ITPS-10
VAX	VMS	SBI
DECnet	IAS	PDT
DATATRIEVE	TRAX	

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RSX-11M/RSX-11S DOCUMENTATION DIRECTORY

1.0 GETTING STARTED

As shipped, the RSX-11M baseline system is ready to run on your PDP-11 computer. This baseline system is mainly used to generate your own system, tailored to your special hardware and software requirements. This tailoring process is described in the RSX-11M System Generation and Management Guide. (RSX-11S users should also consult the RSX-11S System Generation and Installation Guide.)

Before proceeding with system generation, you should thoroughly read the RSX-11M/RSX-11S Release Notes. This document contains important, updated information correcting any errors or noting any changes in the software and documentation of your system.

2.0 HOW THE MANUALS ARE ORGANIZED

The manuals are organized in seven volumes:

- Introduction
- Operation
- Program Development
- Utilities
- File Management and I/O
- Maintenance
- Languages (available under separate license)

A 2-volume RSX-11M System Logic Manual is also available. Refer to Section 3.9 for ordering information.

A volume may consist of several ring binders with several manuals contained in each binder. (The RSX-11M Mini-Reference is a separate handbook.)

Two VAX/VMS manuals that deal with using RSX-11M with VAX/VMS are also available. These manuals are described in Section 3.10.

Table 1 lists the documents in the set with their order numbers. Check your manual set to make sure it matches your system and language options. Documents marked with an asterisk (*) are associated with the RSX-11M software, but are purchased separately or are sent when you purchase the license for the associated software component (such as FORTRAN IV).

Table 1
RSX-11M/RSX-11S Documentation Set

Document Title	Order Number
RSX-11M Mini-Reference	AV-5570C-TC
VOLUME 1: INTRODUCTION	
RSX-11M/RSX-11S Documentation Directory	AA-2593E-TC
RSX-11M/RSX-11S Release Notes	AA-2573F-TC
RSX-11M Beginner's Guide	AA-5245B-TC
Introduction to RSX-11M	AA-2555D-TC
RSX-11M Mini-Index	AA-H262A-TC
RSX-11M V03.2 Master Index (post release)	AA-5430C-TC
VOLUME 2: OPERATION	
RSX-11M System Generation and Management Guide	AA-H625A-TC
RSX-11S System Generation and Installation Guide*	AA-2874D-TC
RSX-11M/M-PLUS MCR Operations Manual	AA-H263A-TC
VOLUME 3: PROGRAM DEVELOPMENT	
RSX-11M/M-PLUS Guide to Program Development	AA-H264A-TC
IAS/RSX-11 MACRO-11 Reference Manual	DEC-11-OIMRA-B-D
IAS/RSX-11 ODT Reference Manual	DEC-11-OIODA-B-D
RSX-11M/M-PLUS Executive Reference Manual	AA-H265A-TC
RSX-11M/M-PLUS Task Builder Manual	AA-H266A-TC
IAS/RSX-11 System Library Routines Reference Manual	AA-5580A-TC
Update Notice No. 1 to IAS/RSX-11 System Library Routines Reference Manual	AD-5580A-T1
RSX-11M Guide to Writing an I/O Driver	AA-2600D-TC
Update Notice No. 1 to RSX-11M Guide to Writing an I/O Driver	AD-2600D-T1
VOLUME 4: UTILITIES	
RSX-11 Utilities Manual	AA-H268A-TC
VOLUME 5: FILE MANAGEMENT AND I/O	
IAS/RSX-11 I/O Operations Reference Manual	AA-2515D-TC
RSX-11M/M-PLUS I/O Drivers Reference Manual	AA-H269A-TC
RMS-11 User's Guide	AA-D538A-TC
RMS-11 Installation Guide	AA-H235A-TC
RMS-11 MACRO-11 Reference Manual	AA-H683A-TC
VOLUME 6: MAINTENANCE	
RSX-11M/M-PLUS Error Logging Reference Manual	AA-H270A-TC
RSX-11M/M-PLUS User Mode Diagnostics Reference Manual	AA-H271A-TC
RSX-11M/M-PLUS Crash Dump Analyzer Reference Manual	AA-H272A-TC

(continued on next page)

Table 1 (Cont.)
RSX-11M/RSX-11S Documentation Set

Document Title	Order Number
VOLUME 7: LANGUAGES*	
BASIC-11*	
BASIC-11 Language Reference Manual*	DEC-11-LIBBB-A-D
IAS/RSX BASIC User's Guide*	DEC-11-LIBIA-B-D
IAS/RSX BASIC Installation Guide	DEC-11-LIBJA-B-D
Update Notice No. 1 to IAS/RSX BASIC Installation Guide	DEC-11-LIBJA-B-DN1
BASIC-PLUS-2*	
BASIC-PLUS-2 Language Manual*	AA-0153A-TK
BASIC-PLUS-2 RSX-11M User's Guide*	AA-01571-TC
BASIC-PLUS-2 RSX-11M/IAS Installation Guide*	AA-0158A-TC
Update Notice No. 1 to BASIC-PLUS-2 RSX-11M/IAS Installation Guide*	AA-0158A-TI
FORTRAN IV*	
PDP-11 FORTRAN Language Reference Manual*	AA-1855D-TC
IAS/RSX-11 FORTRAN IV User's Guide*	AA-1936E-TC
IAS/RSX-11 FORTRAN IV Installation Guide*	AA-1821D-TC
FORTRAN IV-PLUS*	
PDP-11 FORTRAN Language Reference Manual*	AA-1855D-TC
FORTRAN IV-PLUS User's Guide*	AA-1884C-TC
FORTRAN IV-PLUS Installation Guide*	AA-1873D-TC
FORTRAN IV-PLUS Object Time System Reference Manual*	AA-1874B-TC
COBOL*	
PDP-11 COBOL Language Reference Manual*	AA-1749E-TC
PDP-11 COBOL User's Guide*	AA-1757D-TC
PDP-11 COBOL Pocket Guide*	AA-1750D-TC
PDP-11 COBOL Installation Guide*	AA-1745D-TC
Documentation for Internal Operations and Logic (Purchased separately. See Section 3.9.)	
RSX-11M V3.2 System Logic Manual*	AA-5579B-TC
Documentation for VAX/VMS Users (Purchased separately. See Section 3.10.)	
VAX-11/RSX-11M User's Guide	AA-D037A-TE
VAX-11/RSX-11M Programmer's Reference Manual	AA-D020A-TE

*Available under separate license.

Figure 1 outlines a general plan for reading the manuals.

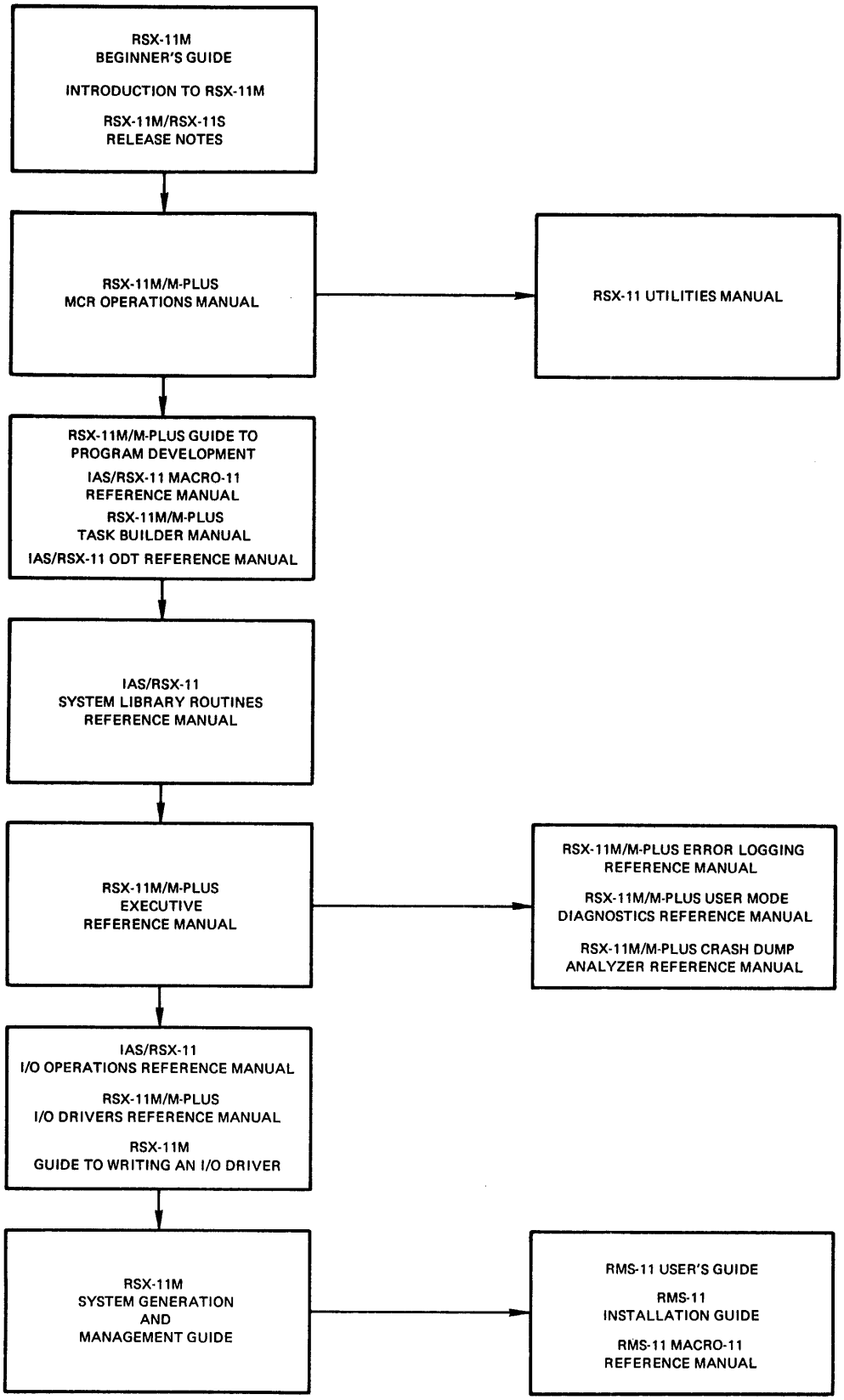

Figure 1 General Sequence for Reading RSX-11M V3.2 Documents

3.0 RSX-11M/RSX-11-S DOCUMENT DESCRIPTIONS

The following sections contain brief descriptions of the documents in the RSX-11M/RSX-11S set.

Documents marked with an asterisk (*) are available under a separate license.

Additional optional software is described in the Software Product Description (SPD) for RSX-11M V3.2.

3.1 RSX-11M Mini-Reference

This handbook, in loose-leaf format, provides a convenient reference for system users. It includes sections on the Monitor Console Routine (MCR), the Task Builder (TKB), the Peripheral Interchange Program (PIP), the On-Line Debugging Tool (ODT), Error Logging, I/O error codes, directive error codes, user mode diagnostics, Radix-50-to-decimal and octal-to-decimal conversions, and the ASCII character set.

3.2 Volume 1: Introduction

The introductory volume consists of manuals that will help you begin using your RSX-11M Version 3.2 or RSX-11S Version 2.2 system. You should first read the release notes, as these describe the latest changes, errors, and corrections which have not been documented elsewhere. Also included is a mini-index to help you find information. A master index will be published after the release.

3.2.1 **RSX-11M/RSX-11S Release Notes** - These notes describe new features of the release and summarize known bugs in the system (with fixes). They also include any updates to the documentation of the RSX-11M and RSX-11S systems. Read it before generating and using your system.

3.2.2 **RSX-11M Beginner's Guide** - This guide teaches new users the fundamentals of RSX-11M operation. It introduces terms and describes procedures. It also guides the user through a set of procedures (to be followed at a computer terminal) that uses an editor (EDI), compiler, and task builder to develop and run a simple FORTRAN program. Some information is also included on using PIP and the Queue Manager to handle computer files.

3.2.3 **Introduction to RSX-11M** - This manual introduces the reader with a general knowledge of computing to the basic concepts and capabilities of the RSX-11M and RSX-11S systems. It also describes features available as options with the original system.

3.2.4 **RSX-11M Mini-Index** - This is a short index to the RSX-11M documentation set. It refers to topics by manual title, chapter number, and section number. The Mini-Index is included in the documentation set you receive.

3.2.5 **RSX-11M V03.2 Master Index** - (Post-release.) This is a complete, detailed index for the RSX-11M documentation set. It refers to topics by manual title and page number.

3.3 Volume 2: Operation

The operation volume consists of manuals that tell you how to generate an RSX-11M Version 3.2 system and, if applicable, an RSX-11S Version 2.2 system. The third manual explains how to use the Monitor Console Routine (MCR).

3.3.1 **RSX-11M System Generation and Management Guide** - This manual is a planning and reference guide for generating the RSX-11M operating system. Included is information on bootstrap-loading a baseline system, summaries of system-generation dialogue questions, and reference information. The manual is intended for system managers, that is, persons responsible for tailoring and generating a system for an installation. The system manager should be familiar with the architecture of a PDP-11 computer and with all the options and features of the RSX-11M operating system. (RSX-11S users also start with this manual.)

3.3.2 **RSX-11S System Generation and Installation Guide*** - This document explains how to use RSX-11M as a host system for generating a tailored RSX-11S system.

3.3.3 **RSX-11M/M-PLUS MCR Operations Manual** - This manual describes how the Monitor Console Routine (MCR) interfaces with the RSX-11M and RSX-11M-PLUS systems. It explains the concepts, procedures, and conventions of RSX-11M/M-PLUS MCR operations, and describes the indirect command file processor. Included are full descriptions of the MCR commands and an alphabetical listing of all MCR and Task Termination Notification (TKTN) messages that the systems return.

3.4 Volume 3: Program Development

The program development volume begins with an overview of the program development process for RSX-11M/M-PLUS. To further explain the process, the other manuals describe, respectively, the MACRO-11 assembly language, the On-Line Debugging Tool (ODT), the Executive, the Task Builder, system library routines, and writing an I/O driver.

3.4.1 **RSX-11M/M-PLUS Guide to Program Development** - This manual is a step-by-step guide to start a MACRO-11 programmer in program development. It describes the hardware and software necessary for development, and explains how to create, assemble, task build, debug, and maintain assembly-language programs. It also introduces the use of the Librarian to create and maintain user macro and object libraries. A brief description of FORTRAN IV program development is included. Examples are given for all steps in the development process.

This guide is intended to be used with other, more advanced manuals until the user becomes familiar with those manuals and needs this manual only as a refresher.

3.4.2 **IAS/RSX-11 MACRO-11 Reference Manual** - This manual describes the assembly language supported by RSX-11M. All symbols, terms, and expressions of the language are defined. The manual also includes suggested programming standards (and the benefits of following them), operating procedures, and methods for writing position-independent code. Knowledge of the MACRO-11 language is not a prerequisite.

3.4.3 **IAS/RSX-11 ODT Reference Manual** - This manual describes the use of the On-Line Debugging Tool (ODT), which aids the user in debugging a task. Prerequisites include familiarity with the MACRO-11 assembly language and the Task Builder. The manual includes explanatory text following actual ODT command sequences.

3.4.4 **RSX-11M/M-PLUS Executive Reference Manual** - This manual describes the RSX-11M/M-PLUS Executive services available for user tasks and the way in which these services are obtained by issuing Executive (or "system") directives. Users of Executive services must be familiar with developing user programs in MACRO-11 or FORTRAN.

3.4.5 **RSX-11M/M-PLUS Task Builder Manual** - This manual describes the concepts and capabilities of the Task Builder (the RSX-11M/M-PLUS linker). It includes both programmer reference and operating information. Subjects covered include Task Builder allocation of virtual address space, Task Builder overlay capability, building shared regions, and building a task on one system to run on another system with different hardware.

3.4.6 **IAS/RSX-11 System Library Routines Reference Manual and Update Notice No. 1** - This manual describes the system library routines available for inclusion in user-written programs in MACRO-11 assembly language. It is intended for use by experienced MACRO-11 assembly-language programmers.

The update corrects errors and describes new features. It has a separate order number.

3.4.7 **RSX-11M Guide to Writing an I/O Driver and Update Notice No. 1** - This guide provides the information needed to write an I/O driver to service a peripheral device for which DIGITAL has not supplied a driver. A user-written driver must adhere to the RSX-11M programming conventions described in this guide. The manual assumes that you understand the device for which you are writing a driver and that you are familiar with the PDP-11 computer, its peripheral devices, and the software supplied with an RSX-11M system. Since the guide is not organized tutorially, the intended audience is assumed to be at a system programmer level of expertise; thus, the manual does not contain definitions of data-processing terms and concepts familiar to senior-level professionals.

The update corrects errors and describes new features. It has a separate order number.

3.5 **Volume 4: Utilities**

The utilities manual describes the utility programs that the RSX-11M/M-PLUS operating systems provide. The utilities allow you to work with different kinds of files and the contents of those files, and with different kinds of media.

3.5.1 **RSX-11 Utilities Manual** - Divided into six parts, this manual details the functions and operations of the following RSX-11M/M-PLUS utility programs:

Editing:
- EDT - DEC Editor
- EDI - Line Text Editor

File Manipulation:
- PIP - Peripheral Interchange Program
- FLX - File Transfer Program

File Spooling:
- PRI and QUE - Print and Queue Utility
- The Queue Manager

Volume Maintenance:
- FMT - Disk Volume Formatter
- BAD - Bad Block Locator Utility
- BRU - Back-Up and Restore Utility
- DSC - Disk Save and Compress Program
- PRESRV - Preservation Utility
- VFY - File Structure Verification Utility

Programming:
- LBR - Librarian Utility Program
- DMP - File Dump Utility

Program Maintenance:
- CMP - File Compare Utility
- SLP - Source Language Input Program
- PAT - Object Module Patch Program
- ZAP - Task/File Patch Program

For each utility, the manual gives information on using the utility, describes command formats and syntax rules, and summarizes the commands and switches.

The manual includes four new utilities (PRI, QUE, FMT, BRU) and three utilities which previously were in separate manuals (EDT, DSC, PRESRV).

3.6 **Volume 5: File Management and I/O**

The file management and I/O volume consists of manuals that describe, respectively, the File Control Services (FCS) and the functions of I/O drivers on the RSX-11M/M-PLUS systems. Also included are manuals

describing how to install and use Record Management Services (RMS-11) on these systems.

3.6.1 **IAS/RSX-11 I/O Operations Reference Manual** - This manual provides reference material on the File Control Services (FCS) of the RSX-11M and RSX-11M-PLUS systems. It explains how to create, use, and delete files with FCS. Users of FCS must be familiar with MACRO-11 or FORTRAN program development procedures.

3.6.2 **RSX-11M/M-PLUS I/O Drivers Reference Manual** - This manual describes the functions of all DIGITAL-supplied I/O drivers. It provides the data needed by experienced programmers who want the time and space advantages of directly interfacing with I/O drivers. The manual is a complete reference for system programmers using MACRO-11 assembly language or FORTRAN.

3.6.3 **RMS-11 User's Guide** - This manual is a reference tool for users of Record Management Services (RMS-11) on different operating systems. It introduces RMS-11 and contains information on RMS-11 utilities. Provided is information on application design and file organization, a glossary of RMS-11 terms, and other reference information.

3.6.4 **RMS-11 Installation Guide** - This manual describes the requirements for installing RMS-11 and RMS-11K software on RSX-11M and other operating systems.

3.6.5 **RMS-11 MACRO-11 Reference Manual** - This manual is written for the advanced MACRO programmer. It includes the reference material needed to understand and use Record Management Services (RMS-11) under different operating systems. The manual explains how to declare RMS-11 facilities, access fields in control blocks, allocate and initialize control blocks, and perform file and record operations. The manual also includes appendixes on status code returns, a description of block I/O, the handling of ANSI-labeled magnetic tapes, formulas for calculating data capacities of RMS-11 files, sample code segments, and procedures for assembling and task-building programs.

3.7 Volume 6: Maintenance

The maintenance volume consists of manuals that tell you how to help your system operate correctly. The manuals describe, respectively, error logging by the system, using diagnostic software, and determining the causes of system crashes.

3.7.1 **RSX-11M/M-PLUS Error Logging Reference Manual** - This manual describes and explains error logging, a subsystem that reports information on hardware reliability in an RSX-11M or RSX-11M-PLUS system. Even if it causes no immediate problem, each error is logged. The state of the system at the time of each error is also logged. At user-determined intervals, error logging generates individual error or summary error reports in readable form.

3.7.2 **RSX-11M/M-PLUS User Mode Diagnostics Reference Manual** - This manual is a guide for using diagnostic software provided with the RSX-11M and RSX-11M-PLUS systems. It describes the initiation procedures for online diagnostic tasks, the reports generated by the tasks, the tests performed by each diagnostic, the error messages associated with the tests, the procedures for intervening in tests, and the options for the tests.

The user mode diagnostics manual is intended for customer personnel responsible for system maintenance and for DIGITAL Field Service representatives responsible for servicing customer installations. The reader should know system concepts and understand peripheral device terminology.

3.7.3 **RSX-11M/M-PLUS Crash Dump Analyzer Reference Manual** - This manual tells the system programmer how to use the Crash Dump Analyzer (CDA) to determine the causes of system crashes. The manual contains operating instructions, summary descriptions of CDA switches and error messages, examples of CDA output listings, and a brief explanation on how to interpret the output listings.

3.8 Volume 7: Languages*

The language manuals describe optional software available with RSX-11M Version 3.2. The languages are BASIC-11, BASIC-PLUS-2, FORTRAN IV, FORTRAN IV-PLUS, and COBOL. You receive the appropriate set of manuals when you purchase the license for the software.

3.8.1 **BASIC-11 Language Reference Manual*** - This manual describes BASIC-11 as implemented in several PDP-11 software systems. It introduces you to programming in BASIC and explains and lists BASIC-11 statements, functions, commands, and error messages. The manual does not teach BASIC. For system-dependent information, consult the BASIC-11 User's Guide.

3.8.2 **IAS/RSX BASIC User's Guide*** - This manual describes the procedures for using BASIC-11 on the RSX-11M operating system. It also describes system-dependent features, utilities, and the use of assembly-language routines with BASIC-11.

3.8.3 **IAS/RSX BASIC Installation Guide and Update Notice No. 1*** - This manual gives instructions for installing BASIC-11 on an RSX-11M system. It includes descriptions of optional features that can be selected during installation.

The update corrects errors and describes new features. It has a separate order number.

3.8.4 **BASIC-PLUS-2 Language Manual*** - This manual describes the BASIC-PLUS-2 programming language, an extension of BASIC-11 with some advanced features. It introduces you to programming in BASIC, and explains and lists BASIC-PLUS-2 statements, functions, commands, and

error messages. The manual is arranged to help the beginner acquire knowledge gradually. For system-dependent information, consult the BASIC-PLUS-2 User's Guide.

3.8.5 **BASIC-PLUS-2 RSX-11M/IAS User's Guide*** - This manual describes the procedures for using BASIC-PLUS-2 on the RSX-11M operating system, including system-dependent features, utilities, and the use of assembly-language routines with BASIC-PLUS-2.

3.8.6 **BASIC-PLUS-2 RSX-11M Installation Guide and Update Notice No. 1*** - This manual gives instructions for installing BASIC-PLUS-2 on an RSX-11M system. It includes descriptions of optional features that can be selected during installation.

The update corrects errors and describes new features. It has a separate order number.

3.8.7 **PDP-11 FORTRAN Language Reference Manual*** - This manual describes aspects of the FORTRAN programming language. Topics included are the elements of the language; the structure of a FORTRAN program; the components; assignment, control, and specification of a FORTRAN statement; user-written subprograms and those provided in the FORTRAN library; formats; and additional I/O capabilities for files on tape and disk. There are also appendixes that provide reference information, including character codes and a language summary.

3.8.8 **IAS/RSX FORTRAN IV User's Guide*** - This manual describes the procedures for compiling, linking, and executing programs in FORTRAN IV on RSX-11M. It also explains the FORTRAN Object Time System, a collection of routines including mathematics, utilities, input/output handlers, and system services.

3.8.9 **IAS/RSX FORTRAN IV Installation Guide*** - This manual gives instructions for installing FORTRAN IV on an RSX-11M system, including choices of optional features that can be made during installation.

3.8.10 **FORTRAN IV-PLUS User's Guide*** - This manual describes FORTRAN IV-PLUS, an extension of FORTRAN IV with some advanced features. It explains how to compile, edit, debug, and link FORTRAN IV-PLUS programs. It also explains the FORTRAN Object Time System, a collection of routines including mathematics, utilities, input/output handlers, and system services.

3.8.11 **FORTRAN IV-PLUS Installation Guide*** - This manual gives instructions for installing FORTRAN IV-PLUS on an RSX-11M system, including choices of optional features that can be made during installation.

3.8.12 **FORTRAN IV-PLUS Object Time System Reference Manual*** - This manual describes the FORTRAN IV-PLUS Object Time System, a collection of routines in object code that you can include in your task.

3.8.13 **PDP-11 COBOL Language Reference Manual*** - This manual is an introduction to COBOL programming and describes and lists COBOL statements, functions, commands, and error messages. System-dependent information is not included but will be found in the PDP-11 COBOL User's Guide.

3.8.14 **PDP-11 COBOL User's Guide*** - This manual describes the procedures for using COBOL on the RSX-11M operating system, including system-dependent features, available utilities, and the use of assembly-language routines in COBOL programs.

3.8.15 **PDP-11 COBOL Pocket Guide*** - This booklet gives COBOL commands and other reference information in a convenient format.

3.8.16 **PDP-11 COBOL Installation Guide*** - This manual gives instructions for installing COBOL on an RSX-11M system, including choices of optional features that can be made during installation.

3.9 Internal Operation and Logic*

3.9.1 **RSX-11M V3.2 System Logic Manual*** - (Post-release.) This 2-volume manual discusses the Executive, with references to the Monitor Console Routine (MCR) and the File Control Processor (F11ACP). It is tutorial in form, although it contains cross-reference information for very experienced programmers who may not need the tutorial information. The user is expected to know about the basics of RSX-11M, MCR, MACRO-11, the Executive, the Task Builder, writing an I/O driver, and system generation.

This manual is not furnished with the documentation set. It can be purchased from:

Accessories and Supplies Group
Product Line 86
Digital Equipment Corporation
Cotton Road
Nashua, New Hampshire 03060

The order number is AA-5579B-TC.

3.10 VAX/VMS Users

Two VAX/VMS manuals describe using RSX-11M with VAX/VMS. The manuals explain, respectively, using RSX-11M components under VAX/VMS and programming on VAX/VMS using RSX-11M task images.

These manuals are not furnished with the documentation set. They can be purchased from:

Software Distribution Center
Digital Equipment Corporation
Maynard, Massachusetts 01754

3.10.1 **VAX-11/RSX-11M User's Guide** - This manual provides the information needed to use the VAX/VMS MCR command language, execute MCR indirect command files, and use RSX-11M components under VAX/VMS.

3.10.2 **VAX-11/RSX-11M Programmer's Reference Manual** - This manual describes VAX/VMS support of RSX-11M Executive directives. It contains information needed by an RSX-11M programmer responsible for making RSX-11M task images run under VAX/VMS in compatibility mode.

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