

## **UPDATE NOTICE 1**

# **Introduction to RT-11**

AD-5281C-T1

**July 1984**

### **NEW AND CHANGED INFORMATION**

This update contains changes and additions to the *Introduction to RT-11*, AA-5281C-TC.

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## INSTRUCTIONS

The enclosed pages are replacements for or additions to current pages of the *Introduction to RT-11*. On replacement pages, changes and additions are indicated by vertical bars ( | ); deletions are indicated by bullets (●).

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# Introduction to RT-11

AA-5281C-TC

**March 1983**

This document is an introductory manual for the RT-11 operating system. Its purpose is to acquaint new users with the RT-11 commands that perform common system operations. This manual presents the background material necessary to understand the system operations. It also contains a series of command examples and demonstration exercises that complement the text.

This manual supersedes the *Introduction to RT-11*, AA-5281B-TC. This manual contains Update Notice 1, AD-5281C-T1.

**Operating System:** RT-11 Version 5.1

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- A volume for program storage (for example, magtape or another disk or diskette); this volume should contain no important information since all information on it will be erased during a later computer exercise
- A copy of the *RT-11 Automatic Installation Booklet* or the *RT-11 Installation Guide*

**NOTE**

You can find hardware configuration information in the various hardware manuals provided with your system. Instructions for starting (bootstrapping) your RT-11 system appear in the *RT-11 Automatic Installation Booklet* and the *RT-11 Installation Guide*. This information should be adequate for you to answer all the questions asked here. If you have trouble, see Appendix B, *Suggestions for Bootstrapping the System*. Do not continue to any other chapter in this manual until you understand the following configuration information and can bootstrap the system yourself.

1. What kind of terminal device are you using (for example, LA120 DECwriter III, VT100 video terminal)?
2. Is your computer a PDP-11/23-PLUS, PDP-11/24, or PDP-11/44?
3. Does your computer operator's console have pushbuttons or switches?
4. How much memory does your computer have?
5. What kind of system volume are you using (for example, RL02 disk, RX02 diskette)?
6. What is the two-letter mnemonic for this volume (typical mnemonics are given in Table 2-1; respond with the mnemonic for your own volume)?

**Terminal**

**Computer**

**System Volume**

**Table 2-1 Representative System Volumes**

<b>Volume</b>	<b>Mnemonic</b>
RD50/RD51 Disk (PC350)	DW
RX01 Diskette	DX
RX02 Diskette	DY
RX50 Diskette (PC325/PC350)	DZ
RK05 Disk	RK*
RK06/07 Disk	DM
RC25/RD51 Disk, RX50 Diskette	DU
RL01/02 Disk	DL

\*Use DK to bootstrap from an RK05 disk.

**Storage Volume**

7. What volume are you using for program storage (for example, TS11 magtape, RL02 disk)?
8. In which device unit will you use this volume (choose any available device unit — for example, 0, 1)?

**Optional Devices and Supported Languages**

9. What peripheral devices are part of your system (for example, line printer, magtape, VT11 display hardware; list all devices other than the terminal and the computer)?
10. What programming languages does your system support (MACRO-11 or BASIC-11, for example)?

**BOOTSTRAP PROCEDURE**

Once you have determined your hardware configuration, you are ready to bootstrap the system. The purpose of the bootstrap procedure is to load and start the RT-11 monitor in computer memory, thus activating the RT-11 computer system for your use.

**NOTE**

If your answer to question 2 in the Hardware Configuration section is YES, continue to the next paragraph. Otherwise, read the section entitled Bootstrapping the System, in Appendix A, for bootstrap instructions.

The bootstrapping procedure for the RT-11 computer system on a PDP-11/23-PLUS, PDP-11/24, or PDP-11/44 processor consists of the following steps. For more detailed instructions on

Typing the new time overrides the previous time.

The system's clock stops when the system stops running. If you want the time to be kept current, you must reenter it whenever you bootstrap the system. If your system has a clock and you do not set the time, the TIME command will return the time elapsed since the last hardware boot.

To check the time or date at any time while you are using the system, simply type either the DATE command or the TIME command, followed by a carriage return only:

### Long and Short Command Format

```
. DATE(RET)
8-JAN-83
```

```
. TIME(RET)
15:06:19
```

The system responds by printing the date or the time, based on the information you previously entered. If the system responds to the DATE command with the message *?KMON-W-No date*, the date has not been set since the system was last bootstrapped.

Each hardware device in the RT-11 system is identified by a two-letter mnemonic. The mnemonics, listed in Table 4-2, are defined in the system software and are recognized and used by the operating system. These are the device names that you generally use in command input and output lines. However, you may want to change any of these device names temporarily, for a variety of reasons. The following paragraphs describe both using the physical device names shown in Table 4-2 and assigning logical (temporary) device names to devices.

### Assigning Logical Names to Devices

Table 4-2 Physical Device Names

Mnemonic	Device
DUn:	RC25/RD51 Disk, RX50 Diskette
DLn:	RL01/02 Disk
DMn:	RK06/07 Disk
DW:	RD50/RD51 Disk (PC350)
DXn:	RX01 Diskette
DYn:	RX02 Diskette
DZn:	RX50 Diskette (PC325/PC350)
LP:	Line Printer
LS:	Serial Line Printer
MMn:	TJU16 Magtape
MSn:	TS11 Magtape
MTn:	TM11 Magtape
RKn:	RK05/RK11 Disk
TT:	Console Terminal

Two additional logical device names are used. These special names are described in Table 4-3.

**Table 4-3 Special Logical Device Names**

<b>Mnemonic</b>	<b>Device</b>
SY:	The volume from which the monitor was bootstrapped; that is, the system volume.
DK:	The default storage volume (initially the same as SY:; that is, the system volume).

You use device names in the input and output portions of a command line to identify where input information can be found and where output information will be sent. If a file is involved, you also include its file name and file type, in the following format:

```
devicename:filename.filetype
```

The device name is followed by a colon and is always separated from any file name and file type by a colon. The device name is generally one of the mnemonics listed in Tables 4-2 and 4-3. When you use a device name in any command, you must also include the device unit number (represented by the letter *n* in Table 4-2) unless the number is 0. The system assumes unit 0 of the device if no unit number is given. Thus, diskette unit 0 is DY: or DY0:; diskette unit 1 is DY1:; RK: disk unit 2 is RK2:; and so on. Note that, according to Table 4-3, you can use the device mnemonic SY: or DK: for your system volume in addition to its standard device name. However, since the system volume is initially the default storage volume for all operations, you do not need to use a device name for your system volume.

The names listed in Tables 4-2 and 4-3 are the device names defined within the system software. However, you can change any of these name assignments temporarily, either by reassigning existing names to different devices or by assigning new logical names of your own choosing to devices.

You might want, for many reasons, to change a device name temporarily and assign it a logical name. You may, for example, have a program written for a device that is not available on your system. If you assign the program name to a device that is available, the program then uses that device instead.<sup>1</sup>

Since not all RT-11 users have access to the same kind of storage volume, you are instructed to assign the logical name VOL: to whatever volume you are using for storage. After you

<sup>1</sup>This is called device independence.



The foreground job is still running and queuing its messages to the monitor. Rerun the background program to collect all the foreground messages while the background job was stopped and the directory was printing.

```
.RUN DEMOBG(RET)
RT-11 DEMONSTRATION PROGRAM
IF INCORRECTLY EDITED, THIS IS THE LAST LINE.
WELL DONE.
```

The bell again rings several times in succession and then rings once every two seconds. Stop the background job by using the double CTRL/C command.

```
CTRL/C
CTRL/C
```

Now stop the foreground job and remove it from memory. To do this, you must first use the CTRL/F command to direct terminal input to the foreground. Type:

```
.CTRL/F
F >
```

The system prints the characters F> to remind you that you are now directing command input to the foreground job. Use the double CTRL/C command to interrupt and terminate the execution of the foreground job, and return control to the background job.

```
CTRL/C
CTRL/C
B >
```

You should unload the foreground job to reclaim memory space for background use. Use the monitor UNLOAD command as follows:

UNLOAD

### Long and Short Command Format

```
UNLOAD F(RET)
```

F represents the foreground job; you should use this code whenever you want to unload the foreground job. To unload any loaded device handlers, you must use their two-letter device mnemonics.

Check to see if the .LST files were produced as a result of this demonstration.

## Long and Short Command Format

```
.DIRECTORY *.LST
 08-Jan-83
DEMOBG.LST      4  08-Jan-83  DEMOFG.LST      6  08-Jan-83
2 Files, 10 Blocks
406 Free blocks
```

The foreground program has access to all the system features available to a background program — opening and closing files, reading and writing data, and so on. However, before you begin to write and use programs in the foreground, read the *RT-11 Software Support Manual* for coding restrictions.

### SUMMARY: COMMANDS USED IN AN FB ENVIRONMENT

#### CTRL/B

Direct all keyboard input to the background job (until CTRL/F).

#### CTRL/F

Direct all keyboard input to the foreground job (until CTRL/B).

#### FRUN

Load and start execution of the foreground job.

#### LOAD dd

Bring the indicated device handler into memory; the handler becomes resident in memory.

#### UNLOAD dd

Take the indicated device handler out of memory, reclaiming its memory space; the handler becomes nonresident in memory.

#### UNLOAD F

Reclaim the memory space used by the foreground job.

### FILE MAINTENANCE

You assembled the source file DEMOFG.MAC and produced an .OBJ file, linking it to produce DEMOFG.REL. You also created a .LST file named DEMOFG.LST on your system volume. You should save on your storage volume the files DEMOFG.REL and DEMOFG.MAC, and delete from your system volume the files DEMOFG.OBJ and DEMOFG.LST. Do not delete DEMOFG.MAC, since this file was distributed as part of the RT-11 operating system. Do the same for the file DEMOFG, which you created as a .SAV file instead of a .REL file.

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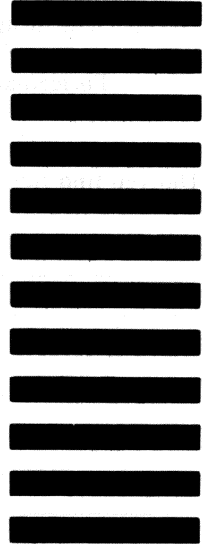


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