RSX–11M/RSX–11S
Information Directory and Master Index

Order No. AA–2593H–TC

digital software

RSX-11M/RSX-11S
Information Directory and Master Index

Order No. AA-2593H-TC

RSX-11M Version 4.2

RSX-11S Version 4.2

digital equipment corporation · maynard, massachusetts

First Printing, December 1979
Revised, March 1982
Revised, April 1983
Revised, July 1985

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Preface

Manual Objectives

The *RSX-11M/RSX-11S Information Directory and Master Index* introduces the RSX-11M and RSX-11S documentation sets. It includes an overview of all the RSX-11M and RSX-11S manuals and a Master Index that will be useful for referring to topics throughout the documentation. The descriptions of the manuals are intentionally brief; refer to the prefaces of the individual manuals for additional information. Read the Information Directory before you read other manuals in either documentation set or use the operating systems.

Intended Audience

The *RSX-11M/RSX-11S Information Directory and Master Index* is intended for all users of the RSX-11M and RSX-11S operating systems. No previous knowledge of these operating systems is required.

Structure of This Manual

The first chapter of this manual briefly describes the manuals in each documentation set. It identifies the kinds of users that are likely to be interested in particular manuals, and suggests a sequence for reading them. The second chapter of this manual is a Master Index which includes index entries for all the manuals in the documentation set.

Associated Manuals

The next manual you should read in this documentation set is the *RSX-11M/RSX-11S Release Notes*, which will give you important information on the RSX-11M/RSX-11S software and documentation.

Chapter 1

Overview of the RSX–11M and RSX–11S Documentation Sets

1.1 Getting Started

Your kit contains an RSX–11M/RSX–11S baseline system that is ready to run on your PDP–11 processor. You will use this baseline system to generate an RSX–11M or RSX–11S operating system, tailored to your own particular hardware and software requirements.

Before beginning system generation, you should become familiar with your hardware configuration and with this documentation set. You should also read the *RSX–11M/RSX–11S Release Notes* and either the *RSX–11M System Generation and Installation Guide* or the *RSX–11S System Generation and Installation Guide*, as appropriate. You will then be prepared to choose among the options offered during system generation.

Figure 1–1 outlines a suggested sequence for reading the manuals in your documentation set. The sequence begins with introductory and more general manuals and then proceeds to advanced manuals that assume a greater understanding of the system.

1.2 How the RSX–11M Manuals Are Organized

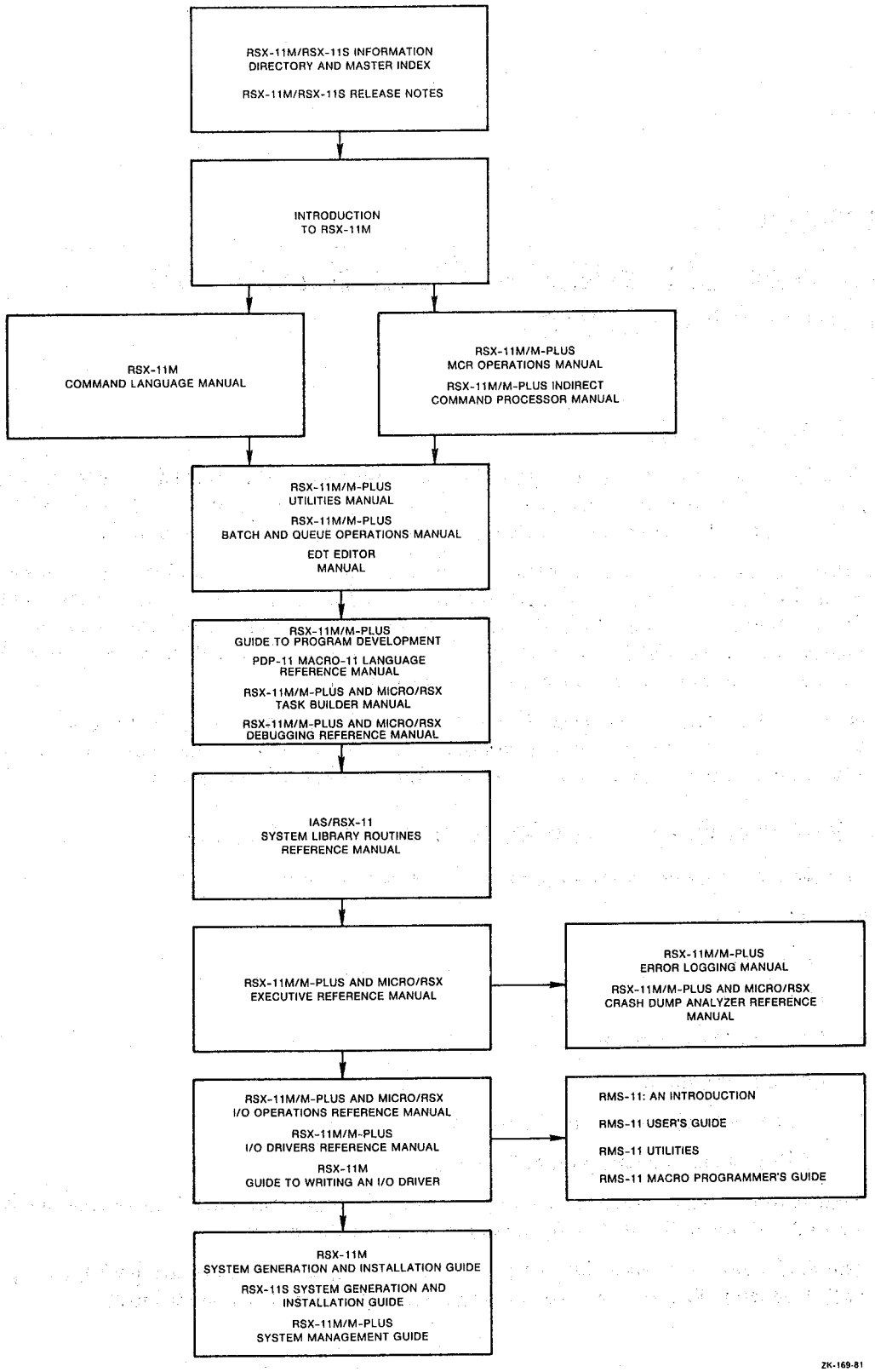
The RSX–11M manuals are organized into seven volumes:

- Introduction
- Operation
- Utilities
- Program Development
- I/O Development
- System Management and Maintenance
- PDP–11 Record Management Services

Each volume consists of one or more three-ring binders, and each binder contains one or more manuals. Refer to Table 1–1 for a complete list of the manuals.

The *EDT Editor Reference Card* and the *PDP–11 Programming Card* are packaged separately; the *RSX–11M Mini-Reference* is also separate, packaged in its own small binder.

Figure 1–1: Suggested Reading Sequence for RSX–11M Manuals



1.3 Intended Reading Audiences for RSX–11M Manuals

Table 1–1 lists the intended reading audience for each document in your set. The audience is divided into the loosely defined groups listed as follows (and indicated in Table 1–1 by an X in one or more of the columns):

US The user: anyone who types at a terminal on an RSX–11M or RSX–11S operating system

AP The applications programmer: anyone who uses the PDP–11 MACRO–11 assembly language or a high-level language to develop programs for user applications

SP The system programmer: anyone who uses PDP–11 MACRO–11 to maintain, modify, and develop software used by the applications programmer or the user

SM The system manager: the person familiar with and responsible for overall operation of an RSX–11M or RSX–11S system and its associated hardware

Table 1–1: RSX–11M Documentation Set Kit Number QJ628-GZ

Title and Order Number	US	AP	SP	SM
Handy Reference Materials				
RSX–11M Mini-Reference AV-5570F-TC	X	X	X	X
EDT Editor Reference Card AV-J756A-TC	X	X	X	X
PDP–11 Programming Card EH-S1046-78	X	X	X	
Volume 1: Introduction				
RSX–11M Software Product Description AE-3407Y-TC	X	X	X	X
RSX–11M/RSX–11S Information Directory and Master Index AA-2593H-TC	X	X	X	X
RSX–11M/RSX–11S Release Notes AA-2573I-TC	X	X	X	X
Introduction to RSX–11M AA-L763B-TC	X	X	X	X
Volume 2: Operation				
RSX–11M System Generation and Installation Guide AA-H625D-TC			X	X
RSX–11M/M–PLUS MCR Operations Manual AA-FD10A-TC	X	X	X	X
RSX–11M Command Language Manual AA-L672C-TC	X	X	X	X
RSX–11M/M–PLUS Batch and Queue Operations Manual AA-L671A-TC	X	X	X	X
RSX–11M/M–PLUS Indirect Command Processor Manual AA-FD05A-TC	X	X	X	X

Table 1–1 (Cont.): RSX–11M Documentation Set Kit Number QJ628-GZ

Title and Order Number	US	AP	SP	SM
Volume 3: Utilities				
RSX–11M/M–PLUS Utilities Manual AA-FD13A-TC	X	X	X	X
EDT Editor Manual AA-M476A-TK	X	X	X	X
Volume 4: Program Development				
RSX–11M/M–PLUS Guide to Program Development AA-L676A-TC		X	X	X
PDP–11 MACRO–11 Language Reference Manual AA-V027A-TC		X	X	X
IAS/RSX–11 System Library Routines Reference Manual AA-5580B-TC		X	X	
RSX–11M/M–PLUS and Micro/RSX Debugging Reference Manual AA-EZ50A-TC		X	X	X
RSX–11M/M–PLUS and Micro/RSX Task Builder Manual AA-AB46A-TC	X	X	X	
RSX–11M/M–PLUS and Micro/RSX Executive Reference Manual AA-FR95A-TC	X	X	X	
Volume 5: I/O Development				
RSX–11M/M–PLUS and Micro/RSX I/O Operations Reference Manual AA-FD14A-TC		X	X	
RSX–11M Guide to Writing an I/O Driver AA-2600E-TC			X	
RSX–11M/M–PLUS I/O Drivers Reference Manual AA-FD09A-TC			X	
Volume 6: System Management and Maintenance				
RSX–11M/M–PLUS System Management Guide AA-FD12A-TC			X	X
RSX–11M/M–PLUS Error Logging Manual AA-L674B-TC			X	X
RSX–11M/M–PLUS and Micro/RSX Crash Dump Analyzer Reference Manual AA-FD11A-TC			X	X
Volume 7: PDP–11 Record Management Services				
RSX–11M/M–PLUS RMS–11: An Introduction AA-L682A-TC	X	X	X	X
RSX–11M/M–PLUS RMS–11 User's Guide AA-L669A-TC		X		X

Table 1–1 (Cont.): RSX–11M Documentation Set Kit Number QJ628-GZ

Title and Order Number	US	AP	SP	SM
RSX–11M/M–PLUS RMS–11 Utilities AA-L670A-TC	X	X	X	X
RSX–11M/M–PLUS RMS–11 Macro Programmer's Guide AA-L668A-TC		X	X	

1.4 RSX–11M Documentation Descriptions

The following sections provide brief descriptions of the volumes and the individual manuals in the RSX–11M documentation set. For a complete description of any manual, read its preface.

1.4.1 Volume 1: Introduction

This volume includes manuals that introduce the RSX–11M documentation set and operating system.

1.4.1.1 RSX–11M Software Product Description

The Software Product Description (SPD) concisely describes the software features and system environment of RSX–11M. It identifies the required and optional hardware and software, and the available training credits and additional services. The SPD includes information on installation requirements and software product support, and gives ordering information.

1.4.1.2 RSX–11M/RSX–11S Information Directory and Master Index

This manual orients the reader to the RSX–11M documentation set. It includes descriptions of the manuals, a suggested sequence for reading the manuals, the intended reading audience for each, and a Master Index to the documentation set. The Master Index is composed of all the topics in the indexes for the individual manuals, without abridgement, and identifies the manual(s) and page number(s) you need for information on a particular topic.

1.4.1.3 RSX–11M/RSX–11S Release Notes

This manual is crucial, as it summarizes the new software features for RSX–11M Version 4.2; RSX–11S Version 4.2; and RMS–11 Version 2.0; and contains an overview of new device support. The *RSX–11M/RSX–11S Release Notes* provides information about the operating system that is not documented in other manuals in the documentation set. Be sure to read the *RSX–11M /RSX–11S Release Notes* before generating and using your system.

1.4.1.4 Introduction to RSX–11M

This tutorial manual is a simple, step-by-step introduction to the RSX–11M operating system for new users. In an interactive terminal session, new users can log in and practice using the DIGITAL Command Language (DCL), the interactive text editor (EDT), and the program development facilities on prepared demonstration files. After guiding the user through the practice session, the manual discusses some general system concepts and features. It has a glossary that defines system terms in some detail.

1.4.2 Volume 2: Operation

The operation volume contains manuals that explain how to generate and install your RSX–11M Version 4.2 system. These manuals also describe the Monitor Console Routine (MCR), the DIGITAL Command Language (DCL), the Indirect Command Processor, and batch and queue operations.

1.4.2.1 RSX–11M System Generation and Installation Guide

This manual is a step-by-step guide to the system generation (SYSGEN) procedure. It includes instructions for copying the distribution kit onto the system disk and generating an RSX–11M system tailored to your needs. Annotated examples of system generations are given.

1.4.2.2 RSX–11M/M–PLUS MCR Operations Manual

MCR is a command line interpreter, an interface for communication between you and the RSX–11M operating system. This manual describes MCR commands and their formats and tells you how to use MCR. File ownership and file protection are explained. An alphabetical list of MCR and Task Termination Notification program (TKTN) messages is given in an appendix.

1.4.2.3 RSX–11M Command Language Manual

The DIGITAL Command Language (DCL) is a command line interpreter that provides direct, transparent access to most common MCR and utility functions. This manual is organized by system functions; it gives full descriptions of all DCL commands, with examples and notes on their usage.

1.4.2.4 RSX–11M/M–PLUS Batch and Queue Operations Manual

This manual explains the use of the Queue Manager (QMG) to control print and batch queue functions, and describes in detail the QMG commands that control these functions. The manual also explains the Batch Processor and describes batch commands and syntax. Error messages are explained in the appendix; a glossary of terms is also included.

1.4.2.5 RSX–11M/M–PLUS Indirect Command Processor Manual

The Indirect Command Processor (Indirect) allows you to process files that contain Indirect, MCR, DCL, or utility commands. These commands are executed as though they had been entered from a terminal. This manual describes the Indirect commands, symbols, and functions, and presents actual examples.

1.4.3 Volume 3: Utilities

This volume contains two manuals, the *RSX–11M/M–PLUS Utilities Manual* and the *EDT Editor Manual*. The *RSX–11M/M–PLUS Utilities Manual* describes utilities that allow you to manipulate different kinds of files and their contents and to perform operations on supported media. The *EDT Editor Manual* describes the function and operation of the interactive text editor EDT.

1.4.3.1 RSX-11M/M-PLUS Utilities Manual

This manual explains each utility's use, describes its commands and switches, and gives detailed command formats and syntax rules. It describes the functions and operations of the following RSX-11M utility programs:

- Line Text Editor (EDI)—A line-oriented, interactive editor used to create and maintain text and source files.
- Peripheral Interchange Program (PIP)—Copies files and performs file control functions.
- File Transfer Utility Program (FLX)—File transfer and format conversion program that transfers files among DOS-11, RT-11, and Files-11 volumes.
- Disk Volume Formatter Utility (FMT)—Formats and verifies several types of Files-11 disks.
- Bad Block Locator Utility (BAD)—Determines the number and location of bad blocks on a volume.
- Backup and Restore Utility (BRU)—Backs up files from a Files-11 volume to one or more backup volumes, and retrieves them as needed.
- Disk Save and Compress Utility Program (DSC)—Copies Files-11 disk files to tape or disk, and from DSC-created tape back to disk. (The DSC Utility functions in much the same way as the BRU utility.)
- File Structure Verification Utility (VFY)—Verifies the consistency and validity of the file structure on a Files-11 volume.
- Librarian Utility Program (LBR)—A library maintenance program that creates and modifies library files.
- File Dump Utility Program (DMP)—A file listing program that allows you to examine the contents of a single file or a volume of files.
- File Compare Utility (CMP)—Compares two text files, record by record, and lists the differences between them.
- Source Language Input Program (SLP)—A noninteractive editing program that is used to maintain and edit source files.
- Object Module Patch Utility (PAT)—Updates, or patches, relocatable binary object modules.
- Task/File Patch Program (ZAP)—A patch utility that examines and directly modifies locations in a task image file or data file.

1.4.3.2 EDT Editor Manual

This manual explains how to use the interactive text editor (EDT) to create and edit ASCII text files. It explains the command line, keypad editing, line editing, nokeypad editing, and the redefining of keys. It also includes sample editing sessions.

1.4.4 Volume 4: Program Development

The first manual in this volume gives an overview of the program development process. The remaining manuals further explain the process by describing the MACRO-11 assembly language, I/O operations, system library routines, the On-Line Debugging Tool, the Task Builder, and the Executive.

1.4.4.1 RSX-11M/M-PLUS Guide to Program Development

This manual is a step-by-step guide to program development for the beginning MACRO-11 programmer. The manual describes the hardware and software necessary for program development and explains how to create, assemble, task build, debug, and maintain MACRO-11 programs. It also introduces the use of the Librarian Utility Program (LBR) for creating and maintaining user, macro, and object libraries. A brief description of FORTRAN program development is included to help orient the FORTRAN programmer. Examples are given for all steps in the program development process.

This guide is intended to be used together with other, more advanced manuals until you become familiar with the program development process; then it can serve as a refresher.

1.4.4.2 PDP-11 MACRO-11 Language Reference Manual

This manual describes how to use the MACRO-11 Assembler to code MACRO-11 programs. It includes descriptions of MACRO-11 features, directives for conditional assembly and program sectioning, and user-defined and system macro libraries. It also documents RSX-11M operating procedures and error messages. Before reading the *MACRO-11 Language Reference Manual*, you should be familiar with your PDP-11 processor and the related terminology, as presented in the *PDP-11 Processor Handbook*.

1.4.4.3 IAS/RSX-11 System Library Routines Reference Manual

This manual describes register handling and arithmetic routines, input and output data conversion routines, output formatting routines, and dynamic memory management and virtual memory management routines. For the more experienced programmer, a list of summary procedures is included.

1.4.4.4 RSX-11M/M-PLUS and Micro/RSX Debugging Reference Manual

This manual describes the use of the On-Line Debugging Tool (ODT) for debugging user tasks, and the Executive Debugging Tool (XDT) for debugging privileged tasks. Actual ODT command sequences are given, followed by explanatory text. The manual also describes procedures for debugging supervisor-mode libraries.

Before reading this manual, you should be familiar with the MACRO-11 assembly language and the Task Builder.

1.4.4.5 RSX-11M/M-PLUS and Micro/RSX Task Builder Manual

This manual describes the concepts and capabilities of the RSX-11M/M-PLUS and Micro/RSX Task Builder (TKB), the linker that produces executable task images (programs that are ready to be installed and run). It contains both programmer reference and operating information, including Task Builder allocation of virtual address space, resolution of global symbols, overlaying capability, the building of shared regions, instruction- and data-space tasks, supervisor-mode libraries, multiuser tasks, and cluster libraries.

Before reading this manual, you should be familiar with the procedures described in the *RSX-11M/M-PLUS MCR Operations Manual* and the *RSX-11M Command Language Manual*, and the programming concepts discussed in the *RSX-11M/M-PLUS Guide to Program Development*.

1.4.4.6 RSX-11M/M-PLUS and Micro/RSX Executive Reference Manual

This manual describes the Executive services available for user tasks and the Executive (system) directives you need to obtain them. You must know how to develop user programs in MACRO-11 or in a high-level language such as FORTRAN to be able to use the Executive services.

1.4.5 Volume 5: I/O Development

This volume consists of manuals that describe the writing and function of I/O drivers on an RSX-11M system.

1.4.5.1 RSX-11M/M-PLUS and Micro/RSX I/O Operations Reference Manual

This manual provides reference material on RSX-11M File Control Services (FCS). It explains how to use FCS to create, use, and delete files under program control. You should be familiar with MACRO-11 or FORTRAN program development procedures before using FCS.

The manual also describes the following:

- The Get Command Line subroutine (GCML)—Provides a device-independent interface for user programs retrieving command lines from either a terminal or a disk file.
- The Command String Interpreter (CSI)—Parses command lines containing file specifications and switches.
- The Table-Driven Parser (TPARS)—Parses command lines at two levels: a syntactical level and a semantic level. It is generated by parse tables created by the user.

Descriptions of ANSI magnetic tape support, unlabeled tape support, and the MAG SET command are included.

1.4.5.2 RSX-11M Guide to Writing an I/O Driver

This guide is an aid in writing an I/O driver to service a peripheral device for which DIGITAL does not supply a driver. It includes information on incorporating a user-written driver in a system, and on debugging a driver with the Executive Debugging Tool (XDT). A summary of Executive routines that a driver can call is provided.

Before you read this manual, you should fully understand the operation of the device for which you require a driver. You must also be familiar with your PDP-11 processor, its peripheral devices, and the software supplied with the RSX-11M system.

1.4.5.3 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 the experienced programmer who wants the advantages in space and time of interfacing with I/O drivers directly.

This manual describes the Files-11 Ancillary Control Processor (F11ACP) and the Magnetic Tape Ancillary Control Processor (MTAACP) and documents the queue I/O requests performed by these processors.

1.4.6 Volume 6: System Management and Maintenance

This volume consists of three manuals that describe how to operate your system correctly and effectively. The manuals describe system management programs and RSX-11M/M-PLUS Error Logging system. They also explain how to use diagnostic software and how to retrieve information to determine the causes of system crashes.

1.4.6.1 RSX-11M/M-PLUS System Management Guide

This manual documents the following programs that the system manager can use to test, monitor, maintain, and customize an RSX-11M/M-PLUS operating system:

- The Account File Maintenance Program (ACNT)—Creates and maintain accounts on multiuser protection systems.
- The Console Logger (CODRV and COT)—Handles I/O to the console output device and records system messages at a terminal and/or in a log file.
- The I/O Exerciser (IOX)—Detects and diagnoses I/O problems on tape and disk units.
- The Bad Block Replacement Control Task (RCT)—Performs bad block handling and recovery on Mass Storage Control Protocol (MSCP) devices.
- The Resource Monitoring Display (RMD)—Displays information about the tasks currently active on the system and the system's available resources.
- The system shutdown task (SHUTUP)—Shuts down the system in an orderly fashion.
- The Virtual Monitor Console Routine (VMR)—A subset of MCR commands that you can use to alter a system image file.
- The Shuffler (SHF)—Compresses space in system-controlled partitions when a memory allocation failure occurs.

The manual includes information on pool monitoring support and the PMT program; how to set up and run the Queue Manager; how to extend and alter DCL; and how to write command line interpreters (CLIs). The Serial Despooler is described in an appendix.

1.4.6.2 RSX-11M/M-PLUS Error Logging Manual

This manual explains the RSX-11M/M-PLUS Error Logging system, a combination of tasks that collect and report information about hardware-related events on an RSX-11M system. The Error Logging system allows you to generate event reports in brief or full format, including information on the state of the system or hardware when the event occurred.

The manual includes chapters on the following:

- The Error Log Task (ERRLOG) and the Error Log Interface (ELI)—ERRLOG gets error information from the Executive and drivers and writes the information into the Error Log File, and ELI sends user commands to ERRLOG.
- The Report Generator (RPT)—Generates Error Log Reports from the Error Log File.
- The Control File Language compiler (CFL)—Updates and modifies DIGITAL-supplied control file modules, or adds error-logging support for non-DIGITAL devices.

1.4.6.3 RSX-11M/M-PLUS and Micro/RSX Crash Dump Analyzer Reference Manual

This manual explains how to use the Crash Dump Analyzer (CDA) to determine the causes of system crashes. It contains operating instructions, descriptions of CDA switches and error messages, examples of CDA output listings, and an explanation of how to interpret the output listings. The manual also includes system symbolic and data structure macro definitions.

1.4.7 Volume 7: PDP–11 Record Management Services

This volume is composed of a set of manuals that describe the PDP–11 Record Management Services (RMS–11). For information on where the RMS–11 files and utilities can be found on the RSX–11M distribution kit, see the *RSX–11M System Generation and Installation Guide.*

1.4.7.1 RSX–11M/M–PLUS RMS–11: An Introduction

This manual introduces the major concepts of RMS–11: record formats, file organizations, and record access modes. It introduces the RMS–11 operations and utility programs, and defines the key terms necessary to understand RMS–11 capabilities and functions.

The manual is intended for all users of RMS–11, including both MACRO–11 and high-level language programmers. Nonprogramming users, programming users who are new to RSX–11M /M–PLUS, and RSX–11M/M–PLUS programmers who are new to RMS–11 should find this document especially useful.

The manual does not provide reference or usage information. You should read this manual before reading the other RMS–11 documents.

1.4.7.2 RSX–11M/M–PLUS RMS–11 User's Guide

This manual is a guide to using RMS–11 in file and task design for application programs written in either MACRO–11 or high-level languages. It is intended for application programmers who want to achieve optimal performance either with a newly written application or with an existing application that no longer performs satisfactorily.

The manual first presents general design considerations to help users select the appropriate file organization for their applications. Then the details of file structure, design, and processing are discussed for each of the three RMS–11 file organizations: sequential, relative, and indexed. Finally, the manual describes techniques that can be used to optimize application program performance, regardless of file organization.

Note that only MACRO–11 programmers can use the full set of RMS–11 capabilities. Subsets of those capabilities are, however, available to high-level language programmers. Programmers who are writing applications in high-level languages should consult their language documentation for details on RMS–11 support.

1.4.7.3 RSX–11M/M–PLUS RMS–11 Utilities

This reference manual describes the utility programs supported by RMS–11. It is intended for users such as high-level language programmers and nonprogramming users (system managers and operators, for example), who either do not require or do not have access to the full set of RMS–11 capabilities.

The RMS–11 utility programs are as follows:

- RMS–11 File Design Utility (RMSDES)—An interactive utility for designing and creating sequential, relative, and indexed files.
- RMS–11 Indexed File Load Utility (RMSIFL)—Reads records from an RMS–11 file of any kind of organization and loads them into an indexed file, optimizing all indexes, both primary and alternates (if any).
- RMS–11 File Conversion Utility (RMSCNV)—Reads records from an RMS–11 file of any organization and loads them into another RMS–11 file of any organization. Note that RMSCNV, unlike RMSIFL, optimizes only the primary index when it loads an indexed file.

- RMS–11 File Display Utility (RMSDSP)—Produces a concise description of any RMS–11 file, including backup files.
- RMS–11 File Back-Up Utility (RMSBCK)—Transfers the contents of an RMS–11 file to another file, on another device, to preserve it in case the original file is lost or damaged.
- RMS–11 File Restoration Utility (RMSRST)—Restores files that were backed up by RMSBCK so that they can be accessed by user programs.

The manual also documents RMSDEF, which has been superseded by RMSDES.

1.4.7.4 RSX–11M/M–PLUS RMS–11 Macro Programmer's Guide

This document is a reference manual describing the macros and symbols that make up the interface between a MACRO–11 program and the RMS–11 operation routines. It is intended for both MACRO–11 programmers and for high-level language programmers who want to use the full set of RMS–11 capabilities in a MACRO–11 subprogram.

The manual presents such programming considerations as how to use RMS–11 macros and symbols in a MACRO–11 program, how to use the directory and file operations to process directories and files, and how to use the stream operations and record or block operations to process records or blocks. Detailed reference information is provided on each RMS–11 operation macro, including the control blocks it uses, the options that can be specified in each control block field, and the values returned in control block fields. A summary of each control block, field, value, and mask is also provided.

In addition, the manual describes the RMS–11 completion codes, fatal error codes, and assembly-time messages.

1.4.8 RSX–11M Mini-Reference

This small manual is a convenient reference for all system users. It includes sections on the Monitor Console Routine (MCR), the DIGITAL Command Language (DCL), the Task Builder (TKB), the RSX–11M utilities, the On-Line Debugging Tool (ODT), the Error Logging System, the Batch Processor, the Queue Manager (QMG), the I/O error codes, the directive error codes, the Executive directive summary, the RMS–11 utilities, and the RMS–11 error codes. The manual also includes Radix–50 conversion tables and the ASCII character set.

1.4.9 EDT Editor Reference Card

This reference card describes keypad editing for the DIGITAL VT52 and VT100 video terminals. It presents common keyboard functions and gives instructions for beginning and ending an editing session. Keypad diagrams for the VT52 and VT100 terminals are included.

1.4.10 PDP–11 Programming Card

This card includes programming information on the following topics:

- PDP–11 addressing modes
- Single-operand instructions
- Double-operand instructions
- Processor register addresses

- Device register addresses
- 7-bit ASCII code
- Bootstrap loader starting addresses and device vectors

1.5 The RSX–11S Documentation Set

Included with the RSX–11S software is the RSX–11S documentation set. This set of manuals describes the host operating system as well as the RSX–11S operating system. It is important that you thoroughly read the *RSX–11M/RSX–11S Release Notes* before reading other manuals in the documentation set and before generating your system.

This section briefly describes the RSX–11S manuals. See Table 1–2 for the manuals' order numbers and intended audiences, and the section following for descriptions of their contents.

1.6 How the RSX–11S Manuals Are Organized

The RSX–11S manuals are organized into five volumes:

- Introduction
- Operation
- Program Development
- I/O Development
- System Management and Maintenance

1.7 Intended Reading Audiences for RSX–11S Manuals

Table 1–2 lists the intended reading audience for each document in your set. The audience is divided into the loosely defined groups listed as follows (and indicated in Table 1–2 by an X in one or more of the columns):

US The user: anyone who types at a terminal on an RSX–11M or RSX–11S operating system.

AP The applications programmer: anyone who uses the MACRO–11 assembly language or a high-level language to develop programs for user applications.

SP The system programmer: anyone who uses MACRO–11 to maintain, modify, and develop software used by the applications programmer or the user.

SM The system manager: the person familiar with and responsible for overall operation of an RSX–11M or RSX–11S system and its associated hardware.

Table 1–2: RSX–11S Documentation Set Kit Number QJ642-GZ

Title and Order Number	US	AP	SP	SM
Handy Reference Materials				
RSX–11M Mini-Reference AV-5570F-TC	X	X	X	X
PDP–11 Programming Card EH-S1046-78	X	X	X	
Volume 1: Introduction				
RSX–11S Software Product Description AE-3427P-TC	X	X	X	X
RSX–11M/RSX–11S Information Directory and Master Index AA-2593H-TC	X	X	X	X
RSX–11M/RSX–11S Release Notes AA-2573I-TC	X	X	X	X
Introduction to RSX–11M AA-L763B-TC	X	X	X	X
Volume 2: Operation				
RSX–11M System Generation and Installation Guide AA-H625D-TC			X	X
RSX–11S System Generation and Installation Guide AA-2874F-TC			X	X
RSX–11M/M–PLUS MCR Operations Manual AA-FD10A-TC	X	X	X	X
RSX–11M/M–PLUS Indirect Command Processor Manual AA-FD05A-TC	X	X	X	X
Volume 3: Program Development				
RSX–11M/M–PLUS Guide to Program Development AA-L676A-TC		X	X	X
PDP–11 MACRO–11 Language Reference Manual AA-V027A-TC		X	X	X
IAS/RSX–11 System Library Routines Reference Manual AA-5580B-TC		X	X	
RSX–11M/M–PLUS and Micro/RSX Debugging Reference Manual AA-EZ50A-TC		X	X	X
RSX–11M/M–PLUS and Micro/RSX Task Builder Manual AA-AB46A-TC	X	X	X	
RSX–11M/M–PLUS and Micro/RSX Executive Reference Manual AA-FR95A-TC		X	X	
Volume 4: I/O Development				
RSX–11M Guide to Writing an I/O Driver AA-2600E-TC			X	

Table 1–2 (Cont.): RSX–11S Documentation Set Kit Number QJ642-GZ

Title and Order Number	US	AP	SP	SM
RSX–11M/M–PLUS and Micro/RSX I/O Operations Reference Manual AA-FD14A-TC		X	X	
RSX–11M/M–PLUS I/O Drivers Reference Manual AA-FD09A-TC			X	
Volume 5: System Management and Maintenance				
RSX–11M/M–PLUS System Management Guide AA-FD12A-TC			X	X
RSX–11M/M–PLUS and Micro/RSX Crash Dump Analyzer Reference Manual AA-FD11A-TC		X	X	

1.8 RSX–11S Documentation Descriptions

The following are brief descriptions of the volumes and the individual manuals in the RSX–11S documentation set. For a complete description of any manual, read its preface.

The *RSX–11S Software Product Description* and the *RSX–11S System Generation and Installation Guide* are found only in the RSX–11S documentation set and therefore have not been previously described in this manual.

1.8.1 Volume 1: Introduction

This volume includes manuals that introduce the RSX–11S documentation set and operating system, as well as information about the host operating system.

1.8.1.1 RSX–11S Software Product Description

The Software Product Description (SPD) concisely describes the functional characteristics and system environment of RSX–11S. It identifies the required and optional hardware and software, and identifies the available training credits and additional services. The SPD includes information on installation requirements and software product support, and gives ordering information.

This document is intended for all RSX–11S users.

1.8.1.2 RSX–11M/RSX–11S Information Directory and Master Index

This manual orients the reader to the RSX–11S and RSX–11M documentation sets. It includes descriptions of the manuals, a suggested sequence for reading the manuals, the intended reading audience for each, and a Master Index to the documentation set. The Master Index is composed of all the topics in the indexes for the individual manuals, without abridgement, and tells you which manuals and page numbers have the information you need on a particular topic.

1.8.1.3 RSX–11M/RSX–11S Release Notes

This manual is crucial, as it summarizes the new software features for RSX–11M Version 4.2 and RSX–11S Version 4.2, as well as RMS–11 Version 2.0. The *Release Notes* tell you which manuals to refer to for complete information on these new features. Incompatibilities between the current and previous versions of RSX–11M and RSX–11S are discussed; and procedures are described for applying corrections to files on the source disk for reporting any problems with the new software. Be sure to read the *Release Notes* before generating and using your system.

1.8.2 Volume 2: Operation

The operation volume explains how to generate and install your RSX–11S Version 4.2 system. It also documents the Monitor Console Routine (MCR).

1.8.2.1 RSX–11M System Generation and Installation Guide

This manual is a step-by-step guide to the system generation procedure. It outlines procedures for bootstrap-loading a baseline system, and explains the SYSGEN questions and the results that occur from your responses. Annotated examples of system generations are given.

RSX–11S SYSGEN Phase I is a subset of RSX–11M SYSGEN Phase I. This manual includes a description of the Phase I questions.

1.8.2.2 RSX–11S System Generation and Installation Guide

This manual describes the RSX–11S operating system and explains how to use a host system for generating an RSX–11S operating system. It also describes RSX–11S supplied software and the distribution kit. Error messages are included in an appendix. Before reading this manual, you should be familiar with the introductory manuals in the documentation set and, in particular, with the system generation procedures for the host system.

This manual is intended for use by system programmers and system managers.

1.8.2.3 RSX–11M/M–PLUS MCR Operations Manual

This manual describes the Monitor Console Routine (MCR). MCR is a command line interpreter, an interface for communication between you and the RSX–11M system. This manual describes MCR commands and their formats and tells you how to use MCR. File ownership and file protection are explained. An alphabetical list of MCR and TKTN (Task Termination Notification program) messages is given in an appendix.

RSX–11S uses a subset of MCR called Basic MCR. This manual gives descriptions of the MCR commands; the *RSX–11S System Generation and Installation Guide* includes summary descriptions.

1.8.2.4 RSX–11M/M–PLUS Indirect Command Processor Manual

The Indirect Command Processor (Indirect) allows you to process files that contain Indirect, MCR, DCL, or utility commands. These commands are executed as though they had been entered from a terminal. The Indirect chapter describes the Indirect commands, symbols, and functions, and presents actual examples.

1.8.3 Volume 3: Program Development

The first manual in this volume gives an overview of the program development process. The remaining manuals further explain the process by describing the MACRO–11 assembly language, I/O operations, system library routines, the On-Line Debugging Tool, the Task Builder, and the Executive.

1.8.3.1 RSX-11M/M-PLUS Guide to Program Development

This manual is a step-by-step guide to program development for the beginning MACRO-11 programmer. The manual describes the hardware and software necessary for program development and explains how to create, assemble, task build, debug, and maintain MACRO-11 programs. It also introduces the use of the Librarian Utility Program (LBR) for creating and maintaining user, macro, and object libraries. A brief description of FORTRAN program development is included to help orient the FORTRAN programmer. Examples are given for all steps in the program development process.

This guide is intended to be used together with other, more advanced manuals until you become familiar with the program development process. At this point, the manual can serve as a refresher.

1.8.3.2 PDP-11 MACRO-11 Language Reference Manual

This manual describes how to use the MACRO-11 Assembler to code MACRO-11 programs. It includes descriptions of MACRO-11 features, directives for conditional assembly and program sectioning, and user-defined and system macro libraries. It also documents RSX-11M operating procedures and error messages. Before reading the *MACRO-11 Language Reference Manual*, you should be familiar with your PDP-11 processor and the related terminology, as presented in the *PDP-11 Processor Handbook*.

1.8.3.3 IAS/RSX-11 System Library Routines Reference Manual

This manual describes register handling and arithmetic routines, input and output data conversion routines, output formatting routines, and dynamic memory management and virtual memory management routines. For the more experienced programmer, a list of summary procedures is included.

1.8.3.4 RSX-11M/M-PLUS and Micro/RSX Debugging Reference Manual

This manual describes the use of the On-Line Debugging Tool (ODT) for debugging user tasks, and the Executive Debugging Tool (XDT) for debugging privileged tasks. Actual ODT command sequences are given, followed by explanatory text. The manual also describes procedures for debugging supervisor-mode libraries.

Before reading this manual, you should be familiar with the MACRO-11 assembly language and the Task Builder.

1.8.3.5 RSX-11M/M-PLUS and Micro/RSX Task Builder Manual

This manual describes the concepts and capabilities of the RSX-11M/M-PLUS Task Builder (TKB), the linker that produces executable task images (programs that are ready to be installed and run). It contains both programmer reference and operating information, including Task Builder allocation of virtual address space, resolution of global symbols, overlaying capability, the building of shared regions, instruction- and data-space tasks, supervisor-mode libraries, multiuser tasks, and cluster libraries.

Before reading this manual, you should be familiar with the procedures described in the *RSX-11M/M-PLUS MCR Operations Manual* and the *RSX-11M Command Language Manual*, and the programming concepts discussed in the *RSX-11M/M-PLUS Guide to Program Development*.

1.8.3.6 RSX-11M/M-PLUS and Micro/RSX Executive Reference Manual

This manual describes the Executive services available for user tasks and the Executive (system) directives you need to obtain them. You must know how to develop user programs in MACRO-11 or in another high-level language such as FORTRAN to be able to use the Executive services.

1.8.4 Volume 4: I/O Development

This volume consists of manuals that describe the writing and function of I/O drivers on an RSX-11M system.

1.8.4.1 RSX-11M Guide to Writing an I/O Driver

This guide is an aid in writing an I/O driver to service a peripheral device for which DIGITAL does not supply a driver. It includes information on incorporating a user-written driver in a system, and on debugging a driver with the Executive Debugging Tool (XDT). A summary of Executive routines that a driver can call is provided.

Before you read this manual, you should fully understand the operation of the device for which you require a driver. You must also be familiar with your PDP-11 processor, its peripheral devices, and the software supplied with the RSX-11M system.

1.8.4.2 RSX-11M/M-PLUS and Micro/RSX I/O Operations Reference Manual

This manual provides reference material on RSX-11M File Control Services (FCS). RSX-11S uses a subset of FCS and its macro calls. It explains how to use FCS to create, use, and delete files under program control. You should be familiar with MACRO-11 or FORTRAN program development procedures before using FCS.

The manual also describes the following:

- The Get Command Line subroutine (GCML)—Provides a device-independent interface for user programs retrieving command lines from either a terminal or a disk file.
- The Command String Interpreter (CSI)—Parses command lines containing file specifications and switches.
- The Table-Driven Parser (TPARS)—Parses command lines at two levels: a syntactical level and a semantic level. It is generated by parse tables created by the user.

Descriptions of ANSI magnetic tape support, unlabeled tape support, and the MAG SET command are included.

1.8.4.3 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 the experienced programmer who wants the advantages in space and time of directly interfacing with I/O drivers.

This manual describes the Files-11 Ancillary Control Processor (F11ACP) and the Magnetic Tape Ancillary Control Processor (MTAACP) and documents the queue I/O requests performed by these processors.

1.8.5 Volume 5: System Management and Maintenance

This volume consists of a set of manuals that describes how to operate your system correctly and effectively. The manuals describe system management programs and the RSX-11M/M-PLUS Error Logging system, and explain how to use diagnostic software and how to retrieve information to determine the causes of system crashes.

1.8.5.1 RSX-11M/M-PLUS System Management Guide

This manual documents the following programs that the system manager can use to test, monitor, maintain, and customize an RSX-11M/M-PLUS operating system:

- The Account File Maintenance Program (ACNT)—Creates and maintains accounts on multiuser protection systems.
- The Console Logger (CODRV and COT)—Handles I/O to the console output device and records system messages at a terminal and/or in a log file.
- The I/O Exerciser (IOX)—Detects and diagnoses I/O problems on tape and disk units.
- The Bad Block Replacement Control Task (RCT)—Performs bad block handling and recovery on Mass Storage Control Protocol (MSCP) devices.
- The Resource Monitoring Display (RMD)—Displays information about the tasks currently active on the system and the system's available resources.
- The system shutdown task (SHUTUP)—Shuts down the system in an orderly fashion.
- The Virtual Monitor Console Routine (VMR)—A subset of MCR commands that you can use to alter a system image file.
- The Shuffler (SHF)—Compresses space in system-controlled partitions when a memory allocation failure occurs.

The manual includes information on pool monitoring support and the PMT program; how to set up and run the Queue Manager; how to extend and alter DCL; and how to write command line interpreters (CLIs). The Serial Despooler is described in an appendix.

1.8.5.2 RSX-11M/M-PLUS and Micro/RSX Crash Dump Analyzer Reference Manual

This manual explains how to use the Crash Dump Analyzer (CDA) to determine the causes of system crashes. It contains operating instructions, descriptions of CDA switches and error messages, examples of CDA output listings, and an explanation of how to interpret the output listings. The manual also includes system symbolic and data structure macro definitions.

Chapter 2
THE RSX–11M/RSX–11S Master Index

2.1 Introduction to the Master Index

The Master Index is a large and comprehensive index to the entire documentation set. The indexes of the individual manuals have been compiled into the Master Index without abridgement.

The Master Index will be valuable to new users who are not sure which manual contains the information they need. It will continue to be valuable as an index to topics that are discussed (or might logically be discussed) in more than one manual.

2.1.1 Format of the Master Index

Each entry in the Master Index is followed by the title of the manual it is referencing. For example, the complete title *RSX–11M/M–PLUS MCR Operations Manual* is abbreviated to "MCR". The titles of all the manuals are in italics. See Table 2–1 for a list of the abbreviated titles.

2.1.2 Manuals Included in the Master Index

The following table lists all the manuals included in the Master Index and their abbreviated titles. Note that the indexes for the *EDT Editor Manual* and the *RSX–11M/RSX–11S Release Notes* are not included in the Master Index. Please refer to the individual indexes of these manuals for the information you need.

Table 2–1: Index Titles for the RSX–11M Documentation Set

Index Title	Manual Title
Batch and Queue	RSX–11M/M–PLUS Batch and Queue Operations Manual
Command Language	RSX–11M Command Language Manual
CDA	RSX–11M/M–PLUS and Micro/RSX Crash Dump Analyzer Reference Manual
Debugging	RSX–11M/M–PLUS and Micro/RSX Debugging Reference Manual
Error Logging	RSX–11M/M–PLUS Error Logging Manual
Executive	RSX–11M/M–PLUS and Micro/RSX Executive Reference Manual
Indirect	RSX–11M/M–PLUS Indirect Command Processor Manual

Table 2–1 (Cont.): Index Titles for the RSX–11M Documentation Set

Index Title	Manual Title
Introduction	Introduction to RSX–11M
I/O Drivers	RSX–11M/M–PLUS I/O Drivers Reference Manual
I/O Operations	RSX–11M/M–PLUS and Micro/RSX I/O Operations Reference Manual
MACRO–11	PDP–11 MACRO–11 Language Reference Manual
MCR	RSX–11M/M–PLUS MCR Operations Manual
Program Development	RSX–11M/M–PLUS Guide to Program Development
RMS–11 Introduction	RSX–11M/M–PLUS RMS–11:An Introduction
RMS–11 Macro	RSX–11M/M–PLUS RMS–11 Macro Programmer's Guide
RMS–11 User's Guide	RSX–11M/M–PLUS RMS–11 User's Guide
RMS–11 Utilities	RSX–11M/M–PLUS RMS–11 Utilities
System Generation (M)	RSX–11M System Generation and Installation Guide
System Generation (S)	RSX–11S System Generation and Installation Guide
System Library	IAS/RSX–11 System Library Routines Reference Manual
System Management	RSX–11M/M–PLUS System Management Guide
Task Builder	RSX–11M/M–PLUS Task Builder Manual
Utilities	RSX–11M/M–PLUS Utilities Manual
Writing I/O Driver	RSX–11M Guide to Writing an I/O Driver

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