

AA-P300B-TV

RainbowTM 100

User's Guide

digital equipment corporation

First Printing, November 1982
Revised, May 1983

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Printed in U.S.A.

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Preface

Intended Reader

This guide is intended for first-time users of Digital Equipment Corporation's Rainbow 100 computer. The purpose of this guide is to provide you with detailed information on how the Rainbow 100 computer operates.

The Rainbow 100 computer runs the CP/M-86/80 operating system, an operating system developed especially for it. Although other operating systems can be run on the Rainbow 100 computer, the CP/M-86/80 operating system is used in the examples in this guide.

This guide assumes that you have:

- Installed the Rainbow 100 computer according to the instructions in the *Rainbow 100 Installation Guide*.
- Read the *Rainbow 100 Getting Started*.
- Made a copy of the CP/M-86/80 master system diskette.

Guide Organization

Chapter 1 introduces the CP/M-86/80 operating system and provides some practice examples.

Chapter 2 describes the Rainbow 100 computer's keyboard.

Chapter 3 explains how to set the Rainbow 100 computer features.

Chapter 4 discusses how to communicate with another computer.

Chapter 5 discusses the CP/M-86/80 operating system commands.

Chapter 6 describes how to use the Rainbow 100 editor, RED.

Chapter 7 describes how to make a system/application diskette that contains the operating system and an application program.

Chapter 8 lists the Rainbow 100 computer error messages, what they mean, and what to do about them.

Appendix A describes how to store, handle, and use diskettes.

Appendix B describes how to use two application programs on a four-drive Rainbow 100 computer.

Conventions Used

Follow the conventions listed below while using this guide.

- In examples of dialog between you and the computer, what the computer displays on the screen is shown in black. The characters you type from the keyboard are shown in color.
- You can type these characters in either lowercase or uppercase characters. Use the Shift or Lock key (see Figure 1) on the keyboard to enable uppercase characters.
- Make sure to type all spaces and punctuation marks exactly as they are printed.

- When you see <Ret>, press the Return key on the keyboard (see Figure 1).
- When you see <Ctrl/C>, hold down the control key (Ctrl key on the keyboard as shown in Figure 1) while you press the C key. (Hold down both keys at the same time).

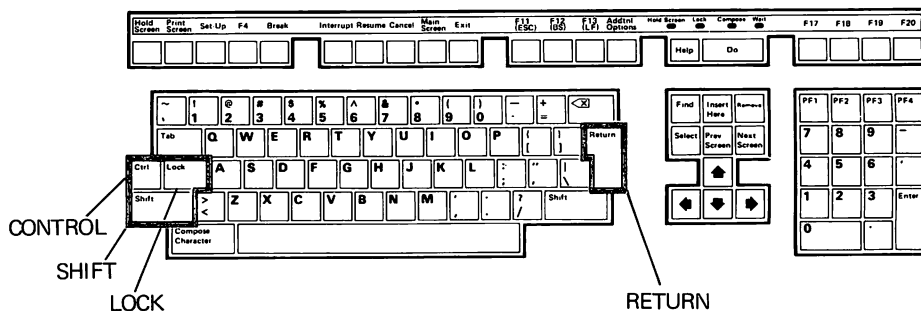


Figure 1. Control, Shift, Lock, and Return Keys

MR-8838

Information for Advanced CP/M-86/80 User's

Advanced users of the CP/M-86/80 operating system may find the Rainbow 100 Technical Documentation Kit (order number QV043-GV) useful. Turn to the end of this guide for ordering information.

Introducing the CP/M-86/80 Operating System

This chapter introduces you to the CP/M-86/80 operating system by explaining various computer concepts and operations. It also provides some practice examples that you can try to get an idea of the operating system's capabilities.

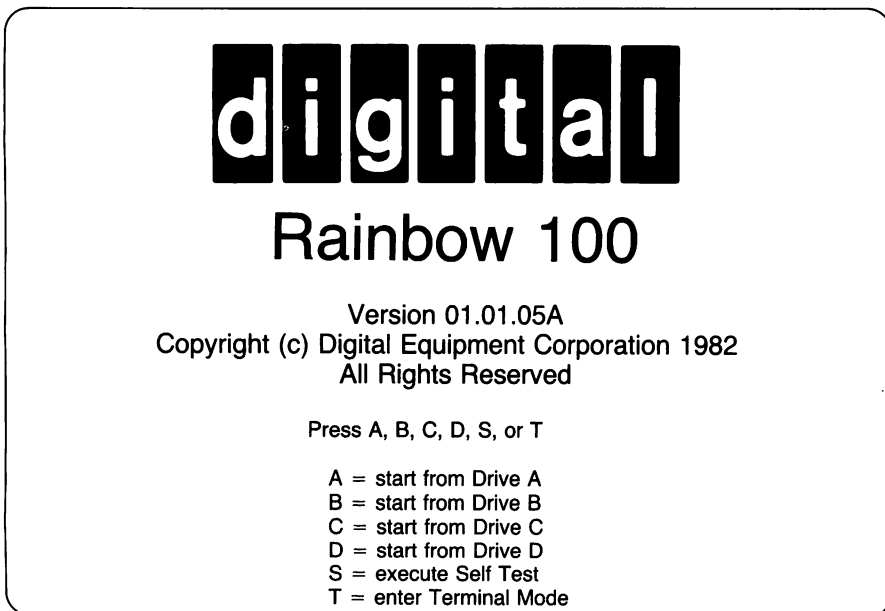
To use this guide, you should have:

1. Installed the Rainbow 100 computer according to the instructions in the *Rainbow 100 Installation Guide*.
2. Read the *Rainbow 100 Getting Started* and have made a copy of the CP/M-86/80 master system diskette.

Getting Started

To try the examples in this chapter, first start the CP/M-86/80 operating system according to the following instructions.

1. Display the Rainbow 100 Main System Menu according to one of the following procedures:
 - If the Rainbow 100 computer is turned off — Make sure that no carriage restraint card(s) or diskettes are in the drives. Turn on the Rainbow 100 computer by pressing the power switch to the on position (1) on the front of the system unit. The drive doors can be opened or closed. The Main System Menu (see Screen 1) should be displayed on the screen.
 - If the Rainbow 100 computer is turned on — Reset the Rainbow 100 computer by pressing the Set-Up key, followed by typing <Ctrl/Set-Up>. The Main System Menu (see Screen 1) should be displayed on the screen.



Screen 1. Rainbow 100 Main System Menu

MR-8111

2. Remove the CP/M-86/80 working diskette from its protective envelope. (You created this diskette in Chapter 2 of the *Rainbow 100 Getting Started*. This diskette is a copy of the master system diskette and also contains the operating system files.
3. Open the drive A door and insert the CP/M-86/80 working diskette. Close the drive A door.
4. Start the CP/M-86/80 operating system by pressing the A key in response to the Main System Menu. By pressing the A key, you tell the computer which drive contains the system diskette.

NOTE: Refer to Chapter 8 if the CP/M-86/80 Start-up Message does not display as shown in Screen 2.

The CP/M-86/80 operating system displays the text shown in Screen 2 when it successfully starts. The last symbol displayed on the left side of the screen, A>, is called the operating system prompt or prompt. It indicates that the operating system is waiting (or prompting) for instructions. The prompt consists of the drive the operating system is currently accessing (A, B, C, or D) and a right angle bracket. The drive that is currently being accessed is known as the active drive or default drive.

Conversing with the Rainbow 100 Computer

To use the Rainbow 100 computer you must tell it what to do — whether you want to run an application program or use one of the operating system's programs. You tell the operating system what to do by typing commands (instructions) from the keyboard which run programs.

Whenever the prompt is displayed, you can type a command. For example, the CP/M-86/80 operating system accepts commands from you to:

- List the names of files on a diskette
- Copy the entire contents of a diskette
- Copy individual files

```
CP/M-86/80 Version 1.0 (1.1)
(c) Copyright 1981 Digital Research Inc.
(c) Copyright 1982 Digital Equipment Corporation
```

```
A>
```

Screen 2. CP/M-86/80 Start-up Message

MR-S-2312-82

- Create text files
- Display a text file on the screen
- Print files on a printer
- Delete files
- Run programs

Most of the operating system commands are designed to act on a file, which is a collection of information. The CP/M-86/80 operating system deals with two types of files:

- Program files, which contain a collection of instructions telling the computer how to perform a specific task.
- Data files, which contain a collection of user information, such as a list of numbers or the text of a memo.

When you create files, you should give them two-part names separated by a period:

- A first name, called a file name
- A last name, called a file type or file extension

NOTE: Refer to Chapter 5 for more information about commands and files.

Issuing Commands

You type a command directly after the prompt. As you type a command, the Rainbow 100 computer displays the characters on the screen to the left of the cursor (see Screen 3). The cursor is a blinking rectangle that indicates where the next character you type is displayed. The cursor moves to the right each time you type a character.

NOTE: You can change the form of the cursor from a rectangle to an underline by using Set-Up (see Chapter 3).

```
CP/M-86/80 Version 1.0 (1.1)
(c) Copyright 1981 Digital Research Inc.
(c) Copyright 1982 Digital Equipment Corporation
```

```
A> █
```

Screen 3. Rainbow 100 Cursor

MR-8410

The Rainbow 100 computer displays the characters you type as lowercase characters unless you use the Shift or Lock keys to obtain uppercase characters. You can type commands in either lowercase or uppercase characters. The Lock key affects only the alphabetic characters.

After typing most commands, press the Return key. Pressing the Return key tells the operating system that you have finished typing the command and want the command executed. Some programs display messages such as <CR> (for carriage return) or "RETURN" to indicate that you should press the Return key.

***NOTE:** A few programs, such as COPY, ask you questions requiring a single-character response. This program processes your response as soon as you type it, without waiting for you to press the Return key.*

Correcting Typing Errors

The CP/M-86/80 operating system only executes correctly spelled commands. If you mistype a command and press the Return key before correcting the mistake, the operating system redisplay the incorrect command followed by a question mark, ?. The question mark indicates that the operating system did not understand the command. Try the following example. Remember, in the examples in this guide, you should only type the characters that are printed in color. The computer displays what is printed in black.

Type:

```
A>DIRR<Ret>
```

The operating system displays DIRR? and then its prompt to show that it is waiting for you to type another command (see Screen 4).

Delete Character, Backspace, and Control Keys

If you mistype a command before pressing the Return key, there are several ways to correct it. Figure 2 shows the position of keys that can be used to correct typing errors.

```
CP/M-86/80 Version 1.0 (1.1)
(c) Copyright 1981 Digital Research Inc.
(c) Copyright 1982 Digital Equipment Corporation
```

```
A>DIRR
DIRR?
A>
```

Screen 4. Example of Typing Error

MR-S-2314-82

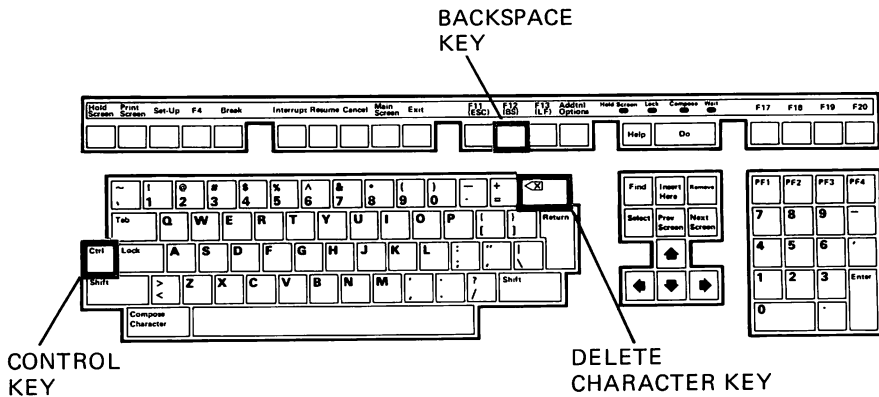


Figure 2. Backspace, Delete Character, and Control Keys

MR-8143

Delete Character Key . Each time you press the delete character key (see Figure 2), the last character you typed is erased from the screen and the cursor is moved back a space. You cannot erase the prompt.

1. To see how the delete character key works, type:

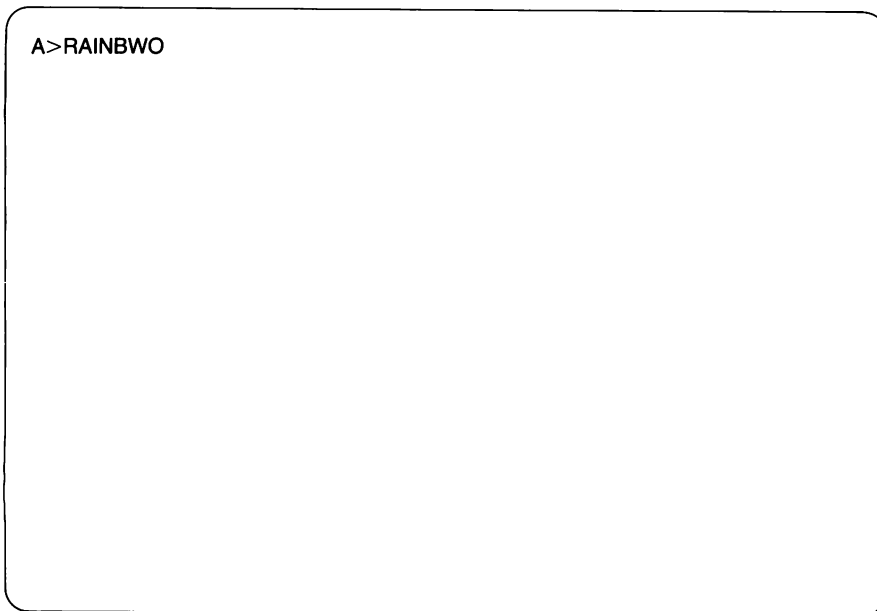
```
A>RAINBWO
```

2. Press the delete character key twice. The characters O and W disappear leaving the characters RAINB displayed on the screen.
3. Type:

```
A>RAINBOW
```

The operating system now displays RAINBOW on the screen. Screens 5a, 5b, and 5c show this sequence.

4. Press the delete character key seven times to erase RAINBOW.



Screen 5a. Delete Character Key

MR-S-2315-82



A>RAINB

Screen 5b. Delete Character Key

MR-S-2317-82



A>RAINBOW

Screen 5c. Delete Character Key

MR-S-2316-82

Backspace Key . On the Rainbow 100 computer, the backspace key (labeled (BS) on the keyboard label strip) also erases the last character you typed from the screen and moves the cursor back a space. It works exactly as the delete character key.

Control Characters . The control key (Ctrl on the keyboard as shown in Figure 2) is a special key that is used in conjunction with certain other keys. They cause the Rainbow 100 computer to perform special functions known as control commands.

To type control commands, hold down the Ctrl key while you press the required letter key and then release them. You can type control commands with or without the Lock key enabled.

Some control commands are displayed on the screen when you type them. These control commands are displayed as a caret (^) followed by the letter you typed. For example, when you type <Ctrl/C>, the characters ^C are displayed on the screen.

Table 1 lists the control commands that you can use to correct mistakes.

Table 1. Control Commands

Command	Function
<Ctrl/R>	Displays a # at current cursor position. Moves the cursor to the next line and redisplay the characters you have typed so far. The CP/M-86/80 operating system does not redisplay its prompt until you press the Return key.
<Ctrl/U>	Displays a # at current cursor position. Moves the cursor to the next line so you can retype the command. The characters on the previous line are ignored. The CP/M-86/80 operating system does not redisplay its prompt until you press the Return key.
<Ctrl/X>	Erases the entire command back to the prompt.

Using CP/M-86/80 Operating System Commands

This section of the chapter shows you how some of the commands on the CP/M-86/80 working diskette affect files.

Looking at the Diskette Directory—The DIR Command

Each diskette that contains files also contains a file directory. A file directory — or directory — is similar to a book's table of contents. A book's table of contents tells you what information is in a book; a diskette's directory tells the CP/M-86/80 operating system what files are stored on the diskette.

1. To list the files stored on the CP/M-86/80 working diskette in drive A, use the DIR command. Type:

```
A>DIR<Ret>
```

Screen 6 shows the entire dialog. The operating system displays the files without a period between the file name and the file type, but you must always include the period when creating and referring to files (see Chapter 5 for more information about files). Note that files on each line in the directory are separated from one another by a colon (:).

The operating system displays the message "SYSTEM FILE(S) EXIST" to remind you that other files are stored on the diskette in the system directory. Chapter 5 describes the system directory.

Copying Files — The PIP Command

The PIP (Peripheral Interchange Program) command copies files from one diskette to another diskette. Such copying is useful if you want to:

- Make a copy of a file and change it without changing the original file
- Make a backup copy of a file on another diskette

To see how PIP works . . . Insert a blank diskette into drive B. Remember to insert it so the orange arrow on the diskette always aligns with the orange stripe on the drive.

Close the drive B door.

Copy the file DEMO.DOC from the working diskette in drive A to the blank diskette in drive B by typing:

```
A>PIP B:=A:DEMO.DOC<Ret>
```

You hear clicking sounds from the drive and the small lights beside each drive turn on briefly. After PIP copies the file, the operating system displays its prompt:

```
A>
```

To check that the copy was made, type:

```
A>DIR B:<Ret>
```

This instructs the operating system to look at the directory on the diskette in drive B. You must type a colon after the B when specifying a drive.

Screen 7 shows the entire dialog. Notice that DEMO.DOC is now listed in the directory of the diskette in drive B.

Performing Diskette Maintenance — The MAINT Command

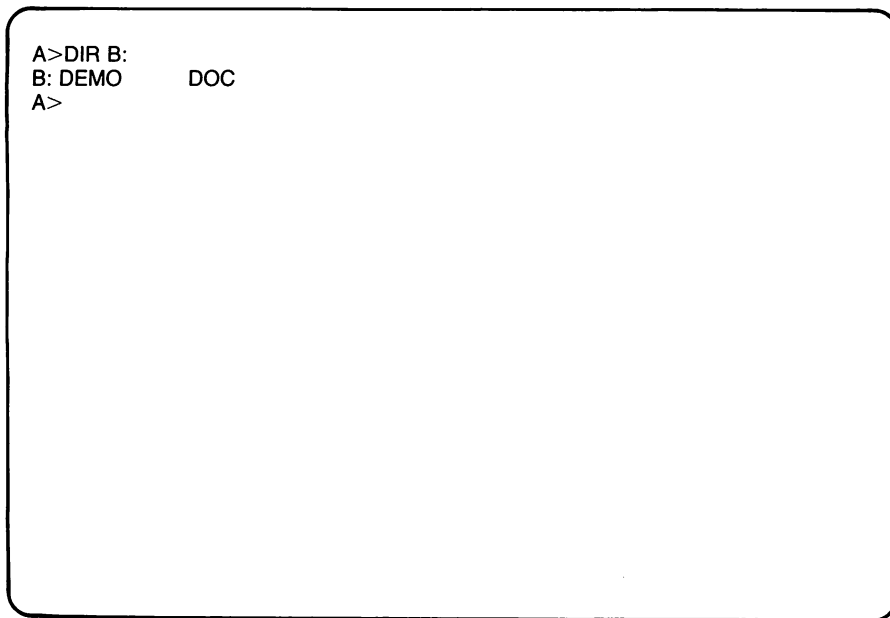
The MAINT command runs the file maintenance program which lets you perform the routine “housekeeping” tasks associated with using diskettes.

```
A>DIR
A: HELP      CMD: MAINT  CMD: PIP      CMD: COPY     COM
A: RED       CMD: DEMO   DOC: STAT     CMD: SUBMIT   CMD
A: SYSCOPY   SUB

SYSTEM FILE(S) EXIST
A>
```

Screen 6. DIR Command

MR-S-2722-83



Screen 7. PIP Command

MR-S-2723-83

Looking at the Diskette Directory . When you type the MAINT command, the files stored on the active diskette are displayed on the screen. This directory of files remains on the screen until you exit MAINT. While viewing the directory, you can move the cursor around and use special function keys (see Figure 3) to:

- Display the contents of files
- Rename files
- Delete files

Try the following examples to see how the MAINT command works.

1. You can list the files stored on the CP/M-86/80 working diskette in drive A on the screen while using MAINT. Type:

A>MAINT<Ret>

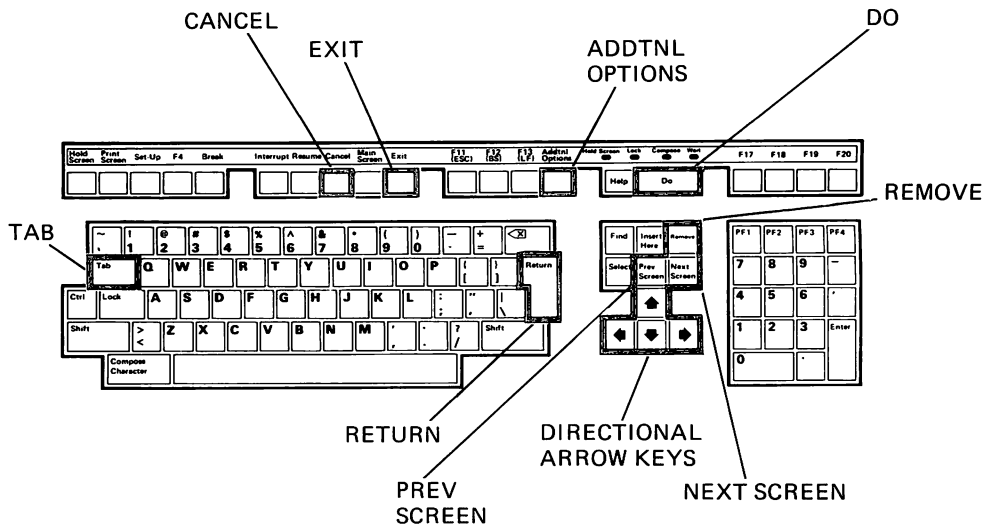


Figure 3. MAINT Keys

MR-8587

MAINT erases the text on the screen and displays the directory of the diskette (see Screen 8). (The values shown in the screens in this guide, such as the file size, displayed under the kilobyte heading (KBs), may not be the same as those on your screen.)

2. You can list summary information about the CP/M-86/80 working diskette while using **MAINT**. Press:

Next Screen

Screen 9 lists summary information about the diskette.

3. To return to the **MAINT** directory, press:

Prev Screen

Displaying a File . You can display the contents of any text file, a file composed of printable characters, on the screen while using **MAINT**.

1. To display the contents of **DEMO.DOC**, move the cursor by using the arrow, Tab, or Return keys to the first D in the file name **DEMO.DOC**.

Drive: A File Specification: ???????? ??? User: 0

FileName	Typ	Attrib	KBs	FileName	Typ	Attrib	KBs	FileName	Typ	Attrib	KBs
ASM	COM	RW Sys	8	HELP	CMD	RW Dir	8	RED1	OVL	RW Sys	2
ASM86	CMD	RW Sys	26	HELP	HLP	RW Sys	24	RED2	OVL	RW Sys	2
COPY	COM	RW Dir	4	LDCOPY	CMD	RW Sys	12	REDHELP	FIL	RW Sys	10
CPM	SYS	RW Sys	16	LMCMD	CMD	RW Sys	6	SAVE	CMD	RW Sys	2
DDT	COM	RW Sys	6	LOAD	COM	RW Sys	2	STAT	CMD	RW Dir	10
DDT86	CMD	RW Sys	14	MAINT	CMD	RW Dir	22	SUBMIT	CMD	RW Dir	4
DEMO	DOC	RW Dir	2	PIP	CMD	RW Dir	8	SYSCOPY	SUB	RW Dir	2
DUMP	COM	RW Sys	2	PRMTVPVT	SYS	RW Sys	2	Z80	SYS	RW Sys	2
ED	CMD	RW Sys	10	RED	CMD	RW Dir	8	Z80CCP	SYS	RW Sys	4
GENCMD	CMD	RW Sys	6	RED	OVL	RW Sys	22				

Screen 8. MAINT Command

MR-S-2740-83

Drive: A File Specification: ???????? ??? User: '0

File Space Allocation Summary

	KBs	FCBs
This User :	70	10
Other Users:	0	0
Available :	316	118
Total :	386	128

Disk Access: R/W

Screen 9. Displaying Diskette Summary Information

MR-S-2322-82

NOTE: *The arrow keys move the cursor character by character in the direction of the arrows; the Tab key moves the cursor horizontally to the first character of the next file name; and the Return key moves the cursor to the first character of the next line.*

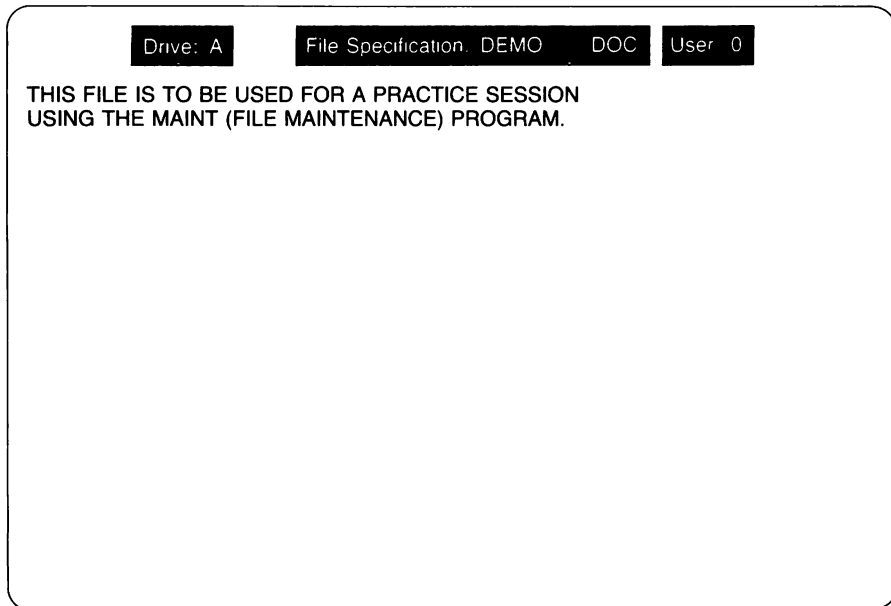
2. Press:

Addnl Options

MAINT erases the directory and then displays the contents of DEMO.DOC on the screen (see Screen 10).

3. To return to the MAINT directory, press:

Exit



Screen 10. Displaying Contents of a File

MR-S-2323-82

Renaming a File . You can change the name of a file by typing the new name directly over the old name while using MAINT.

1. To change the name of DEMO.DOC to FILE.DOC, move the cursor by using the arrow, Tab, or Return keys to the first D in the file name DEMO.DOC.
2. Type:

FILE

Notice that, when you type the first character of the new file name (F in this case), MAINT displays the file entry in boldface characters. A file entry consists of the file name, file type, file attributes, and file size. The boldface characters serve as a reminder that you have “marked” the file for a name change. MAINT does not rename the file until you press the Do key.

***NOTE:** If you decide not to change the file name, before you press the Do key, you can press the Cancel key to ignore the command to change the name. The file entry is returned to its normal state.*

3. This example changes the file name, so press:

Do

When you press the Do key, MAINT momentarily erases the screen. Then, MAINT displays the new directory (see Screen 11). Notice that, DEMO.DOC is no longer in the directory, but FILE.DOC is.

Erasing a File . Eventually, space on a diskette is used up as you create text files or generate data by running programs. You can free up space by deleting files that are no longer needed while using MAINT.

1. To erase the file FILE.DOC, move the cursor by using the arrow, Tab, or Return keys to the F in the file name FILE.DOC.
2. Press:

Remove

Drive A				File Specification ????????				User 0			
FileName	Typ	Attrib	KBs	FileName	Typ	Attrib	KBs	FileName	Typ	Attrib	KBs
ASM	COM	RW Sys	8	HELP	CMD	RW Dir	8	RED1	OVL	RW Sys	2
ASM86	CMD	RW Sys	26	HELP	HLP	RW Sys	24	RED2	OVL	RW Sys	2
COPY	COM	RW Dir	4	LDCOPY	CMD	RW Sys	12	REDHELP	FIL	RW Sys	10
CPM	SYS	RW Sys	16	LMCMD	CMD	RW Sys	6	SAVE	CMD	RW Sys	2
DDT	COM	RW Sys	6	LOAD	COM	RW Sys	2	STAT	CMD	RW Dir	10
DDT86	CMD	RW Sys	14	MAINT	CMD	RW Dir	22	SUBMIT	CMD	RW Dir	4
DUMP	COM	RW Sys	2	PIP	CMD	RW Dir	8	SYSCOPY	SUB	RW Dir	2
ED	CMD	RW Sys	10	PRMTVPVT	SYS	RW Sys	2	Z80	SYS	RW Sys	2
FILE	DOC	RW Dir	2	RED	CMD	RW Dir	8	Z80CCP	SYS	RW Sys	4
GENCMD	CMD	RW Sys	6	RED	OVL	RW Sys	22				

Screen 11. Directory After Renaming a File

MR-S-2741-83

Notice that, when you press the Remove key, MAINT displays the file entry within a reverse video block. This reverse video block serves as a reminder that you have “marked” the file for deletion. MAINT does not delete the file until you press the Do key.

NOTE: *If you decide not to delete the file, before you press the Do key, you can press the Cancel key to ignore the command to delete the file. The file entry is returned to its normal state.*

3. To delete the file, press:

Do

When you press the Do key, MAINT momentarily erases the screen. Then, MAINT displays the new directory (see Screen 12). Notice that, FILE.DOC is no longer in the directory.

Drive: A				File Specification: ????????				User: 0			
FileName	Typ	Attrib	KBs	FileName	Typ	Attrib	KBs	FileName	Typ	Attrib	KBs
ASM	COM	RW Sys	8	HELP	HLP	RW Sys	24	RED1	OVL	RW Sys	2
ASM86	CMD	RW Sys	26	LDPCOPY	CMD	RW Sys	12	RED2	OVL	RW Sys	2
COPY	COM	RW Dir	4	LMCMD	CMD	RW Sys	6	REDHELP	FIL	RW Sys	10
CPM	SYS	RW Sys	16	LOAD	COM	RW Sys	2	SAVE	CMD	RW Sys	2
DDT	COM	RW Sys	6	MAINT	CMD	RW Dir	22	STAT	CMD	RW Dir	10
DDT86	CMD	RW Sys	14	PIP	CMD	RW Dir	8	SUBMIT	CMD	RW Dir	4
DEMO	DOC	RW Dir	2	PRMTVPT	SYS	RW Sys	2	SYSOCOPY	SUB	RW Dir	2
ED	CMD	RW Sys	10	RED	CMD	RW Dir	8	Z80	SYS	RW Sys	2
GENCMD	CMD	RW Sys	6	RED	OVL	RW Sys	22	Z80CCP	SYS	RW Sys	4
HELP	CMD	RW Dir	8								

Screen 12. Directory After Erasing a File

MR-S-2742-83

Exiting from MAINT . You exit MAINT while viewing the directory. Press:

Exit

MAINT erases the directory and the operating system displays its prompt:

A>

NOTE: The housekeeping tasks shown in the discussion of MAINT can also be performed by using the DIR, DIRS, STAT, ERA, REN, and TYPE commands. Refer to Chapter 5 for information about these commands.

Changing the Active Drive

Unless you specify a drive name when you type a command, the CP/M-86/80 operating system assumes that commands act on the files stored on the diskette in the active drive. The active or default drive is named in the prompt. However, any time the CP/M-86/80 operating system displays its prompt, you can tell it to access a different drive and type a command.

There are two ways to access another drive:

1. Specify another drive name as the active drive and then type the command. This causes the computer to access the other drive until it is told to do otherwise.

This method is convenient if you want to work on the other drive for some time, perhaps to run a program and store its results on the diskette in that drive.

- To change the active drive to drive B, type:

```
A>B:<Ret>
```

The operating system displays:

```
B>
```

Drive B is now the active drive. Notice that, the new active drive is named in the prompt. If you now type a command without specifying a drive location, the command defaults to drive B.

- To list the files on the diskette in drive B, type:

```
B>DIR<Ret>
```

The operating system displays:

```
B:DEMO DOC
```

```
B>
```

Screen 13 shows the entire dialog.

2. Specify the drive name after typing the command. This causes the computer to access the other drive only while executing the command; afterward, the computer automatically returns to the active drive.

This method is useful if you want to do something briefly on another drive and then continue working on the active one. It is also useful when you want to run a program that is stored on a diskette in another drive.

- To list the files on the CP/M-86/80 working diskette in drive A, type:

```
B>DIR A:<Ret>
```

```
A>B:  
B>DIR  
B: DEMO      DOC  
B>
```

Screen 13. Changing the Active Drive

MR-S-2727-83

Screen 14 shows the entire dialog.

- To change the active drive back to drive A, type:

```
B>A:<Ret>
```

The operating system accesses drive A and displays its prompt, indicating that drive A is now the active drive.

```
A>
```

Using File References

A file reference identifies a particular file or group of files on a diskette. The CP/M-86/80 operating system accepts references for two kinds of file names:

- Unambiguous file names, which identify a specific file.
- Ambiguous file names, which identify one or more files meeting certain criteria.

```
B>
B>DIR A:
A: HELP      CMD: MAINT   CMD: PIP      CMD: COPY     COM
A: RED       CMD: DEMO    DOC: STAT    CMD: SUBMIT   CMD
A: SYSCOPY  SUB

SYSTEM FILE(S) EXIST
B>
```

Screen 14. Accessing Another Drive

MR-S-2728-83

Ambiguous file names are useful when you want to:

- Find a file whose exact name you have forgotten
- Enter a command that acts on several files at once

You use ambiguous file references by substituting a question mark, `?`, or an asterisk, `*`, for part of an unambiguous file name as follows:

- A question mark matches any single character in the same position as the question mark.
- An asterisk matches part of or all of an entire file name or file type. The asterisk could match from one to eight characters in the file name and from one to three characters in the file type.

To see how the ambiguous file references work, try the following examples.

1. To list all the files on the CP/M-86/80 working diskette in drive A that begin with the letter M and have a .CMD file type (see Screen 15a), type:

```
A>DIR M??????.CMD<Ret>
```

2. To list all the files on the CP/M-86/80 working diskette in drive A with a .CMD file type (see Screen 15b), type:

```
A>DIR *.CMD<Ret>
```

Because * and ? can replace characters, they are known as wildcards. Only certain commands accept wildcards as part of the file name. See Chapter 5 for more information. You cannot use a wildcard to replace a drive name.

Reinitializing the Operating System

Whenever the CP/M-86/80 operating system was previously started and you want to reinitialize it, type <Ctrl/C> directly after the prompt. You should reinitialize the operating system:

- If you change diskettes in a drive, unless the program is expecting the change. Typing <Ctrl/C> directly after the prompt “logs in” or tells the operating system that a new diskette has been inserted. You can change diskettes whenever the prompt is displayed and the drive lights are not lit.
- If the computer encounters some condition that causes it to stop.

When you type <Ctrl/C> (shown as ^C on the screen), you should hear clicking sounds from the drive. If you do not hear clicking sounds, type <Ctrl/C> again. After you type <Ctrl/C>, the operating system displays its prompt.

Resetting the Rainbow 100 Computer

When the Rainbow 100 computer encounters a condition it cannot deal with, it may not display a message or may not respond to any key you type. If this happens, or if you want to start over for some reason, reset the Rainbow 100 computer. You reset the Rainbow 100 computer while it is turned on with diskettes in or out of the drives. To do this:

```
A>DIR M???????.CMD
A: MAINT      CMD
A>
```

Screen 15a. Using File References

MR-S-2328-82

```
A>DIR *.CMD
A: HELP      CMD: MAINT    CMD: PIP      CMD: RED      CMD
A: STAT      CMD: SUBMIT   CMD
SYSTEM FILE(S) EXIST
A>
```

Screen 15b. Using File References

MR-S-2729-83

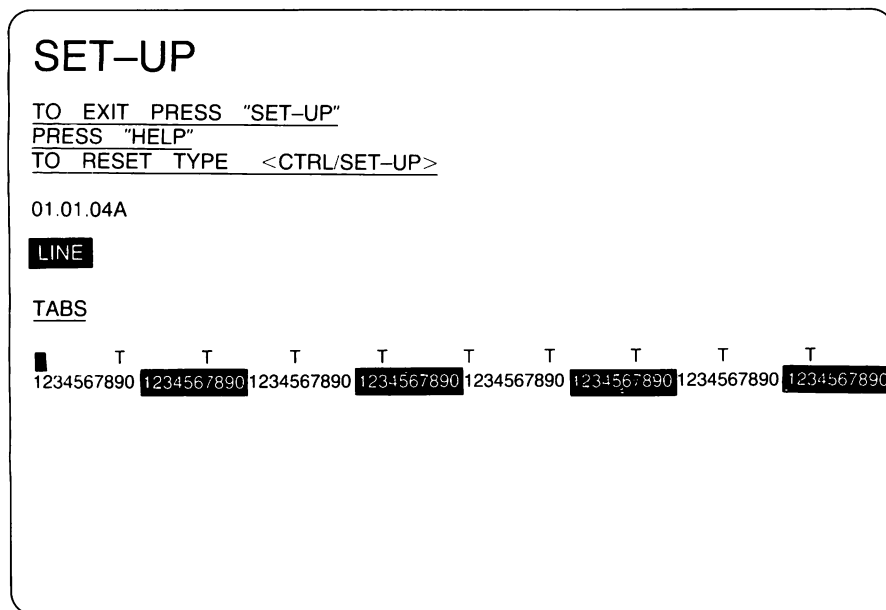
Introducing the CP/M-86/80 Operating System

1. Press the Set-Up key. The text in your screen should look like that in Screen 16.
2. Then type <Ctrl/Set-Up> by holding down the Ctrl key while pressing the Set-Up key.

After you press these keys, the Rainbow 100 computer automatically verifies that all of its components work. The following message is displayed while the components are being checked:

TESTING...

About four seconds later, the test is completed. If no errors are detected, the Rainbow 100 computer then displays the Main System Menu. Resetting the Rainbow 100 computer returns it to a state of being turned off and then on again without pressing the power switch.



Screen 16. Set-Up Display

MR-8168

Error Messages and Conditions

Error messages can display for a variety of reasons. For example, an error message is displayed if you:

- Type a command incorrectly.
- Type an invalid command.
- Forget to type <Ctrl/C> after changing diskettes.
- Omit some information the operating system needs to process the command.
- Select a nonexistent drive.

You cannot anticipate all the conditions that can cause an error message. However, if you get an error message:

- Check for spelling errors and then retype the command if you find any errors.
- Check the list of commands in Chapter 5 to determine if the command you typed is a valid CP/M-86/80 command.
- Type <Ctrl/C> to reinitialize the operating system.
- Refer to Chapter 5 for further discussion of the commands or to Chapter 8 for a list of error messages, what they mean, and what to do about them.

2

Introducing the Rainbow 100 Keyboard

This chapter describes the Rainbow 100 keyboard. You can find more detailed information on how some of the keys work with the CP/M-86/80 operating system in Chapter 1.

Rainbow 100's Keyboard Layout

With the exception of the top row and the middle group of keys, the Rainbow 100 keyboard resembles that of a standard typewriter keyboard (see Figure 4).

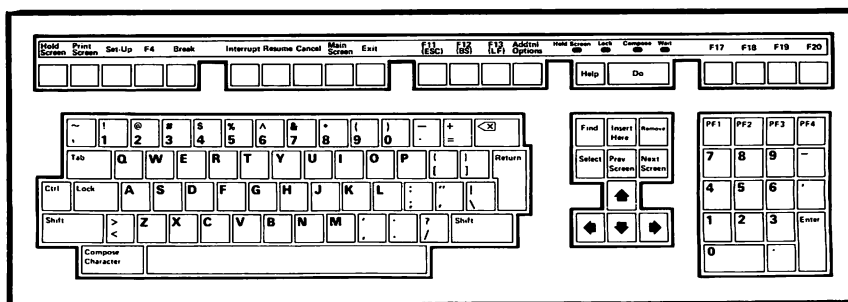


Figure 4. Rainbow 100 Keyboard

MR-8144

Introducing the Rainbow 100 Keyboard

The main difference between a standard typewriter and the Rainbow 100 keyboard is the groups of additional keys on the Rainbow 100 keyboard. These keys have special functions when you use the CP/M-86/80 operating system. They can also have special functions when you use application programs on the Rainbow 100 computer.

Rainbow 100 Keys

The Rainbow 100 keys are divided into four categories:

1. Standard Keys
2. Editing and Cursor Keys
3. Numeric Keypad Keys
4. Function Keys

Standard Keys

Figure 5 identifies the standard typewriter keys.

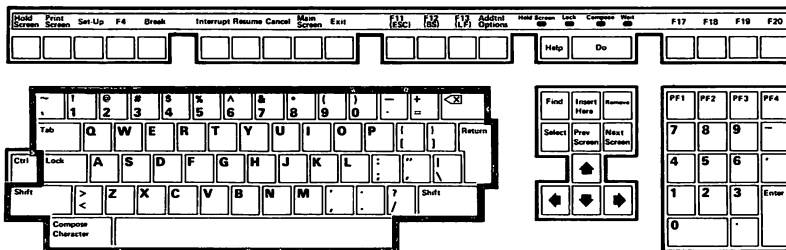


Figure 5. Rainbow 100 Standard Keys

MR-8896

The Shift and Lock keys modify standard key characters. They do not modify numeric keypad characters. Their functions are described in the following paragraphs.

Shift . When you hold down the Shift key, the standard keys on the main keyboard generate upper case characters. You can also use Shift with the function keys.

Lock . If you press the Lock key and the Lock keyboard indicator turns on, the alphabetic keys generate uppercase characters. Lock does not affect the function and numeric keypad keys.

***NOTE:** Lock does not affect the numeric and special symbol keys. Therefore, Lock does not operate like the Shift Lock of a typewriter.*

Editing and Cursor Keys

Refer to Figure 6 for the following key locations, and to Table 2 for the characters that are displayed on the screen when these keys are pressed while using the CP/M-86/80 operating system.

***NOTE:** Certain application programs can make use of these keys, but the CP/M-86/80 operating system does not understand them.*

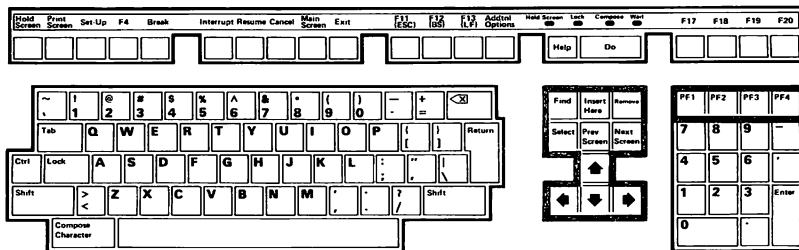


Figure 6. Rainbow 100 Editing and Cursor Keys

MR-8773

Table 2. Rainbow 100 Editing and Cursor Keys

Key	Characters Displayed
Find	^[1~
Insert Here	^[2~
Remove	^[3~
Select	^[4~
Prev Screen	^[5~
Next Screen	^[6~
Up Arrow	^[A
Down Arrow	^[B
Right Arrow	^[C
Left Arrow	^[D
PF1	^[OP
PF2	^[OQ
PF3	^[OR
PF4	^[OS

Numeric Keypad Keys

The Rainbow 100 numeric keypad, as shown in Figure 7, makes certain calculator-like or number-handling programs easier to use. Except for the programmable function keys, PF1 through PF4, the numeric keypad keys duplicate the functions of the corresponding keys on the standard keyboard. The Enter key functions in the same way as the Return key.

The numeric keypad and the programmable function keys can be redefined by application programs.

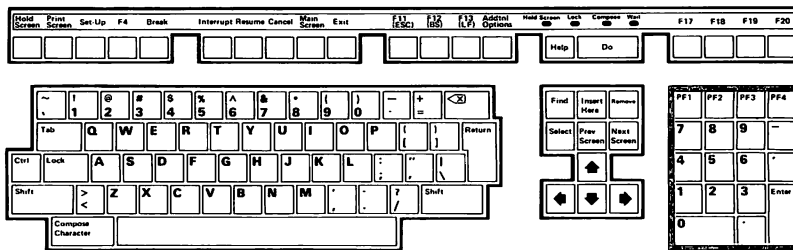


Figure 7. Rainbow 100 Numeric Keypad Keys

MR-8775

Special Function Keys

Refer to Figure 8 for the following key locations.

These keys have no effect when pressed before, during, or after a command is typed. They are intended for later use by application programs (see Table 3).

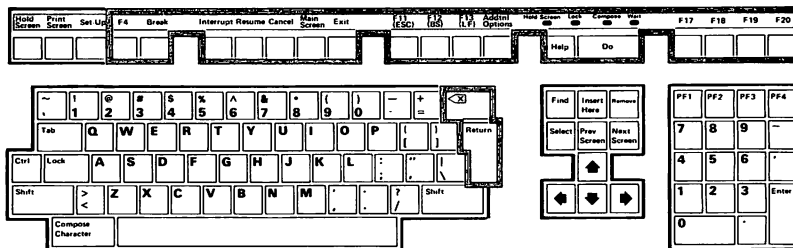


Figure 8. Rainbow 100 Special Function Keys

MR-8774

The following keys are also special function keys that are used by the CP/M- 86/80 operating system.

Backspace . The backspace key, labeled (BS) on the label strip, moves the cursor to the left and erases the character.

Delete Character . The delete character key usually acts as a backspace key, but can repeat the deleted character.

Table 3. Rainbow 100 Special Function Keys

Key	Characters Displayed
F4	^[14~
Interrupt	^[17~
Resume	^[18~
Cancel	^[19~
Main Screen	^[20~
Exit	^[21~
(ESC)	^[
Addnl Options	^[26~
Help	^[28~
Do	^[29~
F17	^[31~
F18	^[32~
F19	^[33~
F20	^[34~
Compose	^[10~

Return and Line Feed . Pressing either of these two keys tells the operating system that you finished typing a command and want the command executed.

Control . The control key, Ctrl on the keyboard, is a special key which is used in conjunction with certain other keys. When the control key is combined with these other keys, a simple command is sent to the CP/M-86/80 operating system.

To enter control commands, you hold down the control key while you press the required letter key.

A list of control keys used by the CP/M-86/80 operating system and their function follow.

Table 4. Control Keys

Control Key	Function Performed
<Ctrl/C>	Stops a running program, if one is running; reinitializes the operating system if typed on a command line.
<Ctrl/H>	Moves the cursor to the left and erases the character; works the same as the backspace key.
<Ctrl/I>	Works the same as the Tab key.
<Ctrl/J>	Works like the line feed, labeled (LF) on the keyboard label strip, and Return keys by stopping the display on the screen.
<Ctrl/M>	Works the same as a carriage return.
<Ctrl/P>	Repeats all console activity at the printer; a second <Ctrl/P> ends the repetition. This only works if the Rainbow 100 computer is connected to a printer.
<Ctrl/Q>	Restarts scrolling if stopped by a <Ctrl/S>.
<Ctrl/R>	Retypes the current command line; does not send the command to the operating system.
<Ctrl/S>	Stops console scrolling temporarily until <Ctrl/S> is pressed again; works the same as the Hold Screen key.
<Ctrl/U>	Cancels the command and displays a #. The cursor moves down one line, and the operating system waits for new command.
<Ctrl/X>	Deletes all characters in the command line.
<Ctrl/Z>	Ends a character sequence.

NOTE: The Set-Up key and Print Screen key are also contained in the top row of keys. The Set-Up key is discussed in Chapter 3, and the Print Screen key is discussed in Chapter 4.

Keyboard Indicators

Refer to the keyboard and examine the four labels seen in Figure 9. These are the keyboard indicators.

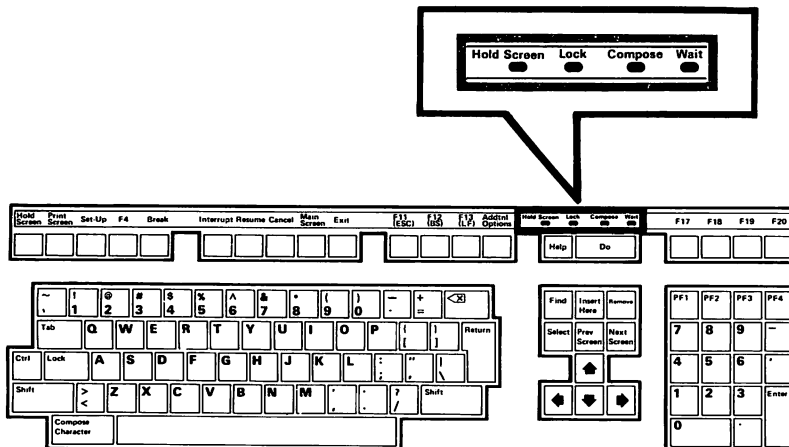


Figure 9. Rainbow 100 Keyboard Indicators

MR-8140

The Hold Screen indicator turns on when you press the Hold Screen key. The Hold Screen key allows you to look at what is on the screen without changing it. Pressing the Hold Screen key suspends what you are doing and freezes the contents of the monitor screen, for example when using the TYPE command. This also means that the characters you type are not displayed until you press the Hold Screen key again.

The Lock indicator turns on when you press the Lock key. When the Lock indicator is on, only uppercase letters are generated. The Lock indicator acts as a reminder that you must press the Lock key again to resume typing lowercase characters. It does not effect the numeric or punctuation keys.

The Compose indicator does not turn on when you press the Compose key in the CP/M-86/80 operating system. However, when pressed it does display a series of characters that look like this: ^[[10~.

The Wait indicator turns on when the keyboard is “locked.” This means that characters typed from the keyboard are no longer received by the operating system and are lost. Keyclicks do not sound when the Wait indicator is on. You must wait until the indicator turns off before typing again.

3

Setting Rainbow 100 Features

The Rainbow 100 computer provides several Set-Up features that affect tab stops, screen background, keyclick volume, and so forth. Some of these feature selections can be set according to your preference. Some, however, must be set in specific ways for the CP/M-86/80 operating system to run. For feature selections that involve a printer or communications device refer to the *Rainbow 100 Owner's Manual*.

Some of the Rainbow 100 features you can check and change are:

- Number of columns (80 or 132)
- Tab settings
- Cursor style
- Automatic repeating of keyboard keys
- Screen background (light or dark)
- Margin bell
- Keyclick volume
- Scroll rate and type

Setting Rainbow 100 Features

You can also reset the computer, save selections, or restore previous settings.

Setting Features

To check or change the Rainbow 100 Set-Up features, you press the Set-Up key (see Figure 10). Pressing the Set-Up key puts the Rainbow 100 computer in Set-Up. You can press the Set-Up key any time after the Main System Menu is displayed. It is not necessary to insert a diskette.

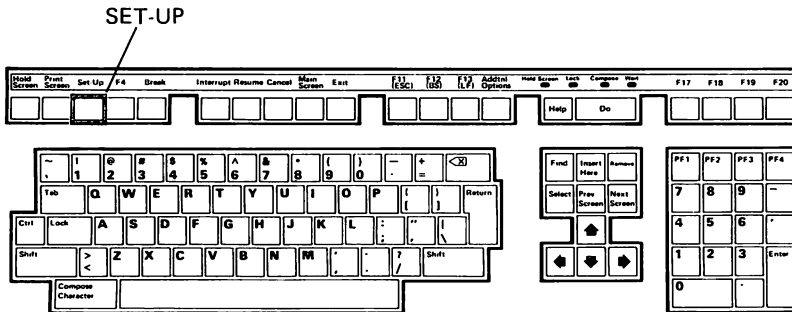
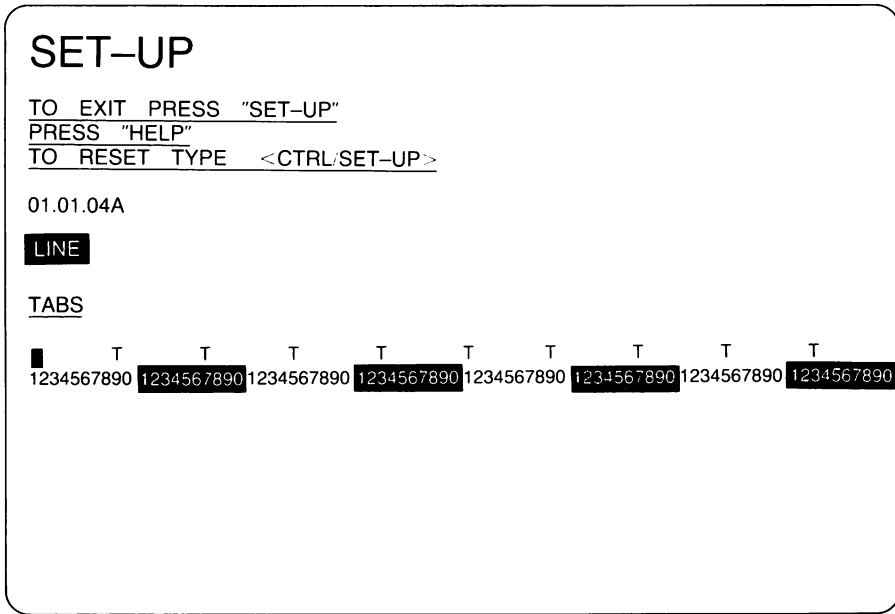


Figure 10. Set-Up Key

MR-8141

Pressing the Set-Up key causes the computer to display the Set-Up Display (also called the Tabs Major Heading Display) shown in Screen 17.



Screen 17. Set-Up Display

MR-8168

When you first press the Set-Up key, any text on the screen is temporarily replaced by the Set-Up display. When you press the Set-Up key to exit from Set-Up, the original text is displayed again. If you enter Set-Up while text is scrolling, moving on the screen, the text stops scrolling until you exit Set-Up. At that point scrolling resumes.

Once in Set-Up, you can use the keys shown in Figure 11 to check and change Rainbow 100 features.

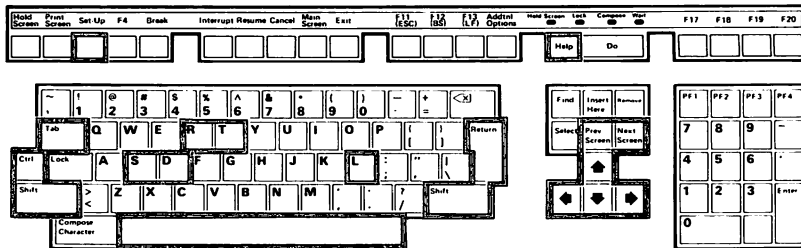


Figure 11. Set-Up Keys

MR-8142

Setting Rainbow 100 Features

All of the Set-Up displays contain the same top four lines (refer to Screen 17) where:

Set-Up	Is the screen title.
To Exit Press "Set-Up"	Pressing the Set-Up key returns you to the operating system or the text.
Press "Help"	Pressing the Help key gives you more information.
To reset type <Ctrl/Set-Up>	Holding down the control key while pressing the Set-Up key resets the computer.

The fifth line contains the version number which can be different from the one in Screen 17.

The sixth line can either be line or local on a light video background. Figure 12 shows an example of what is meant by video backgrounds. The term reverse video is also used when referring to a light screen background.

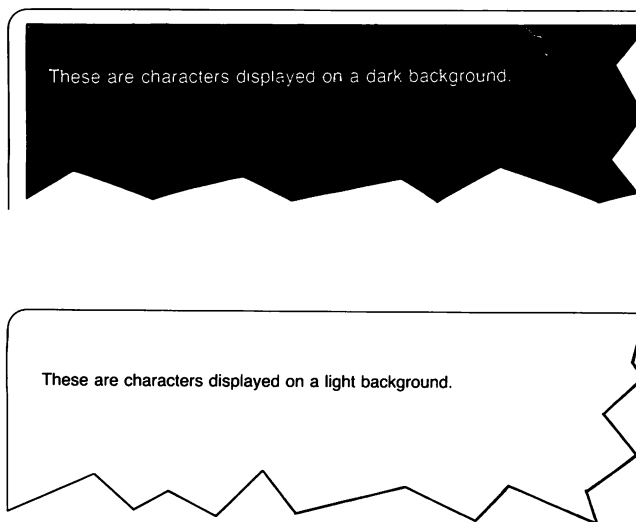


Figure 12. Dark and Light Video Backgrounds

MR-8888

The seventh line contains a major feature heading, and the last lines contain settings and/or minor feature headings.

Set-Up Headings

Set-Up has the following six major headings:

1. Tabs
2. Parameter Settings
3. Modem
4. Printer
5. Miscellaneous
6. Memory

This chapter is only concerned with three headings: Tabs, Parameter Settings, and Miscellaneous.

You move from one major heading to another by using the Next Screen or Prev(ious) Screen keys (see Figure 13). After you are in a major heading, you check the minor headings by using the (←) left and (→) right arrow keys.

Set-Up displays the current setting for a feature in reverse video and/or a boldface cursor. Several values can be associated with each setting; you view these values by pressing the (↑) up arrow or the (↓) down arrow keys (see Figure 13).

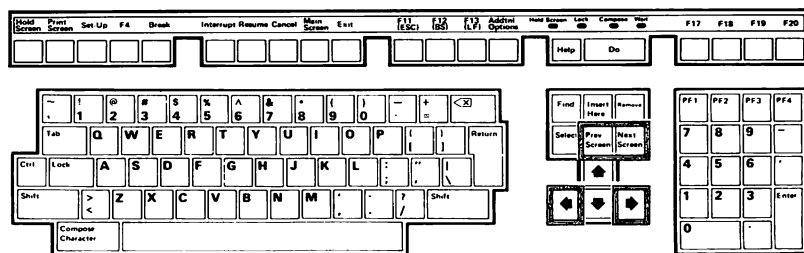
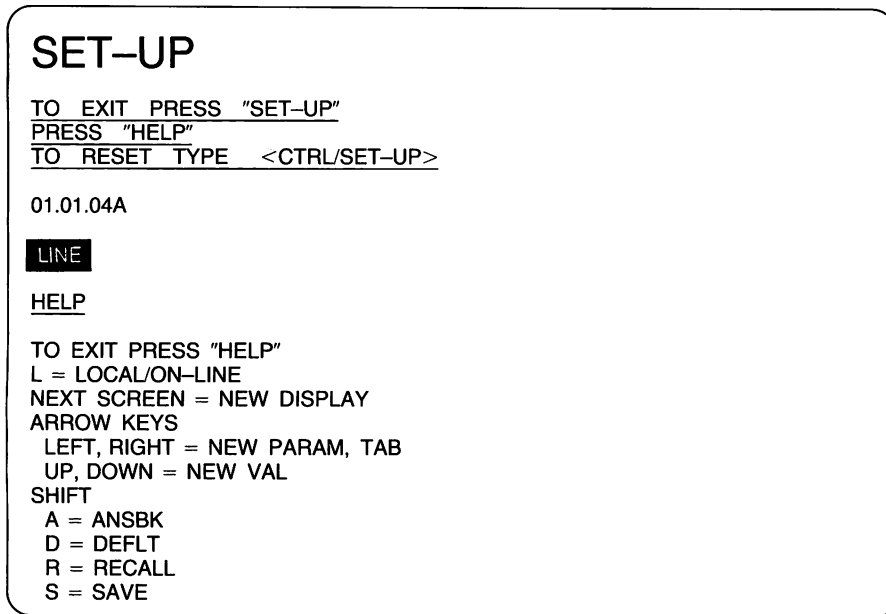


Figure 13. Keys to View Major and Minor Headings

MR-8816

Using the Help Feature

An additional feature available in Set-Up is the Help screen (see Screen 18). While in Set-Up, you can press the Help key located on the right side in the top row of keys. The message displayed acts as a quick reminder of how to change features in Set-Up.



Screen 18. Help Screen

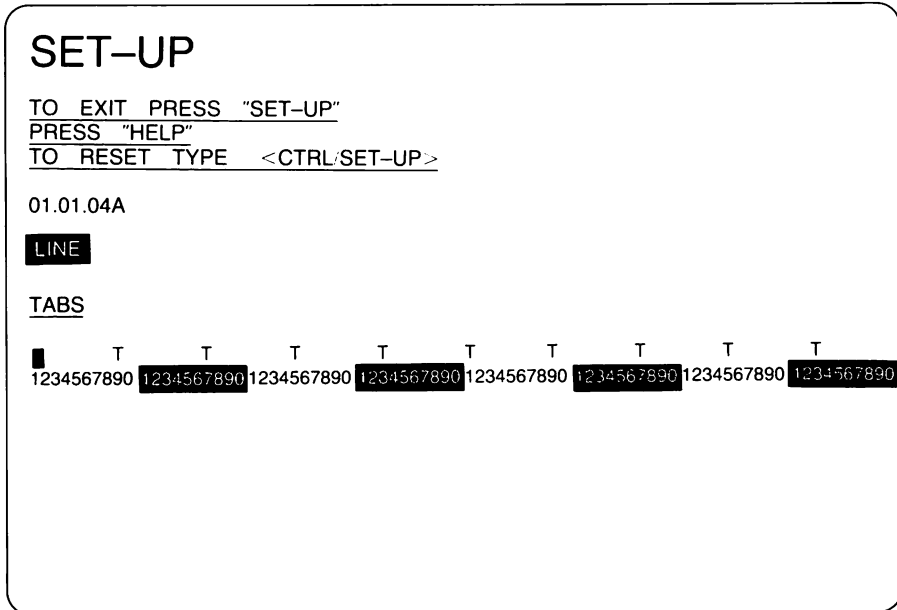
MR-8861

To exit the Help screen, press the Help key. To exit Set-Up while displaying the Help screen, press the Help key first, then the Set-Up key. To reset the computer while displaying the Help screen, press the Help key, then do the reset command.

Tabs Major Heading

When you first press the Set-Up key, you are in the Tabs major heading (see Screen 19). While viewing the Tabs major heading, you can do the following:

1. Switch the computer between on-line and local operations.
2. Change tab stop settings.
3. Move to another major setting by pressing the Next Screen key.
4. Return to a previous major heading by pressing the Prev(ious) Screen key.



MR-8168

Screen 19. Tabs Major Heading

Local and Line

The Rainbow 100 computer normally operates in line mode. When on-line, the keyboard communicates with the CP/M-86/80 operating system. Local mode is used when the computer is in terminal mode (see Chapter 4). If you want to change this feature, you press the L key.

Tab Stops

Across the middle of the Tabs major heading, is a series of numbers (see Screen 19). These numbers represent the columns on the screen in which you type characters. There are either 80 or 132 possible tab stops depending on the screen width setting. The T's indicate the current tab stop settings.

***NOTE:** The CP/M-86/80 operating system does not recognize any settings other than 8, 16, 24, and so on and defaults to those settings. However, in terminal mode and when using some applications, Tabs can be changed to other settings. The process described here is used for those situations.*

You use the left and right arrow keys, the Return key, the Tab key, or the space bar to move the cursor to the numbered locations. Follow the instructions below to change the Tab settings.

Purpose	Action
1. To clear all tab stops	Type <Ctrl/Tab>
2. To move the cursor to a new setting	Press space bar, ←, →, Return, or Tab
3. To set the new tab stop (To set more than one Tab stop repeat steps 2 and 3.)	Press T or the up and down arrow keys
4. To save the new tab stops	Type <Shift/S>

If you want to return to the original factory (default) tab stops, type:

<Shift/Tab>

Parameter Major Heading

If you are in the Tabs major heading and press the Next Screen key, Parameter major heading is displayed (see Screen 20). A parameter is a definable characteristic. You define or determine the features you want to change on the Rainbow 100 computer.

```

SET-UP
TO EXIT PRESS "SET-UP"
PRESS "HELP"
TO RESET TYPE <CTRL SET-UP >

01.01.04A
LINE
PARAM SET
1 101 11001000 101110101001
SCROLL
0 - JUMP
1 - SMOOTH

```

* CURSOR

MR-8169

Screen 20. Parameter Major Heading

The first feature you can change is Scroll (see Screen 20). Scrolling refers to the movement of the text on the screen as you type or issue commands. Text scrolls up from the bottom of the screen, so you can view it.

Look at Screen 20. It shows the major heading as *PARAM SET*. Below it is a series of 1's and 0's (on's and off's). The series shown in Screen 20 also indicates the default settings. This is followed by the minor heading *SCROLL*. Next the feature choices are listed. The 0 is for jump scrolling, and the 1 is for smooth scrolling. This screen pattern is basically the same for all of the other minor headings. Their values are listed in Table 5 along with a description of each feature. The features not listed here are described in the *Rainbow 100 Owner's Manual*.

CAUTION: *If you change screen width while text is on the screen, the text is erased and is lost.*

Setting Rainbow 100 Features

Table 5. Minor Headings

Minor Heading	Values	Meaning
Scroll	0 = jump 1 = smooth	Jump scroll displays new lines as fast as they are received. Smooth scroll limits the speed at which new lines are displayed.
Correspondence/ Data Processing Keyboard	0 = off 1 = on	Does not apply to English keyboards used in the United States.
Screen Width	0 = 80 cols. 1 = 132 cols.	Screen width indicates the number of columns per line; one character per column.
Cursor	0 = underline 1 = block	You can choose between two cursor displays, either a blinking underline (_) or a blinking block (■).
Auto Repeat	0 = off 1 = on	This feature repeats a key automatically when you hold it down for more than one-half second. All keys auto repeat except Set-Up, escape, Return, control characters, Compose, Break, Print Screen, Enter, F4, and Hold Screen.
Screen	0 = dark 1 = light	The dark setting shows light characters on a dark background. The light setting shows dark characters on a light background (refer to Figure 12).
Margin Bell	0 = off 1 = on	The margin bell is a tone that you hear when the cursor moves past the eighth character position from the end of the line.
Keyclick	0 = off 1 = on	A keyclick is the sound you hear each time you press a key.
Auto Wrap	0 = off 1 = on	This feature determines where the next character appears when the cursor is at the right margin. When off, the computer writes all characters into the last column of the current line. When on, the characters are displayed on the next line.
Auto Screen Blank	0 = off 1 = on	When on, the screen blanks after 30 minutes and a small rectangle called a "phantom cursor" is displayed. This saves any text remaining on the screen for long periods from becoming "burned" onto the screen.

NOTE: *If the Rainbow 100 screen auto blanks, pressing any key causes text to display again. You should press the Shift or control key because they do not cause any characters to display in the text when pressed.*

A boldface cursor should be on the first digit in the series of 1's and 0's. As you go through the minor headings, the cursor moves along the line of 1's and 0's showing the current settings for that minor heading.

To change a feature press either the up or down arrow keys. Once you change a minor feature move on to the next one by pressing the right arrow key. If at any point you want to look at a previous setting, press the left arrow key.

To return to the beginning of the line of 1's and 0's, press the Return key.

Table 6 lists the keys and how they are used to change Rainbow 100 computer features.

Table 6. Keys to Change Features

Key	Purpose
Next Screen	Displays the next major heading screen.
Prev Screen	Returns you to a previous major heading.
Up or Down Arrow	Changes the minor heading feature.
Right Arrow	Displays the next minor heading.
Left Arrow	Returns you to a previous minor heading.
Return	Returns the first minor heading to the screen.

Use these keys to change any of the features in Table 5. Remember, however, some features must be set specifically for using the CP/M-86/80 operating system.

CP/M-86/80 Settings

For compatibility with the CP/M-86/80 operating system, certain features require the default settings listed in Table 7. Check them against the settings listed in Table 7. Refer to the *Rainbow 100 Owner's Manual* for more information on the CP/M-86/80 compatibility settings.

Table 7. CP/M-86/80 Settings

Feature	Setting	Meaning
Line/Local	Line	Line
Emulation	1	ANSI
Auto Wrap	0	Off
New Line Mode	0	LF (line feed)

Miscellaneous Major Heading

The Miscellaneous major heading includes the following three features:

- Smooth scroll rate
- Bell volume for the keyboard bell
- Keyclick volume for typing comfort

Keyclicks are the sound you hear when you press the keys on the keyboard.

You continue to press the Next Screen key until the Miscellaneous major heading screen displays (see Screen 21). This screen is similar to the Parameter major heading except it lacks the series of 1's and 0's. The keys used for changing these features are the same as for the Parameter major heading listed in Table 6.

SET-UP

TO EXIT PRESS "SET-UP"
PRESS "HELP"
TO RESET TYPE <CTRL/SET-UP>

01.01.04A

LINE

MISC

2 = SCROLL RATE
7 = BELL VOL
7 = CLICK VOL

Screen 21. Miscellaneous Major Heading

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Scroll . The Rainbow 100 smooth scroll speeds are 3, 6, or 12 lines per second (lps). Set the digit to 0 for 3 lps; to 1 for 6 lps; or to 2 for 12 lps. (There are no selections for jump scroll.)

Bell Volume . The bell volume adjusts bell tone for the margin bell and the bell that sounds when you turn on the Rainbow 100 computer. After each bell volume selection: 1 through 8 (8 being the loudest), the bell sounds to indicate the volume adjustment level.

Keyclick Volume . Keyclick volume is adjustable by setting the digit to 1 through 8 (8 being the loudest). After a volume selection, press the keys on the keyboard to check the new volume level.

Saving Set-Up Features

To avoid reselecting certain Set-Up features each time you start up the computer, you can save the feature(s) you want with the Set-Up save operation. To do this:

1. Enter Set-Up.
2. Make the change or confirm the feature(s) you wish to save.
3. Hold down the Shift key while you press the S key (<Shift/S>).

Recalling Set-Up Features

When you change one or more Set-Up features, the computer operates using the new features until you:

- Change the Set-Up features again
- Turn off the computer
- Recall the original features
- Run an application program which changes the features

You can make temporary changes as often as you like, but the computer returns to its initial state whenever you turn off the power, unless you saved the changes. If you wish to return the computer to its original state without turning off the computer power, you can execute the Set-Up recall operation. To do this in Set-Up hold down the Shift key while you press the R key (<Shift/R>).

CAUTION: *The recall operation permanently erases any text on the screen before you entered Set-Up.*

Default Set-Up Values

When you received the Rainbow 100 computer from the factory, the Set-Up features were set to specific values, called default values. To recall these default values, hold down the Shift key while you press the D key (<Shift/D>). The default values are not saved, nor can they be changed. They are just loaded into the operating memory. For more information on these settings see the *Rainbow 100 Owner's Manual*.

CAUTION: *Recalling the default Set-Up values also recalls the default communications, printer, and memory settings. Recalling the default Set-Up values also permanently erases any text you may have on the screen before you entered Set-Up.*

Executing a Reset

When the computer is reset, it performs a brief self-test, recalls its Set-Up features, and displays the Main System Menu. To reset the computer in Set-Up, hold down the control key while you press the Set-Up key (<Ctrl/Set-Up>).

Changing Screen Brightness

You can change the brightness and clarity of the characters displayed on the screen by using two adjustments on the back of the Rainbow 100 monitor (see Figure 14). They perform the same function as the brightness and contrast controls on a television set.

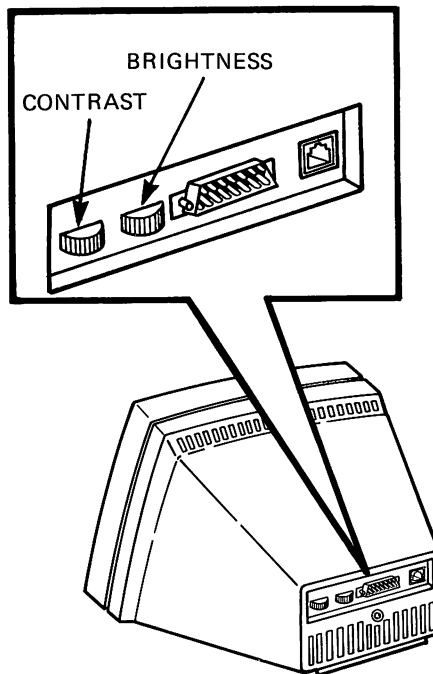


Figure 14. Brightness and Contrast Adjustments

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4

Communicating With Another Computer

Terminal mode allows the Rainbow 100's computer to communicate with another computer, called a host. In terminal mode, the Rainbow 100 computer acts like the DIGITAL VT102 terminal. This means certain keyboard and screen features behave like a VT102 terminal. You need to understand and change Rainbow 100 Set-Up features to be compatible with those of the VT102 terminal.

The Rainbow 100 computer uses its keyboard and screen as input and output devices of the host computer (see Figure 15).

The Rainbow 100 computer transmits keyboard entries to the host computer. It then displays characters received from the host computer on its screen or prints them on a printer.

You can perform the following functions when the Rainbow 100 computer is connected to a host computer.

- Access files on the host computer
- Run programs on the host computer
- Use the host computer's networking services
- Use other services the host computer provides

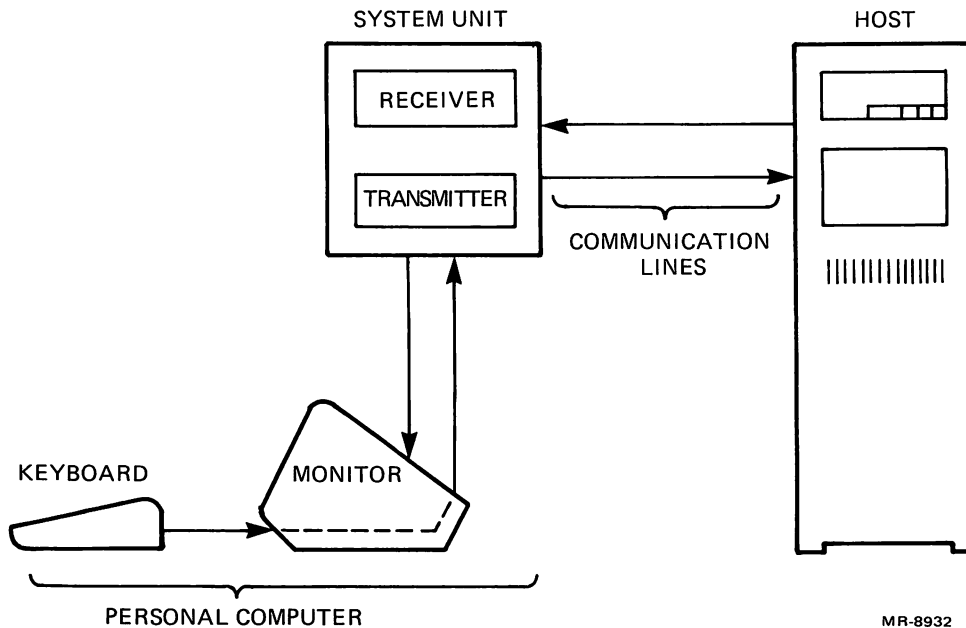


Figure 15. Rainbow 100 Computer Connected to a Host

You can connect the Rainbow 100 computer to a host computer under the following circumstances:

- The host computer must support an ASCII terminal, preferably a VT102 terminal.
- The Rainbow 100 computer must be connected either directly or through a telephone line to the host computer.
- The Set-Up feature selections must be compatible with the host computer or its application programs.

This chapter describes how to access Rainbow 100's terminal mode. It also provides information on Set-Up, the keyboard, and print commands. For more detailed operating information consult the system manager and the host computer's application software documentation. You can also refer to the *Rainbow 100 Owner's Manual* and the *VT102 Video Terminal User Guide*. These sources provide the following information:

1. How to connect to a host computer
2. How to change Set-Up features for terminal mode operations
3. How to connect a printer

Changing Set-Up Features

Before using terminal mode, it is important that the communication and printer Set-Up features be changed to allow communication with the host computer and the printer.

Table 8 lists the settings you change for communication with a host computer, and Table 9 lists the settings you change for communication with a printer after you enter Set-Up. (Refer to Chapter 3 of this guide for the steps used to change and review Set-Up features.) These feature changes require specific information from the system manager or the host computer's documentation. Unless these changes are made, you will be unable to communicate with either the host computer or a printer.

Table 8. Host Communication Settings

Major Heading	Minor Heading
Parameter	Modem stop bits
Modem	Data bits/parity Transmit baud rate Receive baud rate Protocol(FDXA)

Table 9. Printer Communication Settings

Major Heading	Minor Heading
Parameter	New line mode Print termination character
Printer	Data bits/parity Transmit/receive baud rates

NOTE: *It is important that you set the Line/Local feature to Line for communication with a host. However, this feature may be set to either Line or Local for printer communication.*

Accessing Terminal Mode

To access Rainbow 100's terminal mode feature, display the Rainbow 100 Main System Menu (see Screen 22) according to one of the following procedures:

1. If the Rainbow 100 computer is turned off — Make sure that no diskettes are in the drives. Turn on the Rainbow 100 computer with the drive doors opened or closed. The Main System Menu should be displayed on the screen.
2. If the Rainbow 100 computer is turned on — Reset the Rainbow 100 computer by pressing the Set-Up key, followed by typing <Ctrl/Set-Up>. The Main System Menu should be displayed on the screen.



NOTE: Refer to Chapter 8 if the text in Screen 22 does not display or if the screen displays an error message above the Main System Menu.

Before you do anything else it is important to check Set-Up features used in communicating with a host computer. Once the self-test is completed and the Main System Menu is displayed, press the Set-Up key and verify that the features mentioned in the host computer's documentation match the current Set-Up features. If they do not match, change them to the correct settings for terminal mode. (Refer to Chapter 3 of this guide for the steps used to change and review Set-Up features.)

After you have made any necessary changes, exit Set-Up by pressing the Set-Up key. The Rainbow 100 computer redisplay the Main System Menu (Screen 22). No diskettes are needed to run terminal mode. To access terminal mode press:

T

NOTE: Consult the system manager or the host's documentation for what should should display on the screen at this point.

After a successful connection to the host computer, refer to the application program documentation for that computer.

Terminal Mode Keys

In terminal mode certain Rainbow 100 keys are ignored by the host computer. These keys will beep when pressed.

Keys in terminal mode can be divided into the following groups:

- Standard Keys
- Function Keys
- Print Keys

Standard Keys

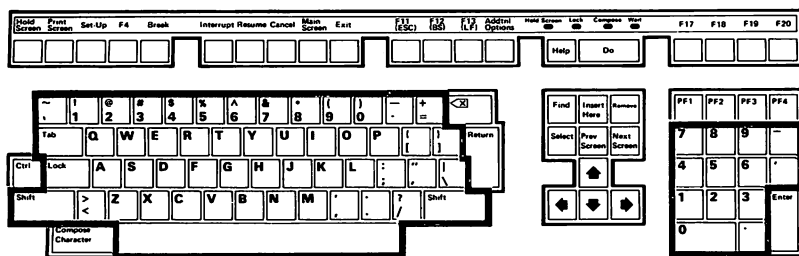
Figure 16 identifies the standard typewriter and numeric keypad keys. The computer can select the numeric keypad to generate the corresponding characters on the main keyboard. The minus, comma, period, and numeric keys on the keypad operate like the corresponding unshifted keys on the keyboard.

The Shift and Lock keys modify standard key characters. They do not modify numeric keypad characters. Their functions are described in the following paragraphs.

Shift . When you hold down the Shift key, the standard keys on the main keyboard generate upper case characters. You can also use Shift with the function keys.

Lock . If you press the Lock key and the Lock indicator turns on, the alphabetic keys generate uppercase characters. Lock does not affect the function and numeric keypad keys.

NOTE: *Lock does not affect the numeric and special symbol keys. Therefore, Lock does not operate like the Shift Lock of a typewriter.*

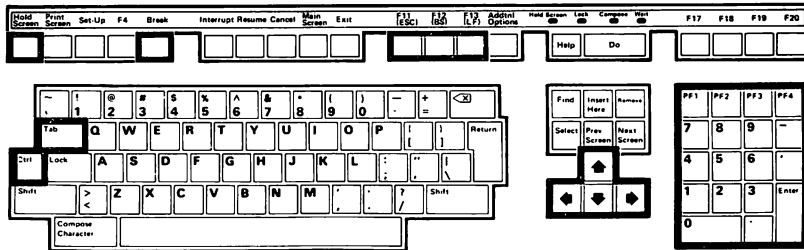


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Figure 16. Terminal Mode Standard Keys

Function Keys

Figure 17 identifies the function keys. The computer can also select the numeric keypad to generate function characters. The application programs define the use of the function keys. Consult the host computer's application documentation for this information.

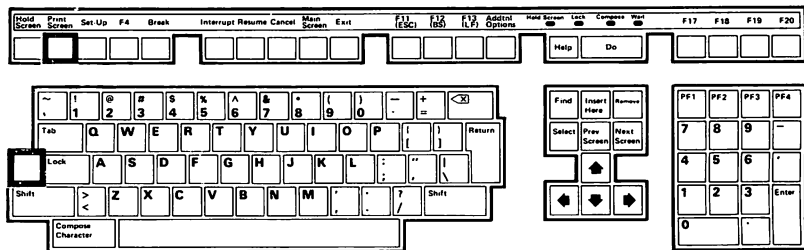


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Figure 17. Terminal Mode Function Keys

Print Keys

Figure 18 identifies the keys that control printing. The optional serial printer can print when the Rainbow 100 computer is set for either line or local operations.



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Figure 18. Terminal Mode Print Keys

Using a Printer

To connect an optional printer and change Set-Up features for printing, refer to the system manager or the host computer's documentation. You can also consult the documentation for the specific printer for additional connection and Set-Up information.

Print Commands

Two commands are used to send text to a printer.

Print Screen . Pressing the Print Screen key causes the printer to print only the text currently on the screen. You can use this command for printing short letters or memos. To do this:

1. Type the text.
2. Press the Print Screen key.

<Ctrl/Print Screen> . If you want to print a complete file, use the control key (Ctrl on the keyboard) and the Print Screen key (<Ctrl/Print Screen>). To do this use the following steps:

1. Type <Ctrl/Print Screen>.
2. Type in a command to display a file on the screen.
3. Press <Ret>.(This step assumes that you have set the New Line feature to 1.)
4. To stop printing type <Ctrl/Print Screen> again.

NOTE: *Printing stops at the end of a file or text. However, if you type another command or more text followed by pressing the Return key, the printer continues to print. You must remember to end all printing sessions with another <Ctrl/Print Screen>.*

5

Using CP/M-86/80 Operating System Commands

This chapter is divided into two sections:

1. Section 1 explains some concepts about commands, files, and diskettes that you need to know to use the CP/M-86/80 operating system commands.
2. Section 2 discusses the most frequently used commands. The commands are listed alphabetically for easy reference.

Section 1: Using Commands and Files

A command generally has three parts:

- The command, which is sometimes called a command keyword
- The optional command tail, which supplies the command with additional information
- The carriage return, which tells the operating system that you are finished typing the command and want to execute the command

Any combination of these parts is known as a command line. An example of a command line follows:

```
DIR MEMO.TXT<Ret>
```

where:

DIR	Is the command
MEMO.TXT	Is the optional command tail
<Ret>	Is the carriage return

When typing commands, exact spacing and punctuation is important. When typing the examples in this guide, type the spaces and punctuation *exactly* as they are printed. In most cases, you must type at least one space after a command to separate it from the optional command tail. Rarely is a space required between the command tail and the carriage return. Additional spacing and punctuation requirements are noted later as each command is described.

Most commands are designed to act on files. To correctly identify which file you want the command to act on, you should include a file specification as part of the command tail. A file specification includes the following three parts:

- The location of a file—that is, which drive the diskette containing the file resides in. If you do not name a specific drive, the CP/M-86/80 operating system assumes the file is on the active drive. If you want to specify a drive other than the active one, type the drive name followed by a colon (:). The drive name is also known as the drive specifier.

- The “first name” of the file (the file name).
- The “last name” of the file (the file type or the file extension). File types are often used to describe the file’s class. For example, .CMD and .COM file types identify operating system programs that you can run by typing the file name.

When you refer to a file, you must separate the file name and file type with a period. An example of a file specification is:

A:MEMO.TXT

where:

A:	Is the file’s location—the diskette in drive A
MEMO	Is the file name
TXT	Is the file type

Naming Files

Use the following conventions when naming files.

- The file name and file type can include any combination of letters, numbers, and printable symbols except:
< > . , ; : = * ? []
- The file name can include from one to eight characters. The operating system ignores any characters after the eighth one.
- The file type can include from one to three characters. The operating system ignores any characters after the third one. The use of a file type is optional; however, it is suggested that you use file types to easily identify classes of files.

Some examples of valid file names are:

XYZ.CMD	X.Y	1
GAMMA.RAY	X.1	GAMMA
GAMMA.1	X	PAY-ROLL.+

Storing Information on Diskettes

The CP/M-86/80 operating system stores files on a diskette in much the same way that you can store files in a filing cabinet.

- When you create a memo using a typewriter, you store it in a folder in a filing cabinet.
- When you create a memo on the computer using a text editing program, the operating system stores the file electronically on the diskette.

Figure 19 shows the files INFO.TXT and FILE.TXT stored in a filing cabinet. Figure 20 shows the same two files stored on a diskette. (Refer to Appendix A for more information about storing information on diskettes.)

Separate Directories on a Diskette

You can use the drawers of a filing cabinet to group files into categories. You can also group the files on a diskette into different categories by using user numbers. User numbers represent unique areas on a diskette that separate files into groups known as subdirectories. These subdirectories are useful when you want to group files—for example, according to function or frequency of use. Subdirectories are also useful when you want to:

- Archive files
- Unclutter the main directory

When you turn on or reset the Rainbow 100 computer, the user number is 0 (the main directory). The user number remains 0 until you change it by using the USER command. (To learn how to change the user number, refer to the discussion of the USER command.) When you use the DIR command, the operating system lists only the files stored in the current user number.

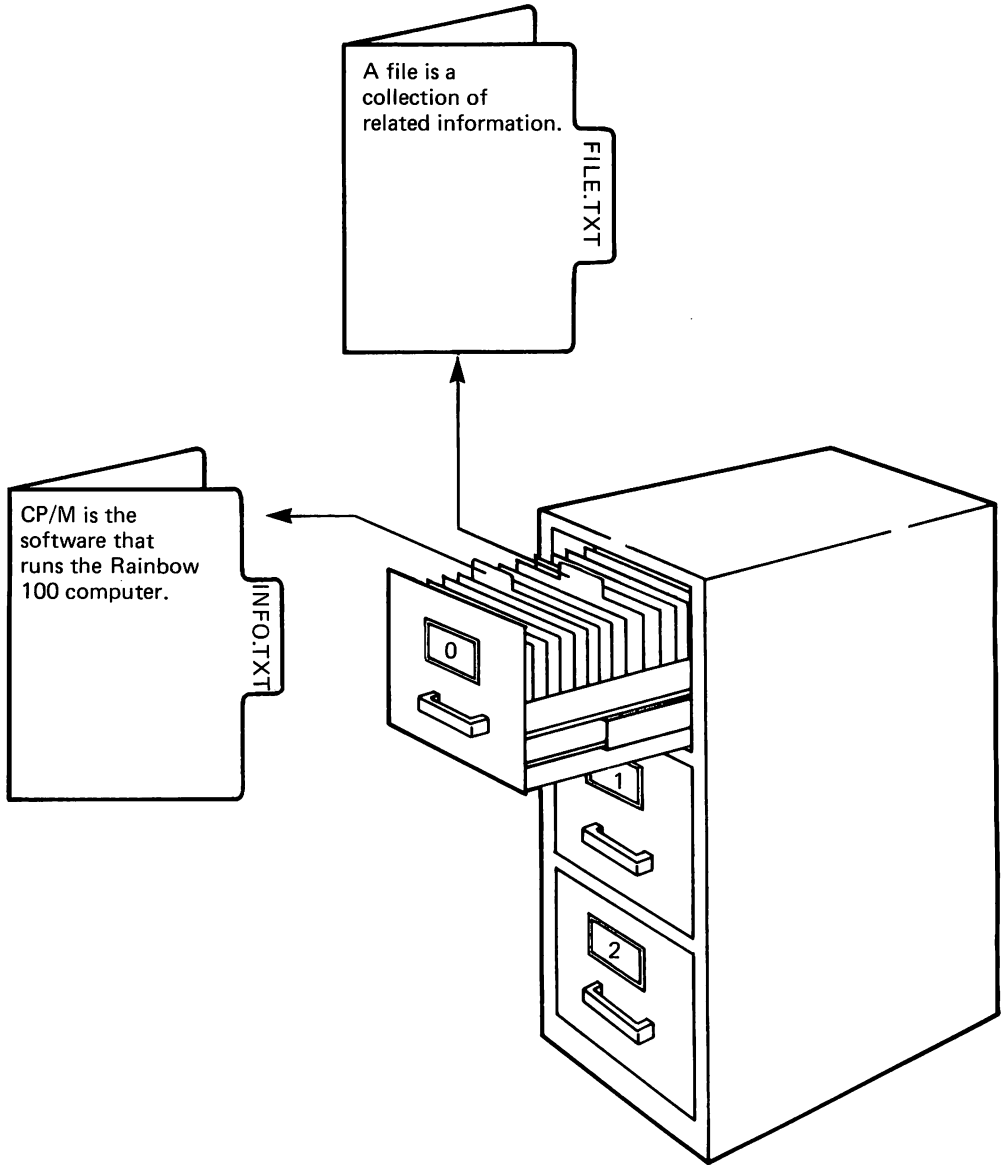


Figure 19. Storing Information in a Filing Cabinet

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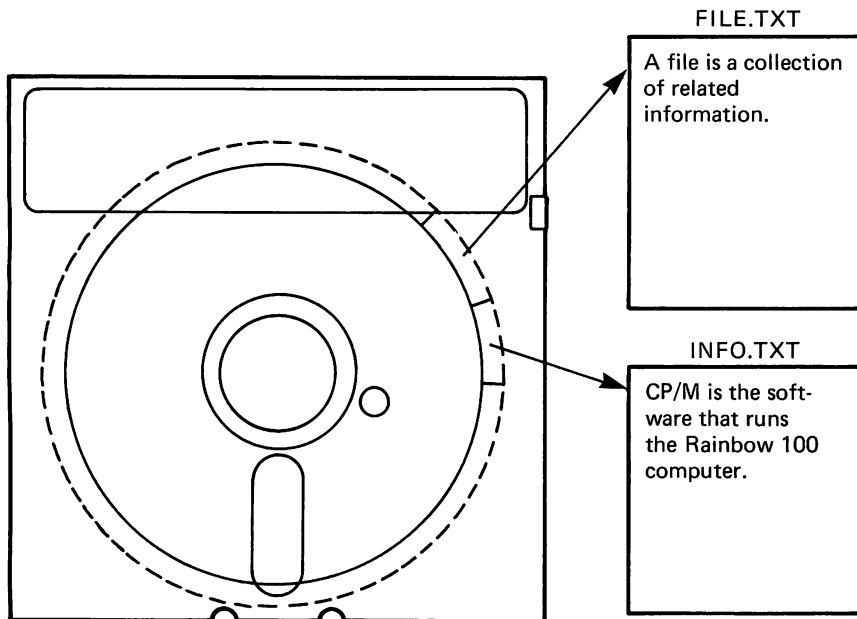


Figure 20. Storing Information on a Diskette

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Attributes

An attribute describes the characteristics of a file or a drive. The CP/M-86/80 operating system uses attributes to describe and control:

- How files are stored and accessed
- How drives are accessed

You can display and change the attributes of a file or drive by using the **STAT** or **MAINT** commands. Refer to the discussions of these commands to learn how to display and change attributes.

The CP/M-86/80 operating system deals with the following four attributes:

1. Directory (Dir)
2. System (Sys)
3. Read Write (RW)
4. Read Only (RO)

File Attributes

When you create a file, the CP/M-86/80 operating system automatically assigns that file two attributes that remain in effect until you change them. Those attributes are:

- The Directory Attribute (Dir)
- The Read Write Attribute (RW)

Directory Attribute . The Directory Attribute controls where the operating system stores the file. Because the file has the Directory Attribute, the operating system enters the file name into the main directory. Whenever you type the DIR command, the operating system displays the file name in the main directory.

The Directory Attribute also controls the availability of the file. When assigned the Directory Attribute, the file is available for use only if you are working in the same user number where the file is stored. For example, you can edit a file that is stored in user number 0 only if you are currently working in user number 0.

Read Write Attribute . The Read Write Attribute controls what you can do to the file. Because the file has the Read Write Attribute, you can:

- Read the file
- Make changes to the file
- Erase the file
- Rename the file

***NOTE:** You can access the file in any of the preceding ways providing a write-protect tab does not cover the diskette's write-protect notch or the diskette does not reside in a drive that is write protected. How to assign a drive an attribute is explained later in this chapter.*

If you wish, you can change these attributes to one or both of the following attributes by using the STAT or MAINT commands:

- The System Attribute (Sys)
- The Read Only Attribute (RO)

System Attribute . The System Attribute controls where the operating system stores the file. If you change the Directory Attribute to the System Attribute, the operating system enters the file name into the system directory. The system directory contains only those files having the System Attribute. To display the files having the System Attribute, you type the DIRS command. The operating system does not list those file names having the System Attribute in response to a DIR command.

The CP/M-86/80 master system diskette you received in the software kit contains the following files in the system directory (with the System Attribute):

CPM.SYS	Z80CCP.SYS	Z80.SYS
PRMTVPVT.SYS	ASM.COM	ASM86.CMD
DDT.COM	DDT86.CMD	DUMP.COM
ED.CMD	GENCMD.CMD	HELP.HLP
LDCOPY.CMD	LMCMD.CMD	LOAD.COM
RED.OVL	RED1.OVL	RED2.OVL
REDHELP.FIL	SAVE.CMD	

The System Attribute also controls the availability of the file. When assigned the System Attribute, the file is available for use regardless of the user number you are working in.

Assigning the System Attribute to files is useful if:

- You want to use a program or file from any user number.
- You have a large directory and want to store programs or files in another directory so that the main directory is not cluttered.

Read Only Attribute . The Read Only Attribute controls what you can do to a file. Because the file has the Read Only Attribute, you can only read the file. You *cannot*:

- Make changes to the file
- Erase the file
- Rename the file

Assigning files the Read Only Attribute is useful if you want to protect them from accidental deletion.

Drive Attributes

The CP/M-86/80 operating system also assigns drives a Read Write Attribute that remains in effect until you change it. Unless you change the Read Write Attribute, all files on any diskette in the drive can be:

- Read
- Changed
- Erased
- Renamed

However, this attribute is overridden if a file has the Read Only Attribute or if the diskette has a write-protect tab on the write-protect notch.

You can temporarily change a drive's Read Write Attribute to the Read Only Attribute by using the STAT command. The files residing on a diskette in a Read Only drive are protected from being accidentally deleted or changed.

It is not a good idea to assign a drive the Read Only Attribute to protect files because the protection is only temporary. The Read Only Attribute is reversed by typing <Ctrl/C>. Because you type <Ctrl/C> to reinitialize the operating system, you can easily reverse the Read Only Attribute without realizing it. If you want to protect all files on a diskette, place a write-protect tab on the write-protect notch of the diskette (described in Appendix A).

Section 2: CP/M-86/80 Operating System Commands

The CP/M-86/80 operating system has two types of commands: built-in and transient. Table 10 lists the characteristics of transient and built-in commands.

Table 10. Transient and Built-in Command Characteristics

Built-in Commands	Transient Commands
Not shown on directory	Shown on directory
Always stored in the computer; automatically read into the computer at start-up	Stored as files on a diskette; read into the computer only when requested
Can be used at any time regardless of which diskette or user number is being used	Can only be used if the requested file exists on the active diskette or if you specify the diskette where the file exists

When you type a command, the CP/M-86/80 operating system does one of the following:

- Finds the command in the computer and runs the command immediately (built-in).
- Finds the program file associated with the command on the diskette; reads the program file into the computer and runs it (transient). (For example, the command PIP runs the program PIP.CMD.)
- Displays the command you typed followed by a question mark, ?, if the command cannot be found in the computer or on the diskette. Usually, this happens because you mistyped a command.

Table 11 lists the commands discussed in this chapter. RED is described in Chapter 6.

Table 11. CP/M-86/80 Operating System Commands

Command	Use
COPY	Copies the entire contents of one diskette to another
DIR	Displays files with the Directory Attribute
DIRS	Displays files with the System Attribute
ERA	Erases a file because you no longer need the file or because the diskette is full and you need to free space on it
HELP	Displays summary information about a command on the screen
MAINT	Renames, erases, changes the attributes of files, or displays the contents of a file
PIP	Copies one or more files from one device to another — for example, from a diskette to another diskette or from a diskette to a printer
RED	Creates or edits a file
REN	Changes the name of a file
STAT	Displays information about files, drives, and other components of the computer
SUBMIT	Executes a series of commands by typing one command
TYPE	Displays the contents of a text file
USER	Displays and changes the current user number

The commands listed in Table 12 are mainly for programmers. They are stored on the CP/M-86/80 master system diskette in the system directory.

Table 12. Additional Commands

Command	Use
ASM	Assembles CP/M-80 programs
ASM86	Assembles CP/M-86 programs
DDT	Debugs CP/M-80 programs
DDT86	Debugs CP/M-86 programs
DUMP	Displays files in hexadecimal form (a CP/M-80 program)

Table 12. Additional Commands (Cont.)

Command	Use
ED	Creates and edits files
GENCMD	Produces command files (.CMD) from hexadecimal files
LDCOPY	Copies the two reserved system tracks from one diskette to another
LMCMD	Produces command files (.CMD) from Intel-L module files
LOAD	Produces command files (.COM) from hexadecimal files
SAVE	Saves CP/M-80 programs in memory as a file on the diskette

Conventions Used

Table 13 lists the conventions used in the discussions of the commands.

Table 13. Conventions

Convention	Meaning
n	Number
filename	File name
.typ	File type
drv:	Drive name (A:, B:, C: or D:)
filespec	File specification
atr	Attribute (RO, RW, Dir, Sys)
[p]	Parameter
dev	Device
dev1	First device
dev2	Second device
logdev	Logical device
phydev	Physical device

Optional portions of a command are enclosed in braces, { }.

COPY

Purpose

COPY is a transient command that copies the entire contents of one diskette to another diskette. Use this command to make backup copies of:

- CP/M-86/80 system diskette
- Application program diskettes
- Data diskettes

Form

COPY<Ret>

Instructions

Type the command and answer the questions that the COPY program asks you. COPY copies the diskette in drive A to the diskette in drive B unless you specify other source and destination drives. You can make additional copies of the source diskette after the first copy is made.

The computer beeps if you press an invalid key. The character is not displayed on the screen. Press the correct key if this occurs.

Press the Exit key (the key above the 9 key on the keyboard) if you want to stop the program. Then press the Exit key again to return to the operating system. If you press the Exit key during the copying process, the program stops after the current set of tracks is read or written.

If you are copying a data diskette on a two-drive Rainbow 100 computer, remove the system diskette from its drive when the program asks you to insert the source and destination diskettes. Insert a data diskette and then press the Y key to start the copying process. The program is now stored in the computer and the copying process can proceed even though the system diskette is no longer inserted in the drive. Return the system diskette to the drive when the program instructs you.

The destination diskette cannot have a write-protect tab on the write-protect notch.

CAUTION: *COPY overwrites any existing information on the destination diskette with the information from the source diskette.*

Example

Copy the CP/M-86/80 operating system diskette (source diskette) in drive A to a blank diskette in drive B (destination diskette). The system diskette should be in drive A and the blank diskette should be in drive B.

1. Type:

```
A>COPY<Ret>
```

The program displays:

```
COPY FROM DISKETTE A TO DISKETTE B? (Y/N)
```

2. Press:

```
Y
```

The program displays a message appropriate to your selection. This example uses A as the source diskette and B as the destination diskette, so COPY displays:

```
INSERT SOURCE DISKETTE INTO DRIVE A  
INSERT DESTINATION DISKETTE INTO DRIVE B
```

```
START COPYING? (Y/N)
```

At this point, if you want to:

- Copy a data diskette on a two-drive Rainbow 100 computer, remove the system diskette from drive A and insert the new source diskette into drive A.

- Change the source or destination diskette, press the N key. The program moves the cursor to the "A" diskette in the original question and waits for you to type the name of the new source diskette. The choices are displayed below the question. Press the key naming the new source diskette. The program then moves the cursor to the "B" diskette in the question and waits for you to type the name of the new destination diskette. Notice that the source diskette has been eliminated from the choices for the destination diskette. Press the key naming the new destination diskette.

This example starts the copying process.

3. Press:

Y

The program displays:

```
READ TRACK tt   WRITE TRACK tt
```

The characters, tt, indicate which of the 80 tracks (numbered 0-79) is currently being read or written.

When the copying process is complete, COPY displays a message appropriate to your response. This example uses B, so COPY displays:

```
COPY/VERIFY COMPLETE TO DRIVE B
IF YOU WANT ANOTHER COPY, INSERT NEW DISKETTE INTO DRIVE B
DO YOU WANT ANOTHER COPY? (Y/N)
```

In this example, you have made a single copy of the source diskette. If you want to make more copies, press the Y key. Then remove the diskette from the destination drive and insert another blank diskette. COPY then asks you if you want to copy the diskette in drive A to the diskette in drive B again. Repeat the steps listed above.

This example makes a single copy of the source diskette.

4. Press:

N

The program displays:

INSERT SYSTEM DISKETTE TO RESTART CP/M-86/80
THEN PRESS Exit

5. Press:

Exit

NOTE: *If you had copied a data diskette, insert the system diskette before pressing the Exit key. The system diskette is automatically "logged in" when you press the Exit key.*

The program ends and the operating system displays its prompt:

A>

DIR

Purpose

DIR is a built-in command that displays a list of file names having the Directory Attribute.

Forms

DIR {drv:}<Ret>

DIR {drv:}filename.typ<Ret>

Instructions

Type the command followed by the optional drive name, file name, and file type. If you omit the drive name, DIR assumes the active drive. If you omit a file name and file type, DIR displays all file names on the specified diskette that have the Directory Attribute. DIR assumes the current user number. DIR accepts wildcards in the file name and file type. If the diskette includes files with the System Attribute, and you request a complete directory, DIR displays the following message after the directory:

```
SYSTEM FILE(S) EXIST
```

Examples

The following examples assume drive A is the active drive.

1. Display a complete directory of file names having the Directory Attribute:

```
A>DIR<Ret>
```

2. Display the directory of the file SHOW.SUB having the Directory Attribute:

```
A>DIR SHOW.SUB<Ret>
```

3. Display a directory of all files with the file name **HELP** having the Directory Attribute:

```
A>DIR HELP.*<Ret>
```

4. Display a directory of all files on the diskette in drive **B** with the file type **.TXT** having the Directory Attribute:

```
A>DIR B:*.TXT<Ret>
```

DIRS

Purpose

DIRS is a built-in command that displays a list of file names having the System Attribute.

Forms

```
DIRS {drv:}<Ret>  
DIRS {drv:}filename.typ<Ret>
```

Instructions

Type the command followed by the optional drive name, file name, and file type. If you omit the drive name, DIRS assumes the active drive. If you omit a file name and file type, DIRS displays all file names on the specified diskette that have the System Attribute. DIRS assumes the current user number. DIRS accepts wildcards in the file name and file type. If the diskette includes files with the Directory Attribute, and you request a complete directory, DIRS displays the following message after displaying the directory:

```
NON-SYSTEM FILE(S) EXIST
```

Examples

The following examples assume drive A is the active drive.

1. Display a complete directory of file names having the System Attribute:

```
A>DIRS<Ret>
```

2. Display the directory of the file SHOW.SUB having the System Attribute:

```
A>DIRS SHOW.SUB<Ret>
```

3. Display a directory of all files with the file name HELP having the System Attribute:

```
A>DIRS HELP.*<Ret>
```

4. Display a directory of all files on the diskette in drive B with the file type .CMD having the System Attribute:

```
A>DIRS B:*.CMD<Ret>
```

ERA

Purpose

ERA is a built-in command that erases a file or group of files from a diskette directory.

CAUTION: *Use ERA with care because erased files cannot be restored.*

To protect files from accidental deletion:

- Place a write-protect tab on the diskette's write-protect notch (see Appendix A).
- Set the file(s) to the Read Only Attribute. (Refer to the discussions of the MAINT or STAT commands.)
- Keep back-up copies of the diskettes. (Refer to the discussion of the COPY command.)

Form

ERA {drv:}filename.typ<Ret>

Instructions

Type the command followed by the optional drive name, the file name, and the file type. If you omit the drive name, ERA assumes the active drive. ERA assumes the current user number.

ERA accepts wildcards in the file name and file type. Verify a deletion by using the DIR or DIRS command.

When you type a command to erase all files on a diskette, ERA displays the following message:

ALL (Y/N)?

To erase all the files, type:

ERA

Y<Ret>

To stop the command without erasing any files, type:

N<Ret>

Examples

The following examples assume drive A is the active drive.

1. Erase the file TEST.TXT:

```
A>ERA TEST.TXT<Ret>
```

2. Erase all files with the file type .TXT:

```
A>ERA *.TXT<Ret>
```

3. Erase all files:

```
A>ERA *.*<Ret>  
ALL (Y/N)?Y<Ret>
```

4. Erase all the files with the file name TEST on the diskette in drive B:

```
A>ERA B:TEST.*<Ret>
```

HELP

Purpose

HELP is a transient command that displays summarized information about some CP/M-86/80 commands and topics.

Forms

HELP {topic} {subtopic}

where:

HELP	Displays a list of topics for which information is available.
HELP {topic}	Displays information about the specified topic and a list of available subtopics.
HELP {topic} {subtopic}	Displays information about the specified subtopic.

Instructions

There are two ways to use the HELP command:

1. Type the command followed by any desired topic or subtopic; for example:

```
A>HELP ERA<Ret>
```

HELP displays its prompt, HELP>, after it displays the requested information. Press the Return key next to the HELP prompt to return to the operating system prompt, A>.

2. Type the command alone. HELP displays its own prompt, HELP>. Then type any desired topic or subtopic; for example:

```
A>HELP<Ret>  
HELP>ERA<Ret>
```

HELP

Press the Return key next to the HELP prompt to return to the operating system prompt, A>; for example:

```
HELP><Ret>  
A>
```

You can abbreviate topics and subtopics. Be sure to use enough characters to uniquely identify the topic or subtopic.

Press the Return key or the Enter key when HELP displays:

Press ENTER to continue

Examples

The following examples assume drive A is the active drive.

1. Display a list of available topics:

```
A>HELP<Ret>
```

2. Display information about the ERA command and display the available subtopics:

```
A>HELP ERA<Ret>
```

3. Display examples (a subtopic) of the ERA command:

```
A>HELP ERA EXAMPLES<Ret>
```

4. Display information on how to use HELP:

```
A>HELP HELP<Ret>
```

In the following examples, the HELP program resides in the computer. HELP displays its prompt, HELP>. The result is the same as in the examples shown above.

HELP>ERA<Ret>

HELP>ERA EXAMPLES<Ret>

HELP>HELP<Ret>

MAINT

Purpose

MAINT is a transient command that runs the file maintenance program. MAINT lets you perform the routine “housekeeping” tasks associated with using a diskette. MAINT combines the functions of the TYPE, DIR, DIRS, ERA, REN, and STAT commands.

NOTE: Using MAINT causes the computer to return to 80 columns if 132 columns are being used.

MAINT displays the directory of the active diskette a screenful at a time. While viewing the directory, you can move the cursor from file to file and “mark” as many files as you want for changes, such as name changes. You can implement all the changes you have marked at one time by pressing the Do key. You can also cancel any of the changes (before pressing the Do key) by pressing the Cancel or Exit keys.

While using MAINT, you can:

- Change file names, file types, or attributes
- Delete files
- Page through the directory forward and backward
- Get information about a diskette
- Display the contents of text files

MAINT is particularly useful if you have a large directory and want to erase unneeded files. Normally, you would:

- List all the files on the diskette by using the DIR command
- Write down or “mark” on paper all the files you want to delete
- Erase each file one by one using the ERA command

To do this using MAINT, you would:

- List all the files on the diskette by using the MAINT command

- Use special function keys to move the cursor to the files that you want to delete
- “Mark” each file for deletion by pressing the Remove key
- Press the Do key to delete all the files that you marked

Forms

MAINT {drv:}<Ret>

MAINT {drv:}filename.typ<Ret>

Instructions

Type the command followed by the optional drive name, file name, and file type. If you omit the drive name, MAINT assumes the active drive. If you omit a file name and file type, MAINT displays all file names on the specified diskette having both the Directory and System Attributes. MAINT assumes the current user number. MAINT accepts wildcards in the file name and file type.

The computer beeps whenever you press a key that MAINT does not recognize, or whenever you try to make a change that is invalid (such as deleting a Read Only file).

While using MAINT, you cannot:

1. Rename, erase, or change the attributes of files that:
 - Have the Read Only Attribute
 - Reside in a drive that has the Read Only Attribute
 - Are stored on a diskette that has a write-protect tab on it
2. Make more than one change to a file at a time. You must complete the first change before making a second change.
3. Change a file size.

Running MAINT. After typing the command, MAINT displays the first screenful or “page” (22 lines) of the diskette’s directory.

MAINT

The first line of the directory lists the drive, file specification, and user number within a reverse video block. If the file name and file type are omitted, MAINT fills the file specification with question marks (referring to an ambiguous file reference).

NOTE: If you specify a nonexistent file or if there are no files stored on the diskette, MAINT displays the diskette summary.

MAINT displays the directory in a three-column, alphabetized format. The following header is displayed at the top of each column:

FileName Typ Attrib KBs

where:

FileName	Is the file name
Typ	Is the file type
Attrib	Are the file's attributes
KBs	Is the file's size in kilobytes

NOTE: A byte is the amount of memory required to store one character; a kilobyte is 1024 bytes. You can store 386 kilobytes on a Rainbow 100 diskette, or about 150 pages of text.

After MAINT displays the first screenful of the directory, you can "page" through the directory, forward and backward, using the Prev Screen and Next Screen keys. If the diskette's directory fits onto one page, pressing the Next Screen or the Prev Screen key causes MAINT to display the diskette summary. (The diskette summary is the last page of any directory.) MAINT displays the following information about the diskette:

<u>File Space</u>	<u>Allocation</u>	<u>Summary</u>
	<u>KBs</u>	<u>FCBs</u>

This User	:	
Other Users:		
Available	:	
Total	:	

Disk Access: R/W

where:

- KBs The number of kilobytes used
- FCBs The number of file control blocks used
- This User: The number of KBs and FCBs used by the current user number
- Other Users: The number of KBs and FCBs used by other user numbers Available:
- Available: The total number of KBs and FCBs available
- Total: The total number of KBs and FCBs used by all user numbers
- Disk Access: The attribute (access mode) of the drive

NOTE: A file control block contains the information necessary for the operating system to access the file, such as the file name, file type, and file size.

Positioning the Cursor . To use the various functions of MAINT, you must tell MAINT which file to act on. To do this, you move the cursor to different positions within the desired file entry. A file entry consists of the FileName, Typ, Attrib, and KBs (kilobytes).

After you move the cursor to the desired file entry, you can then use the special function keys to perform the different housekeeping tasks. Table 14 lists the cursor control keys and the special function keys used by MAINT; Figure 21 shows the location of these keys on the keyboard.

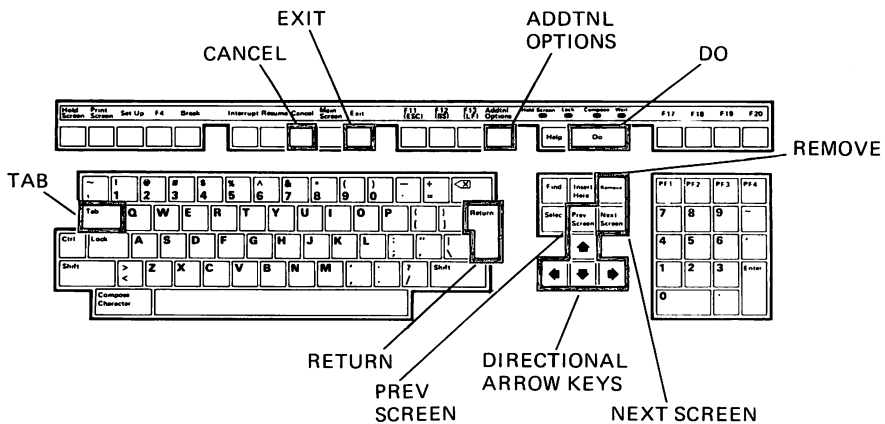


Figure 21. MAINT Keys

Table 14. MAINT Keys

Key	Function
Up Arrow	Moves the cursor up one line at a time.
Down Arrow	Moves the cursor down one line at a time.
Right Arrow	Moves the cursor right one character at a time.
Left Arrow	Moves the cursor left one character at a time.
Tab	Moves the cursor horizontally to the first character of the next file entry.
Return	Moves the cursor to the first character of the next line.
Next Screen	Displays the next page of the directory; displays the next page of a text file.
Prev Screen	Displays the previous page of the directory.
Remove	“Marks” a file for deletion.
Addnl Options	Displays a text file.
Do	Implements all the “marked” changes on the directory.
Cancel	Cancels the “marked” change for the file that the cursor is currently positioned on.
Exit	Cancels all “marked” changes and returns to the operating system; returns to the directory if displaying a file.

Renaming a File Name or File Type . To rename a file name or file type, follow the instructions below.

1. Move the cursor to the first character of the file name or file type (or to the characters that are changing) using the arrow, Tab, or Return keys.
2. Type the new file name over the old file name.

NOTE: *The characters you type are displayed on the screen in the same case as the characters that you are typing over regardless of whether you are using the Shift or Lock keys.*

- You must follow the file naming conventions for files (see the section titled “Naming Files” earlier in this chapter). MAINT ignores any illegal characters as part of the file name or file type, such as a comma, and does not display them on the screen.
 - When you press the first character of the new file name or file type, MAINT displays the file entry in boldface characters. This serves as a reminder that you have marked this file for a name change.
 - If the new file name is fewer characters than the old file name, press the space bar to delete the remaining unwanted characters of the old file name. MAINT ignores any more than eight characters.
3. Now, you can either change the name or cancel the name change.
- If you decide to keep the old file name, move the cursor to any character within the file entry and press the Cancel key. MAINT redisplay the old file name and returns the file entry to its normal state.
 - If you decide to change the name, press the Do key. After you press the Do key, MAINT erases the screen and then redisplay the directory with the new file name or file type. The new file name is alphabetized.

Changing a File Attribute . To change a file attribute (RO, RW, Dir, Sys), follow the instructions below. You can only change one attribute at a time.

1. Move the cursor to the first character of the attribute by using the arrow, Tab, or Return keys.
2. Type the new attribute over the old attribute.
 - MAINT only accepts the characters RW, RO, Dir, or Sys under the **Attrib** heading. MAINT ignores any other characters. To change the RO or RW attribute, move the cursor to the O or the W and type the change. Typing “R” over the R in RW or RO has no effect.
 - When you press the first character of the new attribute, MAINT displays the file entry in boldface characters to remind you that the file is marked for an attribute change.

3. Now, you can either change the attribute or cancel the attribute change.
 - If you decide to keep the old attribute, move the cursor to any character within the file entry and press the Cancel key. MAINT redisplay the old attribute and returns the file entry to its normal state.
 - If you decide to change the attribute, press the Do key. After you press the Do key, MAINT erases the screen and then redisplay the directory with the new attribute.

Erasing a File . To erase a file, follow the instructions below.

1. Move the cursor to any character of the file entry using the arrow, Tab, or Return keys.
2. Press the Remove key. When you press the Remove key, MAINT displays the file entry within a reverse video block to remind you that the file is marked for deletion.
3. Now, you can either delete the file or keep the file.
 - If you decide to keep the file, move the cursor to any character within the file entry and press the Cancel key. MAINT returns the file entry to its normal state.
 - If you decide to delete the file, press the Do key. After you press the Do key, MAINT erases the screen and then redisplay the directory without the file name.

Displaying a File . To display the contents of a text file, follow the instructions below. Do not use MAINT to display nontext files such as those with file types .COM, .CMD, or .SYS. If you accidentally display a nontext file, the screen can become garbled, and the computer can stop. If this happens, reset the Rainbow 100 computer by pressing the Set-Up key, and then typing <Ctrl/Set-Up>.

1. Move the cursor to any character of the file entry by using the arrow, Tab, or Return keys.
2. Press the Addtnl Options key.

- When you press the Addtnl Options key, MAINT erases the directory from the screen. MAINT displays a one-line header at the top of the screen listing the drive name, file specification, and user number within a reverse video block. MAINT then displays the first 22 lines of the file.
- To display the next 22 lines, press the Next Screen key. If the last 22 lines are displayed and you press the Next Screen key, MAINT displays the directory again.
- To return to the directory from any screen within the file, press the Exit key.

NOTE: The file cannot be changed while it is displayed. MAINT ignores any keys that are pressed while the file is displayed on the screen.

Correcting Mistakes . You can change your mind or correct mistakes as long as you have not pressed the Do key. To do this, press the:

1. Cancel key — This key causes MAINT to cancel the change marked on the file entry where the cursor is currently positioned. MAINT returns the entry to its normal state, that is, without the boldface characters or reverse video block. Other marked changes are unaffected. MAINT continues to display the directory on the screen, and you are free to make additional changes or press the Do key to implement the other changes.
2. Exit key — This key causes MAINT to cancel *all* changes that you have marked; you are returned to the operating system prompt, A>.

Exiting MAINT . To exit MAINT, press the Exit key; you are returned to the operating system prompt. If you press the Exit key while displaying a file, you are returned to the MAINT directory.

Examples

The following examples assume drive A is the active drive.

1. Display the first page of the directory of all the files having the Directory and the System Attributes:

```
A>MAINT<Ret>
```

2. Display the contents of MEMO.TXT. While MAINT displays the directory:
 - Move the cursor by using the arrow, Tab, or Return keys to any character of the MEMO.TXT file entry. (The cursor can be on any character including a blank space.)

- Press:

Addnl Options

- MAINT erases the screen and displays the first 22 lines of ME
 - To view the next 22 lines of the file, press the Next Screen key. (Pressing the Next Screen key on the last page of the file causes MAINT to return to the directory.)
 - To return to the directory at any time, press the Exit key.
3. Rename MEMO.TXT to LETTER.TXT. While MAINT displays the directory:

- Move the cursor by using the arrow, Tab, or Return keys to the first character in the file name, M in this case.

- Type:

L

- As soon as you type the first new character, L, MAINT displays the entry in boldface characters.
- Type the remaining characters:

ETTER

NOTE: Remember, if you decide not to change the old file name before pressing the Do key, move the cursor to any character within the marked file entry. Then, press the Cancel key. MAINT redisplay the old file name and returns the file entry to its normal state.

- This example changes the filename. Press:

Do

- MAINT changes the name and lists the new name, LETTER.TXT, in the directory.

4. Change the RW (Read Write) Attribute of the file LETTER.TXT to the RO (Read Only) Attribute. While MAINT displays the directory:

- Move the cursor by using the arrow keys to the W in RW.
- Type:

O

NOTE: Remember that typing "R" over the R in RW has no effect.

- As soon as you type O, MAINT displays the file entry in boldface characters.

NOTE: Remember, if you decide not to change the old attribute before pressing the Do key, move the cursor to any character within the marked file entry. Then, press the Cancel key. MAINT redisplay the old attribute and returns the file entry to its normal state.

- This example changes the attribute. Press:

Do

- MAINT changes the attribute and lists the new attribute, RO, in the attribute column of the directory.

5. Erase the file TEST.TXT. While MAINT displays the directory:

- Move the cursor by using the arrow, Tab, or Return keys to any character within the TEST.TXT file entry. The cursor can be on any character including a blank space.

- Press:

Remove
- As soon as you press the Remove key, MAINT displays the file entry within a reverse video block.

NOTE: Remember, if you decide not to erase the file before pressing the Do key, move the cursor to any character within the marked file entry. Then, press the Cancel key. MAINT returns the file entry to its normal state.
- This example erases the file. Press:

Do
- MAINT makes the change and lists the new directory without the file, TEST.TXT.

Remember that all of the changes shown in the examples above can be made by:

- Moving the cursor from file to file
- Marking the change in each file
- Pressing the Do key *once* to implement all the changes

PIP

Purpose

PIP (Peripheral Interchange Program) is a transient command that copies files from one device to another, such as from a diskette to a printer.

For example, you can use PIP to:

- Copy file(s) from one diskette to another diskette
- Print file(s) on a printer
- Copy file(s) from one user number to another user number
- Combine two or more files into one file
- Rename a file after copying it

Do not use PIP to copy nontext files to a printer.

Forms

PIP has two modes:

1. **Command** — Use this mode for simple copying that can be typed on one line. This mode has several forms shown below. The symbol [p] represents an optional parameter which is an additional instruction for PIP. Table 15 lists the PIP parameters.

- Make a copy of a file and give it a new file name:

```
PIP {drv;}newname.typ={drv;}oldname.typ[p]<Ret>
```

- Copy an existing file to a new file, but keep the old file name:

```
PIP drv:={drv;}oldname.typ[p]<Ret>
```

- Create a new file by combining two existing files:

```
PIP {drv;}newname.typ={drv;}oldname1.typ[p],oldname2.typ[p]<Ret>
```

- Copy data from a device to a file:

PIP {drv;}name.typ=dev:[p]<Ret>

- Copy a file to a device:

PIP dev:={drv;}name.typ[p]<Ret>

- Copy data from one device to another:

PIP dev1:=dev2:[p]<Ret>

The PIP command form you will probably use most often is:

PIP drv:={drv;}oldname.typ[p]<Ret>

2. Program — Use this mode for more complex copying that requires more than one line to type the command. To enter program mode, type:

PIP<Ret>

PIP displays its prompt:

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*

The forms of the PIP command in program mode are identical to those in command mode. However, in program mode, you do not type the command "PIP" on each line.

Pressing the Return key or typing <Ctrl/C> next to the PIP prompt, *, returns you to the operating system prompt, A>.

Optional Parameters . Table 15 lists the optional PIP parameters and their effects. PIP parameters are single characters (or single characters followed by numbers or characters that supply information for the parameter to act on). In Table 15, "n" represents a numeric value and "s" represents a character sequence you supply in the command line. Tell PIP you are finished typing the sequence by typing <Ctrl/Z>. More than one parameter can be used in the same command line.

Table 15. PIP Optional Parameters

Parameter	Effect
Dn	Deletes characters that extend past column n (counted from the last Return or line feed).
E	Echos (displays) all copying operations on the console as they occur.
F	Removes form feeds (page breaks) from the original file.
Gn	Copies a file to or from a user number other than the currently active user number. This is the only parameter allowed to follow the destination file specification.
H	Transfers Intel hexadecimal data.
I	Ignores null records in the transfer of Intel hexadecimal file format. Automatically sets the H option.
L	Converts uppercase characters to lowercase characters.
N	Adds line numbers to each line of the destination file.
O	Transfers nontext files.
Pn	Inserts a page break after each n lines.
Qs ^Z	Copies from the first character (or where the S option is used) of the source file including the string you specified in "s". lowercase characters are to be matched. Can be used with the S option to extract a portion of a file.
R	Copies files having the System Attribute.
Ss ^Z	Copies from the string you specified in "s" of the source file to the end of the file (or where the Q option is used). Program mode must be used if lowercase characters are to be matched. Can be used with the Q option to extract a portion of a file.
Tn	Sets tabs at every nth column.
U	Converts lowercase characters to uppercase characters.
V	Verifies that data has been copied correctly.
W	Writes over files with the Read Only Attribute.
Z	Sets the parity bit to 0.

Instructions

For most forms of the PIP command, type the command followed by:

1. The new file specification, which includes the device, file name, and file type. The new file specification is also referred to as the destination file specification (where data is copied to). You type this information on the left side of the equal sign.
2. An equal sign.
3. The old file specification, which includes the device, file name, and file type. The old file specification is also referred to as the source file specification (where the data is copied from). You type this information on the right side of the equal sign.
4. Any optional parameters. When using parameters, follow the instructions below:
 - Type parameters at the end of the command line inside square brackets, [].
 - Do not include a blank space between the file specification and the opening bracket.
 - If desired, insert more than one parameter within the same square bracket; separate multiple parameters with blank spaces.
 - Do not include a blank space between a parameter and its numeric value.
 - End parameters requiring a character sequence by typing <Ctrl/Z>. PIP ignores any invalid parameter(s) you type within the square brackets; the command is executed as though the invalid parameter(s) did not exist.

If you omit the drive name, PIP assumes the active drive. If you omit the user number, which can be specified by the [Gn] parameter, PIP assumes the current user number. PIP accepts wildcards in file names and file types. Verify the copying procedure with DIR or DIRS.

Checking for Free Space . Before using PIP, you should use the MAINT or STAT commands to check that the destination device has enough free space

so the file can be copied. If there is not enough free space on the destination device, PIP displays the following message:

```
ERROR: DISK WRITE - {drv:}filename.typ
```

Avoiding Accidental Deletion . Use PIP with caution when copying files having identical file names and file types (but containing different data) between devices. You can accidentally delete a file because PIP deletes the old file after copying the new file if the files have the same name and type.

For example, suppose you want to copy the file SURVEY.TXT that contains survey results from the diskette in drive A to the diskette in drive B. However, a file named SURVEY.TXT already exists on the diskette in drive B that contains survey questions.

When you copy SURVEY.TXT from the drive A diskette to the drive B diskette, PIP deletes the original SURVEY.TXT (containing the survey questions) from the drive B diskette. Because the two file names and file types are identical, PIP replaces the version in drive B with the version in drive A. You now have two copies of the file containing survey results. Refer to Figures 22 and 23. To avoid accidental deletion of files, give each file a different file name and file type.

Examples

The following examples assume drive A is the active drive and user number 0 is the current user number. If you omit the drive name, PIP assumes the active drive. However, you may include the active drive name if desired.

For example, you can copy the existing file TEST.TXT on diskette A to the file NEW.TXT on diskette A using any of the following forms:

```
A>PIP A:NEW.TXT=A:TEST.TXT<Ret>
```

```
A>PIP A:NEW.TXT=TEST.TXT<Ret>
```

```
A>PIP NEW.TXT=A:TEST.TXT<Ret>
```

```
A>PIP NEW.TXT=TEST.TXT<Ret>
```

You now have two copies of the same file – but the files have different file names.

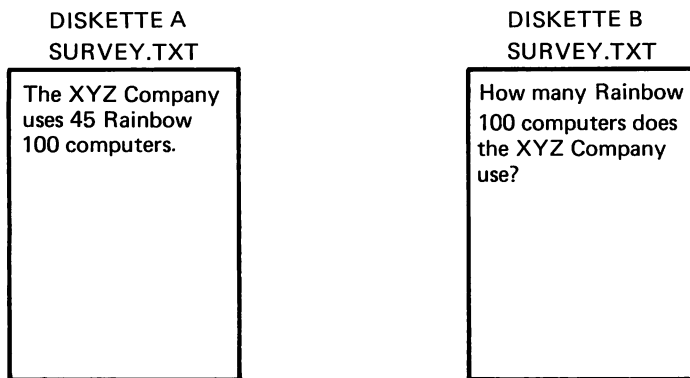


Figure 22. Status of Diskettes Before Copy

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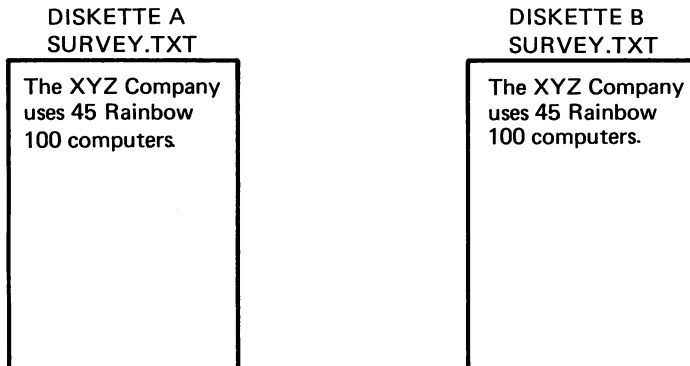


Figure 23. Status of Diskettes After Copy

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The following examples omit the active drive name.

1. Copy the existing file TEST.TXT on the diskette in drive A to the file EXAM.TXT on the diskette in drive B:

```
A>PIP B:EXAM.TXT=TEST.TXT<Ret>
```

This form is considered the long form because you type file names and file types for the destination and source file specifications.

2. Copy the existing file TRANSFER.SUB on the diskette in drive A to the same file name on the diskette in drive B:

```
A>PIP B:=TRANSFER.SUB<Ret>
```

This form is considered the short form because you type only a device for either the source or destination file specifications. PIP replaces the omitted file name and file type with the file name and file type specified in the source file specification. You cannot use this form to copy a file from one drive and user number to the same drive and user number.

3. Copy the existing file NAMES.DOC on the diskette in drive A, user number 0, to the same diskette, user number 2:

```
A>PIP A:[G2]=NAMES.DOC<Ret>
```

You must type the drive name when using the [Gn] option in the destination file specification. Remember that the [Gn] option is the only option allowed as part of the destination file specification.

4. Copy all files with the file type .TXT on the diskette in drive A to the diskette in drive B using a wildcard:

```
A>PIP B:=*.TXT<Ret>
```

When you copy multiple files, PIP displays a message as it successfully copies each file.

5. Create a new file, NEWFILE.TXT on the diskette in drive B from two existing files (OLDFILE1.TXT and OLDFILE2.TXT) on the diskette in drive A:

```
A>PIP B:NEWFILE.TXT=OLDFILE1.TXT,OLDFILE2.TXT<Ret>
```

Separate the existing files with commas; you can enter blank spaces between the comma and the next file name. You can use parameters for each source file specification. The file NEWFILE.TXT contains the two existing files, OLDFILE1.TXT and OLDFILE2.TXT.

6. Extract a portion of the existing file WORDS.TXT on the diskette in drive A and copy it to the file LETTERS.TXT on the diskette in drive B. Begin extracting text with the word *now* and end with the word *letter*.

```
A>PIP B:LETTERS.TXT=WORDS.TXT[SNOW^Z QLETTER^Z]<Ret>
```

The words *now* and *letter* are included in the extracted portion of the file. If you want to match lowercase characters, use program mode.

7. Print the file REPORT.TXT on LST:, the printer:

```
A>PIP PRN:=REPORT.TXT<Ret>
```

Note that PRN: is a symbol used by PIP to output data to the LST: device in a special format that:

- Numbers lines
- Expands tabs
- Paginates

The following command does not number lines, expand tabs, or paginate:

```
A>PIP LST:=REPORT.TXT<Ret>
```

NOTE: Refer to the *Rainbow 100 Installation Guide* if you want to attach a printer to the Rainbow 100 computer.

8. Using program mode, create a new file NEWFILE.TXT on the diskette in drive A from the existing files OLDFILE1.TXT and OLDFILE2.TXT on the diskette in drive A. Then, copy the existing file NEWFILE.TXT on diskette A to diskette B:

```
A>PIP<Ret>  
CP/M-86 PIP VERSION 1.1  
*NEWFILE=OLDFILE1.TXT,OLDFILE2.TXT<Ret>  
*B:=NEWFILE.TXT<Ret>  
*<Ret>
```

The asterisk (*) indicates that PIP is ready to accept commands. Do not type the command PIP while using program mode. To exit PIP program mode, press the Return key or type <Ctrl/C> next to the PIP prompt, *.

REN

Purpose

REN (rename) is a built-in command that changes the name of a file that already exists on a diskette. After you rename a file, the operating system no longer recognizes the file by its old file name.

Form

```
REN {drv:}newname.typ={drv:}oldname.typ<Ret>
```

Instructions

Type the command followed by:

- Optional drive name
- New file name and file type
- Equal sign
- Optional drive name
- Old file name and file type

You must type the old file name exactly as it is displayed in the directory. If you omit the drive name, REN assumes the active drive. REN assumes the current user number. REN *does not* accept wildcards in the file name or file type. If you include drive names for both files, the names must be the same. Verify the name change by using DIR.

Examples

The following examples assume drive A is the active drive.

1. Rename the old file ORIGINAL.TXT to the new file REVISED.TXT:

```
A>REN REVISED.TXT=ORIGINAL.TXT<Ret>
```

REN

2. Rename the old file ORIGINAL.TXT (on the diskette in drive B) to the new file REVISED.TXT (on diskette in drive B):

```
A>REN B:REVISED.TXT=B:ORIGINAL.TXT<Ret>
```

STAT

Purpose

STAT (status) is a transient command that displays information about files and devices. It also enables certain controls over the files and devices.

Different forms of the STAT command let you:

- Display the status of a drive
- Display free space on a diskette(s)
- Display file size
- Display and change the attributes of a file
- Display STAT commands and device names
- Display and set physical-to-logical device assignments
- Display diskette characteristics
- Assign a temporary Read Only Attribute to a drive

The following discussion about the STAT command is divided into two parts:

- How to use STAT with files
- How to use STAT with devices

Status of Files

STAT provides the following levels of information about files and the diskettes they are stored on when you type the following formats:

STAT	Displays the amount of free space remaining on a diskette and the drive's attribute.
STAT filespec	Displays the following information:

Drive — indicates the drive the file is stored in.

User — indicates the user number the file is stored in.

Recs — indicates the number of records used by each file (each record is 128 bytes).

Bytes — indicates the number of kilobytes used by each file.

FCBs — indicates the number of File Control Blocks used by each file; a file control block contains the information necessary for the CP/M-86/80 operating system to access the file, such as the file name, file type, file size.

Attributes — indicates the attributes of the file; RO (Read Only) or RW (Read Write) and Dir (Directory) or Sys (System) are displayed under this heading.

Name — indicates the name of the file.

When you type a command that causes more than one file to be displayed, STAT lists the files alphabetically.

Forms

1. Display the attributes and amount of free space (in bytes) on the diskettes in *all* drives accessed since the last operating system start-up:

```
STAT<Ret>
```

2. Display the amount of free space (in bytes) on a specified diskette:

```
STAT drv:<Ret>
```

3. Display the size (in records and bytes), file control blocks, and attributes of a single file or group of files:

```
STAT {drv;}filename.typ<Ret>
```

4. Assign an attribute to a single file or a group of files:

```
STAT {drv;}filename.typ atr<Ret>
```

```
STAT {drv;}filename.typ $atr<Ret>
```

```
STAT {drv;}filename.typ [atr]<Ret>
```

Instructions

Type the command followed by the optional drive name, file name, file type, and any optional attributes. If you omit the drive name, STAT assumes the active drive. STAT assumes the current user number and accepts wildcards.

When assigning attributes to files, separate the file specification from the attribute with a blank space known as a "separator." If desired, you can precede the attribute with a dollar sign (\$) or enclose the attribute in square brackets ([]). Attributes are RO, RW, Sys, and Dir.

Examples

The responses for the following examples may not be displayed exactly as shown on your screen because your diskette probably contains different files.

For example, the free space remaining on your diskette will probably be different from the values in the examples shown. The examples assume that drive A is the active drive:

1. Display the attributes and amount of free space on the diskettes in drive A and drive B, both of which have been accessed since the last operating system start-up.

```
A>STAT<Ret>
A: RW, Free Space:      180k
B: RW, Free Space:      176k
```

2. Display the attributes, file control blocks, and amount of space occupied by the file SHOW.SUB on the diskette in drive B:

```
A>STAT B:SHOW.SUB<Ret>

Drive B:                               User :    0
Recs  Bytes  FCBs  Attributes  Name
   1    2k    1    Dir RW    B:SHOW    .SUB
-----
Total:    2k    1
B: RW, Free Space:      230k
```

STAT

3. Display the attributes, file control blocks, and amount of space occupied by each file with the file type .TXT:

```
A>STAT *.TXT<Ret>
```

Drive A:			Attributes	User :	0
Recs	Bytes	FCBs	Name		
1	2k	1	Dir RW	A:DOCU	.TXT
1	2k	1	Dir RW	A:SHOW	.TXT

Total: 4k 2
A: RW, Free Space: 230k

4. Assign the System Attribute to the file TEST.TXT:

```
A>STAT TEST.TXT SYS<Ret>  
A: TEST .TXT set to System (Sys)
```

5. Assign the Read Only Attribute to the file SHOW.SUB:

```
A>STAT SHOW.SUB RO<Ret>  
A: SHOW .SUB set to Read Only (RO)
```

Status of Devices

The Rainbow 100 computer routinely communicates with the following devices:

- Video display device — the screen
- Keyboard
- Drives

In addition, the Rainbow 100 computer can communicate with other devices that you connect to it, such as:

- Printers
- Modems (a device used to communicate with a computer over phone lines)
- Other computers

The CP/M-86/80 operating system needs to know which devices are connected to the Rainbow 100 computer so the computer can operate properly. You tell the operating system which devices are connected to the Rainbow 100 computer when you assign logical names to physical devices, such as printers.

Logical names are used because any one of several “physical” devices can be connected to the Rainbow 100 computer to accomplish one function. For example, the logical name CON: (console) represents the user’s console input/output device whether it is a CRT: (video terminal) or a TTY: (teletype).

Logical names are assigned to physical devices through the STAT command.

Standard assignments are made before you receive the Rainbow 100 computer. You should not have to change these unless you want to make different assignments.

Table 16 lists logical names and their generic representations.

Table 16. Rainbow 100 Computer Logical Names

Logical Name	Function
CON:	This is the user console device. It interacts with the operating system, accepts input from a keyboard and displays output on either a video screen or on paper.
AXI:	This device receives information (input only).
AXO:	This device sends information (output only).
LST:	This device lists information (output only), on a printer, for example.

STAT associates these logical names with any one of several standardized physical device names. Table 17 lists the meanings of these names for the Rainbow 100 computer. The term port in Table 17 refers to an input or output connection to the computer.

STAT

Table 17. Rainbow 100 Computer's Physical Name Assignments

Physical Device Name	Physical Device
TTY:	The printer port which allows input and output
CRT:	A video terminal (the video screen and keyboard)
UC1:	Optional communications port
PTR:	Communications port, input only
PTP:	Communications ports, output only
UR1:	Not used
UR2:	Not used
UP1:	Not used
UP2:	Not used
LPT:	Printer port, output only
UL1:	Not used

Forms

1. Display the current physical-to-logical device assignments:

```
STAT DEV:<Ret>
```

2. Display the possible physical-to-logical device assignments and a partial STAT command summary:

```
STAT VAL:<Ret>
```

3. Assign a physical device (phydev:) to a logical device (logdev):

```
STAT logdev:=phydev:<Ret>
```

4. Display diskette storage characteristics:

```
STAT {drv;}DSK:<Ret>
```

This form of STAT displays useful information for advanced users of the CP/M-86/80 operating system.

5. Assign a temporary Read Only Attribute to a drive:

```
STAT drv:=RO<Ret>
```

You can set the drive back to the Read Write Attribute by using the STAT command, typing <Ctrl/C>, or turning the computer off. The operating system sets drives to the Read Write Attribute by default.

6. Display the current user number and all user numbers that contain files:

```
STAT USR:<Ret>
```

Instructions

Type the command followed by any desired parameters. If you omit the drive name, STAT assumes the active drive. STAT assumes the current user number.

Examples

1. Display the current physical-to-logical assignments:

```
A>STAT DEV:<Ret>  
CON: is CRT:  
AXI: is PTR:  
AXO: is PTP:  
LST: is LPT:
```

2. Display a partial STAT command summary and the valid physical-to-logical device assignments:

```
A>STAT VAL:<Ret>  
STAT 2.2
```

```
Read Only Disk: d:=RO  
Set Attribute: d:filename.typ [ro] [rw] [sys] or [dir]  
Disk Status : DSK: d:DSK:  
User Status : USR: d:USR:
```

lobyte Assign:

CON: = TTY: CRT: BAT: UC1:

AXI: = TTY: PTR: UR1: UR2:

AXO: = TTY: PTP: UP1: UP2:

LST: = TTY: CRT: LPT: UL1:

3. Assign the logical name CON: to the physical device CRT:

```
A>STAT CON:=CRT:<Ret>
```

NOTE: Such an assignment is nullified when you type <Ctrl/C> or turn the computer off.

4. Display the characteristics for the diskette in drive A:

```
A>STAT A:DSK:<Ret>
```

```
A: Drive Characteristics
3,120: 128 Byte Record Capacity
390: Kilobyte Drive Capacity
128: 32 Byte Directory Entries
128: Checked Directory Entries
256: 128 Byte Records / Directory Entry
16: 128 Byte Records / Block
40: 128 Byte Records / Track
2: Reserved Tracks
```

5. Set drive B temporarily to the Read Only Attribute:

```
A>STAT B:=RO<Ret>
```

NOTE: Using STAT to write-protect a diskette is probably not advisable because such protection is retained only in the computer and is nullified when you type <Ctrl/C> or turn the computer off.

6. Display the active user and all user numbers that contain files:

```
A>STAT USR:<Ret>
```

```
A: Active User : 0
```

```
A: Active Files: 0
```

NOTE: Refer to the discussion of the USER command to change user numbers.

SUBMIT

Purpose

SUBMIT is a transient command that runs a group of previously generated CP/M-86/80 commands from a file you create. Use SUBMIT if you:

- Type the same series of commands repetitively
- Want to run complex tasks by using one command

Forms

```
SUBMIT filename<Ret>  
SUBMIT filename parameter<Ret>
```

The first form runs command files containing complete commands. The second form runs command files that require input from the keyboard.

Instructions

Create a command file with the file type .SUB using a text editor such as RED. Type the commands, each on a separate line, in the order you want them to be executed. (The .SUB file is sometimes referred to as a command file because it contains commands.) Then type the SUBMIT command followed by the file name containing the commands you want executed.

When run, SUBMIT searches for the specified file name of the file type .SUB and creates a copy of this file named \$\$\$SUB on the diskette you started the operating system from. Because SUBMIT creates a file on this diskette:

- It *cannot* have a write-protect tab on its write-protect notch.
- Some free space must exist on the diskette.

The file, \$\$\$SUB, is a copy of the original file. The operating system executes each command you typed in that file sequentially. The operating system deletes each command line in \$\$\$SUB as it is executed and deletes the entire file when all the commands are executed.

You can stop the SUBMIT program by pressing any key. When you do this, the operating system completes the current command before it stops the SUBMIT program. Because the program did not complete, the file still resides on the diskette you started the operating system from. If you do not delete this file from the diskette before you reset or turn the computer off, the SUBMIT program attempts to continue with the commands remaining in the \$\$\$SUB file the next time you start the computer.

Using Incomplete Commands

If you want to specify different files, drives, or devices each time you run a .SUB file, create a file with incomplete commands. Mark the missing pieces of information with a dollar sign (\$) followed by a number from one to nine, inclusive. SUBMIT allows nine place holders in each .SUB file. The combination of these two characters serves as a place holder until you run SUBMIT and supply the information in the command tail.

Use two dollar signs (\$\$) if you want to include a literal dollar sign in the .SUB file.

Type the specific parameters at the end of the command when running SUBMIT. Type a blank space between each parameter.

When SUBMIT runs the command file, all occurrences of \$1 in the .SUB file are replaced with the first parameter found in the command tail. All occurrences of \$2 are replaced with the second parameter found in the command tail. The same procedure occurs for each place holder.

SUBMIT ignores parameters supplied in the command tail that exceed the number of place holders in the .SUB file. If you do not supply enough parameters, SUBMIT removes the place holders from the .SUB file and executes the command without the information. This usually results in an error.

You cannot nest SUBMIT commands within .SUB files. However, you can cause another .SUB file to execute from the previous .SUB file. Do this by including a SUBMIT command as the last line in the file; this "links" one .SUB file to another .SUB file. In Figure 24 the file XXX.SUB is linked to the file YYY.SUB.

Wildcards can be used as part of the commands within a .SUB file.

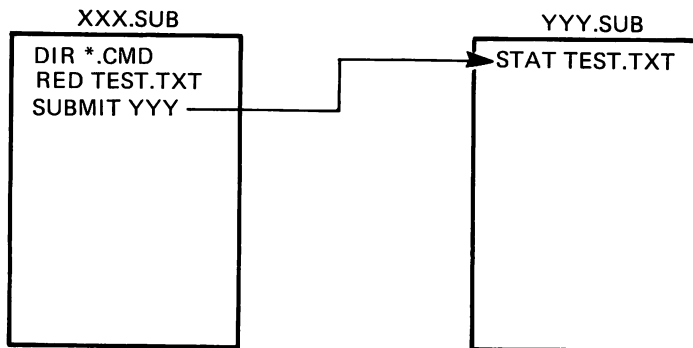


Figure 24. Linking Two .SUB Files

MR-8131

Examples

The following examples assume drive A is the active drive.

1. Create a command file named SUBEX.SUB using the text editor, RED, containing the following complete commands:

```
STAT
RED TEST.TXT
TYPE TEST.TXT
STAT
```

Next, type:

```
A>SUBMIT SUBEX<Ret>
```

When SUBMIT runs the commands in SUBEX.SUB:

- STAT displays the amount of free space on the diskette in drive A.
- The text editor, RED, creates a file named TEST.TXT.
- You type the contents of the file and then return to the operating system.
- TYPE displays the contents of TEXT.TXT after you exit the text editor.
- STAT displays the amount of free space left on the drive A diskette.

SUBMIT

2. Create a command file named TRANSFER.SUB containing the following incomplete commands:

```
PIP $2:=$1:$3.*  
STAT $2:$3.*
```

SUBMIT substitutes the information that you type in the command tail for the place holders \$1, \$2, and \$3 in the file. The colons and asterisks are literal additions that SUBMIT appends to that information so you do not have to type the drive names and file name in the .SUB file.

Next, type:

```
A>SUBMIT TRANSFER B A ACCOUNT<Ret>
```

When SUBMIT runs the commands in SUBEX.SUB:

- B is substituted for all occurrences of \$1.
- A is substituted for all occurrences of \$2.
- ACCOUNT is substituted for all occurrences of \$3.
- B and A are separated by an equal sign, =.
- An asterisk, *, is appended to ACCOUNT.

The result of running TRANSFER.SUB is the same as typing the following commands:

```
A>PIP A:=B:ACCOUNT.*<Ret>  
A>STAT A:ACCOUNT.*<Ret>
```

Include necessary separators, such as periods, colons, and wildcards, in your .SUB file so you do not have to type them on the SUBMIT command line. Sometimes, separators included in a command line result in an error. The following example causes an error because the period between “TEST” and “DOC” can be interpreted as a parameter separator rather than as a character in a single parameter.

```
A>SUBMIT TASK TEST.DOC<Ret>
```

TYPE

Purpose

TYPE is a built-in command that displays the contents of a text file on the Rainbow 100's screen. Text files contain printable characters.

TYPE also displays files even if they:

- Have the Read Only Attribute
- Are stored on a diskette that has a write-protect tab on it
- Reside in a drive that has the Read Only Attribute

Forms

TYPE {drv;}filename.typ<Ret>

Instructions

Type the command followed by the optional drive name, the file name, and the file type. If you omit the drive name, TYPE assumes the active drive. TYPE assumes the current user number. TYPE *does not* accept wildcards in the file name and file type.

Press Hold Screen or type <Ctrl/S> to temporarily stop the text from scrolling; press Hold Screen or type <Ctrl/S> again to continue the display. Repeat this process to stop and start the display. Type <Ctrl/C> or any other key to stop the display and return to the operating system.

Do not use the TYPE command on files with nontext characters such as file types .COM, .CMD, or .SYS. If you accidentally TYPE a nontext file, the screen can become garbled and the computer can stop. If this happens, reset the Rainbow 100 computer by pressing the Set-Up key, and then typing <Ctrl/Set-Up>.

Examples

The following examples assume drive A is the active drive.

1. Display the contents of the file TEST.TXT:

```
A>TYPE TEST.TXT<Ret>
```

2. Display the contents of the file TEST.TXT on the diskette in drive B:

```
A>TYPE B:TEST.TXT<Ret>
```

USER

Purpose

USER is a built-in command that displays or changes the current user number. User numbers refer to unique areas on a diskette. This command is useful if you want to store files in different directories, known as subdirectories, on the diskette. The default user number is 0.

The operating system assigns the current user number to a file when:

- You create a file
- You copy a file from another user number

Form

USER {n}<Ret>

Instructions

Type the command followed by an integer from 0 to 15, inclusive, to change the user number. If you type the command alone, the current user number is displayed.

Most commands access only those files in the current user number. For example, while in user number 7, a DIR command displays only those files in user number 7.

Generally, files stored in user numbers are not accessible by other user numbers. PIP's [Gn] option lets you copy a file from one user number to another. Also, assigning a file the System Attribute allows all user numbers to access that file.

When you turn on or reset the Rainbow 100 computer, the user number is 0. The user number does not change when you reinitialize the operating system by typing <Ctrl/C>.

USER

If you change the user number, the new user number applies to all diskettes. For example, if you change from diskette A to diskette B, the user number remains the same.

Examples

The following examples assume drive A is the active drive.

1. Display the current user number:

```
A>USER<Ret>
```

2. Change the current user number to 3:

```
A>USER 3<Ret>
```

6

Using the Rainbow 100 Editor (RED)

In addition to running application programs on the Rainbow 100 computer, you may want to write programs or short documents (reports, memos, or letters) and store them in files. To create such files, use the Rainbow 100 text editor, RED. An editor is used to create new documents or to modify old ones. RED is a screen-oriented editor that displays your edits a screen full of text at a time instead of a line at a time.

This chapter is divided into two parts. The first part covers creating a document and using the basic editing commands in a tutorial format. The second part covers renaming the document and using the rest of the cursor and editing commands in a tutorial format.

It is assumed that you have powered on the Rainbow 100 computer and have started the CP/M-86/80 operating system.

Starting a Basic Editing Session

This section illustrates the basic editing commands. First, you create a new file (document) which contains some typing errors. Follow the same guidelines for naming files in RED as in naming CP/M-86/80 files. Then, you learn how to move around in the text and fix the errors.

Using the Editor

To get started, type the RED command together with an unambiguous file name and file type. For this example type:

```
A>RED TEST.TXT<Ret>
```

RED creates the file TEST.TXT and displays the following statement:

```
Loading RAINBOW 100 EDITOR ...
```

***NOTE:** If the following message is displayed on the screen instead, you made an error while typing the file name, or you omitted the file name. Type the file name again exactly as indicated above. Be sure to use a valid CP/M-86/80 file name.*

```
RED ERROR: PLEASE ENTER "RED" FOLLOWED BY A FILE NAME.
```

After the document is created, RED displays a one-line command menu (list of choices or options) at the top of the screen. It also displays the drive location and name of the document (see Screen 23).

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:TEST.TXT Char: 1 Line: 1
L-----R
|
```

NOTE: While using RED, pressing a Return or Do key is represented as follows:

<RET>

<DO>

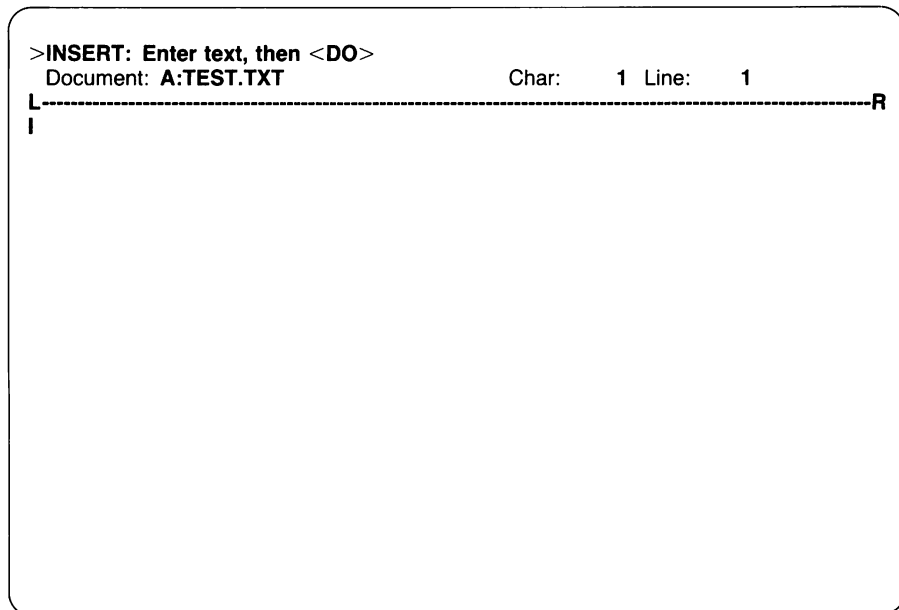
The Return key signals the operating system that you want to execute the command. When you press <RET>, RED displays < as a carriage return marker. The Do key is used to end command responses or cancel any RED command before you press Return.

Entering Text

To insert text in a document, use the Insert command (I) Press:

I

RED then asks you to enter the text and press <DO> when finished (see Screen 24a).



Screen 24a. Inserting Text

MR-S-2368-82

Using the Editor

NOTE: When typing RED commands, type only the first character of the command. The first character of each command is displayed in boldface on the RED command line.

If you make additional errors, correct them using the backspace (BS) key, or leave them as they are.

Type the following text printed in color. Type everything *exactly* as you see it. Be sure to press <RET>. The text contains errors for you to fix later.

```
To the staff;<RET>
<RET>
There will be a staff meeting today<RET>
in the floor Mayflower Conference<RET>
Room at 2:00 P.M. noon.<RET>
<DO>
```

Refer to Screen 24b for the entire dialog.

When you finish inserting the text and press <DO>, the cursor is below the last line of text shown in Screen 24b.

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:TEST.TXT Char: 1 Line: 6
L-----R
To the staff;<
<
There will be a staff meeting today<
in the floor Mayflower Conference<
Room at 2:00 P.M. noon.<
|
```

Screen 24b. Inserted Text

MR-S-2369-82

Exchanging Characters

The **Xchg** command (**X**) exchanges characters or words character-by-character in the text. Move the cursor, using the four arrow keys, to the **s** in the word **staff** in the line: **To the staff;**. Press:

X

The screen should look like Screen 25a.

```

>XCHNG: Enter text, then <DO>
Document: A:TEST.TXT                      Char: 8 Line: 1
L-----R
To the s<taff;<
<
There will be a staff meeting today<
in the floor Mayflower Conference<
Room at 2:00 P.M. noon.<

```

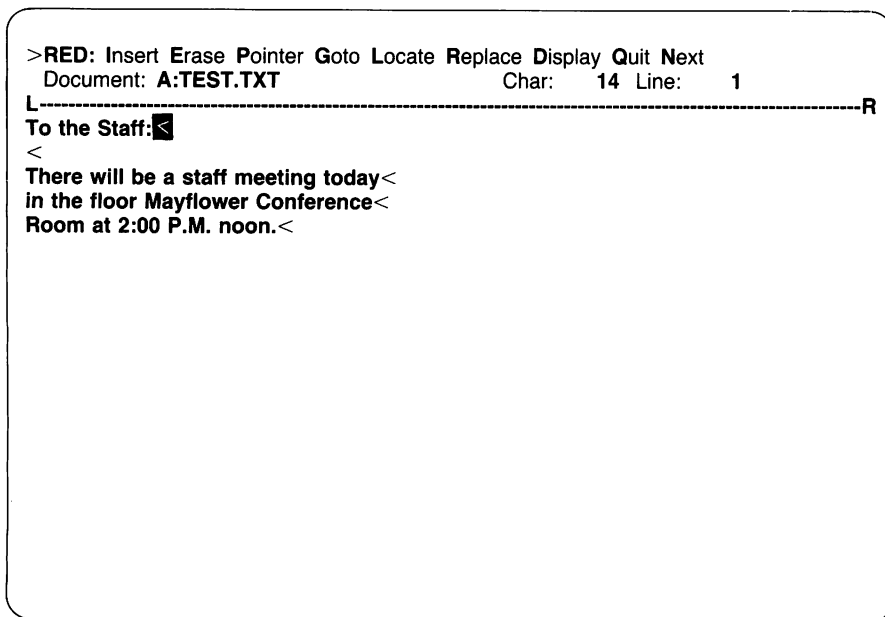
Screen 25a. Exchanging Characters

MR-S-2370-82

RED asks you to enter the new text and press **<DO>** when finished. Type:

Staff:<DO>

As you type the new characters, the old characters are exchanged for the new ones. After you press **<DO>**, RED redisplayes the command line and saves the correction. RED places the cursor on the carriage return marker (**<**) at the end of the line **To the Staff;** (see Screen 25b).



Screen 25b. Exchanged Text

MR-S-2371-82

Inserting Text

The Insert command (**I**), which you used for inserting text, can also be used to add text to a document. Move the cursor, using the arrow keys, to the *f* in the word *floor*. Press:

I

The text drops two lines to open a space for you to type additional text. The cursor position does not change. RED asks you to enter the text and press <DO> when finished (see Screen 26a).

You type the text next to the cursor. *Remember to type a space after the inserted word.* When inserting text, RED treats spaces as though they were letters. Type:

first <DO>

After you press <DO>, the text merges and RED redisplay the command line (see Screen 26b). RED positions the cursor on the *f* in the word *floor*.

```
>INSERT: Enter text, then <DO>
Document: A:TEST.TXT           Char: 8 Line: 4
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the I

      floor Mayflower Conference<
Room at 2:00 P.M. noon.<
```

Screen 26a. Inserting Text

MR-S-2372-82

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:TEST.TXT           Char: 14 Line: 4
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M. noon.<
```

Screen 26b. Inserted Text

MR-S-2373-82

Erasing Text

The **Erase** command (**E**) removes spaces, characters, words, phrases, sentences, and lines from a document. Move the cursor to the space before the word noon using the arrow keys. Then, press:

E

RED asks you to move the cursor to the place where you want to stop erasing and press **<DO>** when finished (see Screen 27a).

```
>ERASE: Move cursor, then <DO>
Document: A:TEST.TXT           Char: 18 Line: 5
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M. Inoon.<
```

Screen 27a. Erasing Text

MR-S-2374-82

Move the cursor to the carriage return mark (**<**) and press:

<DO>

After you press **<DO>**, RED erases the space, the word noon, and the period. It then redisplay the command line (see Screen 27b).

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:TEST.TXT Char: 18 Line: 5
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.☒
```

Screen 27b. Erased Text

MR-S-2375-82

Ending an Editing Session

The **Quit** command (**Q**) ends your work on a document. Press:

Q

RED displays the options in Screen 28 asking whether you want to keep, abandon (do not save edits), or return to the document.

For this example, save the text and changes. Press:

K

RED displays the following message on the screen:

```
Keeping
A:TEST.TXT
please stand by...
```

>QUIT: Keep Abandon <DO> I
Document: **A:TEST.TXT**

Keep – this will save any changes since
 the last editing session.

Abandon – this will end editing **WITHOUT**
 saving the changes made.

<DO> – go back to the document

Screen 28. Quit Options

MR-S-2376-82

The operating system then displays its prompt, **A>**, indicating it is ready to accept another operating system command.

To confirm that the **TEST.TXT** file has been saved, display the directory of the disk. Type:

A> DIR<Ret>

Screen 29 shows the directory with the **TEST.TXT** file included.

```
A>DIR
A: HELP      CMD : MAINT  CMD : PIP    CMD : COPY   COM
A: RED       CMD : TEST  TXT : STAT   CMD : SUBMIT  CMD
A: SYSCOPY   SUB
A>█
```

Screen 29. Directory

MR-S-2437-82

Continuing an Editing Session

The last section of this chapter covers the following:

- Command lines
- Cursor keys/commands
- File renaming
- Additional editing commands
- Rainbow 100's editing keypad

Displaying the Command Lines

After you created TEST.TXT, the RED command line was displayed on the screen. The command line listed the editing commands available in RED. RED's three command lines are shown in Screen 30.

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:TEST.TXT Char: 1 Line: 1
L-----R
|

>RED: Append View Xchng Tab Help Next
Document: A:TEST.TXT Char: 1 Line: 1
L-----R
|

>RED: Move Copy Zap Output Write Next
Document: A:TEST.TXT Char: 1 Line: 1
L-----R
|
```

Screen 30. RED Command Lines

MR-S-2377-82

To display each command line, you press the **N** key for Next. At the end of each command line in Screen 30, the Next command is listed. You can, however, choose any RED command, even if it is not displayed, by typing the first letter of the command.

***NOTE:** Depending on whether you use the Next command or not, the command line displayed on your screen may not match the screens in this text.*

Using the Status Line

Within the command line is an area called the Status Line. It is located just above the broken left and right line. Next to the word Document: on the far left is the drive name and file name. To the far right are the words Char: followed by a number and Line: followed by a number.

Char(acter) keeps track of any characters (letters, numbers, and symbols such as punctuation marks) you have typed in a line of text.

Line keeps track of which line of the text you are on.

The numbers next to each word change as you type or move the cursor through the text. They also provide useful information for moving the cursor around with such commands as **Goto**, **Locate**, and **Tab** discussed in the next section.

Moving the Cursor

The majority of the operations RED performs on text are performed with reference to moving the cursor.

Pressing the left angle bracket key (<) or the minus sign key (-), causes the cursor to work back toward the beginning of the document.

Holding down the Shift key while pressing the right angle bracket key <Shift/> or holding down the Shift key while pressing the plus sign key <Shift/+> causes the cursor to work forward toward the end of the document.

Table 18 lists the keys used to move the cursor in combination with an optional number (n) entry. You press the number first, then the desired key.

Table 18. Keys to Move the Cursor

Key	Action
nArrow	Moves the cursor to the “nth” position using the left, right, up, and down arrow keys.
nPunctuation	Moves the cursor to the “nth” occurrence of the following characters: comma, period, question mark, exclamation point, colon, and semicolon.
nReturn	Moves the cursor to the first character of the line following the “nth” carriage return.
nSpace bar	Moves the cursor to the “nth” space between characters.
nTab	Moves the cursor to the “nth” tab location in text.

Deleting Text

In addition to the backspace key (BS), you can press the delete character and left arrow key to delete text. They function only when inserting text.

Renaming a File and Making Further Edits

Now that you know how to move the cursor and delete text, you are ready to practice the rest of the RED commands. To do this, rename the old file TEST.TXT. Then practice the rest of the RED commands beginning with those on the first command line. The **P**ointer command, however, is described with commands in the third command line.

Next to the CP/M-86/80 prompt type:

```
A>RED MEMO.TXT=TEST.TXT<Ret>
```

RED displays the following message:

```
Loading RAINBOW 100 EDITOR
```

After this message, the RED command line displays on the screen, with the new document name MEMO.TXT (see Screen 31).

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 1
L-----R
|o the Staff:<
|<
| There will be a staff meeting today<
| in the first floor Mayflower Conference<
| Room at 2:00 P.M.<
```

Screen 31. Editing an Old File

MR-S-2378-82

Before doing each command in this part of the chapter, always move the cursor to the top of your text.

Using the Goto Command

The **Goto** command (**G**) is a command that moves the cursor to four different locations: **Top**, **Bottom**, **Line**, or to any preset **Pointer**. Press:

G

RED then asks you where you want the cursor to move to (see Screen 32a).

```
>GO TO: Top Bottom Line
Document: A:MEMO.TXT           Char:  1 Line:  1
-----R
L
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 32a. Using the Goto Command

MR-S-2379-82

You can send the cursor to any of the areas listed in the **Goto** command by typing either the first letter of the location (**Top**, **Bottom**, or **Line**) or by typing a number or a preset pointer. (**Pointers** are discussed in a later section.) Press:

L

Using the Editor

RED asks you to type the line number and return (see Screen 32b). Press:

4<RET>

```
>GO TO: Line: Enter line number; then <RET> I
Document: A:MEMO.TXT Char: 1 Line: 1
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 32b. Using the Goto Command

MR-S-2380-82

The cursor should now be on the first character (i) in the fourth line (see Screen 32c). A four should be displayed next to the word Line on the Status Line.

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 4
L-----R
To the Staff:<
<
There will be a staff meeting today<
In the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 32c. Using the Goto Command

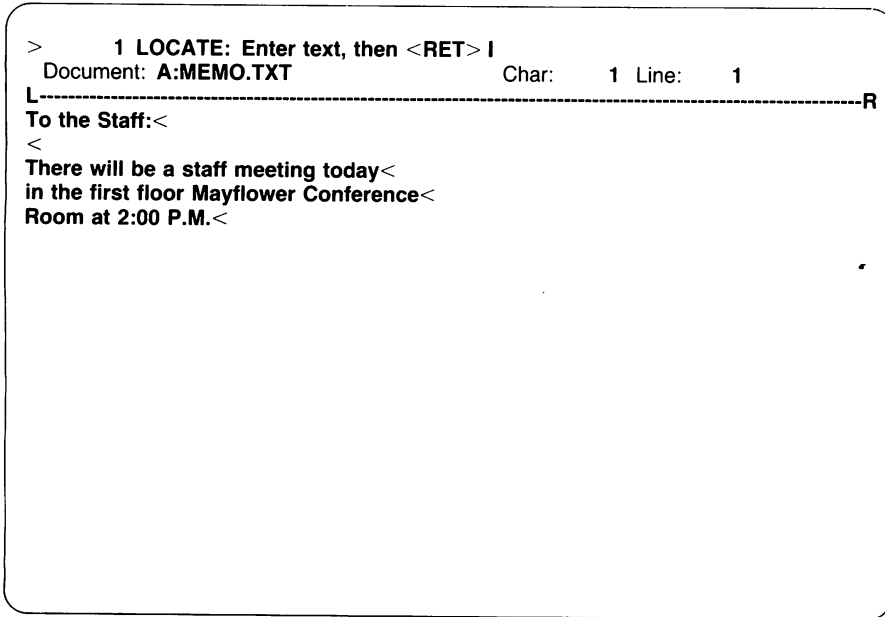
MR-S-2382-82

Using the Locate Command

The **Locate** command (**L**) searches for any character, word, or symbol in your document. A search always moves in the direction indicated by the angle bracket at the beginning of the command line. Before using the **Locate** command, you should check the direction of the angle bracket. If it is not pointing in the desired direction, change it using the keys mentioned under the section “Moving the Cursor” in this chapter. Press:

L

RED asks you to enter the text you are searching for and press <RET> when finished (see Screen 33a). The number one in front of the command indicates that only the first occurrence of the word is being searched for. If you want to search for any other occurrence, you should press the number of the entry and then press the L key.



Screen 33a. Locating Text

MR-S-2382-82

You type the text next to the cursor. Type:

2:00<RET>

The cursor moves to the 2 in 2:00 and the first command line redisplay on the screen (see Screen 33b).

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 9 Line: 5
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 33b. Locating Text

MR-S-2383-82

Replacing Text

The **Replace** command (**R**) finds and replaces a word or characters each time they occur in your document. Press:

R

NOTE: *It is important to type the text exactly as it appears in your document. To replace a word like "the" which may be part of "other", do the following:*

1. Type a space.
2. Type *the*.
3. Type a space.

The number to the left of the word **REPLACE**, indicates how many occurrences of a word can be replaced (see Screen 34a). If you also want to replace the third occurrence of a word, you first type the number of that entry, then press an R.

Using the Editor

RED asks you to enter the old text next to the cursor and press <RET> (see Screen 34a). Type:

2:00 P.M.<RET>

>10000 REPLACE: Enter old text, then <RET> 2:00 P.M.
Enter new text, then <RET>

L-----R

To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
I

Screen 34a. Replacing Text

MR-S-2384-82

RED displays a new line asking you to enter the new text next to the cursor and press <RET>. Type:

10:00 A.M. on Tuesday.<RET>

RED asks if you want the prompt turned on (see Screen 34b). The prompt acts as a check to see if you really want to replace each occurrence of the word(s) or the characters.

If the prompt was turned off, unless you typed a number, only the first occurrence of the word is replaced. Pressing a **P** turns the prompt off. If you wish to replace all occurrences, type the **#** and press <RET>. For now press <RET>.

```
>10000 REPLACE: Enter old text, then <RET> 2:00 P.M.  
Enter new text, then <RET> 10:00 A.M. on Tuesday. Prompt <RET> I  
L-----R  
To the Staff:<  
<  
There will be a staff meeting today<  
in the first floor Mayflower Conference<  
Room at 2:00 P.M.<
```

Screen 34b. Replacing Text

MR-S-2386-82

A new message is displayed (see Screen 34c), and RED asks if you want to replace “2:00 P.M.” with “10:00 A.M. on Tuesday.” The number to the left of REPLACE has changed to indicate how many more occurrences of the word(s) can be replaced.

There is now a blinking cursor on the 2 in 2:00. RED is prompting to see if you want this word replaced. Press:

Y

The old text is replaced with the new text in your document (see Screen 34d), and you also return to the command line.

Displaying Screens of Text

The Display command (D) is used when you have more than one screen or more than a few lines of text. It displays a screen of text at a time by moving either forward or backward.

```
> 9999 REPLACE with: "10:00 A.M. on Tuesday." Yes No I
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 34c. Replacing Text

MR-S-2387-82

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 30 Line: 5
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday|<
```

Screen 34d. Replacing Text

MR-S-2388-82

To move forward one screen, type **D**. To move backward one screen, type **-D**. (This will also change the direction of the angle bracket, cursor movement, on the command line.) If you want to see more of the document, type a number in front of the **D** or the **-**. For this session move on to the next section.

Cycling Through the Command Lines

The **Next** command (**N**) moves you through the three **RED** command lines (refer to Screen 30). Press the letter **N** until you have seen all three lines.

The commands in the next sections are from the second command line. You can either press the **N** key to find the second command line, or just continue following the examples without displaying the second command line. You do not need to display a command to use it.

Appending One Document to Another

The **Append** command (**A**) lets you see a **List** of documents and **Insert** an entire document into another. To insert a document at the end of the text, move the cursor to the bottom of the text and press:

A

RED displays the two commands: **List** and **Insert** (see Screen 35a). To get a **List** of your files, press:

L

At this point (see Screen 35b) you can do any of the following:

1. List all your files by typing the name of the drive containing your diskette of files, then pressing the Return key.
2. Type the drive name and file name using wildcards (refer to Chapter 1) to get a partial file listing, then press the Return key.
3. Type the drive name and the name of a specific file, then press the Return key.

```
> Append: List Insert I
Document: A:TEST.TXT           Char:  1  Line:  6
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
```

Screen 35a. Append Command

MR-S-2389-82

```
> LIST: Enter drive name, then <RET> (You may use * and ? ) I
Document: A:MEMO.TXT           Char:  1  Line:  6
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
```

Screen 35b. Append Command

MR-S-2390-82

For this example type:

A<RET>

The Append command is displayed again, and below the command line, your files are listed (see Screen 35c).

```
>APPEND: List Insert I
Document: A:MEMO.TXT           Char: 1  Line: 6
L-----R
A: HELP      CMD : MAINT    CMD : PIP      CMD : COPY    COM
A: RED       CMD : TEST     TXT : STAT     CMD : SUBMIT  CMD
A: SYSCOPY   SUB : MEMO      $$$
```

Screen 35c. Append Command

MR-S-2391-82

If you look at the list, you see that MEMO.TXT is shown as MEMO.\$\$. This is because the file has not been saved yet. The \$\$ extension indicates a temporary file. Press:

I

RED asks you to enter the document name (file name) and then press the Return key (see Screen 35d). Type:

TEST.TXT<RET>

```
>INSERT: Enter document name, then <RET> I
Document: A:MEMO.TXT Char: 1 Line: 6
L-----R
A: HELP      CMD : MAINT   CMD : PIP     CMD : COPY    COM
A: RED       CMD : TEST    TXT : STAT    CMD : SUBMIT  CMD
A: SYSCOPY   SUB : MEMO    $$$
```

Screen 35d. Append Command

MR-S-2392-82

RED inserts the document TEST.TXT at the cursor location in the document MEMO.TXT (see Screen 35e).

Viewing Another Document

The View command (V) allows you to View one document, while editing another document. Press:

V

RED asks you to type the name of the document you want to View (see Screen 36a), then press <RET>. Type:

TEST.TXT<RET>

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 6
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 35e. Append Command

MR-S-2394-82

```
>VIEW: Enter document name, then <RET>
Document: A:MEMO.TXT Char: 1 Line: 6
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 36a. Viewing a Document

MR-S-2395-82

Using the Editor

RED displays the document TEST.TXT in the lower half of the screen (see Screen 36b). The text is also in a lower intensity than the document you are working on.

```
>VIEW: press any key to continue viewing or <DO>
Document: A:MEMO.TXT          Char: 1 Line: 6
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<

To the Staff:

There will be a staff meeting today
in the first floor Mayflower Conference
Room at 2:00 P.M.
```

Screen 36b. Viewing a Document

MR-S-2396-82

Using Tab

The Tab command (T) shows you where tabs have been set in RED. Press:

T

RED displays the tab locations in the text (see Screen 37a). Tabs cannot be changed in RED. On the Status Line a tab is treated as one character.

RED returns you to the command line and the text (see Screen 37b). You press the Tab key to check tabs. Press:

<RET>

>TABS are set as shown below, press <RET> to continue.

	1		2		3		4		5		6		7		8
1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890
TI	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

Screen 37a. Tab Command

MR-S-2397-82

>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 1

L-----R
To the Staff:<

<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<

To the Staff:<

<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.

Screen 37b. Tab Command

MR-S-2423-82

Using the Editor

If you press the Tab key, when the cursor is positioned on the T in the first line, the cursor moves down the first line to the t in Staff. The character count should increase by only one character(see Screen 37c).

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 2 Line: 1
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 37c. Tab Command

MR-S-2434-82

Getting Help

The **H**elp command (**H**) consists of a series of screens that summarize RED commands and include tips for doing certain commands. Press:

H

RED asks you to press the first letter of the command you want help for (see Screen 38a).

```
>HELP: Enter command I
Document: A:MEMO.TXT           Char: 12 Line: 1
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 38a. Help Command

MR-S-2398-82

For this example, press:

H

RED displays the Help Screen 38b. You can request help for any RED command by repeating the previous steps.

When you are done reading the information, press any key to return to the document.

Using the Pointers with Commands

The commands in the third command line (refer to Screen 30) are used in conjunction with the **Pointer** command (**P**). The pointers act as markers within the text to section off portions for editing or deleting. You can set up to eight pointers (1-8) and can reassign a pointer by reusing the number.

>Press any key to return to document |

COMMAND: **HELP**

WHAT IT DOES: **Explains how to use any RED command.**

HERE'S HOW: **1. Type "H".**
2. Type the first letter of the command you want.
3. To return to text, press any key.

Screen 38b. Help Command

MR-S-2399-82

The general procedure for using these commands follows:

1. Move the cursor to a location.
2. Type **P**.
3. Type a pointer number.
4. Repeat steps 1, 2, or 3 if necessary, using different pointer numbers.
5. Type the command.
6. Type the number of the pointer.
7. Repeat step 6 if necessary.

The following commands use pointers in their operations:

- **Move**
- **Copy**
- **Zap**

- Output
- Write

Moving Sections of Text

The **M**ove command (**M**) moves a marked section of text from one part of the document to another. Move the cursor to the first character in the sixth line. Press:

P

RED asks you to set a pointer (see Screen 39a) using the numbers one through eight. Press:

1

```
>Set POINTER: 1 2 3 4 5 6 7 8
Document: A:MEMO.TXT           Char: 1 Line: 6
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 39a. Move Command

MR-S-2400-82

RED marks the spot with a [1] in a lower intensity than the rest of the screen (see 39b).

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 6
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
[1]To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 39b. Move Command

MR-S-2401-82

To set the next pointer, move the cursor to the carriage return character at the end of the text. The first marker temporarily disappears, and the top line of text scrolls out of view (see Screen 39c).

You are now ready to set the second pointer. Press:

P

RED again asks you to set a pointer. The first pointer displays in low intensity both in the text and on the command line. This reminds you that you have set pointer number one (see Screen 39d). The top line of the text is also displayed again.

```

>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 18 Line: 10
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conferenceff4<
Room at 10:00 A.M. on Tuesday.<
[1]To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.☒

```

Screen 39c. Move Command

MR-S-2402-82

```

>Set POINTER: 1 2 3 4 5 6 7 8
Document: A:MEMO.TXT Char: 1 Line: 6
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
[1]To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference
Room at 2:00 P.M.☒

```

Screen 39d. Move Command

MR-S-2403-82

Using the Editor

To set the second pointer, press:

2

RED sets the second pointer at the end of the text in Screen 39e and displays the command line. The second pointer is displayed in a lower intensity than the rest of the screen.

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 18 Line: 10
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
[1]To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.[2]
```

Screen 39e. Move Command

MR-S-2404-82

Move the cursor to the line after the last line of text (see Screen 39f).

You are now ready to execute the **M**ove command. Press:

M

RED asks you where you want to move the text from (see Screen 39g). Four choices are shown on the command line. This includes the two pointers that you set. Press:

1

```

>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 11
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
I

```

Screen 39f. Move Command

MR-S-2405-82

```

>MOVE: Top Bottom 1 2 From I
Document: A:MEMO.TXT Char: 1 Line: 11
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<

```

Screen 39g. Move Command

MR-S-2406-82

RED now asks you where you want the text moved to (see Screen 39h). Press:

2

```
>MOVE: Top Bottom 1 2 From 1 , To 1
Document: A:MEMO.TXT Char: 18 Line: 10
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
To the Staff:
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.
```

Screen 39h. Move Command

MR-S-2432-82

RED displays the command line, and the text moves down one line (see Screen 39i). The two memos are now separated by a blank line.

Copying Sections of Text

The Copy command (C) copies a marked section of text from one part of a document to another. This is useful if you are repeating lines that display in more than one area of your document.

Move the cursor to the top of the text (see Screen 40a).

```

>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 18 Line: 11
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M. I

```

Screen 39i. Move Command

MR-S-2407-82

```

>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 1
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<

```

Screen 40a. Copy Command

MR-S-2409-82

Using the Editor

You are now ready to set pointers. Press:

P

The **Pointer** screen displays the location of the pointers that were set in the **Move** command. Both the pointers on the command line and in the text are displayed in a lower intensity than the rest of the text (see Screen 40b).

```
>Set POINTER: 1 2 3 4 5 6 7 8
Document: A:MEMO.TXT          Char: 1 Line: 1
-----L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
[1] [2]
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 40b. Copy Command

MR-S-2410-82

You can reset the two pointers using the same numbers. When you do this, the previously set pointers are deleted. Press:

1

Screen 40c shows the results of resetting the first pointer.

Move the cursor to the carriage return character at the end of the text (see Screen 40d).

NOTE: *The text may scroll up one line.*

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 1
```

```
L-----R
```

```
[1]To the Staff:
```

```
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
```

```
[2]
```

```
To the Staff:<
```

```
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
```

Screen 40c. Copy Command

MR-S-2411-82

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 18 Line: 11
```

```
L-----R
```

```
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
```

```
<
To the Staff:<
```

```
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.█
```

Screen 40d. Copy Command

MR-S-2412-82

Using the Editor

You now use the **Copy** command. Press:

C

RED asks you where to begin copying the text from (see Screen 40e). Press:

1

```
>COPY: Top Bottom 1 2 From 1
Document: A:MEMO.TXT Char: 18 Line: 11
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.
```

Screen 40e. Copy Command

MR-S-2413-82

RED now asks you where you want to stop copying the text (see Screen 40f). Press:

2

RED copies the same memo at the beginning of the text to the end of the last memo (see Screen 40g).

NOTE: *The text may scroll up one line.*

```

>COPY: Top Bottom 1 2 From 1 , To I
Document: A:MEMO.TXT Char: 18 Line: 11
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.

```

Screen 40f. Copy Command

MR-S-2414-82

```

>RED: Insert Erase Pointer Goto Locate Replace Display Quit f77Next
Document: A:MEMO.TXT Char: 18 Line: 11
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M. To the Staff:< I
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<

```

Screen 40g. Copy Command

MR-S-2415-82

Erasing Sections of Text

The **Zap** command (**Z**) permanently erases marked sections of a document. You should use this command with care.

At the end of the **Copy** command, the cursor was positioned on the **T** in **To** (refer to Screen 40g). This time leave the cursor at this location. Press:

P

NOTE: *The text may scroll up one line.*

RED asks you to set a pointer and displays the location of the pointers set for the **Copy** command (see Screen 41a). Remember when you reset the same pointer number, it deletes the previously set pointer.

```
>Set POINTER: 1 2 3 4 5 6 7 8
Document: A:MEMO.TXT Char: 18 Line: 11
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
[2]
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M. to the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
```

Screen 41a. Zap Command

MR-S-2416-82

With the cursor located on the T press:

1

RED displays the command line and places pointer one next to the T in To (see Screen 41b).

```

>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 11 Line: 11
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
[2]
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M. ]To the Staff:
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<

```

Screen 41b. Zap Command

MR-S-2417-82

Move the cursor to the line below the last memo. Press:

P

You are ready to set the second pointer (see Screen 41c). Press:

2

RED resets the second pointer at the line below the last memo and leaves a blank line where the previous pointer was (see Screen 41d).

```
>Set POINTER: 1 2 3 4 5 6 7 8
Document: A:MEMO.TXT Char: 1 Line: 16
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
[2]
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.[1]To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
I
```

Screen 41c. Zap Command

MR-S-2418-82

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 16
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<

To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.T[1]To the Staff:
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
[2]
```

Screen 41d. Zap Command

MR-S-2419-82

You are now ready to **Z**ap the marked section at the end of the memos. Press:

Z

RED asks you where to start deleting (zapping) text (see Screen 41e). The pointers are no longer visible.

```
>ZAP: Top Bottom 1 2 From 1
Document: A:MEMO.TXT Char: 1 Line: 16
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<

To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
```

Screen 41e. Zap Command

MR-S-2420-82

To tell RED where to start deleting text, press:

1

RED now asks you where you want to stop deleting text (see Screen 41f).

To tell RED where to stop deleting text, press:

2

RED deletes or zaps the section you indicated (see Screen 41g).

```
>ZAP: Top Bottom 1 2 From 1 , To I
Document: A:MEMO.TXT Char: 1 Line: 16
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<

To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
```

Screen 41f. Zap Command

MR-S-2421-82

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 18 Line: 11
L-----R
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M. I
```

Screen 41g. Zap Command

MR-S-2422-82

Creating Files from Sections of Text

The **Write** command (**W**) creates a new document (file) containing sections of text that you marked. It is a useful command for creating stock paragraphs for form letters, memos, or contracts.

Move the cursor to the top of the first memo to indicate where you want the new file to begin. Press:

P

Screen 42a displays the **Pointer** command. It also displays the pointers that were set when you used the **Zap** command.

```
>Set POINTER: 1 2 3 4 5 6 7 8
Document: A:MEMO.TXT           Char: 1 Line: 1
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.[1] [2]
```

Screen 42a. Write Command

MR-S-2424-82

To reset the first pointer, press:

1

RED displays the command line (see Screen 42b) and resets the first pointer.

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 1
L-----R
[!]To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.[2]
```

Screen 42b. Write Command

MR-S-2425-82

Move the cursor to the carriage return character located between the two memos (see Screen 42c).

To mark the end of the new file you want to create, press:

2

RED displays the **Pointer** command (see Screen 42d) and the current cursor locations.

```

>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 6
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<

To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.

```

Screen 42c. Write Command

MR-S-2426-82

```

>Set POINTER: 1 2 3 4 5 6 7 8
Document: A:MEMO.TXT Char: 1 Line: 6
L-----R
[1]To the Staff:
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<

To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.[2]

```

Screen 42d. Write Command

MR-S-2427-82

Using the Editor

To reset the second pointer, press:

P

Screen 42e shows where the second pointer is reset.

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 6
-----R
[1]To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
[2]
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.
```

Screen 42e. Write Command

MR-S-2428-82

You are now ready to use the **Write** command to create a new file. Press:

W

RED asks you what section you want copied to the new file (see Screen 42f). Press:

1

After you repeat the same process for the second pointer, RED asks you to give the new document a name (see Screen 42g).

```

>WRITE: Top Bottom 1 2 From 1
Document: A:MEMO.TXT           Char: 1 Line: 6
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<

To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.

```

Screen 42f. Write Command

MR-S-2429-82

```

>WRITE: Top Bottom 1 2 From 1 , To 2 to document 1
Document: A:MEMO.TXT           Char: 1 Line: 6
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<

To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.

```

Screen 42g. Write Command

MR-S-2430-82

Using the Editor

Remember that RED accepts only valid CP/M-86/80 file names. Type:

```
TUES.TXT<RET>
```

RED displays the command line, but does not change the text. The pointers are no longer visible (see Screen 42h).

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: A:MEMO.TXT Char: 1 Line: 6
L-----R
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
█
To the Staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.
```

Screen 42h. Write Command

MR-S-2436-82

You are now ready to end this editing session, and check the directory for the files. Follow these directions:

1. Type **Q** for **Quit**.
2. Type **A** for **Abandon**.
3. Type **DIR** next to the system prompt.

Screen 43 displays the file directory. You now have the original memo in TEST.TXT and the edited memo in TUES.TXT.

```
A>DIR
A: HELP      CMD : MAINT  CMD : PIP    CMD : COPY   COM
A: RED       CMD : TEST   TXT : STAT   CMD : SUBMIT  CMD
A: SYSCOPY   SUB : TUES   TXT
A>█
```

Screen 43. Directory

MR-S-2431-82

Printing Section of Text

The **Output** command (**O**) sends a marked section of a document to a printer. To do this command, you must:

1. Connect the Rainbow 100 computer to a printer.
2. Change Set-Up features to be compatible with the printer characteristics.

Refer to the *Rainbow 100 Owner's Manual* for this information.

When you complete these two steps, you press:

O

At this point you can either:

1. Print the whole document by pressing **T** for **Top** and **B** for **Bottom**.

Using the Editor

2. Print a section of the document by setting pointers as you did for the previous commands.

After you perform one of these steps, the text goes to the printer and is printed.

Changing Column Width

To change the width of a column in RED from 80 to 132, next to the system prompt you type:

```
A>RED filename.typ/W<Ret>
```

Using the Rainbow 100 Editing Keypad

In addition to using the keys described in the previous examples, the Rainbow 100 computer has an editing keypad (see Figure 25).

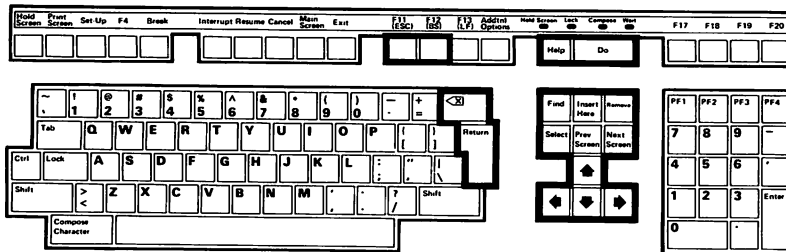


Figure 25. Rainbow 100 Special Editing Keys

MR-8993

Table 19 lists the function of these keys.

Table 19. Special Editing Key Functions

Key	Function
Escape/Do	Used to end command responses or cancel a command.
Backspace/Delete	Used to delete a single character before the cursor only while inserting text.
Return	Signals the operating system that you want to execute a command.
Help	Used alone or with a command key, Help displays information on each command.
Find	Performs the same function as the Locate command.
Insert Here	Performs the same function as the Insert command.
Remove	Performs the same function as the Erase command.
Select	Does not have any function at this time.
Prev Screen	Performs the same function as typing -D (Display command).
Next Screen	Performs the same function as the Display command.
Cursor Keys	Move the cursor around in the text.
Left Arrow	Deletes a single character before the cursor only while inserting text.

Making a System/Application Diskette

Application programs are those programs that solve specific problems or do specific jobs, such as word processing or financial planning.

If you are using an application program routinely, you should copy the operating system and the application program to a *single diskette*. By doing this, you can use one diskette to start the operating system and also to run the application program. Because you use one drive for this diskette, a drive is empty so you can insert a data diskette, which is a diskette that you use with the application program to store information, such as the text of a memo.

The diskette onto which you copy the operating system and the application program is called a *system/application* diskette because it contains the operating *system* and the *application* program. This chapter tells you how to make a system/application diskette.

Application programs you can copy include:

- Programs created for the Rainbow 100 computer and stored on RX50 diskettes

Making a System/Application Diskette

- Programs configured for DIGITAL'S VT180 personal computer (refer to the application program's documentation to determine if the program can be configured for the VT180 personal computer)

Follow the steps in the next two sections of this chapter to make a system/application diskette. In the section titled:

1. "Copying the Operating System Files," you copy the operating system onto a blank diskette.
2. "Copying a Program from Rainbow 100 or VT180 Diskettes," you copy the application program from a Rainbow 100 compatible diskette or a VT180 compatible diskette onto the diskette to which you just copied the operating system.

Copying the Operating System Files

1. Display the Rainbow 100 Main System Menu according to one of the following procedures:
 - If the Rainbow 100 computer is turned off — Make sure that no diskettes are in the drives. Turn on the Rainbow 100 computer with the drive doors opened or closed. The Main System Menu should be displayed on the screen.
 - If the Rainbow 100 computer is turned on — Reset the Rainbow 100 computer by pressing the Set-Up key, followed by typing <Ctrl/Set-Up>. The Main System Menu should be displayed on the screen.
2. Remove the CP/M-86/80 working diskette (the diskette you copied in Chapter 2) from its protective envelope.
3. Open the drive A door and insert the CP/M-86/80 working diskette. Close the drive A door. *If the diskette is wearing a write-protect tab, use another diskette.*
4. Start the CP/M-86/80 operating system by pressing the A key in response to the Main System Menu. A> should be the last characters displayed on the screen.

5. Remove a blank diskette from the diskette box in the Rainbow 100 CP/M-86/80 Operating System Kit. The part number, BL-N402A-BK, should be printed on the blank diskette's label. You copy the operating system to this diskette. It becomes the system/application diskette.
6. Remove the blank diskette from its protective envelope.
7. Open the drive B door and insert the blank diskette. Close the drive B door.

NOTE: *If you did not turn on or reset the computer just before inserting the diskettes, type <Ctrl/C> after A> to tell the operating system that you have inserted new diskettes into the drives.*

8. The following procedure, which copies the operating system to the blank diskette using the SUBMIT program, should complete in about about two minutes. You type only one instruction. In this instruction, A is the source drive and B is the destination drive. The remainder of the instructions are typed by the computer.

NOTE: *If any error messages are displayed at any time during the following procedure, refer to Chapter 8, Error Messages.*

After the A>, type:

```
A>SUBMIT SYSCOPY A B<Ret>
```

As the operating system is being copied, the small lights beside each drive turn on and off and the drives make clicking and whirring sounds. When the copying procedure is completed, the operating system displays A>. Screen 44 shows the entire dialog.

9. Check that all the files were copied. After the A>, type:

```
A>DIR B:<Ret>
```

The file names in Screen 45 should be displayed on the screen followed by:

```
A>
```

Making a System/Application Diskette

```
A>SUBMIT SYSCOPY A B
```

```
A>LDCOPY A: B:  
LDCOPY VERS 1.5
```

```
A>PIP B:=A:*.SYS[ROV]
```

```
COPYING -  
CPM.SYS  
Z80CCP.SYS  
Z80.SYS  
PRMTVPVT.SYS
```

```
A>PIP B:=A:MAINT.CMD[OV]
```

```
A>PIP B:=A:PIP.CMD[OV]
```

```
A>PIP B:=A:COPY.COM[OV]
```

```
A>PIP B:=A:SUBMIT.CMD[OV]
```

```
A>PIP B:=A:STAT.CMD[OV]
```

```
A>
```

MR-S-2330-82

Screen 44. SYSCOPY Dialog

```
A>DIR B:  
B: MAINT      CMD: PIP      CMD: COPY      COM: SUBMIT    CMD  
B: STAT      CMD
```

```
SYSTEM FILE(S) EXIST
```

```
A>
```

MR-S-2332-82

Screen 45. Directory File Names on System/Application Diskette

Then, after the A>, type:

```
A>DIRS B:<Ret>
```

The file names in Screen 46 should be displayed on the screen followed by:

```
A>
```

```
A>DIRS B:
B: CPM          SYS : Z80CCP   SYS : Z80          SYS : PRMTVPVT SYS
NON-SYSTEM FILE(S) EXIST
A>
```

MR-S-2334-82

Screen 46. System File Names on System/Application Diskette

You have now successfully copied the operating system files to the diskette in drive B. Go to the next section to copy the application program onto this diskette.

Copying a Program from Rainbow 100 or VT180 Diskettes

1. Open the drive A door and remove the CP/M-86/80 working diskette. Return it to its protective envelope and store it in a safe place.
2. Open the drive B door and remove the diskette. This was the blank diskette that you have just finished copying the operating system files to.
3. Insert this diskette into drive A. Close the drive A door.
4. Insert the application program working diskette into drive B. (This is the diskette that the application package, such as a word processing or financial planning package, is stored on.) Close the drive B door.
5. To tell the operating system that you have changed diskettes, type:

```
A><Ctrl/C>
```

When you type <Ctrl/C>, you hear clicking sounds from the drive and the small light beside drive A turns on briefly. The operating system displays the following on your screen:

```
A>^C  
A>
```

6. Copy the application program (in drive B) onto the diskette already containing the operating system (in drive A). To do this, you use the PIP program. The number of files that make up an application program working diskette varies. Hence, the time it takes to copy these files varies.

NOTE: *If any error messages are displayed at any time during the following procedure, refer to Chapter 8, Error Messages.*

Type:

```
A>PIP A:=B:.*[OV]<Ret>
```

where:

A: is the location you are copying to (the destination drive).

B: is the location you are copying from (the source drive).

. is a symbol indicating all files.

[OV] are added instructions for PIP.

As the application program files are being copied, the small lights beside each drive turn on and off and the drives make clicking and whirring sounds. PIP displays:

COPYING --

followed by a list of all the file names as they are copied. The file names are the same names as those on the source diskette. When all the files are copied, the operating system displays:

A>

7. Open the drive B door and remove the application program working diskette. Return it to its protective envelope and store it in a safe place.
8. If desired, you can now insert a data diskette into drive B to use with the application program. You can use this diskette to store information. Close the drive B door.
9. To tell the operating system that you have changed diskettes, type:

A><Ctrl/C>

When you type <Ctrl/C>, you hear clicking sounds from the drive and the small light beside drive A turns on briefly. The operating system displays the following on your screen:

A>^C

A>

CONGRATULATIONS! You have now successfully created a system/application diskette which contains the operating system files and the application program. With this diskette, you can now start the operating system and

use your application program. Use this procedure to make system/application diskettes for as many application programs that you have. Be sure to write the following information on the system/application diskette's label:

- The name of the operating system that is stored on the diskette — the CP/M-86/80 operating system.
- The name of the application program that is stored on the diskette.

Described above is the preferred method of creating a system/application diskette. Refer to the discussion of the SUBMIT program in Chapter 5 if you want to customize this procedure to copy other files.

Figure 26 summarizes the steps to make a system/application diskette.

Starting Application Programs

To start the application program, refer to your application program's documentation.

CAUTION: *If your application program requires you to change diskettes, you may be required to change them and type <Ctrl/C> before starting the program to prevent the program from stopping.*

Typing <Ctrl/C> directly after A> tells the operating system that different diskettes have been inserted in the drives. Typing <Ctrl/C> after the application program has started can cause the application program to stop. Refer to the application program's documentation for specific instructions.

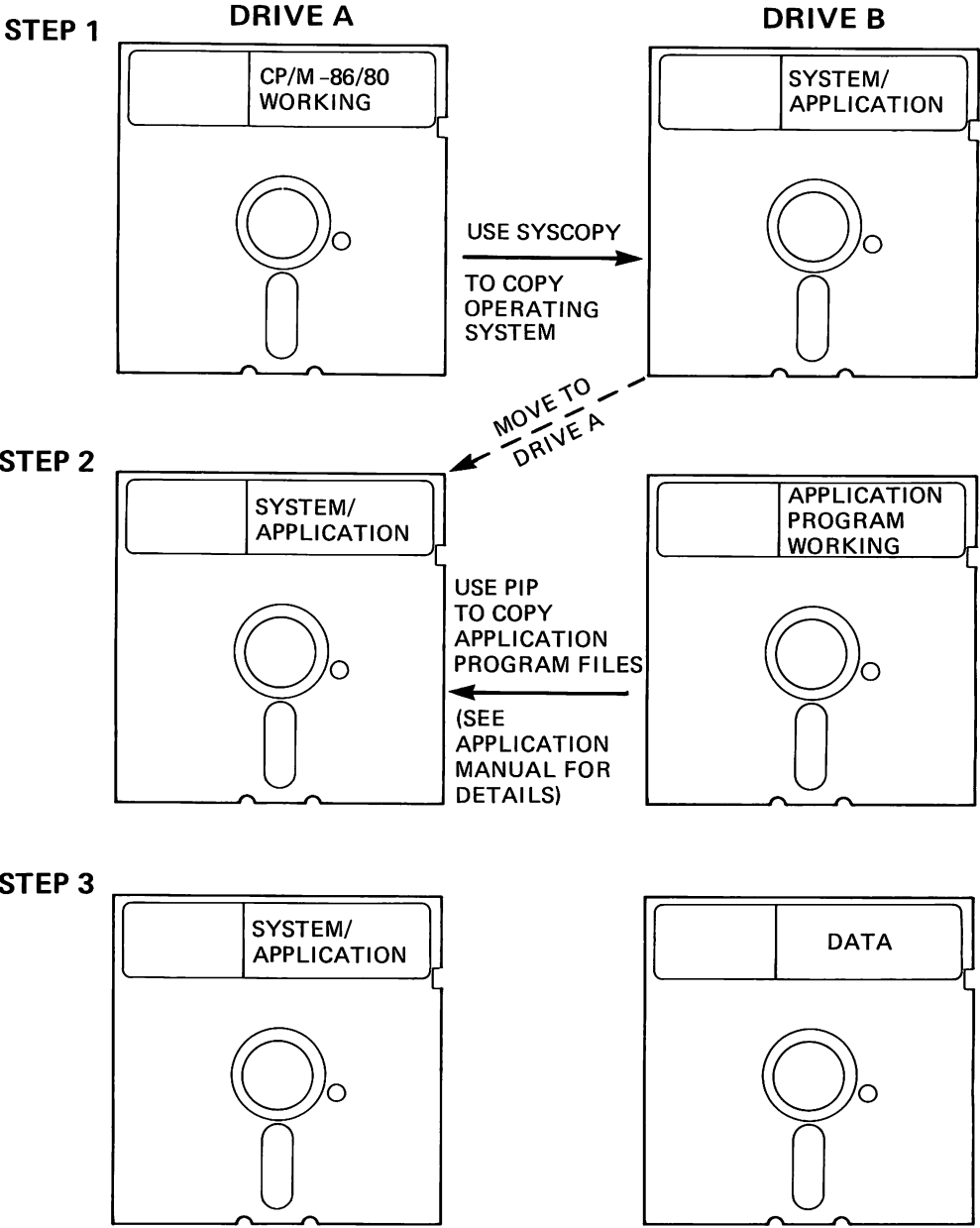
If you are using an application program for the first time, you should type some information on the diskette early in the session to ensure that the program is working correctly.

Copying Data from VT180 Diskettes

If you want to copy the data files you have stored on VT180 diskettes to a Rainbow 100 data diskette, follow the steps below.

1. Display the Rainbow 100 Main System Menu according to one of the following procedures:

Making a System/Application Diskette



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Figure 26. Making a System/Application Diskette

Making a System/Application Diskette

- If the Rainbow 100 computer is turned off — Make sure that no diskettes are in the drives. Turn on the Rainbow 100 computer with the drive doors opened or closed. The Main System Menu should be displayed on the screen.
 - If the Rainbow 100 computer is turned on — Reset the Rainbow 100 computer by pressing the Set-Up key, followed by typing <Ctrl/Set-Up>. The Main System Menu should be displayed on the screen.
2. Remove the CP/M-86/80 working diskette from its protective envelope.
 3. Open the drive A door and insert the CP/M-86/80 working diskette. Close the drive A door.
 4. Start the CP/M-86/80 operating system by pressing the A key in response to the Main System Menu. A> should be the last characters displayed on the screen.
 5. Remove the VT180 diskette from its protective envelope.
 6. Open the drive B door and insert the VT180 diskette. Close the drive B door.

NOTE: *If you did not turn on or reset the computer just before inserting the diskettes, type <Ctrl/C> to tell the operating system that new diskettes have been inserted into the drives.*

7. Use PIP, the file copying program, to copy all the data files from the VT180 diskette to the CP/M-86/80 working diskette.

NOTE: *If any error messages are displayed at any time during the following procedure, refer to Chapter 8, Error Messages.*

Type:

```
A>PIP A:=B:*. *[V]<Ret>
```

where:

A: is the location you are copying to (the destination drive).

B: is the location you are copying from (the source drive).

. is a symbol indicating all files.

[V] are added instructions for PIP.

As the data files are being copied, the small lights beside each drive turn on and off and the drives make clicking and whirring sounds. PIP displays:

COPYING --

followed by a list of all the file names as they are copied. The file names are the same names as those on the source diskette. When all the files are copied, the operating system displays:

A>

8. Open the drive B door and remove the VT180 diskette. Return it to its protective envelope and store it in a safe place.
9. Remove a blank Rainbow 100 diskette from its protective envelope.
10. Insert the blank diskette into drive B. Close the drive B door.
11. To tell the operating system that you have changed diskettes, type:

A><Ctrl/C>

When you type **<Ctrl/C>**, you hear clicking sounds from the drive and the small light beside drive A turns on briefly. The operating system displays the following on your screen:

A>^C

A>

12. Use PIP again to copy the data files from the CP/M-86/80 working diskette in drive A to the blank data diskette in drive B. Type:

A>PIP B:=A:*.*[V]<Ret>

As the files are being copied, the small lights beside each drive turn on and off and the drives make clicking and whirring sounds. PIP displays:

COPYING --

followed by a list of all the file names as they are copied. The file names are the same names as those on the source diskette. When all the files are copied, the operating system displays:

A>

13. The diskette in drive B now contains the data files from the VT180 diskette and the essential CP/M-86/80 operating system programs from the CP/M-86/80 working diskette. If desired, you can delete the operating system programs so that only your VT180 data files remain on the diskette.

Error Messages

This chapter is divided into the following sections:

1. Section 1 describes:
 - The differences between software and hardware problems
 - The Rainbow 100 computer's self-test programs
 - How to interpret the lights on the back of the system unit
 - What to do if a problem occurs
2. Section 2 lists the error messages that can be displayed while using the Rainbow 100 computer, what they mean, and what to do about them. The messages are listed in alphabetical order for easy reference.

Section 1: How To Get Help

In general, Rainbow 100 computer problems can be divided into two categories:

1. Problems that you can find and eliminate on your own
2. Problems that require assistance from one or more of the vendors from whom you acquired your hardware and software system components

Where you go for assistance depends on whether the problem is with the software or the hardware.

If you encounter software problems, you should contact the vendor who sold you the application program you are having problem with.

If you encounter hardware problems, you should contact:

- Your Rainbow 100 computer vendor
- The DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.

It is up to you to isolate which of these sources you should contact. This is usually not as complicated as it seems. Clearly, if a new application program cannot be copied or loaded without error, you have received it either in a corrupted state or in the wrong format. In either case, return it to the vendor for replacement.

If a new application program loads and runs properly up to a point and then fails, make sure that it isn't expecting a device that you do not have, a printer for example, or that it does not require you to redefine a logical device. If none of these explanations fit, there are two possible offenders:

- A "bug" in the application program
- An incompatibility between your version of the CP/M-86/80 operating system and the application program

Table 20. DIGITAL Customer Help Line Phone Numbers

Country	Phone Number
U.S.A.	(800) DEC-8000
Canada	(800) 267-5251
United Kingdom	(0256) 59 200
Belgium	(02)-24 26 790
West Germany	(089) 95 91 66 44
Italy	(02)-617 53 81 or 617 53 82
Japan	(0424) 64-3302
Denmark	(04)-30 10 05
Spain	(1)-73 34 307
Finland	(90)-42 33 32
Holland	(1820)-31 100
Switzerland	(01)-810 51 21
Sweden	(08)-98 88 35
Norway	(02)-25 64 22
Austria	(222)-67 76 41 extension 444
Australia	
Sydney	(02) 412-5555
All other areas	(008) 226377

In either case, contact the application program vendor and see what he recommends.

However, before you contact a software vendor, you should first confirm the reliability of your hardware by running the Rainbow 100 diagnostic tests.

Rainbow 100 Diagnostic Tests

Hardware problems are usually found by the Rainbow 100 computer's two types of diagnostic tests.

The two types of diagnostic tests are:

1. Self-test programs that are built into the Rainbow 100 computer. These self-test programs run when you:

- Turn on the Rainbow 100 computer. This power-on self-test program determines if the computer can load a diskette and run as a terminal. The program completes in about 13 seconds.
 - Reset the Rainbow 100 computer. You reset the Rainbow 100 computer by pressing the Set-Up key and then typing <Ctrl/Set-Up>. This reset self-test program briefly checks the computer's memory — the part of the computer where instructions are stored temporarily. It completes in about four seconds.
 - Press the "S" key in response to the Main System Menu. There must be a diskette in drive A to run this self-test. This extended self-test program checks more Rainbow 100 computer features than the other self-test programs. This program completes in 60-90 seconds. Run this program whenever you think the Rainbow 100 computer is not operating properly. The *Rainbow 100 Owner's Manual* describes how to run this test.
2. A series of diagnostic tests that are stored on a diskette (included in the Rainbow 100 User Kit). These tests check the computer more thoroughly than any of the self-test programs. Refer to the *Rainbow 100 Owner's Manual* for instructions.

Rainbow 100 Self-test Program

The three self-test programs report problems to you by:

1. Displaying written error messages on the top line of the screen.
2. Turning on selected lights on the back of the system unit.

When you turn on, reset or run the extended self-test program, one of the following happens:

1. No errors are detected when the Rainbow 100 Main System Menu is displayed on the screen (see Screen 47). The computer is now ready to use.
2. A non-fatal error is detected and then an error message and the Main System Menu are displayed on the screen. The error message is displayed within a flashing reverse video block. Screen 48 shows an example of a non-fatal error message shown above the Main System Menu.

digital

Rainbow 100

Version 01.01.05A
Copyright (c) Digital Equipment Corporation 1982
All Rights Reserved

Press A, B, C, D, S, or T

- A = start from Drive A
- B = start from Drive B
- C = start from Drive C
- D = start from Drive D
- S = execute Self Test
- T = enter Terminal Mode

Screen 47. Rainbow 100 Main System Menu

MR-8111

CONSULT USER S GUIDE FOR ASSISTANCE - DRIVE A - not ready

digital

Rainbow 100

Version 01.01.05A
Copyright (c) Digital Equipment Corporation 1982
All Rights Reserved

Press A, B, C, D, S, or T

- A = start from Drive A
- B = start from Drive B
- C = start from Drive C
- D = start from Drive D
- S = execute Self Test
- T = enter Terminal Mode

Screen 48. Non-Fatal Error Message

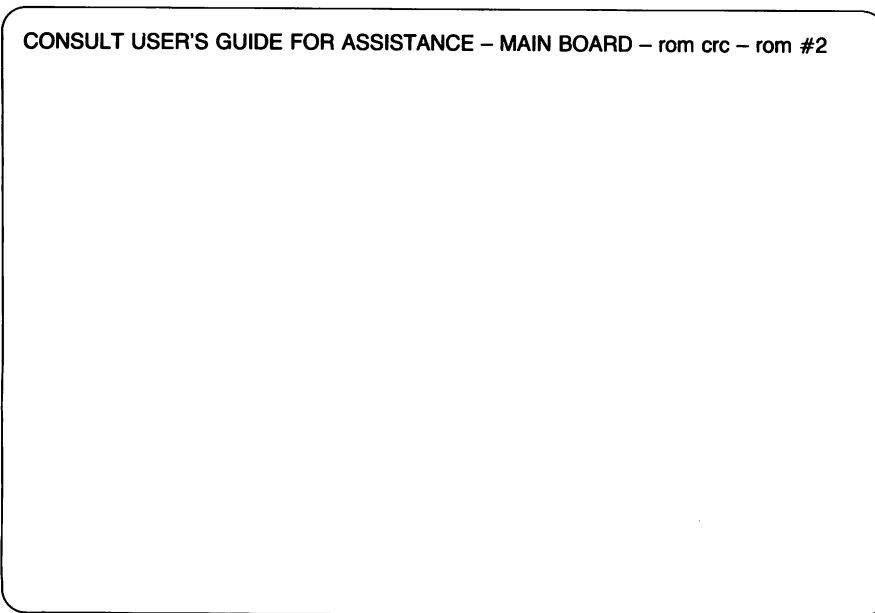
MR-8884

Error Messages

A non-fatal error means that you can still use the Rainbow 100 computer as either a computer or a terminal until the cause of the error is found and corrected. For example, if a drive fails, you can still use the Rainbow 100 computer as a terminal connected to a remote computer. If the communication line fails, you can still use the Rainbow 100 computer as a personal computer.

3. A fatal error is detected and then an error message alone is displayed on the screen and the keyboard beeps three times. The Main System Menu is not displayed. Screen 49 shows an example of a fatal error.

A fatal error means that you cannot use the Rainbow 100 computer until the cause of the error is corrected. A fatal error can indicate that one of the Rainbow 100 computer's components is not working properly.



Screen 49. Fatal Error Example

MR-S-2336-82

If your screen is blank after any of the self-test programs run:

- Check the cables as shown in the *Rainbow 100 Installation Guide*.
- Refer to the section titled “Interpreting Lights” for instructions on how to read the error messages through the lights on the back of the system unit.
- Refer to the *Rainbow 100 Owner’s Manual*.

Interpreting Lights

If any of the self-test programs detects a fatal error, a written error message is displayed on the screen. The same error message is also represented by a specific pattern of lights, numbered one through seven, on the back of the system unit. The pattern of “on” and “off” lights determines the written message. For example, the lights that are turned on in Figure 27 represent the following message:

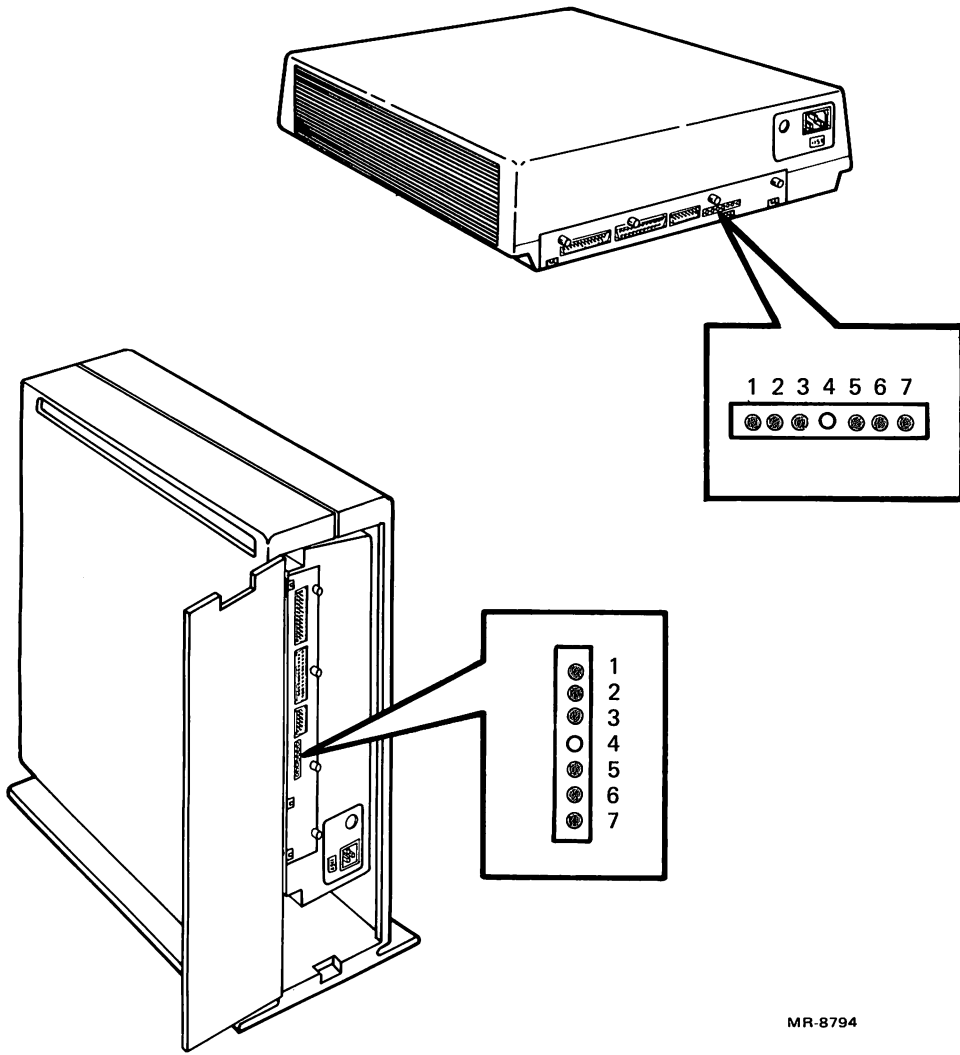
CONSULT USER’S GUIDE FOR ASSISTANCE - MAIN BOARD - rom crc - rom #2

Note that all the lights are turned on except the middle one.

You should use this method of interpreting error messages if, for any reason, an error message is not displayed on the screen. Table 21 lists the fatal error messages and their light representations. The error messages in Table 21 are preceded by the words “CONSULT USER’S GUIDE FOR ASSISTANCE -”. The colored circles indicate that the light is turned on; the white circles indicate that the light is turned off. The symbol - indicates that the light can be on or off.

What To Do If a Problem Occurs

You may or may not be able to run the CP/M-86/80 operating system or certain application programs if the self-test program displays one or more error messages. The computer can seem to run properly if the trouble is in a part of the Rainbow 100 computer you are not using. For example, if a drive fails, you can still use the Rainbow 100 computer as a terminal connected to a remote computer. If the communication line fails, you can still use the Rainbow 100 computer as a personal computer.



MR-8794

Figure 27. Interpreting Lights

Table 21. Error Messages and Light Representations

Error Message	Light						
	1	2	3	4	5	6	7
KEYBOARD	●	●	0	●	0	●	0
MAIN BOARD - contention	0	0	0	0	0	●	0
MAIN BOARD - interrupts off	●	●	●	0	0	0	0
MAIN BOARD - keyboard port	0	0	●	●	0	●	0
MAIN BOARD - ram 0-64k	-	-	-	●	●	0	●
MAIN BOARD - ram arbitration	●	●	●	0	●	0	0
MAIN BOARD - rom crc - rom #0	●	●	●	●	●	●	●
MAIN BOARD - rom crc - rom #1	●	●	●	●	●	●	0
MAIN BOARD - rom crc - rom #2	●	●	●	0	●	●	●
MAIN BOARD - unsolicited interrupt	●	●	●	●	0	0	0
MAIN BOARD - unsolicited interrupt - Z80	●	●	●	0	0	0	●
MAIN BOARD - video	0	●	●	0	●	●	●
MAIN BOARD - video ram	●	●	●	0	●	●	0
MAIN BOARD - video vfr	●	●	●	0	●	●	●
MAIN BOARD - Z80 crc	●	●	●	●	0	0	●
remove card or diskette	0	●	●	0	0	0	●

However, you should not use the Rainbow 100 computer for anything important until the problem that causes the error message is corrected.

If an error message(s) is displayed, RETRY the command or procedure a few times. If you are at a point in an application program where you will not lose any data, you may want to reset the Rainbow 100 computer and start over. Then, retry the command or procedure again.

If the error message persists, refer to the list of messages and possible corrective actions in Section 2 and look up the error message(s). The error messages are listed in alphabetical order. Perform the suggested corrective action and then RETRY the procedure.

Error Messages

If the problem persists, you should run either or both of the following diagnostic tests:

- The extended self-test program. To run this self-test insert a diskette into drive A and press the "S" key in response to the Main System Menu. Refer to the *Rainbow 100 Owner's Manual* for further instructions.
- The diagnostic tests that are stored on the diagnostic diskette included in the Rainbow 100 User Kit. Refer to the *Rainbow 100 Owner's Manual* for instructions.

If the problem still persists and/or if the corrective action suggests that a part of the Rainbow 100 computer be replaced, you should:

- Report the problem to your vendor.
- Report the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.

You can also order the part and install it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

NOTE: *Remember to run the tests stored on the diagnostic diskette included in the Rainbow 100 User Kit before and after replacing any part.*

Section 2: Rainbow 100 Error Messages

This section lists the error messages that can be displayed while using the Rainbow 100 computer. They are listed in alphabetical order for easy reference. Table 22 lists the conventions used in the discussion of the error messages.

Table 22. Error Message Conventions

Convention	Meaning
drv or drv:	Drive name (A, B, C, or D)
nn	Track or sector number on a diskette; or a user number
nnn	Line number in a .SUB file
filename	File name
.typ	File type
filespec	File specification, including the drive name, file name, and file type
phydev	Physical device

When you are instructed to reset the Rainbow 100 computer, symbolized by Set-Up <Ctrl/Set-Up>:

- Press the Set-Up key.
- Then hold down the control key (Ctrl on the keyboard) while you press the Set-Up key.

When you are instructed to reinitialize the operating system, hold down the control key while you press the C key. Do this directly after the prompt. This action is symbolized by <Ctrl/C>. (If you have typed a command after the prompt, type <Ctrl/X> to erase the line back to the prompt.) Depending on the program being run when the error message is displayed, you may have to type

Error Messages

<Ctrl/C> two or three times to reinitialize the operating system. The indications that the operating system is being reinitialized are:

- The drive makes “clicking” sounds.
- The lights beside one or more drives turn on momentarily.

Application Program Error Messages

If any error messages are displayed while using an application program, refer to the application program’s documentation for instructions.

Rainbow 100 Error Messages

The following are the error messages that can be displayed while using the Rainbow 100 computer and the CP/M-86/80 operating system. The error message is printed first, followed by what it means and what to do about it.

Some of the error messages suggest that the system module be replaced after other corrective action fails. The system module, which resides inside the system unit, contains the electrical components and circuits of the computer.

NOTE: *It is recommended that you run the diagnostic tests that are stored on the diagnostic diskette included in the Rainbow 100 User Kit before and after you replace any part of the computer.*

**** Aborted ****

This message can be displayed if you stop a transient program. If desired, correct the problem by retyping the command.

Bad Directory on drv:
Space Allocation Conflict
User nn filespec

This message can be displayed if STAT finds more than one file sharing the same portion of the diskette. The message is followed by a list of file specifications. Retry the procedure or reset the computer and then retry the procedure.

If the problem persists:

1. Erase the file(s) listed after the message.
2. Reinitialize the operating system.
3. Retry the procedure.

Bdos Err on drv:

This message is usually displayed if the diskette is not inserted correctly in the drive.

To retry the procedure, press any key to return to the operating system prompt and:

- Insert a diskette into the drive if there is no diskette in the drive.
- Insert a Rainbow 100 diskette into the drive if the diskette is formatted improperly.
- Reinsert the diskette correctly into the drive if it is upside-down.
- Reinsert the diskette correctly into the drive if it is not inserted fully.
- Close the drive door if it is open.

Then, retry the procedure.

Error Messages

Bdos Err on drv: Bad Sector

This message can be displayed if the diskette is not inserted correctly in the drive or if the diskette is worn.

If you want to ignore the error, press the Return key. Use this option with caution because the information can be read or written incorrectly.

If you want to retry the procedure, press any key.

If you want to return to the operating system, type <Ctrl/C>. You can then retry the procedure after correcting one of the following conditions:

- Insert a Rainbow 100 diskette into the drive if the diskette is formatted improperly.
- Check the diskette for creases, if you find no creases, reinsert the diskette.
- Insert another diskette.

If the problem persists after you retry the procedure with several diskettes:

1. Refer to the *Rainbow 100 Installation Guide* to ensure that the drive cables are installed properly.
2. If the error still persists, replace the drive by:
 - Reporting the problem to your vendor.
 - Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
 - Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

Bdos Err on drv: File R/O

This message can be displayed if the specified file is assigned the Read Only Attribute. To retry the procedure:

1. Press any key to return to the operating system prompt.
2. Assign the file the Read Write Attribute using the STAT or MAINT commands.
3. Retry the procedure.

Bdos Err On drv: R/O

This message is usually displayed if you change diskettes in a drive without informing the operating system of the change. To retry the procedure, press any key to return to the operating system prompt. Then:

- Type <Ctrl/C> to reinitialize the operating system to “log in” the new diskette.
- Assign the drive the Read Write Attribute using the STAT command if the specified drive has been assigned the Read Only Attribute. This message *does not* mean that the diskette has a write-protect tab on it.

Then, retry the procedure.

Bdos Err On drv: Select

This message is usually displayed if you select a nonexistent drive. To retry the procedure, press any key to return to the operating system prompt. Then:

- Select an existing drive if you selected a nonexistent drive.
- Insert a Rainbow 100 diskette into the drive if the diskette is formatted improperly.

Then, retry the procedure.

Error Messages

CANNOT LOAD .COM FILE

This message can be displayed if there is not enough memory to store a CP/M-80 program. Type <Ctrl/C> to reinitialize the operating system and then retry the procedure.

If the error persists, the CP/M-80 program may be too large to store in memory. Check your application program's documentation for the size of the program. The Rainbow 100's computer's transient program area is 48 kilobytes for the 64-kilobyte memory and 61 kilobytes for larger memory sizes.

Cannot write on VT180 disk on drive drv:

This message can be displayed if the operating system tries to write onto a VT180 diskette. To retry the procedure:

1. Remove the VT180 diskette.
2. Insert a Rainbow 100 diskette.
3. Type <Ctrl/C> to "log in" the new diskette.
4. Retry the procedure.

Command too long

This message can be displayed if SUBMIT finds a command in the .SUB file that exceeds 125 characters. To retry the procedure:

1. Edit the .SUB file.
2. Shorten the command.
3. Retry the procedure.

CONSULT USER'S GUIDE FOR ASSISTANCE - boot load

This message can be displayed when you start the operating system if:

- The diskette in the drive is not a Rainbow 100 system diskette. Insert a Rainbow 100 system diskette in the drive.
- The diskette is unreadable or is not inserted fully in the drive. Check the diskette for creases and reinsert the diskette correctly.
- The diskette is write protected and is upside-down in the drive. Insert the diskette correctly in the drive.

Then, restart the operating system.

If the problem persists, insert another system diskette into the drive and restart the operating system.

CONSULT USER'S GUIDE FOR ASSISTANCE - DRIVE drv - index

This message can be displayed when you run the extended self-test program if:

- The diskette is inserted incorrectly in the drive. Reinsert the diskette correctly into the drive.
- The diskette is write protected and is upside-down in the drive. Reinsert the diskette correctly into the drive.

Then, run the self-test program again.

If the error persists, insert another diskette into the drive and run the self-test program again.

If the error persists after trying several diskettes, refer to the *Rainbow 100 Installation Guide* to ensure that the drive cables are installed properly.

Error Messages

If the error still persists, replace the drive by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - DRIVE drv - motor

This message can be displayed when you run the extended self-test program if the diskette in the drive is unreadable. To correct the problem:

- Check the diskette for creases; if you find no creases, reinsert the diskette again.
- Insert another diskette into the drive.

Then, run the self-test program again.

If the error persists after trying several diskettes, replace the drive by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - DRIVE drv - not ready

This message can be displayed when you run the extended self-test program if:

- There is no diskette in the specified drive. Insert a diskette into the drive.
- The diskette is upside-down in the drive. Reinsert the diskette into the drive.
- The drive door is not closed. Close the drive door.

Then, run the self-test program again.

If the error persists after trying several diskettes, refer to the *Rainbow 100 Installation Guide* to ensure that the drive cables are installed properly.

If the error still persists, replace the drive by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - DRIVE drv - read

This message can be displayed when you run the extended self-test program if:

- The diskette in the drive is unreadable. Check the diskette for creases; if you find no creases, reinsert the diskette or insert another diskette.
- The diskette in the drive is a VT180 diskette. Remove the VT180 diskette from the drive and insert a Rainbow 100 diskette.

Then, run the self-test program again.

Error Messages

If the error persists after trying several diskettes, refer to the *Rainbow 100 Installation Guide* to ensure that the drive cables are installed properly.

If the error still persists, replace the drive by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - DRIVE drv - restore

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer until the problem is corrected. However, you can use it as a terminal.

To correct the problem, turn the computer off and on again.

If the error persists after trying several diskettes, refer to the *Rainbow 100 Installation Guide* to ensure that the drive cables are installed properly.

If the error still persists, replace the drive by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - DRIVE drv - seek

This message can be displayed when you run the extended self-test program if the diskette in the drive is formatted improperly. Insert a Rainbow 100 diskette into the drive. Then, run the self-test program again.

If the error persists after trying several diskettes, refer to the *Rainbow 100 Installation Guide* to ensure that the drive cables are installed properly.

If the error still persists, replace the drive by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - DRIVE drv - step

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer until the problem is corrected. However, you can use it as a terminal.

Turn the computer off and on again.

If the error persists after several retries, refer to the *Rainbow 100 Installation Guide* to ensure that the drive cables are installed properly.

If the error still persists, replace the drive by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.

Error Messages

- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - drive not ready

This message can be displayed when you start the operating system if:

- There is no diskette in the specified drive. Insert a diskette into the specified drive.
- The diskette is upside-down in the drive. Insert the diskette correctly into the drive.
- Drive C or D is specified on a computer with drives A and B only. Specify drive A or B.
- The drive door is not closed. Close the drive door.

Then, start the operating system again.

If the error persists after trying several diskettes, refer to the *Rainbow 100 Installation Guide* to ensure that the drive is installed properly.

If the error still persists, replace the drive by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - KEYBOARD

This message can be displayed when you turn on the Rainbow 100 computer if the keyboard is not working properly. You cannot use the Rainbow 100 computer as a personal computer or a terminal if this message is displayed until the problem is corrected. To correct the problem:

- Make sure that the keyboard cable is secured to the back of the monitor and to the bottom of the keyboard.
- Check for any depressed keys by running your fingers over the top of the keyboard keys.

Then, turn the computer off and on again.

If the error persists after several retries, replace the keyboard by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - comm. port

This message can be displayed when you turn on the Rainbow 100 computer if the communications port is not working properly. You cannot use the Rainbow 100 computer as a terminal when this message is displayed. However, you can use the Rainbow 100 computer as a personal computer if the communications port is not used.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.

Error Messages

- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

If you want to use the computer as a personal computer, insert a system diskette into a drive and start the operating system.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - contention

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - interrupts off

This message can be displayed when you turn on the Rainbow 100 computer or while you run an application program.

If the error message is displayed:

1. Alone on the screen (a fatal error), you cannot use the Rainbow 100 computer as a personal computer or as a terminal until the problem is corrected. Turn the computer off and then on again. If the error persists after several retries, replace the system module by:
 - Reporting the problem to your vendor.
 - Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
 - Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.
2. Above the Main System Menu (a non-fatal error), you can use the Rainbow 100 computer as a personal computer and as a terminal. Turn the computer off and then on again. If the problem persists, you should call your vendor or the DIGITAL Customer Help Line for assistance.
3. While running an application program, you should remove the application program diskette from the drive and then turn the computer off and then on again.

If the error message is not displayed when you turn the computer on, run the application program again. If the error message is displayed while running the program again, report the problem to the vendor who sold you the application program or check the program for misuse of instructions if you wrote the program.

If the error message displays after you turn the computer on, you cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected. Replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.

Error Messages

- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - keyboard port

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - nvm data

This message can be displayed when you turn on the Rainbow 100 computer if your previous Set-Up selections, such as screen background and number of columns, were not read correctly. You can still use the Rainbow 100 computer as a personal computer or a terminal. However, the Set-Up selections that you have previously saved are not in effect.

Review your Set-Up selections and reset them if necessary. Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

You can still use the computer as a personal computer or a terminal until the problem is corrected, but you cannot save any Set-Up selections.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - printer port

This message can be displayed when you turn on the Rainbow 100 computer if the printer port is not working properly. You cannot use a printer if this message is displayed. You can still use the Rainbow 100 computer as a personal computer or a terminal.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module if you want to use a printer. To replace the system module:

- Report the problem to your vendor.
- Report the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Order the part and install it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

Error Messages

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - ram 0-64k

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - ram arbitration

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - rom crc - rom #0

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - rom crc - rom #1

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

Error Messages

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - rom crc - rom #2

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - unsolicited interrupt

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - unsolicited interrupt - Z80

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - video

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

Error Messages

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - video ram

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - video vfr

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - Z80 crc

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer or a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - MAIN BOARD - Z80 response

This message can be displayed when you turn on the Rainbow 100 computer. You can only use the computer as a terminal until the problem is corrected.

Turn the computer off and then on again.

If the error persists after several retries and you want to use it as a personal computer, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

Error Messages

CONSULT USER'S GUIDE FOR ASSISTANCE - non-system diskette

This message can be displayed when you start the operating system if the diskette in the drive is not the system diskette. To correct the problem, insert a system diskette into a drive and start the operating system again.

CONSULT USER'S GUIDE FOR ASSISTANCE - RAM OPTION

This message can be displayed when you run the extended self-test program and an error was found in the optional memory. You can use the computer as a personal computer or a terminal. However, if you use it as a personal computer, you may encounter problems running programs.

Turn the computer off and then on again.

If the problem persists after several retries, replace the optional memory by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - remove card or diskette

This message can be displayed when you turn on the Rainbow 100 computer if:

- The carriage restraint card is in the drive and the drive door is closed. Remove the carriage restraint card.
- The diskette is upside-down or inserted incorrectly in the drive and the drive door is closed. Remove the diskette.

Turn the computer off and then on again and insert the diskette correctly.

CONSULT USER'S GUIDE FOR ASSISTANCE - RX50 CONTROLLER BOARD

This message can be displayed when you turn on the Rainbow 100 computer. You cannot use the Rainbow 100 computer as a personal computer until the problem is corrected. However, you can use it as a terminal.

If you want to use the Rainbow 100 computer as a personal computer, turn the computer off and then on again.

If the error persists after several retries, remove the RX50 controller board and insert it again if you have the *Rainbow 100 User's Service Guide* for instructions.

If the error still persists, replace the RX50 controller board by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

CONSULT USER'S GUIDE FOR ASSISTANCE - Set-Up defaults stored

This message can be displayed when you turn on the Rainbow 100 computer. It informs you that a problem was found and corrected in the part of the computer that saves your Set-Up selections. The Set-Up selections that you have previously saved are not in effect; the default Set-Up selections (those set at the factory) are in effect. You can use the Rainbow 100 computer as a personal computer or a terminal; the message is informative only.

Reset and save your desired Set-Up selections.

Error Messages

CONSULT USER'S GUIDE FOR ASSISTANCE - system load

This message can be displayed when you start the operating system if:

- The diskette is not inserted correctly in the drive. Reinsert the diskette into the drive.
- The diskette is unreadable. Insert another diskette into the drive.

Then, restart the operating system.

CONSULT USER'S GUIDE FOR ASSISTANCE - Z80 response

This message can be displayed when you start the operating system. To correct the problem, insert another diskette into the drive (a VT180 diskette may be in the drive) and start the operating system again.

If the error persists after several retries, replace the system module by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

DESTINATION IS R/O, DELETE (Y/N)?

This message can be displayed if PIP tries to delete an existing file with the Read Only Attribute. To correct the problem:

1. Type Y to delete existing file.
2. Type N to stop the copy.

Drive not ready -- drv:
Press CTRL-C to restart,
Space bar to retry, or any other key to continue.

This message can be displayed if the selected drive is not ready. If you selected the correct drive:

- Insert a diskette into the drive if there is no diskette in the drive.
- Reinsert the diskette correctly into the drive if it is upside-down.
- Reinsert the diskette correctly into the drive if it is not inserted fully.
- Close the drive door if it is open.

Then, press the space bar to retry the procedure.

If you did not select the correct drive:

1. Type <Ctrl/C> to return to the operating system prompt.
2. Retry the procedure selecting the correct drive.

If you press any other key, another error message can be displayed.

DRIVE NOT READY. RESTART? (Y/N)

This message can be displayed by COPY if:

- There is no diskette in the drive. Insert a diskette into the drive.
- The diskette in the drive is upside-down. Reinsert the diskette into the drive correctly.
- The diskette is not inserted fully in the drive. Reinsert the diskette into the drive correctly.
- The drive door is not closed. Close the drive door.

Then, press the Y key to retry the procedure.

If you want to exit the program, press the N key and then the Exit key.

Error Messages

Drive write protected -- drv:
Press CTRL-C to restart,
Space bar to retry, or any other key to continue.

This message can be displayed if the operating system tries to write onto a diskette that has a write-protect tab on it. If you want to write the file onto the diskette, retry the procedure by:

1. Removing the write-protect tab from the diskette.
2. Reinserting the diskette.
3. Pressing the space bar.

To stop the procedure, type <Ctrl/C>.

If you press any other key, another error message can be displayed.

drv:{filename.typ}?

This message can be displayed if you specify a nonexistent drive. To correct the problem, specify an existing drive and retry the procedure.

ERROR: BAD PARAMETER

This message can be displayed if PIP finds an illegal parameter included in the command. To correct the problem, retype the command using a valid parameter.

ERROR: CLOSE FILE - {drv:filename.typ}

This message can be displayed if PIP cannot close the specified output file because:

- The diskette has a write-protect tab on it. Remove the write-protect tab from the diskette and reinsert it into the drive if you want to write the file onto the diskette.
- The diskette resides in a drive with the Read Only Attribute. Assign the drive the Read Write Attribute by typing <Ctrl/C> or using STAT if you want to write the file onto the diskette.

Then, retype the command.

ERROR: DISK READ - {drv:filename.typ}

This message can be displayed if PIP cannot read the specified input file properly. This message is usually displayed because the file contains an unexpected end-of-file marker. An end-of-file marker is a code inserted into every text file that indicates where the text ends. To correct the problem, use a debugging program to delete the end-of-file marker. Then retype the command.

ERROR: DISK WRITE - {drv:filename.typ}

This message can be displayed if PIP cannot write the specified output file onto the diskette. This message is usually displayed because the diskette is full of files. To correct the problem, insert a diskette with free space on it to store the file or erase unnecessary files from the full diskette. Then, retype the command.

Error Messages

ERROR: FILE NOT FOUND - {drv:filename.typ}

This message can be displayed by PIP if:

- The file is not found on the specified diskette. Insert the diskette containing the file and retype the command.
- The file name or file type is mistyped. Retype the command including the correct file name and file type.
- The period between the file name and the file type is omitted. Retype the command including the period between the file name and file type.
- The wrong drive is specified. Retype the command including the correct drive.
- The file type is omitted. Retype the command including the file type.
- Too few wildcards are used. Retype the command including enough wildcards.
- The file being copied has the System Attribute and the “R” parameter is not used. Retype the command using the “R” parameter.
- The file is stored in another user number. Specify the correct user number from which to copy.

ERROR: HEX RECORD CHECKSUM - {drv:filename.typ}

This message can be displayed if PIP finds a hexadecimal checksum error during a hexadecimal file transfer while using the “H” parameter. (A checksum is a method of verifying that the hexadecimal file is copied correctly.)

To correct the problem, repeat the procedure that generated the hexadecimal file, and retype the command.

ERROR: INVALID DESTINATION

This message can be displayed if PIP finds an invalid destination in the command. This message usually is displayed because an input device is specified as a destination. To correct the problem, retype the command with a valid destination.

ERROR: INVALID FORMAT -

This message can be displayed if PIP finds an invalid format of the command. This message usually is displayed because:

- There is a blank space between the file specification and a parameter.
- The word "PIP" is typed while in program mode.

To correct the problem, retype the command correctly.

ERROR: INVALID HEX DIGIT - {drv:filename.typ}

This message can be displayed if PIP finds an illegal hexadecimal digit while reading a hexadecimal file while using the "H" parameter. To correct the problem, repeat the procedure that generated the hexadecimal file, and retype the command.

ERROR: INVALID SEPARATOR -

This message can be displayed if PIP finds an invalid character between input file names. To correct the problem, retype the command using a comma to separate two or more input files.

Error Messages

ERROR: INVALID SOURCE

This message can be displayed if PIP finds an invalid source. This message usually is displayed because an output device is specified as a source. To correct the problem, retype the command with a valid source.

ERROR: INVALID USER NUMBER

This message can be displayed if PIP finds an illegal user number in the command. Legal user numbers are 0 to 15. To correct the problem, retype the command using a legal user number.

ERROR: NO DIRECTORY SPACE - {drv:filename.typ}

This message can be displayed if PIP cannot write a file onto a diskette due to insufficient directory space. Diskette directories can hold 128 file names. PIP usually displays this message if the diskette contains many small files.

To correct the problem, insert another diskette with free space on it or erase unnecessary files from the diskette. Then, retype the command.

ERROR: QUIT NOT FOUND

This message can be displayed if PIP cannot find the specified "quit" string in the source file while using the "Q" parameter. To correct the problem, retype the command using a valid string.

ERROR: START NOT FOUND

This message can be displayed if PIP cannot find the specified "start" string in the source file while using the "S" parameter. To correct the problem, retype the command using a valid string.

ERROR: UNEXPECTED END OF HEX FILE - {drv:filename.typ}

This message can be displayed if PIP finds an end-of-file marker before the hexadecimal record is ended while using the "H" parameter. An end-of-file marker is a code inserted into a hexadecimal file that indicates where a hexadecimal record ends. To correct the problem, repeat the procedure that generated the hexadecimal file and retype the command.

ERROR: USER ABORTED

This message can be displayed if you stop a PIP command. If desired, retype the command.

ERROR: VERIFY - {drv:filename.typ}

This message can be displayed if PIP finds a difference between the source and destination files while using the "V" parameter. Usually this indicates a destination diskette failure. To correct the problem, insert another destination diskette, and retype the command.

Error On Line nnn Disk Write Error

This message can be displayed if SUBMIT cannot create a temporary \$\$\$SUB file on the diskette that the operating system was started from. This message usually is displayed due to a full diskette.

To correct this problem, insert another diskette with free space on it or erase unnecessary files from the full diskette, and retype the command.

Error Messages

Error On Line nnn Parameter Error

This message can be displayed if SUBMIT finds invalid place holders in the .SUB file. For example, you may have typed 1\$ rather than \$1 in the .SUB file.

To correct the problem, edit the .SUB file, correct the error, and retype the command.

Error On Line nnn No 'SUB' File Present

This message can be displayed if SUBMIT cannot find the specified .SUB file. This message can be displayed if:

- The file name is mistyped. Retype the command with the correct file name.
- The file type is other than .SUB. Create a file with a .SUB file type, insert the desired commands, and retype the command.

FILE EXISTS

This message can be displayed if you try to create or rename a file to an existing file name. To correct the problem, use another file name.

File Not Found

This message can be displayed by STAT if:

- The specified file is not found on the specified diskette. Insert the diskette containing the file.
- The file name or file type is mistyped. Retype the command including the correct file name and file type.

- The period between the file name and the file type is omitted. Retype the command including the period between the file name and file type.
- The wrong drive is specified. Specify the correct drive.
- The file type is omitted. Retype the command including the file type.
- Too few wildcards are used. Retype the command including enough wildcards.

Invalid Assignment

This message can be displayed if STAT finds an invalid physical-to-logical device assignment in the command. This message usually is displayed because:

- The physical or logical name is mistyped or is invalid. Retype the command with valid physical and logical names.
- The equal sign is omitted from the command. Retype the command including an equal sign.

The command `STAT VAL:` displays valid assignments.

Invalid Assignment

Use: `STAT drv:=RO`

This message can be displayed by STAT if:

- An invalid attribute is assigned to a drive. Retype the command including a valid drive attribute.
- The attribute is omitted from the command when assigning a drive an attribute. Retype the command including an attribute.

Error Messages

Invalid Assignment

Use: STAT drv:filename.typ [size] [ro] [rw] [sys] or [dir]

This message can be displayed if STAT finds an invalid attribute in the command. This message usually is displayed if:

- The colon is omitted from a physical or logical device name. Retype the command including the colon as part of the physical or logical device name.
- The drive name is omitted. Retype the command including a drive name.
- The attribute is mistyped. Retype the command including a valid attribute.
- An invalid attribute separator is included. Retype the command including a valid attribute separator.

MEMORY NOT AVAILABLE

The operating system displays this message if:

- There is not enough memory to store the program you want to use. Check the size of the program to make sure it fits into memory by referring to the program's documentation.
- Memory is not cleared from the previous program. Type <Ctrl/C> to clear memory.

Then, retry the procedure.

nn?

This message can be displayed if you specify a user number less than 0 or greater than 15. To correct the problem, retype the command using a valid user number.

NO FILE

This message can be displayed if:

- The file is not found on the specified diskette. Retype the command after inserting the diskette containing the file.
- The file name or file type is mistyped. Retype the command including the correct file name and file type.
- The period between the file name and the file type is omitted. Retype the command including the period between the file name and file type.
- The wrong drive is specified. Retype the command including the correct drive.
- The file type is omitted. Retype the command including the file type.
- Too few wildcards are used. Retype the command including enough wildcards.

NON-SYSTEM FILE(S) EXIST

This message can be displayed if you type DIRS and files with the Directory Attribute exist on the diskette for the current user number. No action is required; this is an informative message only indicating that the diskette contains files with the Directory Attribute.

Read error

This message can be displayed if TYPE finds an error while reading a file. To correct the problem, use STAT to check the status of the file, and retype the command.

Error Messages

READ ERROR. RESTART? (Y/N)

This message can be displayed if COPY cannot read the source diskette. To correct the problem, insert a new source diskette. Then press the Y key to retry the procedure.

If you want to exit the program, press the N key and then the Exit key.

RED ERROR: PLEASE ENTER "RED" FOLLOWED BY A FILE NAME

This message can be displayed if RED finds an invalid file name or no file name in the command. To correct this problem, type a valid file name in the command.

Read error on drive drv:, track nn, sector nn
Press Return to ignore error, any other key to continue.

This message can be displayed if the operating system cannot read a diskette.

- If you want to ignore the error, press the Return key. Use this option with caution because the information can be read incorrectly. If you press the Return key and the problem cannot be ignored, another error message can be displayed.
- If you want to stop the procedure, type <Ctrl/C> to return to the operating system prompt.
- If you press any other key, another error message can be displayed.

Rename Error: File "filename.ext" already exists
Strike any key to continue...

This message can be displayed if MAINT tries to rename a file to an existing file name. To correct the problem, press any key to implement the other changes you marked on the MAINT directory. Then, rename the file with another name.

Seek error on drive drv:, track nn
Press CTRL-C to restart,
Space bar to retry, or any other key to continue.

To retry the procedure, correct one of the following conditions:

- Insert a Rainbow 100 diskette into the drive if the diskette is formatted improperly.
- Insert a new diskette into the drive if the diskette is unreadable.
- Type <Ctrl/C> to notify the operating system of a diskette change if diskettes were changed.
- Reinsert the diskette into the drive if it is not inserted correctly.

Then, press the space bar to retry the procedure.

To stop the procedure, type <Ctrl/C> and return to the operating system prompt.

If you press any other key, another error message can be displayed.

If the problem persists after trying several diskettes, refer to the *Rainbow 100 Installation Guide* to ensure that the drive cables are installed properly. If the error still persists, replace the drive by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Table 20.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide*. This guide *is not* included in the Rainbow 100 User Kit.

SYSTEM FILE(S) EXIST

This message can be displayed if you type DIR and files with the System Attribute exist on the diskette for the current user number. No action is required; this is an informative message only indicating that the diskette contains files with the System Attribute.

The file CPM.SYS Not Found on This Disk
Do a system reset with a new disk

This message can be displayed if the operating system cannot find the file CPM.SYS on the system diskette. This file must be stored on the system diskette to start the operating system. To correct the problem:

1. Reset the Rainbow 100 computer by pressing the Set-Up key and then typing <Ctrl/Set-Up>.
2. Insert a system diskette with the file CPM.SYS on it.
3. Restart the operating system.

The File PRMTVPVT.SYS Not Found on Boot Disk.

This message can be displayed if the operating system cannot find the file PRMTVPVT.SYS on the system diskette. This file must be stored on the system diskette when running CP/M-86 programs after running CP/M-80 programs. To correct the problem:

1. Insert a system diskette with the file PRMTVPVT.SYS stored on it.
2. Type <Ctrl/C> to reinitialize the operating system.
3. Retry the procedure.

The File Z80CCP.SYS Cannot be Loaded

This message can be displayed if the operating system cannot load the file Z80CCP.SYS into memory. This file must be loaded to run CP/M-80 programs. To correct the problem:

1. Type <Ctrl/C> to reinitialize the operating system.
2. Retry the procedure.

The File Z80CCP.SYS Not Found on Boot Disk

This message can be displayed if the operating system cannot find the file Z80CCP.SYS on the system diskette. This file must be stored on the system diskette to run CP/M-80 programs. To correct the problem:

1. Insert a system diskette with the file Z80CCP.SYS stored on it.
2. Type <Ctrl/C> to reinitialize the operating system.
3. Retry the procedure.

The File Z80.SYS Not Found on Boot Disk

This message can be displayed if the operating system cannot find the file Z80.SYS on the system diskette. This file must be stored on the system diskette to run CP/M-80 programs. To correct the problem:

1. Insert a system diskette with the file Z80.SYS stored on it.
2. Type <Ctrl/C> to reinitialize the operating system.
3. Retry the procedure.

Error Messages

Timeout on phydev:
Press CTRL-C to restart,
Space bar to retry, or any other key to continue.

This message can be displayed if you specify a printer or communications device that does not respond. To retry the procedure, correct one of the following conditions:

- Turn the device on.
- Connect the device.
- Specify an existing device.
- Refer to the *Rainbow 100 Owner's Manual* to set the correct baud rate.

Then, press the space bar to retry the procedure.

To stop the procedure, type <Ctrl/C>.

If you press any other key, another error message can be displayed.

The logical names LPT:, PTP:, or UC1: are displayed in place of phydev:.

Topic not found

This message can be displayed if HELP finds no information on the requested topic. To correct the problem, select a topic from the menu.

Write error on drive drv:, track nn, sector nn
Press Return to ignore error, any other key to continue.

This message can be displayed if the operating system cannot write onto a diskette.

- If you want to ignore the error, press the Return key. Use this option with caution because the information can be written incorrectly. If you press the Return key and the problem cannot be ignored, another error message can be displayed.
- To stop the procedure, type <Ctrl/C> and return to the operating system prompt.
- If you press any other key, another error message can be displayed.

WRITE ERROR. RESTART? (Y/N)

This message can be displayed if COPY cannot write onto the destination diskette. To correct the problem, insert a new destination diskette. Then, press the Y key to retry the procedure.

If you want to exit the program, press the N key and then the Exit key.

Appendices

A

Diskettes

Flexible diskettes, when used with care, are remarkably durable and reliable storage devices. Any given portion of a diskette's surface can be read and written upon millions of times before the oxide film that holds the data begins to wear too thin to consistently hold data. Moreover, flexible diskettes routinely pass, without a single error, diagnostic tests that fill the diskettes' tracks with data which is checked, changed, and rewritten in worst-case format, over and over and over.

In spite of their ruggedness and reliability, flexible diskettes (the pros call them "floppies") have acquired a somewhat poor reputation in data processing circles. Why?

A glance in any computer room or office where flexible diskettes are used shows them setting on top of video terminals exposed to heat and magnetic fields, setting beneath coffee cups and cold drink cans, and even lying on the floor without their protective envelopes.

Although many of these diskettes forget what they were told, a surprising number of them continue working through the coffee and cola rings, through the grit and grime and magnetic influences, for months or years at a time.

Don't push your luck. If you wish to avoid joining the ranks of frustrated flexible diskette users, carefully observe the following precautions.

Storing Diskettes

- Keep flexible diskettes in close-fitting, dust-tight boxes (like those they are packaged in when you buy them ten at a time).
- Store these boxes in rooms with consistent temperature, humidity, and cleanliness.

Handling Diskettes

Follow the tips below when handling diskettes.

- Avoid bending the diskettes. The “flexibility” of flexible diskettes is an accident of their design, not a goal. They will bend, but when bent their covers tend to crease or warp in ways that cause wear and binding when the drives rotate the diskette inside. Insert diskettes *gently* into their drives.
- Never allow your fingers to touch the diskette data surface (that is, the shiny, usually brown or black surface inside the black cover). Body oils cause the drive read/write heads (small electromagnets used to read or write information) to behave erratically—usually at the cost of data.
- Always return diskettes to their protective envelopes—even if you expect to use them again in a few seconds. One piece of grit on a diskette picked up from a desk top can wipe out a week's work.
- Keep diskettes far away from magnets. Magnets are often used to hold notes and pictures to metal surfaces. These handy items can damage diskettes.
- The best place to store diskettes, even temporarily, is in their storage boxes. However, if you *must* lay your diskettes (in their protective envelopes, of course) on your desk top rather than replace them in their storage boxes, never lay *anything* on top of them. Once you cover a diskette with a memo, the next thing you lay down will inevitably be a magnetized paperweight, stapler, or a key ring.

Using Diskettes

- Always identify your diskettes with the self-sticking labels that most manufacturers provide for that purpose. You can always ask the computer to tell you what is on the diskette, but this slows you down unnecessarily. If you fill out these labels after they are applied to the diskette cover, use only felt-tip pens because they require minimum pressure. **Never** use a ball-point pen or pencil. They can seriously deform both the diskette cover and the diskette inside.
- Never allow diskettes to become so full that you risk running out of space while trying to write data to them. Leave some free space on your data diskettes.
- When running application programs that write data to diskettes, do not exchange one diskette for another except when the program tells you to do so or has finished executing. Some programs open files and leave them open until all the required data has been entered and acted upon. You almost certainly will have trouble if you exchange diskettes in the middle of such an operation. Reinitialize the operating system by typing <Ctrl/C> before inserting a diskette into a drive that has just been used for writing data. This will ensure that the operating system has initialized all its internal diskette pointers.
- Do not turn the computer's power on or off when a diskette is inserted into any drive.

Diskette Backup Procedures

These procedures involve making copies of any edited diskettes.

Why? A diskette is not immortal. Sliding a diskette in and out of its jacket or a poor drive will wear it out. Accidents mentioned above and under "Handling Diskettes" may also occur.

Follow these tips and protect your work.

- Make copies of original diskettes. Label the original "master" and store it. You might want to make two copies of the original.

- Set up a diskette rotation method. Use five diskettes. At the close of day one, copy diskette work onto day two's diskette. At the close of day two copy work onto day three's diskette. Label diskettes with the numbers, actual dates, or days of the week.
- Take diskettes out of use after six months of rotation.

Above all "better safe than sorry". Months of work can be lost due to worn-out or damaged diskettes.

Diskettes and Files

The CP/M-86/80 operating system deals with a wide range of information including programs, text, and data. Information is organized in the form of files, and the files are stored on diskettes. File names distinguish electronic files much the same way as labels on file folders distinguish paper files in a cabinet.

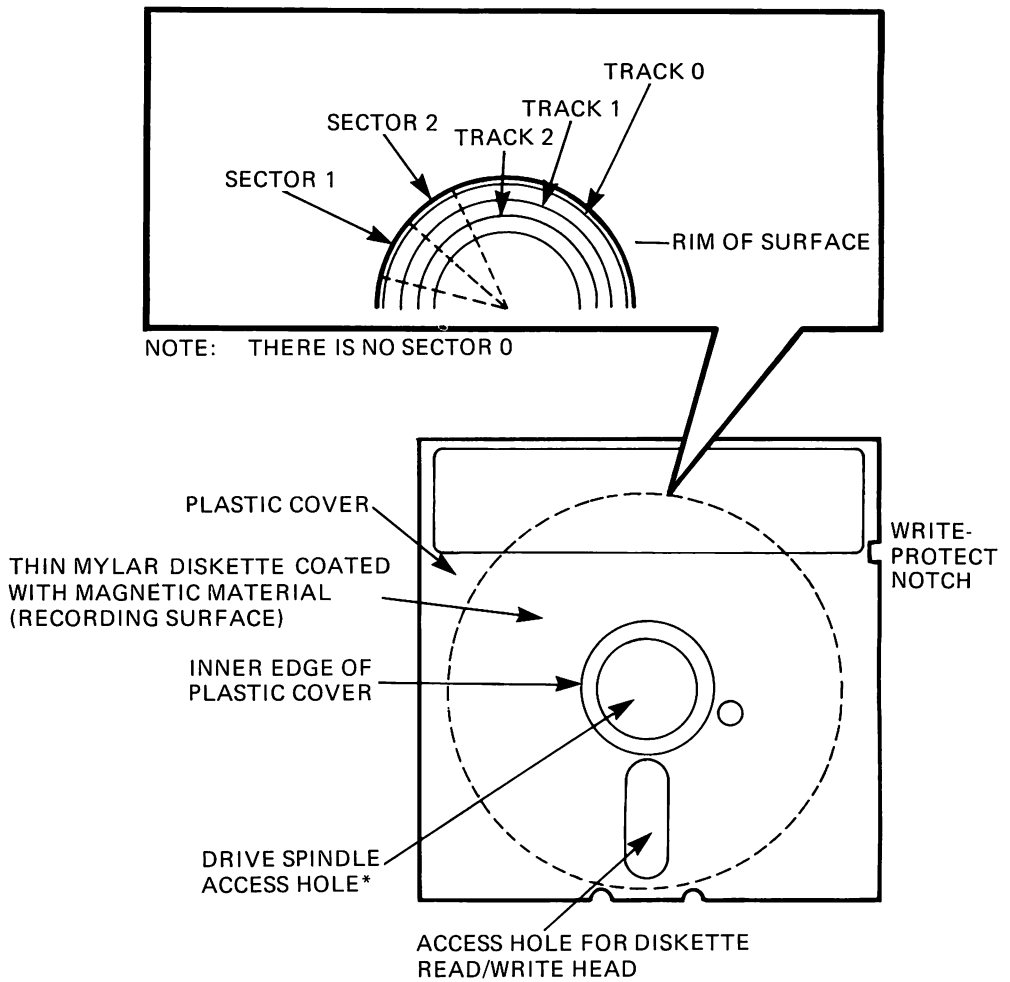
Storing Information on Diskettes

The computer stores and retrieves files by referring to tracks and sectors on a diskette (see Figure 28). Rainbow 100 diskettes have 80 tracks, (numbered 0-79); each diskette is composed of ten sectors. Sectors store blocks of "bytes," each byte represents one character such as a letter, a digit, or a symbol. Because each sector has a unique location on a diskette, the computer can find a particular sector on a particular track and store information in it or retrieve information from it.

The amount of information you can store on a diskette depends on the diskette's "density." The Rainbow 100's double density diskettes can hold twice as much information as single density diskettes. You can store about 115 pages of typewritten text on one diskette assuming 54 lines per page and 65 characters per line.

Protecting Data on Diskettes

You can protect the data on a diskette from being accidentally deleted by applying a self-sticking write-protect tab onto the diskette's write-protect notch (Figure 29). This tab prevents the computer from writing on the



* ROTATING SPINDLE ENTERS THIS HOLE, GRABS DISKETTE , AND SPINS IT.

Figure 28. Tracks and Sectors on a Diskette

MR-8163

diskette. You can remove the write-protect tab by peeling it off the diskette when you want the computer to write on it.

You can purchase write-protect tabs at any computer store.

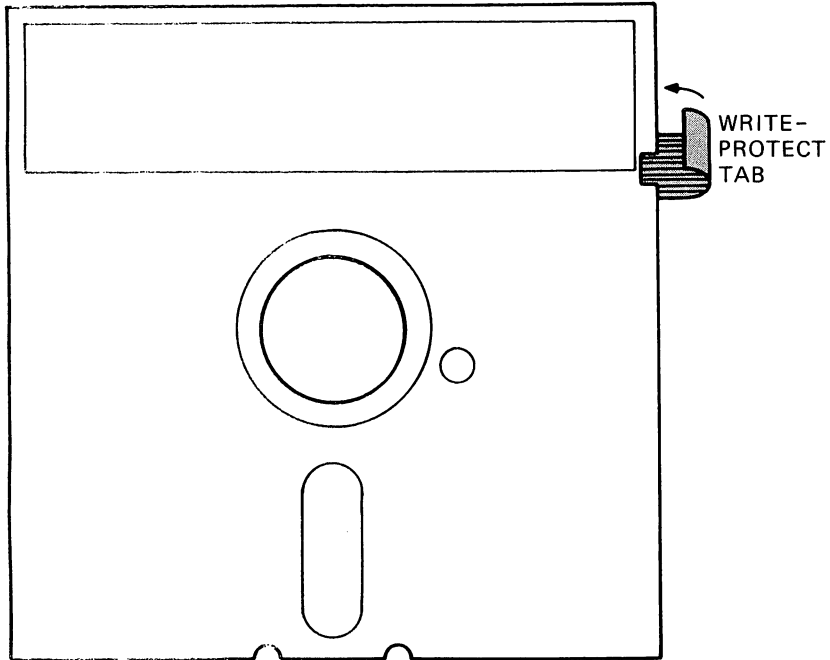


Figure 29. Applying a Write-Protect Tab

MR-8162

B

Using Application Programs with Four Drives

If your Rainbow 100 computer has four drives and you have two application programs, insert the diskettes as shown in Figures 30 and 31. This arrangement uses the drive's reading and writing mechanisms more efficiently. You need only have the operating system on one diskette.

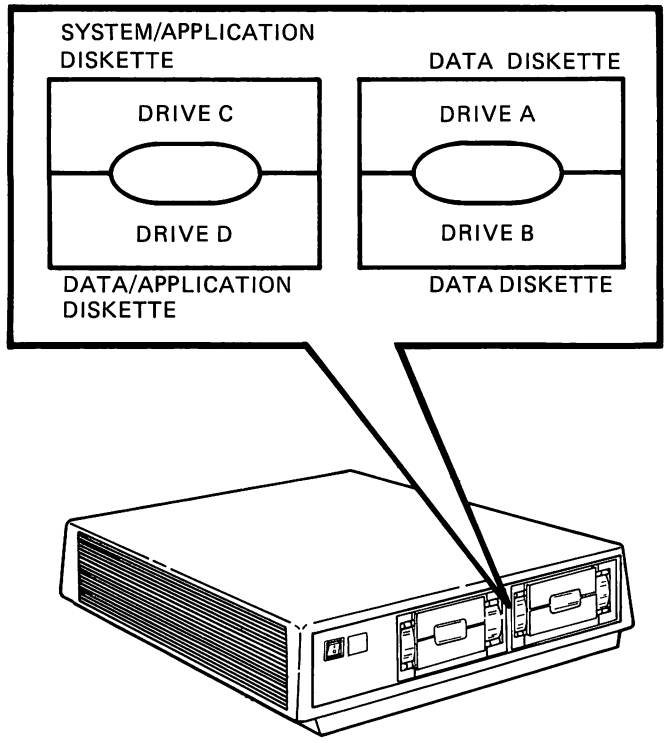


Figure 30. Using Four Drives

MR-8797

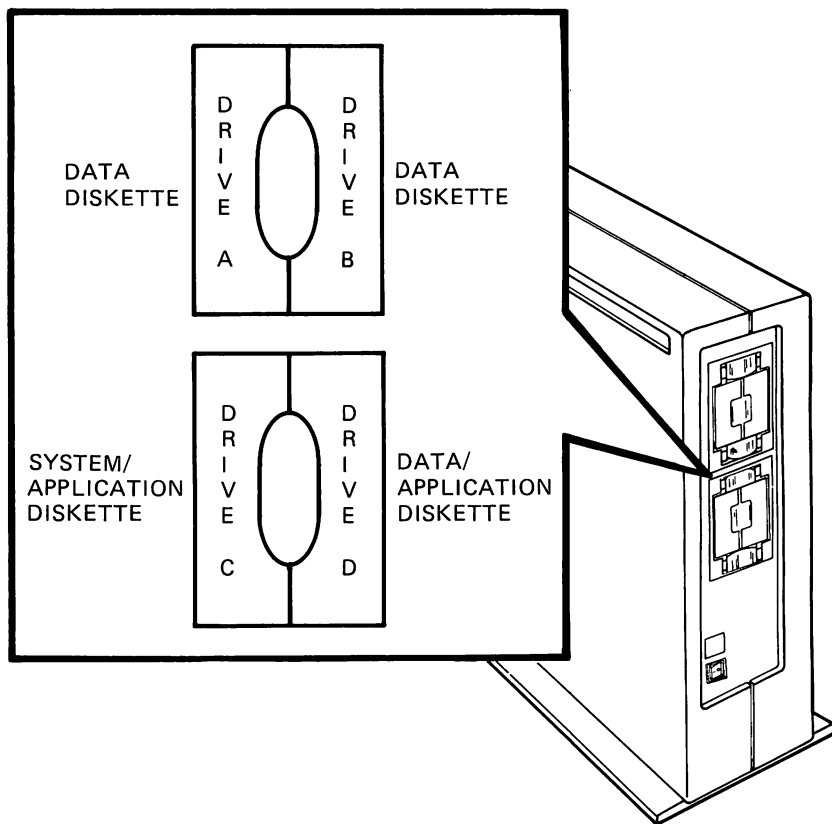


Figure 31. Using Four Drives (Floor Stand)

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