Chapter 5
ED

Compared to such text editors as Valdocs™ and WordStar®, ED is more difficult to use. But ED is also capable of some powerful and quick operations that you may find useful in certain circumstances.

This chapter will only provide you with a rudimentary understanding of how ED works. Refer to the Digital Research *CP/M Operating System Manual* if you wish to become truly proficient in the use of ED.

Creating a File with ED

ED offers a default line numbering feature to make it easy to locate specific lines of text.

1. Look at the display screen. Do you see the A⟩ prompt? If not, press **RESET**.

2. After the A⟩ prompt, type:

```
ED POEM.DOC
```

3. Press **RETURN**. The screen displays:

```
NEW FILE
: *
```

   This indicates that ED has just opened the file POEM for you. Notice the *. This symbol is ED's way of letting you know that it is ready for you to enter a command.

4. Press **i**. This is a command instructing ED to go into insert mode. It also instructs ED to type out uppercase and lowercase letters just as you enter them at the keyboard.

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If you press *uppercase* I instead of lowercase; ED will automatically convert all the text to capital letters when you TYPE or print it.

5. Press **RETURN**. The screen displays:

```
1:
```

This indicates two things:

- That you have left ED's command mode (symbolized by the now-absent *) and entered ED's insert mode, and
- That ED is waiting for you to enter a line of text in line 1.

Practice using ED by entering text in line 1, as follows.

1. After the 1: type:

```
If useless things
```

2. Press **RETURN**. The screen displays:

```
1: If useless things
2:
```

ED has taken the text you typed and stored it in what is known as the *text buffer.* (The text buffer is an area of memory reserved for text files.)

3. Now enter another line, as follows:

```
2: do not hang
```

4. Press **RETURN**. The screen displays:

```
1: If useless things
2: do not hang
3:
```

5. Complete the poem by entering lines and pressing **RETURN** after each line you enter, using this text:

```
3: in your mind,
```


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```
4: every season
5: is a good season
6: for you.
7:
```

6. Press ^**Z**. This is the way you tell ED that you have completed entering text. When ED recognizes the ^**Z**, it will display this on your screen:

   ```
   : *
   ```

   Look familiar? You'll recall that the * represents ED's command mode. In other words, ED is waiting for further instructions from you.

7. Press **e** (or **E**, whichever you prefer—ED doesn't care) to instruct ED that you wish to end the session and save the file POEM.DOC on your diskette. The screen displays:

   ```
   : *e
   ```

8. Press **RETURN**. The A⟩ prompt displays.

Editing a Text File with ED

Now that you have a file to work with, you can practice editing it.

1. After the A⟩ prompt, type:

   ```
   ED POEM.DOC
   ```

2. Press **RETURN**. The ED command prompt displays:

   ```
   : *
   ```

3. Type:

   ```
   #a#t
   ```

   This means "append all lines to the text buffer, then type them all out." (# = all, a = append, and t = type.)

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4. Press **RETURN**. The screen displays:

```
1: If useless things
2: do not hang
3: in your mind,
4: every season
5: is a good season
6: for you.
1: *
```

ED is awaiting your command (indicated by the *) and has put an imaginary placemark at the first character of line 1.

This imaginary placemark is known as the *character pointer*, or *CP*. You'll need to keep track of the CP—even though you can't see it!—as you edit with ED.

Keeping track of the CP

To practice keeping track of the CP, replace the first word, *If*, with *When*. Use the ED command s (search).

1. Type:

   ```
   sIf^ZWhen^Z
   ```

2. Press **RETURN**. The screen displays:

   ```
   1: *
   ```

   Now, where is the CP? (Remember, CP stands for *character pointer.*) You may think that it's at the beginning of line 1 again. If so, you're wrong.

3. Type 0t and press **RETURN**. The screen displays:

   ```
   1: When*
   ```

   This 0t (that's zero-tee) is very handy. It places the * right on top of the imaginary CP. So the CP was, and is, right at the end of the first word of line 1. That makes sense, since you just asked ED to replace the first word.

   Now let's see what the whole line looks like.

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4. Press **0** (again, that's zero). This moves the CP to the *beginning* of the line it is now in the middle of, then displays the line.

5. Press **RETURN**. The screen displays:

```
1: When useless things
1: *
```

This tells you that:

- The change was made correctly (*When* has replaced *If*),
- ED is waiting for your next command, and
- The CP is at line 1. (Though you can't tell from this display, it's in front of the first character. Whenever you instruct ED to go to the beginning of a line and display the line, the CP returns to the beginning of the line after displaying it.)

Deleting text

Use the k (kill) command to delete text. Practice on line 6. To do this, you must first move the CP to line 6. Here's how:

1. To move the CP forward 5 lines, press **5**.

2. Press **RETURN**. The screen displays:

```
6: for you.
6: *
```

This indicates that the CP is positioned at the beginning of line 6, and that ED is in command mode (the * tells you so).

3. To kill line 6, press **k**.

4. Press **RETURN**. The screen displays:

```
: *
```

ED is still in command mode. To see what POEM looks like now,

5. Press **b** (for beginning) to return the CP to the front of the text.

6. Type #t to instruct ED to display the contents of the entire file.

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7. Press **RETURN**. The screen displays:

```
1: When useless things
2: do not hang
3: in your mind,
4: every season
5: is a good season
1: *
```

Note that line 6 did *not* display. You have successfully deleted it. ED has returned to the beginning of the text and awaits your next command.

Inserting a character

Insert a period at the end of line 5, which has become the last line of POEM.

The CP is at the front of line 1. Move it to line 5.

1. After the 1: *, press **4**.
2. Press **RETURN**. The screen displays:

   ```
   5: is a good season
   5: *
   ```

   The CP is now at the beginning of line 5, and you are in command mode.
3. Enter the commands that will replace the last two letters of the word *season*, *on*, with the letters *on* and a period (*on.*). After the * prompt, type:

   ```
   son^Zon.^Z
   ```

   Be sure to use lowercase *s*.
4. Press **RETURN**. The screen displays:

   ```
   5: *
   ```

   Take a look at what you've just done.

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5. Type:

   ```
   b#t
   ```

   This means "go to the beginning and type all lines."

6. Press **RETURN**. The screen displays:

```
1: When useless things
2: do not hang
3: in your mind,
4: every season
5: is a good season.
1: *
```

ED is in command mode, and the CP is at the beginning of the text file.

Inserting text

To practice inserting text, put the last line of the poem back into POEM.DOC.

1. After the * prompt, type:

   ```
   -bifor you.
   ```

   This will take you to the bottom of the text file, put you into insert mode, and insert *for you.* at line 6.

2. Press **RETURN**. The screen displays:

   ```
   *
   ```

3. Press **e**, to end your session with ED.

4. Press **RETURN**. The screen displays the A⟩ prompt.

   See how POEM.DOC looks now.

1. After the A⟩ prompt, type:

   ```
   ED POEM.DOC
   ```


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2. Press **RETURN**. The screen displays:

```
: *
```

3. Type:

```
#a#t
```

4. Press **RETURN**. The screen displays:

```
1: When useless things
2: do not hang
3: in your mind,
4: every season
5: is a good season.
6: for you.
1: *
```

Note that there's still a period at the end of line 5.

Deleting a character

Delete the period from the end of line 5.

1. After the * prompt, type:

```
s.
```

This command instructs ED to search for and delete the first period it encounters.

2. Press **RETURN**. The screen displays:

```
1: *
```

ED searched and did not encounter a period in line 1.

3. Press **RETURN** again. Now the screen displays:

```
5: *
```

This indicates that ED searched through lines 2 - 5, and encountered and deleted the period it found in line 5.

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Viewing the final product

Let's see how POEM.DOC looks now.

1. Type:

```
b#t
```

2. Press **RETURN**. The screen displays:

```
1: When useless things
2: do not hang
3: in your mind,
4: every season
5: is a good season
6: for you.
1: *
```

3. Press **e** to end your session with ED and transfer the file POEM from the text buffer to the diskette.

4. Press **RETURN**. The screen displays the A⟩ prompt, indicating that you have left ED and that CP/M-80 is waiting for your next instruction.

ED Commands

ED has other commands that you didn't use in the exercise. Here's a list of some of those commands as well as those you've already encountered.

Creating a file with ED

i or I	This is the command to use when you create a new file. It instructs ED to go into insert mode. You can also use it to add lines to an existing file. Use **I** to instruct ED to TYPE or print all text in uppercase letters. Use **i** if you want both lowercase and uppercase letters.
^Z	Use ^**Z** to let ED know that you've finished entering text.

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E	Press **E** to move text from the text buffer to disk and to exit ED. ED doesn't care whether it's uppercase or lowercase.
Q	Use **Q** for Quit. If you decide not to save the file on disk.

Displaying an existing file with ED

nA	*A* stands for *append*. Use it to move lines of text from a disk and append them to the text buffer, where you can edit them. If you know that you need to edit only the first six lines of a file, 6A will move them to the text buffer.
#A	This command fills the text buffer.
nT/-nT	*T* stands for *type*. Use nT to type (that is, display on the screen) n lines after the CP and -nT to type n lines before the CP.
#T	Use nT to display all lines from the CP forward.
n/-n	If you'd like the next line to display on the screen, just press **1**. The character pointer moves ahead one line and displays it. To move ahead two lines, press **2**, and so on. To move back one line, use **-1**. The previous line displays. To go the start of the current line and display it, press **0**.
#a#t	Use this command to append and display all lines in the text file.
0T	This command displays the text of a line from the beginning of the line to the CP.

Getting around with ED

B/-B	Use this command to move the CP to the beginning or bottom of the file you are editing.

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nC/-nC	This moves the CP the number of characters that you specify, C for forward and -C for backward.
nL/-nL	Use this command to move the CP n lines forward or backward.
n:	This command moves the CP to the beginning of the specified line number.
n/-n	Use this command to move the CP n lines forward or backward in the buffer and to have the line display on the screen.
nP/-nP	Use the P command to move the CP n pages forward and the -P command to move the CP n pages backward. ED displays the selected page.
0P	This command shows 23 lines from the current position.

Editing text with ED

nstext^Znew text^Z	The s command stands for *search and replace*. Use lowercase s to locate existing text and replace it with new text. If the text that needs to be replaced occurs more than once, you can precede s with the number of occurrences, and ED will automatically search out and replace the specified number.
#s	If you use #s, ED will search out and replace *all* occurrences.
nD/-nD	Use this command to delete n characters after or before the CP.
nK/-nK	Use this command to delete n lines after or before the CP. When you delete a line, the RETURN at the end of the line goes with it.
E	Use **E** to end the editing session.
0	Use this command if you're not happy with the edits you've just made. It stores the file just as it was before you began editing.

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Moving blocks of text with ED

nX	Use this command to transfer a block of text to a temporary file. When you key in nX, the specified number of lines following the CP moves to the temporary block move file. If the file already contains text, the block is added to it.
R	This command reads the block move file into the buffer, and places it before the CP.
Rname	If you have boilerplate text (standard text that is used repeatedly), use this command to insert the text from the BOILER.LIB file. Of course, you have already created the BOILER.LIB file with ED. Rname reads the BOILER.LIB file into your text at the current location.

Miscellaneous ED commands

0V	This command tells you: 1) How many more bytes you can add to the buffer and 2) the total buffer size.
nW	If the text buffer is filling up and you have more text to add, use this command to move text from the buffer to the temporary file.
#W	Use #W to move all lines.
0W	Use 0W to move enough lines to leave the buffer half empty.
U/-U	Use U to convert lowercase keyboard input to uppercase before you append from the disk. Use -U to change to the normal condition of leaving uppercase and lowercase as they are.
V/-V	If you *don't* want line numbers on the display screen, type -V after the * prompt. Use V to reinstitute line numbering.

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Chapter 6
SUBMIT

The CP/M-80 transient command SUBMIT allows you to store frequently-used command sequences on disk and execute them any number of times without retyping.

You use ED or some other text editor to create a text file, consisting of executable commands, with the .SUB file type. Then you execute the batch of commands with SUBMIT.

Creating a SUBMIT File

Let's say that there are some standard program files that you'd like to have on every disk. Instead of using the PIP command every time you use a new diskette, set up a SUBMIT file to execute PIP automatically.

1. After the A⟩ prompt, type:

   ```
   ED TEST.SUB
   ```

   Note that the file type is .SUB. This is important, because SUBMIT only executes .SUB files.

2. Press **RETURN**. The screen displays the ED command prompt:

   ```
   : *
   ```

3. Press **i** to access ED's insert mode.

4. Press **RETURN**. The screen displays:

   ```
   1:
   ```


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This indicates that ED is waiting for you to enter a line of text. Enter these lines:

```
1: pip b:=submit.com
2: pip b:=copydisk.com
3: pip b:=setup.com
4:
```

5. Close the file as usual, by pressing ^**Z** on line 4.

   WARNING: Be sure that you don't press RETURN yet. SUBMIT won't work if you have an extra RETURN in the file.

6. Press **e**.

7. Press **RETURN**.

   Now check out what you've just done.

8. After the A) prompt, type:

   ```
   SUBMIT TEST
   ```

   Note that the SUBMIT command requires the file name only.

9. Press **RETURN** and watch the display screen.

SUBMIT invokes PIP three times as it copies the specified program files from the drive A disk to the drive B disk.

Using Variables with SUBMIT

With the .SUB file you just created, you can easily copy the specified files from the drive A disk to the drive B disk.

But what if you'd like to be able to vary the TO and FROM drives and the files that are to be copied? You can do all this with SUBMIT, using special symbols ($1, $2, and $3) as *placeholders*.

Set up a SUBMIT file now, using placeholders. Name the file *OPTIONS.SUB*.

1. Create the OPTIONS.SUB file and enter these two lines:

   ```
   PIP $2:=$1:$3
   DIR $2:
   ```


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2. Close the file.

Use the .SUB file you have just created to copy the file PRACTICE.1 from the drive A disk to the drive B. These are the rules:

- The *first* value you type after the file name replaces each occurrence of $1.
- The *second* value you type after the file name replaces each occurrence of $2.
- The *third* value you type after the file name replaces each occurrence of $3.

1. After the A) prompt, type:

```
SUBMIT OPTIONS A B PRACTICE.1
```

2. Press **RETURN**. SUBMIT automatically performs the copy operation, then displays the drive B directory, complete with PRACTICE.1.

Using XSUB with SUBMIT

XSUB extends the power of SUBMIT by allowing you to automate keyboard input.

When you invoke a CP/M-80 command with SUBMIT and that command requires responses to questions it asks, you'd normally have to be right there at the keyboard, providing CP/M-80 with all the data it needs. When you use XSUB with SUBMIT, it is XSUB that responds to requests for information.

You can also use XSUB to speed up processing time. The following example refines the first example in this chapter, which invokes PIP three times. XSUB has the power to invoke PIP only once and still copy all three files. Here's how.

1. After the A) prompt, type:

```
ED NEW.SUB
```

2. Using ED or some other text editor, set up a program file that consists of these lines:

```
xsub
pip
b:=submit.com
```


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```
b:=copydisk.com
b:=setup.com
```

Now let's review this file, line-by-line, to understand exactly what's going on.

xsub—whenever you use XSUB with SUBMIT, it must be the *first* line in the file.

pip—this line invokes the PIP command.

b:=submit.com—this line instructs the system to copy the SUBMIT.COM file from drive A to drive B.

b:=copydisk.com and b:=setup.com—like the previous line, these lines instruct the system to copy the program files COPYDISK.COM and SETUP.COM to the drive B disk.

Close the file. Then run it and watch what happens.

3. After the A› prompt, type:

```
SUBMIT NEW
```

Notice that PIP is invoked only once, and that from then on XSUB interacts with the system to provide the required information.

After all the files are copied, the PIP * displays.

4. Press **RETURN**. The A› displays.

For a little more practice with using XSUB and the placeholders, review the sample SUBMIT program, DEMO.SUB, that is on your system diskette.

The DEMO.SUB file, as you'll see when you execute it, looks like this:

```
XSUB
DIR
TYPE DEMO.SUB
TYPE $1
ED $1
I$2
E
TYPE $1
```


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This instructs SUBMIT to:

- Invoke XSUB, for automated input.
- Display the disk directory.
- Type the contents of the DEMO.SUB file.
- Type the file you have assigned to the SUBMIT placeholder $1.
- Invoke the CP/M-80 text editor, ED, to edit the $1 file.
- Insert the value you have assigned to the SUBMIT placeholder $2.
- End the session with ED.
- Type the altered contents of the file represented by $1.

To see exactly how the DEMO.SUB file works, assign the file PRACTICE.1 to $1, and a date (01/06/84) to $2.

1. After the A⟩ prompt, type:

```
SUBMIT DEMO PRACTICE.1 01/06/84
```

2. Press **RETURN**, then just sit back and watch what happens.

That's all there is to it—unless you're an expert, in which case you'll also want to know that XSUB only works with programs that use the buffered console input (BDOS function 10).

In the next few chapters, you'll learn about the QX-10 utilities.

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Chapter 7
COPYDISK

The QX-10 utility COPYDISK has three functions:

- It sets blank diskettes to the QX-10 format,
- It copies information from one diskette to another, and
- It prepares diskettes for use with an application program.

Note: COPYDISK does *not* format or copy information from or to a hard disk nor does it copy from or to a diskette that is not in the QX-10 format.

In Chapter 1, you learned to use COPYDISK to format a blank diskette and to copy the entire contents of one diskette to another one. In this chapter, you'll learn how to use COPYDISK to:

- Copy the system tracks and the system file (CPM2.SYS) from one diskette to another,
- Copy data *only* from one diskette to another, and
- Create an application program diskette.

Copying System Information

You've probably realized by now that you can only initialize your QX-10 with a system diskette. But what is a system diskette? Quite simply, it's any diskette that contains the CP/M-80 operating system—the system tracks (tracks 0 and 1) and the CPM2.SYS file.

You also probably realize by now that your QX-10 cannot boot the system with a *data diskette* (that is, a diskette that does not have the operating system on it) in the LEFT drive.

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In this section, you'll learn how to copy the operating system to a data diskette, which will allow you to work with the data diskette in the LEFT drive.

1. Leave your CP/M-80 system diskette in the LEFT drive and your practice diskette (the one that you formatted* in Chapter 1, and have been PIPing files to) in the RIGHT drive.

2. Press **COPYDISK**—the third key from the left in the top row of keys on your keyboard. The screen displays:

```
                    MAIN OPTION LIST
1 - Format and Erase a Diskette
2 - Copy the Contents of One Diskette to Another
3 - Create an Application Program Diskette
E - EXIT TO CP/M
ENTER OPTION ==>
```

3. Press **2**. The screen displays:

```
 STATUS   COPY OPTION LIST
 LEFT     Location of Diskette to be Copied FROM
 RIGHT    Location of Diskette to be Copied TO
 ALL      1 - Copy All, System or Data Tracks
              COPY COMMAND LIST:
          S - START COPY OPERATION
          E - EXIT TO MAIN MENU
          ENTER OPTION ==>
```

4. Press **1** to see the available copy options. The screen displays:

```
Ø=COPY ENTIRE DISKETTE 1=COPY SYSTEM ONLY 2=COPY DATA ONLY
```

The default setting is 0, COPY ENTIRE DISKETTE. This is the

*Before you can copy the operating system to a diskette, the diskette must be formatted.

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option you used in Chapter 1, when you copied the CP/M-80 system diskette.

5. Press **1** again to change the setting to COPY SYSTEM ONLY. Note that the entry in the STATUS column has changed from *ALL* to *SYSTEM*.

6. Now press **S** to start the copy operation, then **Y** to verify that you wish to begin.

7. When the copy procedure is complete, this message appears:

```
ENTER OPTION ==>
```

8. Press **E** to return to the COPYDISK Main Option List.

9. Press **E** again to return to CP/M-80.

10. Remove the CP/M-80 system diskette from the LEFT drive and the data diskette (which now contains the operating system) from the RIGHT drive.

11. Insert the data diskette into the LEFT drive and use ^**C**, to generate a warm boot.

12. Type DIR and press **RETURN**. The directory displays the files on the diskette in the LEFT drive, which now contains all the CP/M-80 resident commands and has the ability to initialize the system. (If you'd also like to have some transient commands on this diskette, use PIP to copy them.)

Copying Data Only

Use this option to make a backup copy of a data diskette.*

1. Remove the bootable copy of your data diskette from the LEFT drive and insert your CP/M-80 system diskette.

2. Press ^**C**.

3. Insert a blank, formatted diskette into the RIGHT drive. (Use COPYDISK to format one if necessary.)

---

*You can also use the *.* option of PIP to make a backup copy of a data diskette, but it takes longer. If you're copying to a diskette that is not in the QX-10 format, you *must* use PIP.

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4. Press **COPYDISK**.
5. Press **2** to select the option COPY THE CONTENTS OF ONE DISKETTE TO ANOTHER.
6. Press **1** to view the available options.
7. Press **2** to select the COPY DATA ONLY option.
8. Press **S** to start and **Y** to verify.
9. When the copy operation is complete, this message appears:

   ```
   ENTER OPTION ==>
   ```

10. Press **E** to exit to the COPYDISK Main Option List.
11. Press **E** again to exit to the A> prompt.

Creating an Application Program Diskette

Use this option of COPYDISK to copy the application software you purchased for your QX-10. It copies both the operating system and the application program files to a blank diskette, transforming it into your APPLICATION PROGRAM MASTER COPY.

Here's how it works.

Making an application diskette master copy

1. Place a write protect tab on your application software diskette to make absolutely certain that you don't lose any information.
2. Leave your CP/M-80 system diskette in the LEFT drive.
3. Insert a blank diskette (it doesn't need to be formatted) into the RIGHT drive and push the drive release button in.
4. Press **COPYDISK**. The screen displays:

```
                    MAIN OPTION LIST
1 - Format and Erase a Diskette
2 - Copy the Contents of One Diskette to Another
3 - Create an Application Program Diskette
E - EXIT TO CP/M
ENTER OPTION ==>
```


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5. Press **3**. The screen displays:

```
STATUS   COPY OPTION LIST
LEFT     Location of Application Diskette to be Copied
         FROM
RIGHT    Location of Application Diskette to be Copied
         TO
         COPY COMMAND LIST:
         S - Start Copy Operation
         E - Exit to SETUP Main Menu
         ENTER OPTION ==>
```

6. Press **S** to start the copy operation. The screen displays:

```
Mount Application Diskette to be 'Copied FROM' in LEFT
drive.
Mount Application Diskette to be 'Copied TO' in RIGHT
drive.
This operation will erase the contents of the diskette
in RIGHT drive.
DO YOU WANT TO CONTINUE? (Y/N):
```

7. Follow the instructions on the screen. That is, *remove the CP/M-80 system diskette from the LEFT drive and insert the application diskette in its place.*

8. Now press **Y** to verify that you do wish to continue. The system formats the diskette in the RIGHT drive and copies the contents of the diskette in the LEFT drive.

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When the copy operation is complete, the system beeps and the screen displays:

```
Mount System Diskette to be 'Copied FROM' in LEFT drive
Leave Application Diskette to be 'Copied TO' in RIGHT
drive.
DO YOU WANT TO CONTINUE? (Y/N):
```

9. Remove the application diskette from the LEFT drive and store it in a safe place.
10. Insert your CP/M-80 system diskette in the LEFT drive.
11. Leave the RIGHT drive as it is.
12. Press **Y**. The system copies the two system tracks (tracks 0 and 1) from the system diskette to the diskette in the RIGHT drive, then this message appears:

    ```
    Copying File: CPM2.SYS
    ```

    This message indicates that the system is copying the CPM2.SYS file, which contains the operating system, to the diskette in the RIGHT drive. When the copy operation is complete, the system beeps and the screen displays:

    ```
    ENTER OPTION ==>
    ```

13. Press **E** to exit to the COPYDISK Main Option List.
14. Press **E** to exit to CP/M-80.
15. Remove the copy you have just made from the RIGHT drive and label it *Application Diskette MASTER Copy.*
16. Place a write protect tab over the notch of the Application Diskette MASTER Copy.

Making an application diskette working copy

Remember, making two backup copies of your program diskettes is standard practice. So, the next step is to make another copy of your application diskette.

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1. Remove your system disk from the LEFT drive and insert the MASTER copy of the application diskette.
2. Insert a blank diskette into the RIGHT drive.
3. Press **2** to select the option COPY THE CONTENTS OF ONE DISKETTE TO ANOTHER. Leave the status at COPY ALL.
4. Press **S** to start and **Y** to verify.
5. When the copy operation is complete, remove the diskette from the RIGHT drive and label it *Application Diskette WORKING Copy.*
6. Remove the Application Diskette MASTER Copy from the LEFT drive and store it in a safe place.
7. Press **E** twice to exit COPYDISK.

When you're ready to run your application program, insert the Application Diskette WORKING Copy into the LEFT drive. After the A⟩, type the name of the program you want to run.

COPYDISK and PIP

Just in case it's not entirely clear to you yet:

- You cannot use COPYDISK to copy individual files from one diskette to another. You need PIP for that.
- Before running PIP to copy files to a blank diskette, you must format the diskette, using the FORMAT option of COPYDISK.
- COPYDISK copies files to and from diskettes only. You can run COPYDISK on a hard disk system to copy data *from one diskette to another,* but to copy files from diskettes to a hard disk, or from the hard disk to a diskette, you must use PIP.

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Chapter 8
SETUP

When we had you prepare the CP/M-80 system diskette for your use, we made some assumptions. For example, we assumed that you have a parallel printer, that you do *not* have a hard disk, and that you'd like to see a continuous display of the date and time at the bottom of your display screen.

In this chapter, you'll see all our assumptions in the form of default settings, which display in the STATUS column of the SETUP menus. You'll also learn how to change the default settings that don't apply to your system.

One word of caution: SETUP is a powerful utility. *Don't make any changes unless you're sure you know what you're doing.* We'll help you out by flagging the SETUP options that can get you into trouble.

Display Options

1. Press **HELP** (the second key from the left at the top of your keyboard), which is programmed to bring up the SETUP utility. The screen displays:

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```
                    MAIN OPTION LIST:
 A) Display Options              F) Disk Drive Assignments
 B) Date and Time Options        G) Serial Port Options
 C) Keyboard Options             H) Printer Support Options
 D) Function Keys                I) Auto Boot Execution
    Modification                    Options
 E) Disk Subsystem Options

                    EXIT OPTION LIST:
P - EXIT and Permanently Update Configuration
T - EXIT and Test Updated Configuration
Q - Abort SETUP with no Configuration Changes

                    ENTER OPTION ==>
```

2. Press **A** to view the Display Options. The screen displays:

```
 STATUS        DISPLAY OPTION:
 ENABLED       1) Auto Line Wrap
 ENABLED       2) Blinking Cursor
 DISABLED      3) Bit 7 Masking
               E - Exit to MAIN MENU
               ENTER OPTION ==>
```

The three Display Options on the menu relate to the appearance of your display screen.

Auto line wrap

When auto line wrap is enabled, you can type away at the keyboard and the system automatically inserts a carriage return and line feed as soon as you've typed enough characters to fill a line.

If you disable the auto line wrap, the system *doesn't* automatically insert a carriage return and line feed at the end of each line. Instead, it piles characters on top of each other, each one replacing the previous one.

You won't lose any information if you disable the auto line wrap. Your computer retains it in memory. But what you see on the display screen won't make much sense.

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Blinking cursor

The blinking cursor option enabled causes the QX-10 cursor to appear as a blinking block. Disabled causes it to appear as a steady block.

Notice that the cursor is now blinking. You can cause it to stop blinking like this:

1. Press **2**. The screen displays:

```
Ø = DISABLED 1 = ENABLED
```

2. Press **0**. The status changes to disabled.
3. Press **E** to exit to the SETUP Main Option List.
4. Look at the EXIT OPTION LIST at the bottom of the screen:

```
   EXIT OPTION LIST:
P - EXIT and Permanently Update Configuration
T - EXIT and Test Updated Configuration
Q - Abort SETUP with no Configuration Change
```

5. Press **T** to temporarily (until the next cold boot) make the cursor stop blinking.

   The A⟩ prompt appears, and the cursor stops blinking.

6. Now, hold down the **GRPH SHIFT** and **CTRL** keys, then press **STOP**.* The A⟩ appears and the cursor starts blinking again.

   - If you use the P (permanent) exit option, the cursor won't start blinking again unless you go back into SETUP and reenable the blinking cursor.
   - If you use the Q (quit) exit option, the cursor just keeps right on blinking.

*This key combination has the same effect as pressing **RESET**.

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Bit 7 masking

If you have a programming background, read this:

The QX-10 character set is comprised of the standard ASCII character set 0 - 127 and the QX-10 graphic characters, 128 - 255. To enable graphic characters in the QX-10, the BIOS does not strip off the high-order bit (bit 7). Select bit 7 masking to mask off the most significant bit of the ASCII character set in order to use older versions of software which require 7-bit ASCII character codes.

If you do *not* have a programming background, do this:

1. Press **HELP** to re-enter SETUP and **A** to select Display Options.
2. Press **3**. The screen displays:

   Ø - DISABLED 1 - ENABLED

3. Press **1** to enable bit 7 masking.
4. Press **E** to exit to the SETUP Main Option List.
5. Press **T** to exit and make this change temporary. The A⟩ prompt displays.
6. Press **HELP** to go back into SETUP. The screen displays the SETUP Main Option List.

Look at the border around the List. Instead of a solid line, it now consists of letters—x, y, t, d, e, u. Very strange. The cause of this strange display is bit 7 masking.

Some application programs are written for computers like the QX-10, which are 8-bit machines and have the ability to produce graphic characters; others are written for computers which do not have graphic capability. If you run one of the latter programs on your QX-10, it may produce strange screen displays, like the one you just saw.

Here's the bottom line: because the QX-10 is an 8-bit computer and most application programs run just fine on an 8-bit computer, leave the bit 7 masking option in the disabled condition as a general practice.

But if you ever run an application program that produces strange characters on the display screen, go into the SETUP utility and enable

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bit 7 masking. This may correct the problem. Of course, when you have finished running the 7-bit application program, you should return bit 7 masking to its disabled status. Do that now:

1. Press **Q** to exit SETUP.
2. When you see the A⟩ prompt, hold the **GRPH SHIFT** and **CTRL** keys down and then press **STOP**, to reinstate the disabled status of bit 7 masking.

Date and Time Options

These options allow you to have a continuous display of the date and time and to reset the date and time. Here's how:

1. Press **HELP** to run SETUP.
2. Press **B**. The screen displays:

```
STATUS          DATE AND TIME OPTION
ENABLED         1) Date and Time Display
                2) Date and Time Setting
                E - Exit to MAIN MENU
                     ENTER OPTION ==⟩
```

Date and time display

When the date and time display option is enabled, the current date and time values display on line 25 in the lower right corner of the screen.

Date and time setting

The date and time setting option allows you to enter the correct date and time.

1. Press **2**. The screen displays:

```
Date and Time Entry
Enter 24-Hour Time:
DAY MM/DD/YY HH:MM
→
```


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2. Type the day (use three letters—MON, TUE, WED, THU, FRI, SAT, or SUN), then type a space and the date and time. When you enter the time, base it on a 24-hour clock.

   For example, suppose today is Friday, December 23, 1983, and the time is 6:25 p.m. To set the date and time, type:

   ```
   FRI 12/23/83 18:25
   ```

3. Then press **RETURN**.

   If you make an error as you enter the date and time, one of the following error messages displays:

   For an incorrect day format (such as FRZ):

   *** ERROR: Invalid Day of Week ***

   For an incorrect date format (such as 12/35):

   *** ERROR: Invalid Date Format ***

   For an incorrect hour format (such as 25:00):

   *** ERROR: Invalid Hour ***

   For an incorrect minute format (such as 01:65):

   *** ERROR: Invalid Minute ***

   After the error message appears, the date/time displays with a blank entry field. To correct an error condition, type the correct date and time, then press **RETURN**.

4. Now press **E** to return to the SETUP Main Option List.

Keyboard Options

Under CP/M-80, your QX-10 has several options relating to the keyboard. Press **C** now, to see what those options are. The screen displays:

```
STATUS          KEYBOARD OPTIONS:
ENABLED         1) Typamatic Keys
HASCI           2) Select Function Key Mapping
CAPS LOCK       3) SHIFT LOCK Key Interpretation
                E - Exit to MAIN MENU
                ENTER OPTION ==>
```


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Typamatic keys

If you enable this option, when you hold a key down it will repeat until you release it. If you disable this option, the keys won't repeat when you hold them down.

Select function key mapping

The first three sets of keys in the top row of keys on your keyboard are *function keys*. Just as the name implies, a function key can be programmed to perform a function, rather than to produce a single character.

You've already used two of the function keys on your keyboard: the **HELP** key, which runs the SETUP utility for you, and the **COPYDISK** key, which (oddly enough) runs the COPYDISK utility. In computer jargon, this means that the **COPYDISK** *function key mapping* is COPYDISK, and that the **HELP** function key mapping is SETUP.

If these two function keys were mapped differently, you'd have to type the word *SETUP* after the A⟩ prompt every time you wanted to run SETUP, and the word *COPYDISK* after the A⟩ prompt every time you wanted to run COPYDISK. The obvious value of a function key is that it saves you time and trouble. Press **2**. The screen displays:

```
Ø - HASCI  1 - TVI-92Ø  2 - CUSTOM
ENTER OPTION ==⟩
```

HASCI—The collective name for the default function key mappings is *HASCI*. These settings are defined in Table 8-1.

Table 8-1 - HASCI function key mappings

Function Key	Setting
HELP	SETUP
COPYDISK	COPYDISK
INDEX	INDEXER
MAIL	MTERM
MENU	MENU
CALC	PLAN (Microplan)
DRAW	GPLAN (Graphplan)

TVI®-920—If you have a programming background, you know that the TVI-920 terminal has standard function key mappings. Table 8-2

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shows how the QX-10 function keys are mapped to support TVI-920 application programs:

Table 8-2 - TVI-920 function key mappings

Function Key	Setting
HELP	F-1
COPYDISK	F-2
UNDO	F-3
STORE	F-4
RETRIEVE	F-5
PRINT	F-6
INDEX	F-7
MAIL	F-8
MENU	F-9
CALC	F-10
SCHED	F-11

Some application programs are designed to run with the TVI-920 function key mappings. If the documentation accompanying an application program instructs you to press F-1, F-2, F-3, or some other F-key, select the TVI-920 function key mappings when you run that particular program.

CUSTOM—The default settings for the custom function key mappings is HASCI. But let's say that you have specific ideas about what you'd like the function keys to do for you and that your ideas don't correspond to either the HASCI or TVI-920 settings. You can use the custom option to put into effect function key mappings of your own design.

When we get to the next option of SETUP, function key modification, we'll teach you:

- How to change the default settings of your function keys, and
- How to make the new settings effective with the custom function key mapping option.

But for now, press **0** to retain the default function key mapping and exit this option.

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SHIFT LOCK key interpretation

The status of the **SHIFT LOCK** key interpretation option tells your QX-10 how to interpret the **SHIFT LOCK** key. Press **3** to view the possibilities, which appear at the bottom of the keyboard options menu:

```
0 - CAPS LOCK 1 - SHIFT LOCK
ENTER OPTION ==>
```

CAPS LOCK—When you want the **SHIFT LOCK** key to affect only the alphabetic keys, not the number or punctuation keys, select the caps lock option. This is the default status.

SHIFT LOCK—Select this option if you want your keyboard to type uppercase letters and symbols (not numbers) when you depress the **SHIFT LOCK** key.

Press **0** now, to leave the caps lock option in effect.

Function Keys Modification

This is the option we mentioned above in connection with the custom function key mappings. If you wanted to, you could customize a total of 33 function keys: all 17 of the keys at the top of your keyboard and 16 of the function keys shifted (all but the **STOP** key).

To learn how this works, practice changing the setting of the **COPYDISK** function key from COPYDISK to DIR.

1. First, press **2**. This is the select function key mapping option of the keyboard options menu. This message appears at the bottom of the screen:

   ```
   Ø - HASCI  1 - TVI-92Ø  2 - CUSTOM
   ENTER OPTION ==>
   ```

2. Press **2** to select the custom function key mapping.

3. Press **E** to return to the SETUP Main Option List.

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4. Press **D** to review the function keys modification options. The first programmable function key, which is **STOP**, displays:

```
STATUS          FUNCTION KEY OPTION:
STOP            1) Select Function Key
DISABLED        2) Enable Function Keys
DISABLED        3) Carriage Return Delimiter
                4) Function Key String
                E - Exit to MAIN MENU
                ENTER OPTION ==>
```

Select function key

Use the select function key option to select the function key you wish to view and/or change:

1. Press **1**. This message appears:

   ```
   Select Function Key:
   ```

2. Press **COPYDISK** since we're practicing with the COPYDISK function key. The screen displays:

```
STATUS          FUNCTION KEY OPTION:
COPYDISK        1) Select Function Key
ENABLED         2) Enable Function Key
ENABLED         3) Carriage Return Delimiter
                4) Function Key String
                E - Exit to MAIN MENU
                ENTER OPTION ==>
```

Enable function key

Use this option to enable or disable the function key you have selected.

Leave the status of the enable function key option enabled.

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Carriage return delimiter

This option appends a carriage return to the end of the function you are programming for a particular key. It's enabled now because before COPYDISK can execute, it must be followed by a carriage return. The same is true for DIR.

So leave the status of the carriage return delimiter enabled.

Function key string

Use this option to *change* the current function key string. A *function key string* is simply a string of characters (such as COPYDISK or SETUP) programmed to a single function key. The string of your choice may be from 0 to 24 characters long, and may consist of any of the characters on your keyboard.

Here's where you actually reset the **COPYDISK** function key so that it will run DIR instead of COPYDISK:

1. Press **4**. The screen displays:

```
STRING>      COPYDISK
Hex Msb>     44554454
Hex Lsb>     3F09493B
                ↑  ↑  ↑   ↑   ↑   ↑
Column>         4  8  12  16  20  24
```

   These are the ASCII and hexadecimal strings for the **COPYDISK** function key.

2. Press the space bar once to delete *COPYDISK*.
3. Type DIR.
4. Press **RETURN** to let the system know you have finished entering text.
5. Press **E** to exit to the SETUP Main Option List.
6. Press **T** to exit to CP/M-80 and temporarily update the system.
7. To see what you've done, press **COPYDISK**. The directory for the logged drive displays.

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Now that you understand the procedure, return the function key mapping to HASCI:

1. After the A⟩ prompt, press **HELP** to run the SETUP utility.
2. Press **RETURN**. The SETUP Main Option List displays.
3. Press **C** to view the Keyboard Options menu.
4. Press **2** to select function key mapping.
5. Press **0** to return the function key mapping to HASCI.
6. Press **E** to exit to the SETUP Main Option List.

Note: When you select a shifted function key, the characters *SHF/* precede the name of the selected key on the display screen. For example, if you select **COPYDISK** shifted, the screen displays:

```
SHF/COPYDISK
```

Disk Subsystem Options

Your QX-10 offers several options relating to disks.

Press **E** to see what choices you have.

```
STATUS      DISK SUBSYSTEM OPTIONS:
ENABLED     1) Diagnostic Error Messages
ENABLED     2) Standard Disk Error Retry
ENABLED     3) RAM Disk
QX-10 380K  4) Format of RIGHT Diskette
            E - Exit to MAIN MENU
            ENTER OPTION ==⟩
```

Diagnostic error messages

There are two types of errors: *recoverable* (soft) and *non-recoverable* (hard).

An example of a recoverable error is a speck of dust on a diskette, which may interfere with program execution for awhile, then cease to be a problem after the system has made a few attempts to recover from the error.

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A non-recoverable error is one that the system can't deal with. The error simply won't go away until you step in and type something at the keyboard or press **RESET**.

With this option enabled, the system reports both recoverable and non-recoverable errors by displaying an error message at the bottom of the screen.

Disable the option if you want error messages for non-recoverable errors only.

Refer to Appendix B for QX-10 error messages and Appendix C for CP/M error messages.

Standard disk error retry

By the time you see an error message at the bottom of the display screen with the option enabled, the system has already tried to recover from the error five times.

Disable the option if you want the system to report errors after only one attempt at recovery.

RAM disk

RAM is an abbreviation for *Random Access Memory.* Your QX-10 can both read and write to the RAM disk, which has a 112K capacity. The advantage of the RAM disk is that it is very fast. If you wish to execute a program in record time, you can use PIP to copy it to the RAM disk and then run the program there. But if you do, be aware of these considerations:

- If you store a file in the RAM disk, some of the data may be lost or altered when you press **RESET**, and
- The system deletes all data in the RAM disk when you turn the power off.

Leave the status of the RAM disk enabled, unless you're running a program that specifically tells you to disable it.

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Format of right diskette

The right drive of your QX-10 can read and write to a variety of diskette formats, as shown in Table 8-3:

Table 8-3 - Optional diskette formats

FORMAT	DENSITY	SIDES/ DISK	TRKS/ SIDE	SECTORS/ TRACK	BYTES/ SECTOR	SYSTEM TRACKS
QX-10	DOUBLE	2	40	10	512	2
QX-10	DOUBLE	2	40	16	256	2
MFCP/M	DOUBLE	2	40	16	256	4
IBM 1*	DOUBLE	1	40	8	512	2
IBM 2*	DOUBLE	2	40	9	512	2

1. Press **4**. The screen displays:

```
Ø - QX-1Ø 38ØK    2 - QC-1Ø MFCP/M    4 - IBM 2
1 - QX-1Ø 3ØØK    3 - IBM 1
```

   The default status of the format of right diskette option is 0, the QX-10 380K. If you wish to read or write to a diskette in one of the other acceptable formats, insert the diskette into the RIGHT diskette drive, then:

2. Press the key corresponding to the format of the diskette you wish to read or write to.

3. Press **E** to return to the SETUP Main Option List, then exit from SETUP with the T exit option.

Note: If you select the P exit option, the effect will be the same—that is, the default QX-10 380K format will be reinstated in the next cold boot.

You can use the CP/M-80 resident commands and STAT.COM, PIP.COM, and ED.COM to work with diskettes that are not in the QX-10 380K format. You *cannot* use COPYDISK with diskettes that are not in the QX-10 380K format.

*The IBM formats refer to CP/M-86® implementations

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Disk Drive Assignments Option

Use the disk drive assignments option of the SETUP Main Option List to assign your left and right diskette drives and hard disk (if you have one) to *logical* drives. You can assign any physical drive to any logical drive—but you *must* assign one of your physical drives to logical drive A.

When you press **F**, the screen will display:

```
          DRIVE ASSIGNMENTS AS CURRENTLY DEFINED:
A:     B:     C:     D:     E:     F:     G:     H:
L-F    R-F
I:     J:     K:     L:     M:     N:     O:     P:
                             RAM

                RE-DEFINED DRIVE ASSIGNMENTS
A:     B:     C:     D:     E:     F:     G:     H:
L-F    R-F
I:     J:     K:     L:     M:     N:     O:     P:
                             RAM
                      → Move Right
                      ← Move Left
                      E - Exit to Main Menu
0 - 1 - L-F 2 - R-F 3 - RAM 4 - H-1 5 - H-2
```

On this screen, L-F = Left Floppy, R-F = Right Floppy, RAM = RAM, H-1 = Hard Disk #1, and H-2 = Hard Disk #2 (remember, CP/M-80 automatically divides the hard disk into two logical disk drives).

Look at the upper half of the screen. It shows the current physical-to-logical drive assigments. Now look at the lower half of the screen. This is the part of the screen you use to *change* drive assignments.

If you have the standard two-drive system, leave the drive assignments just as they are.

But if you have a hard disk system, make the following changes:

1. If you haven't done so already, press **F** to display the disk drive assignments option.

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2. Press **4** to assign drive A to one of the logical hard disk drives.
3. Press → to space over to drive B.
4. Press **5** to assign the second logical hard disk drive to drive B.
5. Press → to space over to drive C.
6. Press **1** to assign the LEFT diskette drive to drive C.
7. Press → to space over to drive D.
8. Press **2** to assign the RIGHT diskette drive to drive D.
9. Press **E** to exit to the SETUP Main Option List.

Note: A change in drive assignments will not go into effect unless you use the P exit option, then press **RESET**.

Serial Port Options

When your CP/M-80 system diskette is new, it's set up so that you can connect a Hayes Smartmodem 1200™ to the serial port of your QX-10. If you have another type of external modem, a serial printer, or some other RS-232C-compatible device, the documentation accompanying the device should tell you what settings to use.*

Leave the default settings for the serial port just as they are unless you 1) **must** change them, and 2) know exactly what you're doing.

Press **G** to see what the possibilities are.

```
STATUS        SERIAL PORT OPTION:
1200          1 - Baud rate
NONE          2 - Line Protocol
NONE          3 - Parity
8             4 - Data Length in Bits
1             5 - Number of Stop Bits
DISABLED      6 - Bit 7 Masking
DISABLED      7 - Interrupt Driver
              E - Exit to MAIN MENU
              ENTER OPTION ==>
```

*For pin settings on the RS-232C connector, see Appendix E.

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Baud rate

This option allows you to set the baud rate for the RS-232C port. Allowable settings are:

0 - NONE	3 - 110	6 - 300	9 - 1800	C - 4800
1 - 50	4 - 134	7 - 600	A - 2400	D - 7200
2 - 75	5 - 150	8 - 1200	B - 3600	E - 9600

The default setting is 1200.

Line protocol

This option allows you to select ETX/ACK, XON/XOFF, or no handshaking protocol, or you may select the hardware handshaking protocol CTX/RTS.

Parity

This option allows you to select odd, even, or no parity.

Data length in bits

This option allows you to select 5, 6, 7, or 8 bits as the character size. The default setting is 8.

Number of stop bits

This option allows you to set the number of stop bits to 1, 1.5, or 2.

Bit 7 masking

Remember, you went over bit 7 masking at the beginning of this chapter, in the display options section.

The default status for the bit 7 masking option for the serial port is disabled. If you're attaching a device to your serial port that requires bit 7 masking, the documentation accompanying the device should tell you that the high order bit, or most significant bit (MSB - bit 7) must be masked off.

Interrupt driver

Most application programs run under the standard polling mode, which is effective when the interrupt driver is disabled. Change the

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status of the interrupt driver option to enabled *only* if the documentation accompanying the application program in question specifies that it requires the interrupt driver.

Press **E** now, to return to the SETUP Main Option List.

Printer Support Options

Use the printer support option to identify the type of printer you have attached to the parallel port. The default setting is the Epson FX-80™ printer.

Press **H**. The printer support option screen displays:

```
STATUS        PRINTER SUPPORT OPTION (PARALLEL PORT):
FX-80         1) Attached Printer
DISABLED      2) Bit 7 Masking
DISABLED      2) Single Sheet Mode
              E - Exit to MAIN MENU
              ENTER OPTION ==>
```

Attached printer

Use this option to specify the type of printer you have connected to the parallel port. Note that the default status is the Epson FX-80 printer.

Press **1** now, to view your choices:

```
0 - NONE          6 - RX-100        C - COMREX CR-III
1 - UNDEFINED     7 - MX-80
2 - CENTRONICS    8 - MX-100
3 - FX-80         9 - LQ-1500
4 - FX-100        A - COMREX CR-I
5 - RX-80         B - COMREX CR-II
```

Press the number key corresponding to the type of printer you have connected to your QX-10.

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- If you have a serial printer, select the NONE option and use STAT to change the LST: device from LPT: to UL1:. (See Chapter 3.)
- If your printer doesn't fall into any other category on the screen, select the UNDEFINED option.

Read Chapter 10, which describes system features, for details about printer support.

Bit 7 masking

The default status for the bit 7 masking option for the parallel port is disabled. If your printer requires bit 7 masking, the documentation accompanying the printer should tell you that the high order bit, or most significant bit (MSB—bit 7) must be masked off.

Single sheet mode

This option allows you to set up your printer, via the QX-10, to accept single sheets of paper rather than continuous form paper. When this option is enabled, the QX-10 overrides the paper out signal on your printer.

Press **E** to exit to the SETUP Main Option List.

Auto Boot Execution Options

Suppose you want to check the disk directory every time you power ON or press **RESET**. With the auto boot execution option, you can do this easily.

When you press **I**, the screen displays:

```
STATUS          AUTO BOOT OPTION:
DISABLED        1) Execute Auto Boot Command on Cold
                Start
                2) Command to be Executed
                E - Exit to MAIN MENU
                ENTER OPTION ==>
```


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Execute auto boot command on cold start

Enable executes the command of your choice on a cold start (power on or RESET). Disable this option when you don't want the command to execute on a cold start.

Command to be executed

This option allows you to define the command string. The string can be from 0 to 24 characters long. Follow through with the DIR example, just for practice. (Of course, you can select any command that is on your system diskette.)

1. If you haven't done so already, press **I** from the SETUP Main Options List.
2. Press **1** to select the option execute auto boot command on cold start.
3. Press **1** again, to change the status to enabled.
4. Press **2** to select the command to be executed option. The screen displays:

```
STRING > ↑   ↑   ↑   ↑   ↑   ↑
Column > 4   8   12  16  20  24
```

5. Type DIR.
6. Press **RETURN**.
7. Press **E** to exit to the SETUP Main Option List.
8. Press **P** to notify SETUP that you have made a change through the auto boot execution option.
9. Hold down the **GRPH SHIFT** and **CTRL** keys, then press **STOP**. The system automatically displays the disk directory.

Now return the auto boot execution option to its default condition, disabled.

1. Press **X** to exit to CP/M-80.
2. Press **HELP** to run SETUP.
3. Press **I** to select the auto boot execution option.
4. Press **1** to disable the option execute auto boot command on cold start and then set it to disabled.

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While you're at it, you might as well return the command to be executed option to its original blank status:

1. Select the command to be executed option and then press the space bar to delete DIR.
2. Press **RETURN**.
3. Press **E** to return to the SETUP Main Option List.
4. Press **P**.
5. Press **RETURN**.
6. Press **RESET** to make sure your change went into effect. (The system should *not* autoboot with DIR.)

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Chapter 9
INDEXER

The INDEXER utility shows an alphabetical listing of the files on the specified disk. You can use INDEXER to:

- Perform many of the same functions as the CP/M-80 resident and transient commands,
- Copy files from one user area to another, and
- Log onto a different disk drive.

Here's how INDEXER works:

After the A› prompt, press **INDEX**.

The system runs the INDEXER program, and the screen:

- Shows the copyright information for INDEXER,
- Identifies the active drive, user area, and available space on the disk,
- Displays the message *Use HELP key for command menu*, and
- Presents an alphabetical listing of all the files on the disk.

The listing that INDEXER displays will vary, of course, but the format will remain the same for all disks. Since you are currently checking the drive A disk, the listing will look something like this:

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```
))ASM      .COM      8K((  PRACTICE.3      2K
  COPYDISK.COM      22K    RANTEST .BAS      2K
  CPM2     .SYS     52K    RFILE   .         2K
  DDT      .COM      6K    SETUP   .COM      32K
  DEMO     .SUB      2K    STAT    .COM      6K
  DUMP     .COM      2K    SUBMIT  .COM      2K
  ED       .COM      8K    TEMP1   .TXT      2K
  INDEXER  .COM      8K    TEMP2   .TXT      2K
  LOAD     .COM      2K    TEMP3   .TXT      2K
  MBASIC   .COM     24K    XSUB    .COM      2K
  PIP      .COM      8K    ---------------   ---
  PRACTICE.1         2K    ---------------   ---
  PRACTICE.2         2K    ---------------   ---
```

Look at the screen. Note that INDEXER displays the file size next to the filename and that the first entry is:

```
))ASM .COM 8K((
```

(If you happen to have a file on your drive A disk that precedes the letters *ASM* in the alphabet, that file will be listed first.)

The))((symbol identifies the current file to be used in any command. It is called the *File Pointer*, or *FP*.

Now review the INDEXER Command Menu by pressing **HELP**. The screen displays:

```
                    COMMAND MENU
      Screen Controls              Miscellaneous Commands
-------------------------------------------------------------
↓     Next File                    S - Start Again
↑     Previous File                U - Remaining Space
→     Next Column                  A - Retag Files and
←     Previous Column                  Reset Disks
T -   Tag On/Off                   X - eXit to CP/M

                  File Operations
V -   View at CRT                  C - Copy File
P -   Print File                   D - Delete File
      (any key aborts)             R - Rename File
M -   Copy Tagged Files            Q - Delete Tagged Files
      → Depress any key to return to File Display
```


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The best way to find out how the commands work is to use them. Be sure that you have a formatted diskette in the RIGHT drive, because you're going to be copying files from the LEFT drive to the RIGHT drive.

Screen Controls

Review the screen control commands in the left column. These commands allow you to select a specific file or files from the directory, and to mark them for group operations.

Next, practice using the screen controls.

1. Press **RETURN** or some other key, if you prefer, to return to the file display. The alphabetical listing of the files on the drive A disk appears on the screen.
2. Press ↓ (Next File). The FP moves down to the next file listed.
3. Press ↑ (Previous File). The FP moves up one file and settles there—that is, it moves back to where it was when you began.
4. Press → (Next Column). The FP jumps over to the next column of the directory listing.
5. Press ← (Previous Column). The FP moves one column to the left—once again, back to the first file in the directory.
6. Press **T** (Tag On/Off). INDEXER immediately *tags* the file, i.e., marks it with the # symbol. (This is a way for you to select more than one file, then use INDEXER to perform group moves or group deletes.)
7. Press ↑ to move back to the tagged file, then press **T** again. Note that the # symbol disappears.

Miscellaneous Commands

There are just four commands in this category.

Start a new drive

Use this command when you want to log onto a different drive or user area.

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1. Press **S**. The screen displays:

   ```
   Log a New Drive (A-P)?
   ```

2. Press **B** to log onto the RIGHT drive. The screen displays:

   ```
   New User (Ø-15)?
   ```

3. In this case, there's no reason to change the default user area, so press **0**. But be aware that if you wanted to, you could log onto any of the 16 possible user areas simply by typing the appropriate number.

4. Press **RETURN**. (When you specify a two-digit user area, **RETURN** isn't necessary.)

5. Next, the screen displays:

   ```
   ENTER SEARCH ID RETURN = *.*:
   ```

   Because this is the first time in this session with INDEXER that you have used S, INDEXER automatically presents *.* as the default SEARCH ID.

   You now have these options:

   - To look at the entire directory for the specified drive and user area, you would press **RETURN**.
   - To look at a selected group of files, such as the .COM files, you would type *.filetype (for example, *.COM) then press **RETURN**.
   - To check for the presence of one file only, you would type the filename (include the file type) and press **RETURN**.

   Try out each of these options, beginning with the first:

1. Press **RETURN**. INDEXER displays the names of all the files on drive B in user area 0.

2. Press **S**, **A**, **0**, and **RETURN**; type *.COM, and press **RETURN**. INDEXER displays only the names of the .COM files in user area 0 of drive A.

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3. Press **S**, **A**, **0** and **RETURN**. Note that the default SEARCH ID has changed from *.* to *.*COM*.

4. Check for the presence of PIP.COM. Type:

```
PIP.COM
```

5. Press **RETURN**. INDEXER displays the message *PIP.COM* on the screen, indicating that PIP.COM is on the diskette. (Of course, you already knew that. But you can also use this feature of INDEXER to check for the presence of files on other disks and in other user areas.)

6. One last thing: press **S**, **A**, **0** and **RETURN**. Note that the new default SEARCH ID is *PIP.COM*. This default will remain in place until you: 1) type in something else, or 2) exit INDEXER and start again, which will automatically replace the default SEARCH ID with *.*.

Remaining Space

This INDEXER command performs one of the CP/M-80 STAT.COM functions.

1. Press **U**. The screen displays:

```
Space of Drive (A-P)?
```

2. Press **A**. INDEXER displays the number of bytes (in k bytes) remaining on the diskette in drive A. If you wish to check the remaining space on drive B, press **U**, then **B**.

Exit to CP/M

Use this command to end your sessions with INDEXER and return to CP/M-80.

1. Press **X**. After the screen message "leaving INDEXER," the A> prompt displays, indicating that you have left the INDEXER program and are back at the CP/M-80 command level, on drive A.

2. Return to INDEXER. Press **INDEX**.

Retag Files

The last of the miscellaneous commands, *A — Retag Files and Reset Disks*, allows you to automatically retag files that you have previously tagged and copied as a group to another disk or user area. You'll

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see exactly how this works after you learn to use the *M — Copy Tagged File* command, below.

File Operations

These commands are really the heart of INDEXER. You'll use them to perform a variety of functions that would normally require the use of several different resident and transient commands.

View at CRT

This feature of INDEXER has the same effect as the CP/M-80 resident command, TYPE.

1. Use the screen controls to move the FP to the PRACTICE.3 file. If you need to refresh your memory about how to use the screen controls, press **H** or **HELP**, then press any key to return to the file display.

2. Press **V**. The file at the FP position (PRACTICE.3) displays on the screen. If the file is longer than 24 lines, it will scroll by on the screen.

   - To interrupt the scrolling, press ^**S**.
   - To resume scrolling, press any key.
   - To terminate scrolling, press any key.

3. When the entire file has scrolled by on the display screen, the message *Depress any key to quit VIEW* will display. Press **RETURN** (or any other key).

Print file

If you have a parallel printer, print the file you just viewed with V by pressing **P** or **PRINT**. Of course, your printer must be on and online. To interrupt the printing, press any key.

Copy file

Skip over the copy tagged files command in your Command Menu for a moment—we'll cover it next. INDEXER's C command resembles

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the single file copy feature of PIP. But C offers an extremely simple approach to copying files into user areas 0 - 15.*

The first step to using C is to move the FP to the file you wish to copy.

1. Use the screen controls to move the FP to the PIP.COM file.
2. Press **C** (copy file). The screen displays:

   ```
   PIP.COM : To Drive (A-P)?
   ```

3. Press **A** to notify INDEXER that you wish to remain on the drive A disk. The screen displays:

   ```
   To User (0 - 15)?
   ```

4. Press **2** to notify INDEXER that you wish to copy the PIP.COM file to user area 2.
5. Press **RETURN**.

   When the messages disappear from the bottom of the screen, you'll know that INDEXER has copied the PIP.COM file into user area 2. Check it out.

6. Press **S**, **A**, **2**, and **RETURN** twice. INDEXER displays the contents of the directory for user area 2 on the drive A disk:

   ```
   ))PIP .COM:((
   ```

   Now return to user area 0.

7. Press **S**, **A**, **0**, **RETURN** type *.*, and press **RETURN**.

Copy tagged files

The INDEXER M command resembles the CP/M-80 transient command, PIP.COM. It allows you to copy a specified group of files from one diskette to another.

Begin by tagging two or three files. Now you'll learn how to copy the tagged files to a disk in another drive.

---

*You can use both the C and M commands to copy files into *any* user area (you'll get to M in just a moment). This is an advantage of INDEXER over PIP.COM. If you want to use PIP to copy files into any user area other than 0, you must first perform file maintenance to patch PIP into that user area.

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1. Press **M**. The screen displays:

```
Mass Copy To Drive (A-P)?
```

2. Press **B** to notify INDEXER that you want to copy the marked files to the diskette in the RIGHT drive. The screen displays:

```
To User (0-15)?
```

3. Press **1** to notify INDEXER that you want to copy the files that you tagged into user area 1. The screen displays:

```
Auto Replace Files (Y/N)?
```

If you press **Y**, INDEXER automatically copies the tagged files in user area 0 on drive A to user area 1 on drive B, replacing any files on drive B that have the same name as tagged files on drive A.

If you press **N**, INDEXER automatically copies to the drive B disk any tagged files on drive A that are *not already present* on drive B. Also, if a duplicate filename exists on the drive B disk, INDEXER displays the message *Replace (Y/N)?* after the filename.

As INDEXER copies the tagged files, it displays a message at the bottom of the screen—for example, as it copies the ASM.COM file, it displays:

```
COPYING "ASM .COM"
```

You'll know that all the tagged files have been copied when INDEXER stops displaying the *COPYING* message.

Tag again

Now use the tag again command, which you first encountered in the section on the INDEXER screen controls, to retag the same files and copy them onto another user area.

1. Press **A**. INDEXER automatically retags the files you just copied to user area 1 on drive B.

2. Press **M**, **B**, **2**, **RETURN**, and **Y**. Now INDEXER automatically copies all the tagged files to user area 2 of drive B.

Now, check out what you've just done.

1. Press **S**, **B**, **1**, **RETURN**, type ***.***, and press **RETURN** to view the directory of user area 1 on the drive B disk.

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2. Press **S**, **B**, **2**, and press **RETURN** *twice* to view the directory of user area 2 on the drive B disk.

3. Press **S**, **A**, **0**, and press **RETURN** *twice* to return to user area 0 on drive A.

Delete file

This INDEXER command has the same effect as the CP/M-80 resident command, ERA.

Warning: As with ERA, there is no way to retrieve a file once you have deleted it with the INDEXER D command. Be very careful.

Practice by deleting the PIP.COM file from user area 2 on drive A:

1. Press **S**, **A**, **2**, and **RETURN** twice to view the directory of user area 2 on drive A.

2. If PIP.COM is the only file listed in the directory, the FP will (of course) be at the PIP.COM file. If there are other files listed, use the arrow keys to move the FP to the file you wish to delete.

3. Press **D**. The screen displays:

```
Delete ?
```

4. Press **N** if you decide *not* to delete the file. Press **Y** if you wish to delete the file.

   When there is more than one file in the directory and you delete one of them, the screen displays the message *Deleted*.

   When there is only one file in the directory and you delete it, the screen displays:

```
***List Empty*** Relog (Y/N)?
```

When you see this message, you should:

5. Press **Y** to indicate that you do wish to log onto another drive or user area.

6. Now press **A** and **0**, and then press **RETURN** *twice* to go back to user area 0 of drive A.

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Rename file

The INDEXER R command is like the CP/M-80 REN command. Use it to change the names of files on your disks.

Practice by changing the name of the PRACTICE.3 file to TEST.

1. Use the arrow keys to move the FP to the PRACTICE.3 file.
2. Press **R**. The screen displays:

```
PRACTICE.3 : New Name?
```

3. Type the name TEST.
4. Press **RETURN**. The name *PRACTICE.3* changes to *TEST*, and the FP moves down to the next file in the directory.

Delete tagged files

The INDEXER Q command allows you to delete a group of tagged files. Practice using it by tagging and deleting a group of files on the drive B disk.

1. Press **S**, **B**, **0**, and **RETURN** twice to log onto user area 0 of the drive B disk.
2. Use **T** to tag two or three files.
3. Press **Q**. The screen displays:

```
Confirm Each Delete (Y/N)?
```

4. Press **Y**. This gives you an important check

WARNING: If you press N, INDEXER automatically (and very quickly) deletes all the tagged files.

Because you pressed **Y**, INDEXER will ask you to confirm that you really do want to delete each tagged file. For example, if the first tagged file is ASM.COM, the screen displays:

```
Deleting ''ASM .COM'' (Y/N)?
```

5. Press **Y**, and INDEXER deletes the file, then displays the name of the next tagged file.

   Press **N**, and INDEXER does *not* delete the file; it moves on to the next tagged file.

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When you have finished deleting files from the directory, use the S command to log onto another drive, or the X command to exit to CP/M-80.

And that is how to use INDEXER.

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Chapter 10
System Features

Your QX-10 offers a variety of features, some of which you encountered in Chapter 8. These features make your QX-10 powerful, adaptable, and easy to use.

System Overview

One of the most advanced features of the QX-10 is memory bank switching. The B Release of CP/M-80 takes advantage of this feature.

Through bank switching, the QX-10 can use four memory banks (banks 0 - 3) instead of only one (bank 0). Some of the practical effects of bank switching are:

- The previous maximum memory capacity (with bank 0 only) was 64K. The current memory capacity (with banks 0 - 3) is 232K.
- The TPA (Transient Program Area) in the QX-10, which was formerly 51.5K, is now 54.5K.
- The system BIOS (remember, the BIOS is the Basic Input Output System) supports more features than ever before. Programmable function keys, a RAM disk that can also be used as an extended TPA area, a hard disk driver, and a graphics driver for application software are all available with the B Release of CP/M-80.

The QX-10 Terminal

The computer terminal consists of the keyboard and console (video display screen). One of the most familiar terminals in the computer

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world is the TVI-920. Your QX-10 terminal is modeled after the TVI-920. See Appendix F for a list of supported and unsupported TVI-920 features.

The QX-10 keyboard

The HASCI keyboard is designed to make it easy for you to tell your QX-10 what to do. The function keys are fully programmable, and each one can produce a string consisting of as many as 24 characters.

Through the SETUP utility, you can select the default HASCI function key mapping, the TVI-920 function key mapping, or design and select your own customized function key mapping.

Application programs tailored to the QX-10 remap the function keys so that they correspond to frequently-used functions in the application. Read your application program documentation carefully for function key assignments.

Other keyboard features are: *typamatic* keys, which repeat when held down, and a 128-character type-ahead buffer that eliminates the possibility of losing any characters through fast typing.

To generate a cold boot when the computer is already running, either press **RESET** or hold down the **GRPH SHIFT** and **CTRL** keys, then press **STOP**. We recommend using the **GRPH SHIFT, CTRL,** and **STOP** key combination instead of pressing **RESET**, to avoid getting into the habit of reaching for **RESET** every time you have a problem.

Note: Four of the graphic character keys on your keyboard do not generate the symbols marked on them. These are:

Marked Key	Produces
±	;
¢	D
°	=
¼	?
½	>

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The QX-10 display screen

Your QX-10 display screen offers you 24 possible output lines, with 80 characters per line. Line 25, which is not an output line, displays error messages* and one status message: the date and time.

The date and time display is continuous, unless you disable it through the SETUP utility. You can also use SETUP to reset the date and time, turn auto line wrap on or off, and specify a blinking or non-blinking cursor.

If you know BASIC or assembly language programming, you can send the hexadecimal codes for the QX-10 graphic characters to the display screen. To print the contents of a screen containing graphic characters, type ^**PRINT**. (See Appendix D for the QX-10 hexadecimal codes for the 8-bit graphic characters.)

A new and important system feature is the CRT saver, which prevents the screen image from burning—and therefore permanently marking—the display screen. After 20 minutes of idle time, the display screen goes blank. To turn on the screen again, press any key. The operating system ignores the keystroke, and the image that was on the screen earlier reappears.

Disk Subsystems

Your QX-10 comes with two integral drives for diskettes, a RAM disk, and the ability to support a Comrex ComFiler hard disk.

Diskettes and the QX-10

The QX-10 LEFT and RIGHT diskette drives are 5-¼" and double-sided. Under the B Release of CP/M-80, the RIGHT disk drive supports a variety of diskette formats. This allows you to read and/or write to diskettes that have a format different from the standard QX-10 diskette format. (See Table 8-3, Optional Diskette Formats, in the Disk Subsystem Options section of the SETUP utility chapter.)

RAM disk

RAM is an abbreviation for *Random Access Memory.* Your QX-10 can both read and write to RAM. The advantage of the RAM disk is

*See Appendix B for QX-10 Error Messages, and Appendix C for CP/M Error Messages.

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that, because it exists in memory, it loads and saves programs faster than a mechanical disk can.

The standard disk format for the QX-10 RAM disk is 128-byte sectors, with 128 sectors per track. A block (the minimum file size) on the RAM disk is 1K. This allows for greater flexibility than physical disks, which have a 2K block size.

The capacity of the RAM disk is 112K. That translates into somewhere between 35 and 40 pages of printed text. When your system diskette is new, the RAM disk is assigned to logical drive M, and its status (through the SETUP utility) is enabled.

If you wish to execute a program in record time, you can use PIP to copy it to the RAM disk, and run it there. But if you do store a file in the RAM disk, be aware that:

- The data will be lost when you press **RESET** or power off.

Comrex ComFiler

If you wish to add storage capacity to your QX-10, you may want to install a Comrex ComFiler. The documentation accompanying the hard disk details the installation procedures.

After the hard disk is physically installed, your CP/M-80 system diskette automatically divides it in two. Then you must use the drive assignment option of the SETUP utility to assign the hard disk to two CP/M-80 logical drives (we recommend drives A and B) before you can use it.

Note: If the power switch of the hard disk is off, the QX-10 won't know it's there. Be sure to turn the power switch on, so that your QX-10 will recognize the hard disk and make the appropriate drive assignments.

WARNING: To avoid damaging your hard disk, NEVER turn the power switch of your Comrex ComFiler OFF when the power to your QX-10 is ON.

Printer Support

When your CP/M-80 system diskette is new, it's set up to run an Epson FX-80 printer connected to the parallel port. If you have some other type of printer, use the printer support options of the SETUP utility to change the attached printer option.

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You have several choices.

The B Release of CP/M-80 for the QX-10 supports the Epson MX, FX, and RX printers and the Epson LQ-1500™. For these and the Centronics-type and Comrex, ComRiter CR-II™, and ComRiter CR-III™ printers, the system provides printer error messages.

The system does not provide messages for undefined printers.

By typing ^**PRINT**, if the printer connected is an Epson printer, you can generate a screen dump. The screen dump prints text and graphic characters just as they appear on the screen. Graphic displays—e.g., circles, pie charts, etc.—also print just as they appear on the screen.

Note: If you have a serial printer, the system does not generate printer error messages or screen dumps. And remember, to use a serial printer with your QX-10, select NONE as the attached printer option of SETUP and use STAT to change the LST: device to UL1:.

One final word about printers: if you've ever been alarmed by the *paper out* signal when you're doing nothing more than feeding single sheets of paper through the printer, we have good news. You can now override the paper out signal through the SETUP utility (enable the single sheet mode of the printer support option).

The Serial Port

When your system diskette is new, it expects you to attach a Hayes Smartmodem 1200™ to the serial port of your QX-10. If you have some other peripheral device in mind, read the manual accompanying that device for specifics about baud rate, line parity, protocol, and so forth. Then make the appropriate changes through the SETUP utility.

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