Guide to RT–11 Documentation

Order Number AA–5285K–TC

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This guide gives a brief synopsis of each document in the software documentation set shipped with RT–11 Version 5.6. The guide also suggests a reading path for RT–11 users.

Read this guide before using RT–11 Version 5.6 software.

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1 RT–11 Documentation Set 1

1 Introduction

This guide describes the RT–11 operating system documentation set. If you are unfamiliar with RT–11, use this as a guide to recommended reading. If you are familiar with RT–11, use it as a reference to the contents of individual manuals.

2 Organization of the Documentation Set

The documentation set consists of 22 manuals describing the RT–11 operating system. Except for the *RT–11 Quick Reference Manual*, a smaller spiral-ring binder, the manuals are 8½-by-11 inches, contained in 13 three-ring binders. Spine inserts list acronyms for documents in each volume. Table 1 lists all documents contained in the set, volume location, document acronym, and the Digital order number.

Table 1: RT–11 Documentation Set

Volume	Document Title	Acronym	Order Number
1	Guide to RT–11 Documentation	GUI	AA–5285K–TC
	RT–11 System Release Notes	RLN	AA–5286L–TC
	RT–11 Master Index	MAS	AA–HW49C–TC
2	Introduction to RT–11	INT	AA–5281E–TC
3	RT–11 Automatic Installation Guide	AIG	AA–LW85B–TC
	RT–11 Installation Guide	INS	AA–H376F–TC
	RT–11 System Generation Guide	SYG	AA–M240E–TC
4	RT–11 Commands Manual	COM	AA–PDU0A–TC
5A	RT–11 System Utilities Manual–Part I	SUM	AA–M239D–TC
5B	RT–11 System Utilities Manual–Part II	SUM	AA–PF6TA–TC
6	PDP–11 Keypad Editor User's Guide	KED	AA–H853C–TC
	PDP–11 Keypad Editor Reference Card		AV–H854B–TC
	RT–11 IND Control Files Manual	IND	AA–PDU1A–TC
7	RT–11 System Message Manual	MES	AA–5284H–TC
8	RT–11 System Macro Library Manual	SML	AA–PD6LA–TC
9	RT–11 System Subroutine Library Manual	SSL	AA–PD6MA–TC
10	RT–11 Volume and File Formats Manual	VFF	AA–PD6PA–TC
	RT–11 System Internals Manual	SIM	AA–PD6NA–TC
11	RT–11 Device Handlers Manual	DEV	AA–PE7VA–TC
	DBG–11 Symbolic Debugger User's Guide	DBG	AA–HJ37C–TC
12	PDP–11 MACRO–11 Language Reference Manual	MAC	AA–NJ90B–TK
Spiral-bound	RT–11 Quick Reference Manual	QRM	AA–M241D–TC

If you purchase any optional products (for example, FORTRAN IV or FORTRAN–77) along with the operating system, the documentation for those products is separate from the RT–11 operating system documentation.

Figure 1 is a reading and reference guide to the documentation set. Documents labeled "reference" are for all users and are not designed to be read from beginning to end. Documents labeled "optional" are not required for efficient use of RT–11.

Figure 1 categorizes the intended audience for each manual and suggests reading paths appropriate for each type of user. FORTRAN (FORTRAN IV or FORTRAN–77), BASIC–PLUS, and C languages are options commonly chosen to run on the RT–11 operating system. The figure lists only FORTRAN and BASIC–PLUS programmers, but represents several types of users.

Although this guide does not describe each optional programming language manual, these languages usually have the following type of manuals:

- **Release Notes**

  Up-to-date information on the current release of a product.

- **Installation Guide**

  Procedures you need to customize, install, and test the installation of a product.

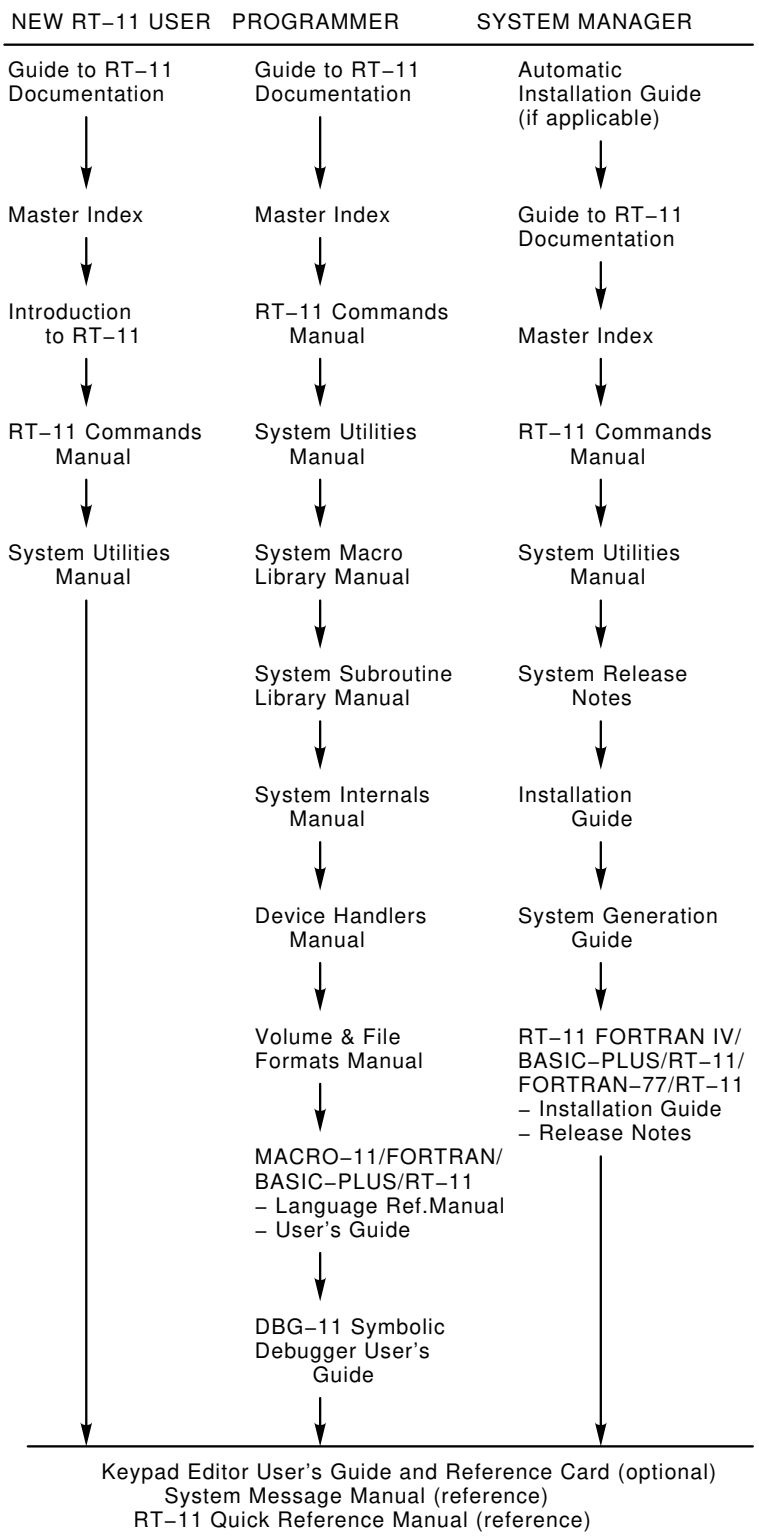
- **Language Reference Manual**

  Elements and structure of a language as implemented on a PDP–11 computer on which RT–11 runs. This manual has operating-system independent information. You usually need the language user's guide for a specific operating system to know how the language works on that operating system.

- **Language User's Guide**

  Instructions for using a language on a specific operating system; for example, how to compile or interpret (as in BASIC–PLUS), link, execute, and debug programs on RT–11. Such guides might also tell you how to increase the efficiency of your programs, how to call subroutines, how to interpret diagnostic messages.

Figure 1: Reading and Reference Guide to RT–11 Documentation



Three categories of users are indicated in Figure 1:

New RT–11 User — Probably familiar with a higher-level programming language; may or may not be familiar with computers and software fundamentals. Unfamiliar with RT–11 operating procedures.

Programmers — MACRO–11 programmers must be familiar with the PDP–11 instruction set or an assembly language such as MACRO–11. Should be familiar with the RT–11 operating procedures described in the *Introduction to RT–11*.

FORTRAN programmers must be familiar with PDP–11 FORTRAN IV or another FORTRAN language. Should be familiar with the RT–11 operating procedures described in the *Introduction to RT–11*.

BASIC–PLUS programmers must be familiar with BASIC–PLUS or another BASIC language. Should be familiar with the RT–11 operating procedures described in the *Introduction to RT–11*.

System Manager — Familiar with RT–11 operating procedures. Responsible for generating and maintaining RT–11 and FORTRAN IV, FORTRAN–77, or BASIC–PLUS, if present, at the user site.

Because RT–11 is a single-user system, an RT–11 user may fall into more than one of the categories above. For example, almost every MACRO–11 system programmer also serves from time to time as system manager. Therefore, these categories are just guidelines rather than specific descriptions of users.

Optional software products in addition to FORTRAN IV, FORTRAN–77, BASIC–PLUS, and C languages are available for RT–11 Version 5.6. Contact your local sales office for information about these products.

3 Descriptions of Documents

The following sections describe the documents, other than the *Guide to RT–11 Documentation*, listed in Table 1. The descriptions are presented in the same sequence as listed in the table. Each description gives the purpose and contents of the manual.

3.1 RT–11 System Release Notes

The *RT–11 System Release Notes* provide up-to-date information on the current releases of the RT–11 monitor and system programs.

Before you install the RT–11 system, read the release notes thoroughly. The release notes describe the current version of the software, the differences between the current version of the software and the previous release, and known problems present in the distributed software.

3.2 RT–11 Master Index

The *RT–11 Master Index* contains index entries for all RT–11 manuals and for the *RT–11 Release Notes*.

3.3 Introduction to RT–11

The *Introduction to RT–11* introduces the new user to the RT–11 operating system and explains how to use major features of that system. Examples and exercises accompany the explanations to help familiarize the reader with the topic being described.

The manual is divided into four parts and a glossary of computer terms:

- Part I, Basics for the New User, describes the basic concepts, procedures, and commands you need to know in order to use the operating system.
- Part II, Using the RT–11 Monitors, describes how to use the RT–11 monitors. This part explains how to use the system job feature and startup command files.
- Part III, Using RT–11 Features, describes useful features available under all the distributed monitors.
- Part IV, Programming with RT–11, describes RT–11 support for developing MACRO–11, BASIC–PLUS, FORTRAN IV, and FORTRAN–77 programs. This part briefly explains how to compile, debug, link, and run sample programs and how to construct library files.

3.4 RT–11 Automatic Installation Guide

The *RT–11 Automatic Installation Guide* describes the requirements for using the automatic installation procedure, the major steps of the procedure, and how to use the procedure.

The automatic installation procedure is mostly self-explanatory. You use it to automatically install the RT–11 operating system from RX02 diskettes, RX50 diskettes, RL02 disk, or TK50 tape.

3.5 RT–11 Installation Guide

The *RT–11 Installation Guide* describes the following:

- Contents of the RT–11 software kit.
- How to manually install, customize, test, and maintain RT–11.

  How to select the components you need in your working system, plan the arrangement of components on volumes (if appropriate), identify mandatory patches, and select the customizations you need to make. This description does not include how to generate your own monitor and handlers. If you decide to do that, see the *RT–11 System Generation Guide*.

The guide is divided into two chapters on how to prepare for an installation and nine chapters on how to install the operating system according to different hardware configurations. The guide's modular structure lets you read only the chapters

describing your hardware and software. As you read the first two chapters, you can define your system requirements and choose a reading path through the rest of the guide.

Before you manually install RT–11, you should read the *RT–11 Commands Manual* and review the other RT–11 manuals. After you have installed RT–11, see the appropriate language installation guide for instructions on the manual installation of FORTRAN IV or FORTRAN–77 and BASIC–PLUS, if required. If you need to generate your own specific RT–11 monitor, see the *RT–11 System Generation Guide* (Section 3.6).

3.6 RT–11 System Generation Guide

After you install RT–11, you may find it advantageous to generate (create) your own RT–11 monitor. The *RT–11 System Generation Guide* describes the system generation process. Before you use this guide to generate a special monitor, you should be familiar with the RT–11 operating system and the RT–11 documentation set.

This guide is divided into three chapters that respectively describe how to:

- Prepare for system generation

  This chapter explains how to get the information you will need to answer the SYSGEN dialog questions.

- Run the SYSGEN procedure and how to assemble and link the monitors and handlers
- Perform a system generation when using diskettes

The guide has four appendixes that list, respectively:

- SYSGEN dialog questions and answers that duplicate the distributed monitors
- Answers to the questions that create a typical system with multiterminal support
- RT–11 conditionals
- Customization patches for specially generated monitors

3.7 RT–11 Commands Manual

The *RT–11 Commands Manual* is a revision of the *RT–11 System User's Guide*. The name of this manual has changed because it now consists primarily of RT–11 commands. As such this manual contains useful operational information for RT–11 users who need to know about the operating system commands.

The manual is divided into two parts and two appendixes:

- Part I, Using the Command Language, describes how to use the RT–11 command language. This part has three chapters:
  - Chapter 1. How to Use DCL Commands
  - Chapter 2. Using Special Function Keys
  - Chapter 3. Using Files, Volumes, and Devices

- Part II, Command Descriptions, presents in alphabetical order a description of each RT–11 command. A command description lists the command name, states its purpose, presents format of the command string, parameters, and command options.

3.8 RT–11 System Utilities Manual

The *RT–11 System Utilities Manual*, Part I and Part II, provides all RT–11 users with detailed descriptions how to use the RT–11 system utilities to develop and execute programs and to maintain files and storage media. The 32 utilities, presented in alphabetical sequence, are divided into two parts for easy reference.

3.9 PDP–11 Keypad Editor User's Guide

The *PDP–11 Keypad Editor User's Guide* tells you how to:

- Create, edit, and save text files with the PDP–11 keypad editor, KED.
- Create and use macros and command files to simplify editing procedures.
- Copy text to or include text from another file(s) while editing a file.
- Create a journal file to save your work in case of a system crash.
- Use editing features a programmer may want.

3.10 PDP–11 Keypad Editor Reference Card

The *PDP–11 Keypad Editor Reference Card* summarizes the main keypad editor features. The card is a reference for users who have familiarized themselves with the keypad editor through the *PDP–11 Keypad Editor User's Guide* or the chapter on the default editor in the *Introduction to RT–11*. Place the *PDP–11 Keypad Editor Reference Card* in the front pocket of Volume 7.

3.11 RT–11 IND Control Files Manual

The *RT–11 IND Control Files Manual* is a three-part user document that describes how to program control files:

- Part I, Using IND Control Files, describes how to use the control-file processor to create and execute control files.
- Part II, IND Directive Descriptions, describes individual IND directives.
- Part III, IND Primary Error Messages, lists and describes IND error messages and explains how to respond to them.

3.12 RT–11 System Message Manual

The *RT–11 System Message Manual* is a reference manual for all RT–11 users. The manual lists:

- Every diagnostic message that is displayed by the monitors, and system utilities.

  The messages are listed alphabetically according to the software module that generated them, the error level within the messages, and the first words of the

messages. For each error condition, a brief explanation of the most likely causes is given and at least one corrective action is suggested.

- Procedures for recovering from error conditions reported by the hardware rather than by the software.
- Guidelines to review when you have inadequate storage for a program's requirements or too large a program to run.
- Procedures to use if RT–11 fails completely.

3.13 RT–11 System Macro Library Manual

The *RT–11 System Macro Library Manual* is a reference document for experienced assembly language programmers and FORTRAN IV programmers who wish to use the SYSMAC (for MACRO–11 calls). This manual, along with the *PDP–11 MACRO–11 Language Reference Manual*, contains instructions for programming in the MACRO–11 assembly language under the RT–11 operating system.

3.14 RT–11 System Subroutine Library Manual

The *RT–11 System Subroutine Library Manual* is a reference document for experienced assembly language programmers and FORTRAN IV programmers who need to use the services of the system subroutine library (SYSLIB.OBJ), a library of functions and subroutines that you can call from FORTRAN or assembly language programs.

3.15 RT–11 Volume and File Formats Manual

This manual describes the format of RT–11 disk and magtape volumes and the RT–11 file formats. This information will be most useful to system programmers, but will also provide valuable background information for application programmers. This manual consists of two chapters that replace Chapters 8 and 9 of the *RT–11 Software Support Manual*.

3.16 RT–11 System Internals Manual

This programmers' manual consists of completely revised information previously contained in Chapters 1 through 6 of the *RT–11 Software Support Manual*.

3.17 RT–11 Device Handlers Manual

This manual describes the structure of device handlers, how to write your own device handler, and provides specific programming information about distributed RT–11 device handlers. The manual consists of two chapters.

3.18 DBG–11 Symbolic Debugger User's Guide

The *DBG–11 Symbolic Debugger User's Guide* tells how to use the DBG–11 symbolic debugging utility package. The guide describes DBG–11 commands and shows their use with a sample program. You should have some knowledge of assembly language programming before trying to use DBG–11.

3.19 PDP–11 MACRO–11 Language Reference Manual

The *PDP–11 MACRO–11 Language Reference Manual* is for the MACRO–11 programmer who is familiar with the PDP–11 family and the instruction set. This manual shows you how to develop MACRO–11 programs. Because this manual contains system-independent information, it must be used in conjunction with a system-specific user's guide. The RT–11 supplements are the *RT–11 Commands Manual* and the *RT–11 System Utilities Manual*.

The manual has four parts and several appendixes:

- Part I, Assembly and Formatting, lists the key features of MACRO–11, identifies programming standards and conventions, and describes the format you use to code source programs.
- Part II, Programming in MACRO–11 Assembly Language, presents information essential to programming in MACRO–11, including the elements of MACRO–11 instructions, MACRO–11 output, relocation and linking of object modules, and accessing and manipulating data stored in memory.
- Part III, MACRO–11 Directives, describes the directives that control the processing of source statements during assembly.
- Part IV, Operating Procedures, describes how to use MACRO–11 on different operating systems.
- The appendixes include information on character sets, directives, error messages, coding standards, and virtual memory allocation.

3.20 RT–11 Quick Reference Manual

The *RT–11 Quick Reference Manual* contains the following information:

- RT–11 commands
- RT–11 utilities
- Programmed request summaries
- System subroutines
- Control blocks
- Disk and file formats
- Fixed offsets and status words
- Queue formats
- ASCII and RAD50 character sets
- Permanent device names

- Standard file types
- Octal to K-word equivalents
- EMT List

4 RT–11 Update User's Guide

The *RT–11 Update User's Guide* is not part of the RT–11 documentation set as supplied to new users of the operating system. This guide is for those who buy an update of the operating-system software.

The *RT–11 Update User's Guide* describes the following:

- A general procedure for updating your RT–11 operating system
- Some helpful hints and procedures when updating the operating system
- How to run the RT–11 UPDATE program to update to the current level the RT–11 operating system and its layered-product distribution software.

5 Optional Software Products

A variety of software products is available for the diverse needs of RT–11 users. These products cover a broad range of categories, such as marketing, purchasing, inventory management, manufacturing, and engineering. The products are sold singly or in combination and can be installed individually after you have installed RT–11. Contact your local sales office for information about these products.