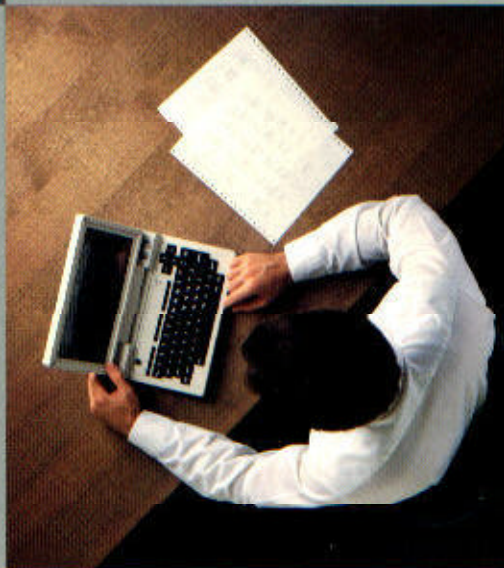


# TANDY 200 Owner's Manual



**The FCC Wants You to Know . . .** This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) that are certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception. If this occurs, try relocating the receiving antenna, or relocating the computer.

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*Tandy® 200 Owner's Manual*

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## *To Our Customers*

Congratulations on purchasing the Tandy 200—a truly revolutionary portable computer!

This manual shows how to immediately start using all 6 of the Tandy 200 built-in programs, how to relate these programs with each other, and how to do many of today's most exciting and practical applications.

The best way to use this manual is to start at the beginning and try all the examples. If you are in a hurry, though, to do one application, take 5 or 10 minutes to read Chapter 1 first. Then skip to the chapter that interests you.

After reading this manual, you can get in-depth information on the more feature-filled programs from the other Tandy 200 manuals:

- *Tandy 200 Multiplan Manual*
- *Tandy 200 TELCOM Reference Manual*
- *Tandy 200 BASIC Reference Guide*

Please feel at ease with the Tandy 200. Pressing the wrong key or typing the wrong information does no damage to a computer. You can usually correct a mistake simply by typing the information again correctly. If this does not work, turn to "Help" in the back of this manual.

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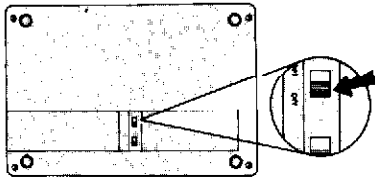
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## ***Chapter 1/ Starting Up***

This chapter shows how to start the Tandy 200 and enter programs. You will need the Tandy 200 power adapter (Cat. No. 26-3804) or 4 Size AA alkaline batteries.

## Starting the Tandy 200

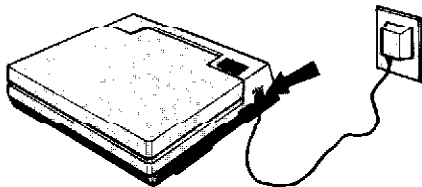
1. Open the Tandy 200 case and turn on the Memory Power Switch:



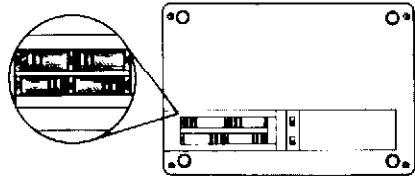
Never turn this switch off. Doing so causes you to lose all information you have stored in the Tandy 200.

2. Supply electric or battery power:

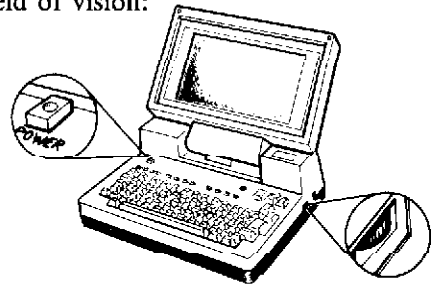
If using electricity, connect the Tandy 200 to an electric outlet, using the Tandy 200 power adapter. (Use only the Tandy 200 power adapter!)



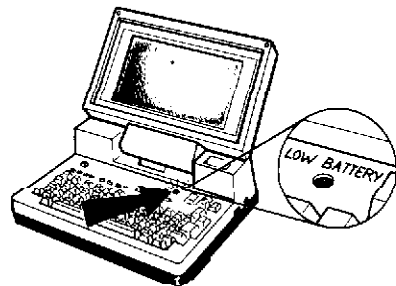
If using batteries, insert them as shown:



3. Press the Power Switch, and adjust the DISP dial to your field of vision:



Battery power lasts 14 hours. When the red battery indicator turns on, you have about 20 minutes of battery power left:

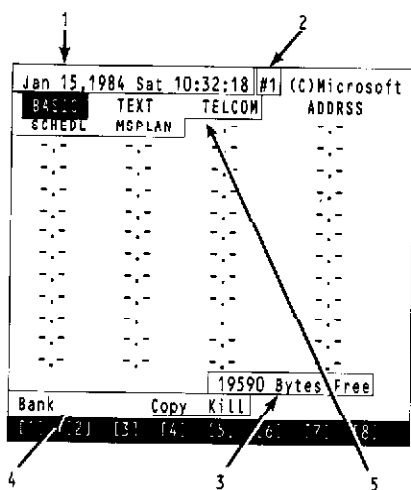




*Note: You can get a Radio Shack Computer Center to modify the Tandy 200 so that you can use rechargeable batteries.*

### Using the Main Menu

On your screen is a menu similar (but not identical) to this:



*Note: If you do not see this menu, press (F8), the spacebar, or (SHIFT) and (BREAK) at the same time to "return" to it.*

This is the Main Menu. It gives you this information:

1. Today's date and time. You will set this later in this chapter.
2. The number of the *random-access memory bank* (called *RAM bank*, for short) that you are now using. The Tandy 200 uses a RAM bank to store information. If you purchased extra

banks, press (F1) or (TAB) to move to Bank #2 and Bank #3.

3. The number of *bytes* (characters) remaining in the currently-used RAM bank. At startup, you have room to store about 19,590 characters in each RAM bank.

4. The functions you have available: Bank, Copy, and Kill.

5. The 6 program files that come with the Tandy 200—BASIC, TELCOM, ADDRSS, SCHEDL, TEXT, and MSPLAN. These are built in to the Tandy 200's *read-only memory* (ROM) and, with the exception of SCHEDL, are available from any of the RAM banks. (SCHEDL is available only from Bank 1.)

The remaining spaces are empty now but will contain the names of the files (programs or data) you store in RAM. Each RAM bank has room for 47 files.

### Entering a File

The file in reversed characters is ready to enter. "Move" to other files by pressing the arrow keys (at the top of the keyboard).

Move to BASIC. Then "enter" it. (Press the (ENTER) key.) You see BASIC's startup message:

Tandy 200 Software  
Copyright 1984 Microsoft  
19334 Bytes Free

"Exit" BASIC by pressing (FB) (at the top of the keyboard).

Move to, enter, and exit 2 other files—TEXT and TELCOM—using the same keys: the arrow keys, (ENTER), and (FB).

*Note: If you accidentally enter SCHEDL, ADDRSS, or MSPLAN, you will need to exit these programs somewhat differently. SCHEDL and ADDRSS initially ask you to exit by pressing the spacebar. MSPLAN requires that you exit by pressing (SHIFT) and (BREAK) at the same time.*

### Setting the Clock and Calendar

Enter BASIC. Then press (ENTER) so that "Ok" is the last line on your screen. Check the (NUM) key at the bottom of your keyboard; if it is pressed, release it.

**Enter today's day:** Use the format DAYS="day", with "day" abbreviated—MON, TUE, WED, THU, FRI, SAT, or SUN. For example, if today is Tuesday, type:

DAYS="TUE" (ENTER)

(To produce uppercase letters, use (SHIFT) or (CAPS LOCK), just as you would on a normal typewriter.)

**Enter today's date:** Use the format DATE\$="yy/mm/dd". For example, if today is March 4, 1985, type:

DATE\$="03/04/85" (ENTER)

**Enter the time:** Use the format TIME\$="hh:mm:ss", with military hours. For example, if it is now 4:03 p.m. and 15 seconds, type:

TIME\$="16:03:15" (ENTER)

**If you get an error message:** Perhaps you omitted the quotation marks, omitted a leading 0, or used a wrong abbreviation. Press (ENTER). Then type the day, date, or time again correctly.

**When finished:** Check to be sure that BASIC stored the correct day, date, and time. Type:

PRINT DAYS (ENTER)

PRINT DATE\$ (ENTER)

PRINT TIME\$ (ENTER)

Return to the Main Menu (by pressing (FB)), and you see the current day, date, and time.

### Using the Calculator

The Tandy 200 has a 4-function calculator. To turn it on, press and lock the (NUM) key (to turn on the "numeric keypad"); then press (GRPH) (to turn on the calculator). You see the calculator's display on the top line of your screen.

Calculator 0

The right keys are now numeric. Use them to make quick computations. For example, compute

26 X 38 + 127 in the following manner. Note that you need to use a \* rather than an X symbol for multiplication:

When you type:	The top line of the screen shows:	
27	Calculator	27
*	Calculator	* 27
38	Calculator	* 38
+	Calculator	+ 1026
127	Calculator	+ 127
<b>(ENTER)</b>	Calculator	1153

In addition to the numeric keypad, the Tandy 200 calculator has these special keys:

- (BKSP)**—deletes the last character
- (SHIFT DEL)**—deletes the last entry
- (SHIFT DEL)** twice—deletes the entire operation
- (ENTER)**—enters or continues a calculation
- (+)**—adds (same as **(X)**)
- (-)**—subtracts (same as **(-)**)
- (:)**—multiplies (same as **(\*)**)
- (/)**—divides

All other keys are “locked out” while the calculator is on. Turn off the calculator by pressing **(GRPH)**. Turn off the numeric keypad by releasing **(NUM)**.

You can use the Tandy 200 calculator at the Main Menu or while running any of the Tandy 200 programs. It will have no effect on the program you are running.

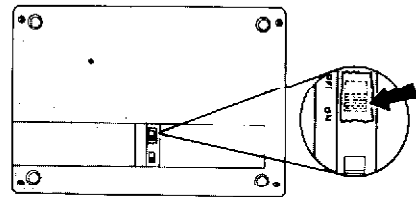
### Turning Off the Tandy 200

When finished using the Tandy 200, simply press the Power Switch (but be sure to leave the Memory Power Switch on). If you forget to turn off the power, the Tandy 200 waits 10 minutes and then turns it off for you.

### Keeping Information Safe in Memory

The next chapters show how to store information in the Tandy 200's RAM. The Tandy 200's internal battery keeps this information in RAM even when the power is off. Make sure this internal battery never dies:

- Never turn off the Memory Switch on the bottom of the Tandy 200. This turns off the internal battery. We suggest that you put tape over this switch so nobody turns it off:



- If you need to let the Tandy 200 sit idle for more than 5-15 days, be sure that it has batteries in it and that these batteries are not dead. The Tandy 200's internal battery needs some kind of power source so that it can keep itself charged.

## Using a Printer

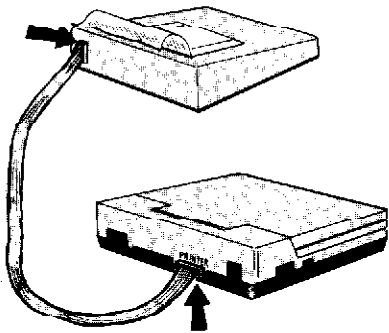
*Note: If you do not have a printer, skip to the next chapter.*

You can use any Radio Shack "parallel" printer with the Tandy 200. To connect it, you need to purchase the Tandy 200 printer cable (Cat. No. 26-1409).

Unpack your printer. Refer to your printer's owner's manual for instructions on:

- Inserting a ribbon
- Inserting paper
- Turning on the printer's power
- Turning the printer online

Turn all equipment off. Then make these connections:



Do not force the connections; they work only 1 way. If they are difficult to make, you may have the cable upside-down.

With the printer connected and online, press the (PRINT) key (at the keyboard top). The printer prints what is on your screen. In later chapters you will learn more uses of the printer.

## Chapter 1 Summary

### Tandy 200

*To print the screen:* Press (PRINT).

*To turn on the "numeric keypad":* Press (NUM).

*To enter the "all caps" mode:* Press (CAPS LOCK).

*To turn on the calculator:* Press (NUM); then (GRPH).

*To turn off the calculator:* Press (GRPH); then release (NUM).

### Main Menu

*To enter a file:* Press (ENTER).

*To move to a file:* Use the arrow keys.

*To move to another RAM bank:* Press (F1) or (TAB).

### BASIC

*To enter the day, date and time:* Use the DAY\$, DATE\$, and TIME\$ commands.

*Note: Each chapter lists functions you might want to remember. Tandy 200 functions (such as (PRINT) or (NUM)) work the same no matter what program you are using. Other functions (such as (F1)) might work differently with each program.*

## ***Chapter 2/***

### ***Writing Notes and Letters (TEXT)***

In this chapter, you will create a “text” file. You will learn how to store notes, letters, sales orders, or any information in this file and, if you have a printer, how to print the information as a formatted document.

## Creating a Text File

Assume you want to create a text file to store seminar notes. To create the file, enter the TEXT program. TEXT asks:

File to edit?

Enter a name for a file that has 6 or fewer characters. For example, type SEMINR (ENTER).

TEXT creates a file named SEMINR. You see a blank screen with a back arrow and a blinking box.

The back arrow is the end of the file. The blinking box (called the "cursor") is your position in the file.

## Entering Text

Release the (CAPS LOCK) key if it is pressed to get out of the "all caps" mode. Then type these notes letting the words "wrap" from one line to the next. (The only time you need to press (ENTER), the carriage return, is when you must end a line, such as the end of a paragraph.)

"Use of Portable Computers at Customer Locations,"  
Computer Seminar, June 15,  
1984: (ENTER)

1. Enter orders (ENTER)
2. Transmit orders to main computer (ENTER)
3. Access timesharing computer (ENTER)

Note how TEXT adjusts the words that wrap to the next line. You see this on your screen:

```
"Use of Portable Computers at Customer
Locations," Computer Seminar, June 15,
1984:◀
1. Enter orders◀
2. Transmit orders to main computer◀
3. Access timesharing computer◀
◀
[1] [2] [3] [4] [5] [6] [7] [8]
```

**To correct mistakes:** Use the (BKSP) key (at the top, right corner). It backspaces and erases.

**To insert text:** Using the arrow keys, move the cursor to position at which you want to insert text; then type your insertion. For example, move the cursor up to the "U" in "Use" and type Reps . TEXT adjusts your text accordingly:

```
"Reps Use of Portable Computers at
Customer Locations," Computer Seminar,
June 15, 1984:◀
1. Enter orders◀
2. Transmit orders to main computer◀
3. Access timesharing computer◀
◀
[1] [2] [3] [4] [5] [6] [7] [8]
```

**To delete text:** Move the cursor on top of the character you want deleted; then press **(SHIFT) (DEL)**. For example, move to the "1" in "June 15" and delete it by pressing **(SHIFT)** and then **(DEL)** at the same time. **(DEL)** is actually a shifted **(BKSP)** key.)

```
"Reps Use of Portable Computers at
Customer Locations," Computer Seminar,
June 5, 1984:◀
1. Enter orders◀
2. Transmit orders to main computer◀
3. Access timesharing computer◀
◀
```

**To repeat text:** Press a key and hold it down for a while. TEXT repeats the key, over and over.

You may be repeating characters faster than TEXT can process them. You then discover that TEXT "remembers" what you type. You see TEXT "catch up" with you even after you finish.

### **Entering and Exiting a Text File**

To exit the text file and return to the Main Menu, press **(F8)**. The Main Menu shows the name of the file you created—SEMINK.DO. The .DO extension tells you that SEMINR.DO is a text file—not a program.

Also note that you now have fewer bytes free. This is because of the memory consumed by SEMINR.DO. Move to SEMINR.DO's position on the Main Menu, and you see its precise length at the bottom.

Now re-enter SEMINR.DO. (Move to SEMINR.DO and press **(ENTER)**.) You see the information still there—just as you left it.

Try turning the Tandy 200's power off and then on again. The information that you store in the Tandy 200 remains safe—even when the power's off—and will remain safe as long as you follow the precautions listed in Chapter 1.

### **Printing a Text File**

In Chapter 1, you learned how to print a display by pressing **(PRINT)**. To print an entire text file, such as SEMINR.DO, you need to enter the text file and press **(SHIFT) (PRINT)**.

Enter SEMINR.DO. Press **(SHIFT)** and **(PRINT)** at the same time. TEXT shows how it will format what it prints:

```
Width: 80
Left-Margin: 0
Page size: 66
Line/Page: 65
Top margin: 0
```

You can change any of these numbers by using the arrow keys to position the cursor, then typing a new number. Use numbers within these ranges:

- Width: 10 to 132
- Left Margin: 0 to 121
- Page size: 0 to 99
- Line / Page: 0 to 99
- Top margin: 0 to (page size—line/page)

Once satisfied with the settings, press **ENTER**. **TEXT** asks:

Continuous Y/N?

Type **Y** **ENTER** if you want to print all the pages continuously; type **N** **ENTER** if you want the printer to temporarily stop after each page.

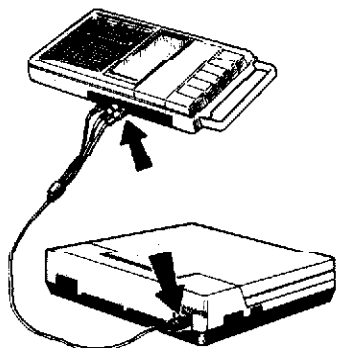
If you decide you do not want to print, press **SHIFT** and **BREAK** at the same time. (**BREAK** is at the upper left corner.) No matter what program you are using, you can always use **SHIFT** **BREAK** to cancel the current operation.

### *Saving a Text File on Tape*

Using tape, you can store endless numbers of files: large files, old files, infrequently-used files, and backup files of important information. By storing these files on tape, you can use the Kill function (described later in this chapter) to free up RAM space for the files you use every day.

We recommend you use Radio Shack's CCR-81 or CCR-82 computer recorder (Cat. No. 26-1208 or 26-1209), which includes a recorder-to-computer cable (Cat. No. 26-1207).

**To connect the recorder:** Plug in the 3-pronged end of the cable: the black plug to EAR, the large grey plug to AUX, and the small grey plug to REM. Connect the other end of the cassette connector to the back of the Tandy 200:



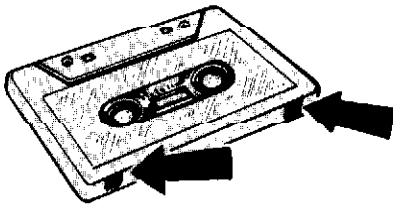
**To save a text file:** Insert a blank tape in the recorder, and rewind it to the start. (If using a tape with a leader, forward the tape past the leader.) Press the recorder's **PLAY** and **RECORD** buttons until they lock. Press **F3**, and **TEXT** prompts:

Save to:



Enter a filename using 6 or fewer characters; for example, type SEMINR (ENTER). The recorder turns on, records, and then stops automatically. We recommend you store 2 or 3 copies of the file.

*To protect a file:* Once you have recorded a file on tape, you may want to *write-protect* the tape. To do so, remove the 2 notches on top of the tape:



With the notches removed, you can load information from the tape, but you cannot record anything on it. If you ever want to cancel this write-protection, put some tape over the 2 notches.

*To load a file:* Rewind the tape and press the PLAY button until it locks. Set the volume between 4 and 6, for the CCR-81, or on "P", for the CCR-82. Press (F2), and TEXT prompts:

Load from:

In response to this prompt you can simply press (ENTER) (to load the next file) or enter a specific filename, such as SEMINR (ENTER) (to load the specified file).

Type SEMINR (ENTER). TEXT turns on the recorder and, when it finds the SEMINR file, displays the message:

Found: SEMINR.DO

When the above prompt disappears, TEXT has finished loading SEMINR.DO into RAM.

### *Deleting, Copying, and Renaming a File*

The Tandy 200 lets you delete, copy, and rename any Tandy 200 file except the built-in program files. (The built-in programs are in read-only memory (ROM) and cannot be altered.) To use these functions, return to the Main Menu.

*To delete a file:* Move to a file's position on the Main Menu and press the Kill key (F5). The Main Menu gives you a chance to reconsider by asking "Are you sure? (Y/N)". Press (Y) if you are sure and the file is deleted from RAM.

*To copy a file to another bank:* Move to a file's position on the Main Menu, and press the Copy key (F4). The Main Menu asks for a "Destination Bank:". Type the number of another bank, and the file is copied.

The Copy function can be used only by customers with multiple banks. If you have only one bank, you can use the (PASTE) key to copy a text file, as instructed in the next chapter.

**To rename a file:** Enter BASIC and, at the Ok prompt, enter the NAME command using this format: NAME "oldname" AS "newname" (ENTER). Enter the full filename, including its extension, for example, NAME "SEMINR.DO" AS "MEMO.DO" (ENTER)

## Chapter 2 Summary

### Tandy 200

**To stop an operation:** Press (SHIFT) (BREAK).

### TEXT

**To move the cursor:** Use the (←) (↑) (→).

**To move to the next line:** Let the words "wrap" as you type, or press (ENTER).

**To insert text:** Move the cursor anywhere in the text and type.

**To delete a character:** Move the cursor on top of a character and press (SHIFT) (DEL).

**To print a text file:** Press (SHIFT) (PRINT), answer the print formatting questions, and press (ENTER).

**To save a text file on tape:** Press (F3); then type a filename.

**To load a text file from tape:** Press (F2); then type a filename.

### Main Menu


**To copy a file to another bank:** Move to the file and press (F4).

**To delete a file:** Move to the file and press (F5).

**To see a file's size:** Move to the file's position.

### BASIC

**To rename a file:** Use the NAME command.



## ***Chapter 3/ Cutting, Pasting, and Finding Text (TEXT)***

Information on paper is static and cumbersome to change. In contrast, the information you store in a Tandy 200 text file is flexible and simple to change. This chapter shows the easy way to “edit” text without retyping it.

## Sample File

As an example of editing text, suppose you are a sales representative and want to update orders from customers' stores. Create a text file named ORDERS.DO that has these orders:

```
ELM FURNITURE◀
pine tables      15◀
pine chairs      5◀
maple tables     18◀
◀
JONES FURNITURE◀
maple tables     3◀
pine cabinet     5◀
redwood shelves  20◀
◀
HANDY JOE◀
<-
[1] [2] [3] [4] [5] [6] [7] [8]
```

(You can use **(TAB)** to go to the next column, just as on a normal typewriter.)

## Using the Cursor Movement Keys

You have learned that you can move the cursor with the arrow keys. To move the cursor quickly, you can use a combination of an arrow key and a **(SHIFT)** or **(CTRL)** key.

**(SHIFT) (→)** Moves to the right word

**(SHIFT) (←)** Moves to the left word

**(CTRL) (→)** Moves to the right of the line

**(CTRL) (←)** Moves to the left of the line

**(SHIFT) (↑)** Moves to the top of the display

**(SHIFT) (↓)** Moves to the bottom of the display

**(CTRL) (↑)** Moves to the top of the file

**(CTRL) (↓)** Moves to the bottom of the file

## Using the Edit Function Keys

To edit a file, use TEXT's function keys—**(F1)** through **(F8)**—at the top of the keyboard. To see what these keys do, press **(LABEL)** (also at the keyboard top). At the bottom of your screen, you see:

Find Load Save List Copy Cut Sel Menu

Each function is above a number. For example, "Menu" is above the number 8. This tells you that you can return to the Main Menu with the **(F8)** key. You can turn this bottom line on and off with the **(LABEL)** key.

## Finding Text

Suppose you want to quickly find all orders of "maple tables." First move to the start of the text. Then press the Find key (**(F1)**).

You see "String:" at the bottom of the screen. Enter the "string" of characters you want to find:

String: maple tables **(ENTER)**

You see TEXT quickly jump to the first occurrence of “maple tables”:

```
ELM FURNITURE◀
pine tables      15◀
pine chairs     5◀
maple tables     18◀
◀
JONES FURNITURE◀
maple tables     3◀
pine cabinet    5◀
redwood shelves 20◀
◀
HANDY JOE◀
◀-
Find Load Save List Copy Cut Sel Menu◀
(1) (2) (3) (4) (5) (6) (7) (8)
```

Find the next occurrence of the same string. Press (F7) and, to find the same string, simply press (ENTER).

Try to find a third occurrence of the string. TEXT prints “No Match”. There are no more occurrences of “maple tables” in your text.

### Selecting Text

Now suppose you need to “cut” Elm Furniture’s order of “pine tables”. To cut text, you first “select” what you want to cut:

1. Move to the start of the text you want to select. In this case, move to the “p” in “pine tables”.
2. Press the Select key (F7). This puts you in the “select mode.”

3. Select text using any of the cursor movement keys. In this case, press (SHIFT) (←) 3 times.

TEXT shows what you have just selected in reverse characters. If this is not the text you want, press (SHIFT) (BREAK) to cancel the operation and try it again:

```
ELM FURNITURE◀
pine tables     15◀
pine chairs     5◀
maple tables     18◀
◀
JONES FURNITURE◀
maple tables     3◀
pine cabinet    5◀
redwood shelves 20◀
◀
HANDY JOE◀
◀-
Find Load Save List Copy Cut Sel Menu
(1) (2) (3) (4) (5) (6) (7) (8)
```

### Cutting Text

With text selected, you can cut it simply by pressing the Cut key (F6). You see:

```
ELM FURNITURE◀
pine chairs     5◀
maple tables     18◀
◀
JONES FURNITURE◀
maple tables     3◀
pine cabinet    5◀
redwood shelves 20◀
◀
HANDY JOE◀
◀-
Find Load Save List Copy Cut Sel Menu
(1) (2) (3) (4) (5) (6) (7) (8)
```

When you cut text, it is actually transferred to an area of memory called the “paste buffer.” With the **(PASTE)** key (at the top), you can “paste” this text anywhere you want.

Paste the text into Jones Furniture’s order. Move to the “r” in “redwood.” Then paste the text in place by pressing **(PASTE)**

```
ELM FURNITURE◀
pine chairs      5◀
maple tables    18◀
◀
JONES FURNITURE◀
maple tables    3◀
pine cabinet    5◀
pine tables     15◀
redwood shelves 20◀
◀
HANDY JOE◀
<-

Find Load Save List Copy Cut Sel Menu
(1) (2) (3) (4) (5) (6) (7) (8)
```

### Copying Text

Now suppose the next customer, Handy Joe, wants the exact “copy” of Jones Furniture’s order. First, select the text you want to copy. In this example:

1. Move just under the “J” in “Jones Furniture.”
2. Press **(F7)**.
3. Use the cursor movement keys to select the following text. (In this example, press **(CTRL)** **(=)** and then press **(L)** 4 times.)

```
ELM FURNITURE◀
pine chairs      5◀
maple tables    18◀
◀
JONES FURNITURE◀
maple tables    3◀
pine cabinet    5◀
pine tables     15◀
redwood shelves 20◀
◀
HANDY JOE◀
<-

Find Load Save List Copy Cut Sel Menu
(1) (2) (3) (4) (5) (6) (7) (8)
```

After selecting text, press the Copy key (**(F5)**) to copy the text into the paste buffer. Then move to where you want the copied text to be—in this example, just under the “H” in “Handy Joe”—and press **(PASTE)**:

```
pine chairs      5◀
maple tables    18◀
◀
JONES FURNITURE◀
maple tables    3◀
pine cabinet    5◀
pine tables     15◀
redwood shelves 20◀
◀
HANDY JOE◀
maple tables    3◀
pine cabinet    5◀
pine tables     15◀
redwood shelves 20◀
<-

Find Load Save List Copy Cut Sel Menu
(1) (2) (3) (4) (5) (6) (7) (8)
```

### Moving Text to Other Files

The information you cut or copy into the paste buffer remains there even after you exit a file. Because of this, you can move text from 1 file to the next as

long as both files are in the same RAM bank. For example, assume you want to move some text from ORDERS.DO to SEMINR.DO:

1. Select a block of text from ORDERS.DO and cut (**F6**) or copy (**F5**) it into the paste buffer.
2. Enter SEMINR.DO and, at the position where you want the text inserted, press (**PASTE**).

### *Clearing the Paste Buffer*

Just like text files, the contents of the paste buffer consume memory. After cutting and pasting or copying and pasting a large block of text, less memory is available.

You can “clear” the paste buffer by replacing its contents with nothing. To do this, press (**F7**), the Select key, and then copy nothing into the paste buffer by pressing (**F5**), the Copy key. The paste buffer now contains nothing, which, of course, consumes no memory.

You may find the amount of memory consumed by the paste buffer to be somewhat confusing. If so, refer to Reference C.

### *Listing Information from a File*

TEXT includes an additional function, called LIST, that lets you select information from a text file. This function works in a similar way as the SCHEDL and ADDRSS programs and is described in the next chapter.

### *Chapter 3 Summary*

#### *Tandy 200*

*To turn on and off the function-key display:* Press (**LABEL**).

#### *TEXT*

*To move to the next word:*

Press (**SHIFT**) and (**-**) or (**-**).

*To move to the next line:* Press (**CTRL**) and (**-**) or (**-**).

*To move to the top or bottom of the screen:* Press (**SHIFT**) and (**↑**) or (**↓**).

*To move to the top or bottom of the file:* Press (**CTRL**) and (**↑**) or (**↓**).

*To find text:* Press (**F1**); then enter what you want to find.

*To select text:* Press (**F7**); then use the cursor movement keys.

*To cut text:* Select text and press (**F6**).

*To copy text:* Select text and press (**F5**). Then move to where you want it copied, and press (**PASTE**).

***Chapter 4/  
Finding Schedules and Addresses  
(SCHEDL and ADDRSS)***

This chapter shows how to use the Tandy 200 SCHEDL and ADDRSS programs—as well as a LIST program from which both SCHEDL and ADDRSS are variations—to select information from a file. You will also learn how to store alarms in a schedule file.



## Using SCHEDL with NOTE.DO

The SCHEDL program selects “records” from a file named NOTE.DO. So before using SCHEDL, you need to create NOTE.DO. Use TEXT, as you have done in previous chapters, to create NOTE.DO; then insert these records:

```
9/18/85, product schedules due◀
9/25/85, 2:30, staff meeting◀
9/23/85, 11:45, lunch with Jones◀
10/10/85, reviews due◀
10/18/85, announcement due◀
11/01/85, 10:30, New York flight, United
Airlines◀
10/05/85, 4:45, return flight, American
Airlines◀
11/07/85, proposal due
<-
```

A record is any text—a word, line, paragraph, or even an entire file—that ends with **(ENTER)**. The above file has 8 records. Your records can be in any format. The above records are just 1 example.

Once you have created NOTE.DO, you can use SCHEDL to select records from it. Return to the Main Menu and enter SCHEDL. SCHEDL, like all Tandy 200 programs, shows all its functions on the bottom line. Also like all Tandy 200 programs, SCHEDL lets you use **(LABEL)** to turn on and off the bottom line.

To select records, press the Find key **(F1)** and tell SCHEDL which records you want to find. For example, press **(F1)**; then type **due (ENTER)**:

Schd: Find due **(ENTER)**

SCHEDL selects all the records in NOTE.DO that have the word “due”:

```
Schd: Find due◀
9/18/85, product schedules due
10/10/85, reviews due
10/18/85, announcement due
11/07/85, proposal due
Schd:
```

```
Find Edit Lfnd Menu
11. [2] [3] [4] [5] [6] [7] [8]
```

Try using other words to find records: **10/**, **product meeting**, **flight**, and **lunch**. If SCHEDL cannot display all the records on one screen, it asks:

More Quit

Press the More key **(F3)** or **(M)** to see the next display or the Quit key **(F4)** or **(Q)** to quit the selection.

If you have a printer, you can use the Lfnd key **(F5)** rather than the Find key. SCHEDL prints your selected information on the printer.

## Using ADDRSS with ADRS.DO

ADDRSS selects records from a file named ADRS.DO, rather than NOTE.DO. Other than that, ADDRSS and SCHEDL work the same.

For example, using TEXT, create a file named ADRS.DO with these records:

```
Rick Schell:214/925 7993. 453 Red
River, Dallas, TX, 75229◀
Ellen Dunlap:312/374-4822: 916
Drummond, Chicago, IL, 65219◀
Joe Shmow :214/876-2222: 815 Maple.
Dallas, TX, 75219◀
Glenda Elliott :817/824-3385: 716 Apex,
Ft. Worth, TX, 87112◀
<-
```

[1] [2] [3] [4] [5] [6] [7] [8]

As with NOTE.DO, it makes no difference what format you use for the records. However, by enclosing telephone numbers in colons (:), you will be able to autodial these numbers using the TELCOM program later in this manual.

To find addresses, return to the Main Menu and enter the ADDRSS program. Then find: TX, 214, and Joe Shmow.

## Using LIST with other Text Files

You have learned that you can use SCHEDL to select records from NOTE.DO and ADDRSS to select records from ADRS.DO. Both are variations

of the Tandy 200 LIST program—and LIST lets you select records from any text file.

From the Main Menu, enter any text file from which you want to select records; for example, enter the ORDERS.DO file that you created in an earlier chapter. After entering the text file, press the List function key (F4).

At the top of the screen, you see the name of your text file—in this example, ORDERS.DO—and can select records from this file. A record, as you recall, is any text—such as a word, line, or paragraph—that ends with **ENTER**.

For this example, select all records that have the word “table”. Type **F1 table ENTER**. This causes LIST to display these records:

maple tables	18
maple tables	3
oak tables	15
maple tables	3
oak tables	15

When finished listing records, return to the text file by pressing the Edit function key (F4).

## Organizing Records

You can easily find information in NOTE.DO and ADRS.DO if the information in these files is consistent. You may want to try using symbols to tag information.

For example, in NOTE.DO, you may want to use an asterisk (\*) to tag each critical date and a number sign (#) to tag each each personal date:

10/03/85, 11:45, lunch with Jones #  
10/10/85, reviews due  
10/18/85, announcement due \*

Or, in ADRS.DO, you may want to use a code such as \*\*IN\*\* to tag the members of an insurance organization or \*\*PR\*\* to tag prospective clients:

Rick Schell :214/925-7993: -  
453 Red River,  
Dallas, TX, 75229 \*\*IN\*\*  
Ellen Dunlap :312/374-4822:  
916 Drummond,  
Chicago, IL, 65219 \*\*PR\*\*  
Joe Shmow :214/876-2222:  
815 Maple,  
Dallas, TX, 75219 \*\*IN\*\*

### Setting Alarms

The Tandy 200 lets you store any number of alarms in the NOTE.DO file. Each alarm causes it to beep and display whatever comment you have stored with the alarm. To store an alarm in NOTE.DO use this exact "alarm format":

*dd/dd/dd,tt:tt:tt,A,message*

*dd/dd/dd* is a date; it must include all 6 digits (even the year) separated by slashes.  
*tt:tt:tt* is a time; it must include all 6 digits (even the seconds) separated by colons.  
A is an "alarm flag." *message* is any message you want displayed.

For example:

09/23/85,14:30:00,A,staff meeting

On September 23, 1985 at 2:30 P.M., the Tandy 200 will beep and return to the Main Menu. You can then press **[SHIFT]** **[LABEL]** and the Tandy 200 will display "staff meeting."

### Chapter 4 Summary

**SCHEDL, ADDRSS, and LIST**

**To find records:** Press **[F1]**; then enter what you want to find.

**To find and list records on the printer:** Press **[F5]**; then enter what you want to find.

**Note:** *SCHEDL* finds records from NOTE.DO; *ADDRSS*, from ADRS.DO; and *LIST*, from any text file.

## *Chapter 5/*

### *Using Spreadsheets (PLAN)*

Often executives need to analyze how various “what ifs” will affect company plans. What if the cost of labor rises by 10%? What if materials’ costs are cut? To help with this kind of analysis, Tandy 200 comes with a spreadsheet program called MSPLAN, a subset of the popular Multiplan program.

## Designing a Simple Spreadsheet

As a simple example of how to use a spreadsheet, assume you need to analyze how varying costs will affect January's total production costs:

	January		
Labor			
Materials			
Total			

At the Main Menu, enter MSPLAN. MSPLAN asks:

File to use?

Enter a file name. For this example, type **COSTS** (ENTER).

Multiplan then displays a blank spreadsheet with 4 columns across and 15 rows down:

	1	2	3	4
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

The cursor is at Row 1, Column 1 (R1C1). Move to the next column (R1C2) by pressing (→).

Keep moving right and you see that, although you can see only 4 columns at a time, the spreadsheet actually has 63 columns. Move down and you see that it actually has 99 rows.

Move to R1C2, and type **January**. You see what you are typing at the bottom of the screen. If you make a mistake, use (BKSP) to correct it:

	1	2	3	4
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Value: January  
 (1) (2) (3) (4) (5) (6) (7) (8)

Press (ENTER), and January appears at your current position—R1C2:

	1	2	3	4
1		January		
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

(1) (2) (3) (4) (5) (6) (7) (8)

Assume you make a mistake and want to "blank out" January. Position the cursor at January. Press **(F2)**, the Blank function key, and then **(ENTER)**.

(As with other Tandy 200 programs: You can see the meaning of all Multiplan's function keys by using the **(LABEL)** key. You can cancel a function and return to the spreadsheet by pressing **(SHIFT) (BREAK)**.)

Finish the spreadsheet design by entering **Labor**, **Materials**, and **Total** in the positions shown below:

	1	2	3	4
1		January		
2				
3	Labor			
4	Materials			
5				
6	Total			
7				
8				
9				
10				
11				
12				
13				
14				
15				
[1] [2] [3] [4] [5] [6] [7] [8]				

### Entering Data

You are now ready to enter data. Enter **2000** and **6000** in the positions shown:

	1	2	3	4
1		January		
2				
3	Labor	2000		
4	Materials	6000		
5				
6	Total			
7				
8				
9				
10				
11				
12				
13				
14				
15				
[1] [2] [3] [4] [5] [6] [7] [8]				

### Entering Formulas

You **could** enter 8000 (2000 + 6000) as the total. 8000, however, is a static total and defeats the purpose of an electronic spreadsheet. Enter the total's formula instead: the sum of R3C2 (which is now 2000) and R4C2 (which is now 6000).

Move to the total position (R6C2), and enter the formula: **=R3C2 + R4C2 (ENTER)**.

	1	2	3	4
1		January		
2				
3	Labor	2000		
4	Materials	6000		
5				
6	Total			
7				
8				
9				
10				
11				
12				
13				
14				
Value: =R3C2+R4C2 (ENTER)				
[1] [2] [3] [4] [5] [6] [7] [8]				

Multiplan prints the result of this formula—8000—in the total position.

	1	2	3	4			
1		January					
2							
3	Labor	2000					
4	Materials	6000					
5							
6	Total	8000					
7							
8							
9							
10							
11							
12							
13							
14							
15							
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]

Now enter different numbers for labor and materials costs. Multiplan instantly adjusts the total.

*Note: If Multiplan does not print the total, perhaps you omitted the equal sign (=) when entering the formula. Blank out your mistake and enter the formula again. If it still does not enter the correct result, perhaps 2000 and 6000 are in the wrong row/column positions. Blank them out and try again.*

*If Multiplan prints “#VALUE!,” you have entered a number—2000 or 6000—incorrectly. Perhaps you preceded the number with a blank space. Blank out both numbers and enter them again.*

## Entering and Exiting Spreadsheet Files

Return to the Main Menu by pressing (FB). On the Main Menu, you see COSTS.CO. The .CO extension tells you that COSTS is a spreadsheet file, rather than a text file or a program.

From the Main Menu, you can enter and use COSTS.CO just as you can enter a text file—by moving to the file and pressing (ENTER). You can also delete, copy to another bank, or rename the file, just as you can with a text file.

## Learning More about Spreadsheets

This chapter gives a simple example of a spreadsheet. With 63 columns and 99 rows, and with Multiplan’s many commands and features, you can make a much more sophisticated spreadsheet. Imagine, for example, the power of the spreadsheet shown in Figure 1.

To learn how to use Multiplan’s many features, as well as some helpful Multiplan commands (such as commands that save a spreadsheet to tape or copy a spreadsheet to the same bank), read the Multiplan manual that comes with the Tandy 200.

<i>Sales</i>	<i>January</i>	<i>February</i>	<i>March</i>	<i>Sum</i>
<i>Soft</i>				
<i>Hard</i>				
<i>Total Sales</i>				
<i>Costs</i>				
<i>Material</i>				
<i>Overhead</i>				
<i>Labor</i>				
<i>Total Costs</i>				
<i>Gross Profits</i>				

**Figure 1. Spreadsheet**

**Chapter 5 Summary**

**MSPLAN**

**To move the cursor:** Use the arrow keys.

**To enter a value:** Move the cursor to where you want the value; then type it and press **(ENTER)**.

**To blank a value:** Move the cursor to the value you want blanked; then press **(F2)**.

**To enter a formula:** Move the cursor to where you want the formula, type = followed by the formula; then press **(ENTER)**.





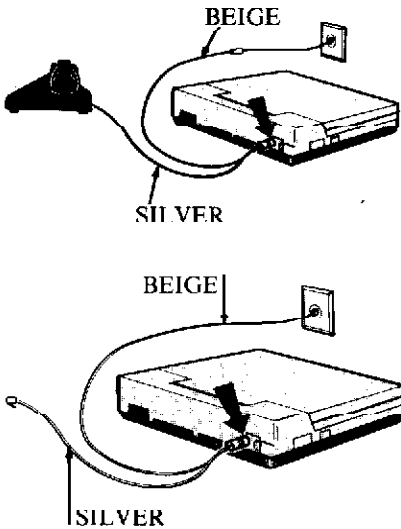
## ***6/ Dialing Telephone Numbers (TELCOM)***

This chapter shows how to autodial telephone numbers and switch between tone and pulse dialing. To use any of the features described in this chapter, you need a modem cable (Cat. No. 26-1410).

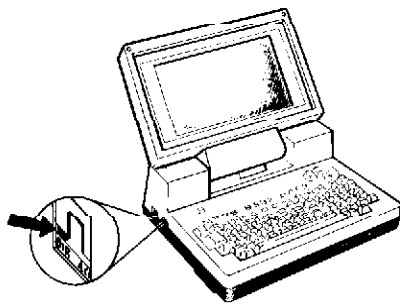
## Connecting to the Telephone

Open the packet containing the modem cable. Save the instructions for use later in this manual.

Connect the Tandy 200 to the telephone in either of these ways. (It makes no difference which way you use.)



Set the DIR/ACP switch to DIR:



Enter TELCOM. TELCOM's bottom line gives the meaning of its function keys. As with the other programs, you can use **(LABEL)** to turn on and off this display.

Find Call Stat Term Menu

## Setting TELCOM Parameters

TELCOM's top line gives its currently-set parameters. Only 2 of them are important for autodialing:

*MIENN,O,10 pps*

- The "M" tells TELCOM to use the built-in modem. (You must use the built-in modem to autodial.)
- The "10 pps" tells TELCOM to pulse dial at 10 pulses per second.

If your display shows different values for these 2 parameters, press the Status function key **(F3)** and enter the new value by typing **M7IENN,O,10 pps** **(ENTER)**. Then press **(F3)** **(ENTER)** to see that you have set the parameters correctly.

## Autodialing Numbers

Press the Call function key **(F2)** and you see "Call." Now type the number you want to call.

Examples:

555-1212

1-(214)-352-3535

9/555-1212

Be sure to include all digits required to dial the number. (For example, a "1" or "9" may be required, or perhaps the "\*" or "#" symbols are required.) TELCOM ignores extra symbols, such as the hyphen (-) and the slash (/). As with other programs, you can use (BKSP) to correct mistakes.

Before pressing (ENTER), pick up the telephone receiver. Press (ENTER) and you hear TELCOM dial the number.

### *Finding and Autodialing Numbers*

You can find and autodial a telephone number stored in ADRS.DO (Chapter 4) as long as you have enclosed it in colons (:). For example, assume ADRS.DO contains this number:

Joe Shmow :1-214/876-2222:  
815 Maple,  
Dallas, TX, 75219

To find and autodial this number:

1. Press the TELCOM FIND key (F1), and enter any part of the record you want to find. To find the record containing Jow Shmow, for example, you could enter **214, Dallas, TX, or Joe:**

Telcom: Find Joe (ENTER)

TELCOM displays the first record that contains these characters. Example:

Joe Shmow :214/876-2222

2. At the bottom of the screen TELCOM asks whether you want to call (Call), find the next record containing these characters (More), or quit finding records (Quit):

Call More Quit

Since this is the record containing the number you want to dial, press Call (F2). TELCOM shows the number as it dials.

3. Before TELCOM finishes dialing, pick up the telephone receiver—Otherwise, the connection will be broken.

### *Fast Pulse Dialing*

By dialing at 20 pps (20 pulses per second), you can dial numbers twice as fast. Press the Stat key (F3) and change the 10 pps to 20 pps:

M711ENN,O,20 pps (ENTER)

(As stated earlier, you can press (F3) (ENTER) to check that you have entered the parameters correctly.) Your local telephone system may not be able to use 20 pps. If not, change back to 10 pps.

## *Tone Dialing*

Many long distance services require that you send it tones, produced by tone dialing. To get TELCOM to tone dial, change 10 pps to T:

**M7IIENN,O,T (ENTER)**

Your local telephone system may not be able to use tone dialing. If not, you can still send tones to a long distance service as follows:

1. Set TELCOM for tone dialing.
2. Using manual dialing, call the long distance service. (By dialing manually, you are using pulse dialing, which your local telephone system requires.)
3. Wait for the long distance service to give its signal. (Typically, this is a long, audible tone.)
4. Using the CALL key, autodial the expected numbers. (By autodialing, you are using tone dialing, which your long distance service requires.)

## *Storing Pauses in Autodial Sequences*

Assume that you use a long distance service, and you normally dial Joe Shmow with this sequence:

1. First you dial the long distance service's number (335-4190).
2. Then you pause for about 4 seconds for the service to sound a tone.
3. Then you dial account information (548-559), followed by Joe Shmow's number (1-214/876-2222).

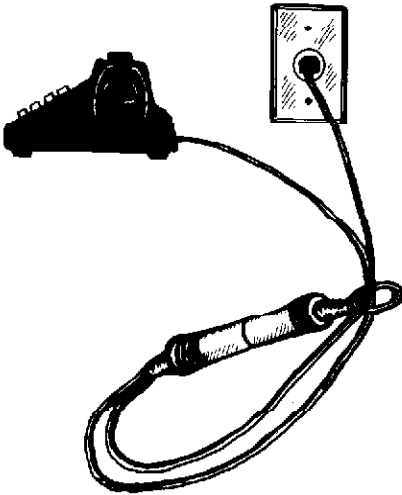
You can store this entire sequence in ADRS.DO with 2 equal signs (=)—each stores a 2-second pause:

```
Joe Shmow :335-4190
= = 548-559/1-214/876-2222:
815 Maple,
Dallas, TX, 75219
```

The above example assumes you do not need to switch modes (tone/pulse) while dialing the number. You can switch modes only one way: by manually using the STAT key.

### *Disconnecting from the Telephone*

For convenience, you can disconnect the Tandy 200 from the modem cable, but still leave the modem cable connected to the telephone. If you do this, you need to complete the circuit that normally goes to the Tandy 200 by connecting it to the modem cable's "shorting" plug:



### *Chapter 6 Summary*

#### **TELCOM**

**To find and autodial a number:** Press (F1), enter any part of a record in ADRS.DO, and press (F2) to call.

**To enter and autodial a number:** Press (F2) and enter the number.

**To reset communication parameters:** Press (F3); then enter the new parameters.

**To display the current communication parameters:** Press (F3).

***Chapter 7/  
Communicating with Another Computer  
(TELCOM)***

This chapter shows how to communicate with CompuServe Information Service, a large multi-purpose computer service, and access its many data bases. You can access CompuServe from anywhere in the United States and Canada.

## What You Need

To communicate with CompuServe, you need a way of connecting to an ordinary telephone—You can use either:

- The Tandy 200 modem cable that you used in the last chapter—This is the most reliable because it connects the Tandy 200 directly to the telephone wire.

or

- An acoustic coupler (Cat. No. 26-3805)—Use this when you cannot directly connect to a telephone (for example, when using a pay phone).

You also need to find the following CompuServe materials that come with the Tandy 200 modem cable:

- A packet containing a CompuServe user ID and password—You can use this ID and password to access CompuServe for 1 hour, free of charge, during “standard time” (6PM to 5AM).
- A pamphlet listing CompuServe’s telephone numbers—CompuServe has numbers in almost all the major U.S. cities; you can use any of these numbers to access CompuServe.

If you do not have a modem cable, you can obtain a CompuServe ID, password, and telephone number by calling CompuServe—(800) 848-8199 or, in Ohio, (614) 457-0802—or by purchasing the Radio Shack Universal Signup Kit (Cat. No. 26-2224).

## Connecting to CompuServe

### 1. Set the TELCOM Parameters.

Enter the TELCOM program and check its parameters. The last parameter (10 pps, 20 pps, or T) is only for autodialing, but the others must be:

M7E1ENN,O

If your parameters are different, press the Stat key (F3) and then type M7E1ENN,O (ENTER). Then press (F3) (ENTER) again and you should see the correctly set parameters.

### 2. Connect to the telephone.

**Modem Cable:** Connect the Tandy 200 to the telephone as you did in the last chapter. Be sure the DIR/ACP switch (on the left) is set to DIR.

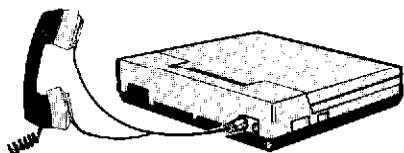
**Acoustic Coupler:** Connect the acoustic coupler to the Tandy 200 PHONE jack (on the rear). Set the DIR/ACP switch (on the left) to ACP.

### 3. Call the CompuServe network.

Dial any of CompuServe's access numbers. If using the modem cable, you can dial any way you want manually or automatically. If using the acoustic coupler, you can dial only 1 way manually.

### 4. Establish a terminal connection.

When you hear CompuServe's computer tone, press the term key (**F4**). If using the acoustic coupler, you should now place the phone in the coupler:



### 5. Wait for the terminal function key Display.

A few seconds after you press the Term key, the Tandy 200 establishes a terminal connection with CompuServe and shows these functions on the bottom of your screen:

Prev Down Up Full BRK Bye

If these functions do not appear, hang up the telephone and try again. Check that you have the right phone connection, communication parameters settings, and ACP/DIR switch settings.

### 6. Press **CTRL C**.

While holding down **CTRL**, press **C**. This connects you to CompuServe Information Service.

### 7. Enter Your User ID.

CompuServe asks for your user ID. Enter the user ID from your CompuServe packet, for example:

User ID: 76338,448 **ENTER**

### 8. Enter Your Password.

CompuServe asks for a password. Enter the password from your CompuServe packet, for example:

Password: AGING;MELLOW  
**ENTER**

To keep your password confidential, CompuServe does not let your password appear on your screen.



## *Your First CompuServe Session*

*Note: Although your session with CompuServe should closely resemble the one described in this chapter, do not expect it to be identical. CompuServe often revises or improves its menus and prompts.*

CompuServe normally starts up with a "top menu." For your first session, though, CompuServe may ask preliminary questions.

After each question CompuServe typically shows a selection of responses and prompts you for your choice. For example:

- 0 Explanation of terminal types
- 1 VIDTEX software compatible
- 2 ANSI compatible (VT-100)
- 3 VT52
- 4 Teleray
- 5 CRT
- 6 Other

Key choice:

Notice in this example that you can choose "0" and CompuServe gives you instructions. CompuServe often offers "online instructions" such as these.

The following are some questions CompuServe may ask and how we suggest you respond.

- What kind of terminal do you have? Select "Other".
- How many lines does your terminal have? Select "16".
- How many characters per line does your terminal have? Select "40".
- Do you want to read or agree to CompuServe's service terms? Select the option that lets you "exit the service". (You can agree to the terms and sign up for continued service later, after becoming more familiar with CompuServe.)

In each case, type the appropriate menu selection number; then press **(ENTER)**. For example:

Key choice: 3 **(ENTER)**

If you make a mistake, use **(CTRL) (H)** to backspace. (The **(BKSP)** key does not work with CompuServe.) Press **(CTRL)** and then, while holding down **(CTRL)**, press **(H)**.

## *CompuServe Menus*

After its preliminary questions and messages, CompuServe displays a "top menu" similar to this:

1. Home Services
2. Business & Financial
3. Personal Computing
4. Services for Professionals
5. The Electronic Mall™
6. User Information
7. Index

Enter your selection number, or **H** for more information !

This menu leads you to a series of submenus. After each menu, you see the “!” sign, which is CompuServe’s menu prompt. In response to the “!” prompt, you can enter your menu selection (for example, **1** (ENTER)) or a CompuServe command such as:

- **P** (ENTER)—to see the previous menu.
- **T** (ENTER)—to go back to the top menu.
- **BYE** (ENTER)—to exit CompuServe.

For example, typing **T** (ENTER) at the “!” prompt always returns you to the top menu or the first menu of the system.

### *Seeing TELCOM’s Previous Screen*

Sometimes CompuServe’s information may scroll off your screen faster than you can read it. When this happens, you can use one of TELCOM’s terminal-mode function keys, the “previous screen” key (**F1**).

Press (**F1**) to see the previous screen; then (**F1**) again to return to the current screen. TELCOM keeps 2 screens in memory at all times.

### *Logging Off CompuServe*

CompuServe computes your online time by the minute rather than the hour. If you logoff after using only 15 minutes of free time, for example, you can logon again for an additional 45 free minutes.

To logoff CompuServe:

1. Wait until you see the “!” prompt on your screen. If CompuServe is displaying a long message, you can usually return to the “!” prompt by pressing (**CTRL**) (**C**). (Hold down (**CTRL**) while pressing (**C**).
2. Type **BYE** (ENTER). CompuServe logs off and displays the amount of time you have been online.

After logging off, press TELCOM’s Bye key (**F8**) and, when TELCOM asks if you are sure, type **Y** (ENTER). TELCOM then exits its terminal mode. You see TELCOM’s original function-key display on the bottom of the screen:

Find Call Stat Term Menu

## ***Subscribing to CompuServe***

Each time you log on during your free hour, CompuServe asks if you want to read and agree to its service terms. By agreeing to these terms, you will be able to sign up, while online, for continued CompuServe service.

CompuServe then will ask for billing information. Be prepared to give either your: (1) Master charge number, (2) Visa charge number, or (3) bank address and checking account number.

After signing up, CompuServe bills you only for the time you spend online (unless you use special services). At this writing, CompuServe's online charge is:

\$6.00/hour—standard time  
\$12.50/hour—prime time

(This is CompuServe's charge for a 300-baud modem line—which is the only kind of line you can use with the Tandy 200 modem cable or acoustic coupler.)

## ***Learning More About Communications***

You can use use TELCOM to communicate with many other public-access computer services, such as Dow Jones and The

Source. You can also use TELCOM to communicate and exchange text files with private computers, such as an office or a timesharing computer.

To learn about TELCOM communications, read the *Tandy 200 TELCOM Manual*. The TELCOM manual also shows how to use TELCOM features—such as saving online information—that are useful when communicating with other computers.

## ***Chapter 7 Summary***

### ***TELCOM Terminal Mode***

***To enter terminal mode:*** Press (F4).

***To see the previous menu:*** Press (F1).

***To disconnect from the terminal mode:*** Press (FB).

### ***CompuServe Menu Commands***

***To go to the previous menu:*** Type P (ENTER).

***To go to the top menu:*** Type T (ENTER).

***To logoff:*** Type BYE (ENTER).

### ***CompuServe Control Characters***

***To backspace:*** Press (CTRL).

***To break:*** Press (CTRL)(C).



*Chapter 8/*

*Running BASIC Programs (BASIC)*

This chapter shows how to type and run simple programs, using the BASIC programming language.

## Entering BASIC

Enter BASIC from the Main Menu in the same way you entered the other programs (by moving to BASIC and pressing **(ENTER)**). You see BASIC's prompt:

Ok

Press the **(LABEL)** key and you see the meaning of BASIC's function keys on the bottom of the screen.

## Typing and Running a BASIC Program

Before typing a program, erase anything you may have accidentally stored in BASIC's memory. Press **(ENTER)**; then type:

NEW **(ENTER)**

Now type this simple BASIC program exactly as shown:

```
10 CLS (ENTER)
20 PRINT @ 175,
"HELLO!" (ENTER)
30 PRINT @ 242, "I SEE
WE SPEAK THE SAME
LANGUAGE ....." (ENTER)
40 PRINT @ 410,
"BASICALLY SPEAKING."
(ENTER)
```

When you run this program, the CLS command will clear the screen. The PRINT @ command will tell BASIC to display text on the screen at the specified position.

To see if you have entered all the lines in this program correctly, press the List function key **(F5)**. If you typed a line incorrectly, simply press **(ENTER)** and type it again correctly. When finished typing the program, press **(ENTER)**.

Test the program by pressing the Run function key **(F4)**. Your screen shows:

```
HELLO!
I SEE WE SPEAK THE SAME LANGUAGE .....
Ok BASICALLY SPEAKING.
File Load Save Run List Menu
1179 .F2: .F3: .F4: .F5: .F6: .F7: .F8:
```

## Saving a BASIC Program

To save the program in RAM, press the Save function key **(F3)**. BASIC displays:

SAVE "

Enter a name for the program. For example, type HELLO **(ENTER)**.

Return to the Main Menu (by pressing **(F8)**) and you see a new file—HELLO.BA—on the menu. The .BA extension tells you that HELLO is a BASIC program.

You can run HELLO anytime you want by moving to HELLO.BA's position on the Main Menu and pressing **(ENTER)**.

### ***Loading a BASIC Program***

You might want to load a program back into BASIC so that you can revise and edit it. To do so, enter BASIC and press the Load function key (**(F2)**). BASIC displays:

LOAD "

Type HELLO **(ENTER)**. Press the List key (**(F5)**) and you see that HELLO.BA is loaded into BASIC.

### ***Editing a BASIC Program with TEXT***

To edit a BASIC program, press **(ENTER)** and, at BASIC's "Ok" prompt, type:

**EDIT (ENTER)**

This command loads the BASIC program into TEXT. You can now edit the BASIC program, just as you edit a TEXT file. When finished editing, press **(F8)**, and the program is loaded back into BASIC.

### ***Learning More About BASIC***

Many books are available in computer stores that teach how to program in BASIC. You can use any of these books to learn how to program and use the *Tandy 200 BASIC Reference Guide* to learn which BASIC commands the Tandy 200 uses.

### ***Chapter 8 Summary***

#### ***BASIC***

***To erase BASIC memory:*** Type NEW **(ENTER)**.


***To list a BASIC program:*** Press **(F5)**.

***To run a BASIC program:*** Press **(F4)**.

***To save a BASIC program:*** Press **(F3)**; then enter a filename.

***To load a BASIC program:*** Press **(F2)**; then enter a filename.

***To edit a BASIC program:*** Type EDIT **(ENTER)**. (Return to BASIC by pressing **(F8)**.)



***Chapter 9/  
Expanding the Tandy 200***

This chapter shows how you expand the Tandy 200 with add-on equipment and programs, and also gives sources for additional information on the Tandy 200.

## ***Tandy 200 Equipment***

The Tandy 200 lets you connect any of the following equipment:

- **A printer.** You can get a hard-copy of information as shown in this manual by using any Tandy or Centronics-compatible parallel printer.
- **A cassette recorder.** You can increase your storage capacity as shown in this manual by using any cassette recorder—we recommend the CCR-81 recorder (Cat. No. 26-1208) which comes with the required cable (Cat. No. 26-1207).
- **Extra RAM.** You can expand the Tandy 200's RAM to 72K by adding up to a total of three 24K RAM banks.
- **A bar code reader.** You can optically scan product code labels by adding the Tandy Bar Code Reader (Cat. No. 26-1183).
- **A disk drive.** You can expand the power of the Tandy 200 to that of a larger computer by purchasing the Tandy Disk/CRT display unit (Cat. No. 26-3806). This gives you one 5 ¼" floppy disk drive and can be attached to a normal television display or video monitor.
- **A direct connect modem cable.** You can directly connect the Tandy 200's built-in modem to the telephone as shown in this manual by using the Tandy 200 Modem Cable (Cat. No. 26-1410).
- **An acoustic coupler.** You can connect the Tandy 200's built-in modem to any telephone (even in a phone booth) as shown in this manual by using the Tandy 200 Acoustic Coupler (Cat. No. 26-3805).
- **An external modem.** In addition to the Tandy 200 built-in modem, you can also use any RS-232-compatible external modem. See the Tandy 200 TELCOM manual for more information.
- **Another computer.** You can directly connect to the RS-232 connector of another computer by purchasing an RS-232 cable (Cat. No. 26-4403) and a null modem adapter (Cat. No. 26-1496). See the Tandy 200 TELCOM manual for information on how to do this.



## ***Tandy 200 Programs***

You can purchase many additional Tandy 200 programs that enhance the capabilities of the Tandy 200 built-in programs or let you do additional functions:

- **Tandy-supported software.** These programs are supported and supplied by Tandy. You can get a list of available programs at any Radio Shack Computer Center.
- **Tandy express order software.** These programs are supplied by Tandy, but supported by the vendors that developed the programs. You can also get a list of these programs at any Radio Shack Computer Center.
- **Programs from other suppliers.** These programs are supplied and supported by outside vendors. You can find out the programs that are available for the Tandy 200 by reading the portable computing magazines, described below.

You will normally be able to purchase programs either as ROM cartridges (which you can plug into the bottom of the Tandy 200) or as cassette tapes (which you will need to load into RAM using a cassette recorder).

Please note that most Model 100 programs will not work on the Tandy 200. The only Model 100 programs that will work on the Tandy 200 are programs that are written in BASIC and use no operating system calls.

## ***Tandy 200 Information***

For additional information on the Tandy 200, see the following publications:

- The 3 other manuals that come with the Tandy 200: *Tandy 200 Multiplan Manual*, *Tandy 200 TELCOM Reference Manual*, and *Tandy 200 BASIC Reference Manual*.
- *Tandy 200 Technical Reference Manual* (Cat. No. 26-3861). This manual gives information on the Tandy 200 operating system calls as well as technical information on how to program the hardware.
- *Tandy 200 Portable Computer* (Cat. No. 26-3869). This book will be sold through Radio Shack Computer Centers.
- *Portable 100*, Computer Communications, Inc., 15 Elm St., Camden, Maine 04843; and *PCM*, Falsoft, Inc., 9529 Highway 42, Prospect, Kentucky, 40059. These two magazines are for owners of portable computers.

## *References*

- A. Help
- B. Text Special Keys
- C. Memory Required by TEXT Paste Buffer
- D. BASIC Programs
- E. Tandy 200 Technical Information

## **Reference A/ Help**

This reference helps with problems you may encounter while going through this manual. For additional help, see the TELCOM, Multiplan, and BASIC manuals.

### **General**

**Red battery light on.** When the light first comes on, you have 20 minutes of battery power left. Immediately turn the power off, and insert new batteries or use the AC power cord.

#### **Screen and keyboard freezes.**

This could be caused by several factors: (1) The calculator may be on. Turn it off by pressing **(GRPH)** and then unlocking **(NUM)**. (2) An operation may be in progress. Press **(SHIFT)** and then **(BREAK)** at the same time. Try this several times. (3) The Tandy 200 may be hung up. At last resort, press Reset, the small button on the rear of the Tandy 200 next to the RS232C connector. Try this several times.

#### **Cannot return to Main Menu.**

Press one of the following keys: **(F8)**, the spacebar, or **(SHIFT)** **(BREAK)** (at the same time).

**A file is no longer on Main Menu.** You may be in the wrong RAM bank. Press **(F1)** or **(TAB)** to move from bank to bank.

#### **No files are on the Main Menu.**

Check the Memory Switch on the bottom of the Tandy 200. If it is off, all the contents in RAM have been permanently erased.

**Screen blank.** Use the DISP dial on the right side of the Tandy 200 to adjust your display. If this does not help, push the power button to make sure the power is on. Then check for dead batteries or an improperly connected AC power cord.

**Image not clear.** Use the DISP dial (located on the right side of the Tandy 200) to adjust the screen to your field of vision.

**Characters printing as numbers.** Depress the NUM key (at the bottom of the keyboard) and the right keys print as characters, rather than numbers on a numeric keypad.

**Characters printing as all caps only.** Depress **(CAPS LOCK)** to get in the upper- and lowercase mode.

### **TEXT, SCHEDL, ADDRSS, and MSPLAN**

**Insertion is slow.** This happens when you are inserting text at the beginning of a long scrolling string of text. To shorten the text string, insert a carriage return by pressing **(ENTER)**. (You can delete the carriage return later.)

**Memory full error.** Select a smaller block of text. See “Reference C, Memory Required by the TEXT Paste Buffer.”

**ADRS.DO or NOTE.DO not found.** You do not have a file named NOTE.DO or ADRS.DO in the specific RAM bank you are using.

**#VALUE! error.** Your formula asks MSPLAN to make a computation on strings, rather than numbers. (If a space precedes a number, MSPLAN regards its value as a string. For example, “ 32” is a string; “32” is a number.) Change all strings to numbers.

### **TELCOM**

**Cannot establish a connection.** If you do not get TELCOM’s terminal function-key display (Prev, Down, Up, etc.), you have not established a connection for one of many reasons.

1. *The connectors:* If using the modem cable—the beige cable goes to the wall line, the grey cable goes to the phone line, and the plug goes to the Model 200 PHONE socket. If using the acoustic coupler—the telephone speaker goes to the acoustic coupler microphone, the telephone microphone goes to the acoustic coupler speaker, and the plug goes to the Model 200 PHONE socket.

2. *The ACP/DIR setting:* If using the modem cable, this switch must be set to DIR; if using the acoustic coupler, it must be ACP.

3. *The communication parameters:* Make sure they are set to M7E1ENN, O.

4. *CompuServe’s baud rate:* You must call one of CompuServe’s 300-baud numbers.

5. *The sequence for establishing terminal connections:* Make sure you hear CompuServe’s computer tone before pressing the TERM key.

**CompuServe is sending many unreadable characters.** This is usually because you do not have your communication parameters set correctly. With CompuServe, they should be M7E1ENN, O.

**CompuServe is sending occasional unreadable characters.** This is probably caused by a bad telephone line. Hang up and try again.

**CompuServe’s characters are scrolling faster than you can read them.** Press the Previous key (F1) to see the previous screen. Press (F1) again to see the current key.

**The characters you type appear in duplicate.** Press (F4) to change from “Half” to “Full.”

The characters you type appear differently on your display. CompuServe is echoing the characters it is receiving from you, and they are different from the characters you are typing. This is probably caused by a bad telephone connection. Hang up and try again.

## BASIC

**TM Error.** Type the command again exactly as shown in the manual. You have probably omitted quotation marks or a dollar sign.

**SN Error.** Type the command again. You have made a typographical error.

**FF Error.** Type the command again using the complete filename, including the extension. Be sure you spell it as shown on the Main Menu.

**Program running continuously.** Press **(SHIFT) (BREAK)** to stop program execution.

**Program ill-formed.** The BASIC program contains lines without line numbers in the beginning. Go back to TEXT and be sure each line in the BASIC program begins with a line number and ends with an **(ENTER)** character.

## Reference B/ TEXT Special Keys

This reference lists the special **(CTRL)**, **(GRAPH)**, and **(CODE)** characters you can use with the TEXT program.

### TEXT (GRAPH) Keys

By pressing **(GRAPH)** and another key, you can display the following characters on your screen. (These characters will not print on the printer.)

\	(GRAPH) -
^	(GRAPH)
{	(GRAPH) 9
!	(GRAPH) _
}	(GRAPH) 0
~	(GRAPH)
⌘	(GRAPH) p
⌘	(GRAPH) m
(x	(GRAPH) f
⌘	(GRAPH) x
⌘	(GRAPH) c
+	(GRAPH) a
⌘	(GRAPH) h
⌘	(GRAPH) t
π	(GRAPH) i
√	(GRAPH) r
±	(GRAPH) /
Σ	(GRAPH) s
∞	(GRAPH) '
+	(GRAPH) =
∫	(GRAPH) i
◀	(GRAPH) e
⌘	(GRAPH) y
⌘	(GRAPH) u
↓	(GRAPH) ;

	(GRAPH) q
	(GRAPH) w
	(GRAPH) b
	(GRAPH) n
	(GRAPH) .
	(GRAPH) o
	(GRAPH) ,
	(GRAPH) l
	(GRAPH) k
	(GRAPH) 2
	(GRAPH) 3
	(GRAPH) 4
	(GRAPH) 5
	(GRAPH) 8
	(GRAPH) 7
	(GRAPH) 6
	(GRAPH) 7
(upper left)	(GRAPH) !
(upper right)	(GRAPH) @
(lower left)	(GRAPH) #
(lower right)	(GRAPH) \$
	(GRAPH) %
	(GRAPH) ^
(upper)	(GRAPH) Q
(lower)	(GRAPH) W
(left)	(GRAPH) E
(right)	(GRAPH) R
	(GRAPH) A
	(GRAPH) S
	(GRAPH) D
	(GRAPH) F
	(GRAPH) X
	(GRAPH) U
	(GRAPH) P
	(GRAPH) O
	(GRAPH) I
	(GRAPH) J
	(GRAPH) :
	(GRAPH) M

	(GRAPH) >
	(GRAPH) <
	(GRAPH) L
	(GRAPH) K
	(GRAPH) H
	(GRAPH) T
	(GRAPH) G
	(GRAPH) Y
	(GRAPH) C

### TEXT (CODE) Keys

By pressing (CODE) and another key, you can display the following characters on your screen. (These characters will not print on the printer.)

	(CODE) '
	(CODE) x
	(CODE) c
	(CODE) "
	(CODE) M
	(CODE) )
	(CODE) _
	(CODE) +
	(CODE) s
	(CODE) R
	(CODE) C
	(CODE) p
	(CODE) ;
	(CODE) /
	(CODE) O
	(CODE) A
	(CODE) O
	(CODE) U
	(CODE) [
	(CODE) a
	(CODE) o
	(CODE) u
	(CODE) S

T	CODE: T
é	CODE: d
ù	CODE: .
à	CODE: v
"	CODE: =
f	CODE: F
à	CODE: !
é	CODE: 3
î	CODE: 8
ó	CODE: 9
ù	CODE: 7
"	CODE: -
è	CODE: e
î	CODE: i
á	CODE: q
í	CODE: k
ó	CODE: l
ú	CODE: j
ñ	CODE: n
á	CODE: z
ø	CODE: .
í	CODE: !
î	CODE: i
É	CODE: D
A	CODE: Q
f	CODE: K
Ó	CODE: L
Ú	CODE: J
■	CODE: Y
Æ	CODE: X

## TEXT (CTRL) Keys

By pressing (CTRL) and one of these keys, you can do the same cursor movement and editing functions as the keys described in Chapters 2 and 3.

Control Operation:  
Character

- (CTRL) (A) Same as (SHIFT) (-)
- (CTRL) (B) Same as (SHIFT) (!)
- (CTRL) (C) Same as (SHIFT) (BREAK)
- (CTRL) (D) Same as (-)
- (CTRL) (E) Same as (!)
- (CTRL) (F) Same as (SHIFT) (-)
- (CTRL) (G) Same as Save function key
- (CTRL) (H) Same as (BKSP)
- (CTRL) (I) Same as (TAB)
- (CTRL) (L) Same as Select function key
- (CTRL) (M) Same as (ENTER)
- (CTRL) (N) Same as Find function key
- (CTRL) (O) Same as Copy function key
- (CTRL) (Q) Same as (SHIFT) (-)
- (CTRL) (R) Same as (CTRL) (-)
- (CTRL) (S) Same as (-)
- (CTRL) (T) Same as (SHIFT) (!)
- (CTRL) (U) Same as Cut function key
- (CTRL) (V) Same as Load function key
- (CTRL) (W) Same as (CTRL) (!)
- (CTRL) (X) Same as (!)
- (CTRL) (Y) Same as (SHIFT) (PRINT)
- (CTRL) (Z) Same as (CTRL) (!)

### *Reference C/ Memory Required by the TEXT Paste Buffer*

This reference explains the memory that the TEXT program's paste buffer needs to use to cut and paste or copy and paste text.

Whenever you cut or copy text, TEXT puts a copy of that text in the paste buffer, and the text remains in the paste buffer until you replace it with something else. This requires additional memory—more than you might at first think is necessary.

For example, assume you want to **cut and paste** 5,000 bytes (characters) of text. To do this, you need an additional 5,000 bytes of memory for the paste buffer to use.

- When you “cut” the text, TEXT **moves** the 5,000 bytes from the text file to the paste buffer.
- When you “paste” the text, TEXT **puts an extra copy** of the 5,000 bytes into the text file.

As another example, assume you want to **copy and paste** 5,000 bytes of text. To do this, you need an additional 10,000 bytes of memory—5,000 bytes for the paste buffer to use and 5,000 bytes for the copy.

- When you “copy” the text, TEXT **puts an extra copy** of the 5,000 bytes into the paste buffer.
- When you “paste” the text, TEXT **puts an extra copy** of the 5,000 bytes into the text file.

If you do not have enough memory to cut and paste or copy and paste a large block of text, TEXT will give you a “memory full” error. An easy solution to this problem is to simply divide the large block into smaller blocks and then work with each block individually.



### *Reference D/ BASIC Programs*

This reference provides some simple BASIC programs you might want to enter and save. When entering a BASIC program, you must type it exactly as shown. A misspelled word or misplaced parenthesis could cause the program not to run.

#### *LOAN.BA*

This program computes a full amortization table of a loan. You input: (1) the full amount of the loan (do not type a comma or a dollar sign), (2) the interest you pay, and (3) the total number of months to pay off the loan (for example, 20 years  $X 12 = 240$  months).

```
10 CLS:INPUT "TYPE  
LOAN AMOUNT";L  
20 INPUT "ANNUAL IN-  
TEREST RATE IN PER-  
CENT";R  
30 INPUT "NUMBER OF  
MONTHS TO PAY OFF  
LOAN";M  
40 R = R * .01/12  
50 P = R * L / (1 - (1 + R)^(-  
M))  
60 I% = 1:OA = L:CLS  
70 PRINT "NUMBER IN-  
TEREST PRINCIPAL NEW  
BAL"  
80 F1$ = "### ##,###.## ###,  
###.## ###,###.##"
```

```
90 F2$ = "MONTHLY  
PAYMENT = $##,###.##"  
100 F3$ = "TOTAL IN-  
TEREST PAID = $##,###.##"  
110 X = X + 1  
120 MC = R * L  
130 PP = P - MC  
140 NB = L - PP  
150 TI = TI + MC  
160 PRINT USING  
F1$:I%,MC,PP,NB  
170 IF X = 14 THEN  
GOSUB 240  
180 IF I% <> M THEN I%  
= I% + 1: L = NB: GOTO  
110  
190 GOSUB 240  
200 PRINT "ON $ " OA  
"LOAN AT " R*1200 "% IN-  
TEREST RATE FOR " I%  
"MONTHS"  
210 PRINT:PRINT USING  
F2$:P  
220 PRINT USING F3$:TI  
230 END  
240 INPUT "PRESS (ENTER)  
TO CONTINUE";R$: X = 0:  
CLS  
250 RETURN
```

#### *SORT.BA*

This program sorts all the records in *ADRS.DO*; then stores the sorted list in *SORT.DO*.

**Warning:** If you already have a file named *SORT.DO*, running this program will delete all information in the file.

You can rename SORT.DO with the NAME command described in Chapter 2.

```
10 CLEAR 1000: DIM
N$(100)
20 CLS: I = 1
30 OPEN "ADRS.DO" FOR
INPUT AS 1
40 IF EOF(1) THEN 80
50 LINE INPUT #1, N$(I)
60 I = I + 1
70 GOTO 40
80 CLOSE #1
90 OPEN "SORT.DO" FOR
OUTPUT AS 1
100 CLS
110 PRINT @ 137,
"-sorting"
120 I = I - 1
130 X = 0
140 X = X + 1
150 IF X > I THEN 230
160 IF N$(X) = "ZZ" THEN
140
170 FOR Y = 1 TO I
180 IF N$(Y) < N$(X) THEN
X = Y
190 NEXT Y
200 PRINT #1, N$(X)
210 N$(X) = "ZZ"
220 GOTO 130
230 CLOSE #1
240 PRINT @ 137,
"finished"
250 END
```

## BAR.BA

This program lets you input 12 numbers, then displays a simple bar chart of the numbers. (When you have finished running the program, press **(SHIFT)** **(BREAK)**.)

```
10 CLEAR 1000: DIM D(12)
20 FOR I = 1 TO 12
30 PRINT "DATA FOR
MONTH " I: INPUT D(I)
40 IF D(I) > YH THEN YH
= D(I)
50 NEXT I
60 YL = YH
70 FOR I = 1 TO 12
80 IF D(I) < YL THEN YL
= D(I): NEXT I
90 CLS: M = 1: XA = 562
100 FOR I = 1 TO 12
110 PRINT @ XA, M;
120 XA = XA + 3: M = M
+ 1
130 NEXT I
140 P = (YH + YL) / 55: X1 =
16
150 FOR I = 1 TO 12
160 Y1 = 55 - (D(I) / P)
170 LINE (X1, Y1) -
(X1 + 8, 110), 1, BF
180 X1 = X1 + 18: Y1 = 0
190 NEXT I
200 GOTO 200
```

## *Reference E/ Tandy 200 Technical Information*

This reference contains information on how to change the Tandy 200 default power up conditions, how to restore it to its original memory condition, and also gives technical information on all the Tandy 200 device interfaces.

### *Auto Power-Off Settings*

If inactive for 10 minutes, the Tandy 200 turns itself off. You can change this 10-minute time interval or completely cancel the power-off function.

**To change the 10-minute time interval:** Enter BASIC and type the POWER command using the format **POWER *n***. *n* is a number from 10 to 255—The Tandy 200 will multiply *n* times 6 seconds. For example:

**POWER 10** (ENTER)

The above command sets the time interval to 1 minute (10 X 6 seconds = 60 seconds):

**To cancel the auto power-off function:** Enter BASIC and type the following:

**POWER CONT** (ENTER)

### *Cold Restart*

If you ever need to restore the Tandy 200 to its original memory condition, you can do so with a cold restart.

**Warning: This will erase all files you have stored in memory.**

To do a cold restart, press (CTRL) (PAUSE) while either pressing the Power Switch or pressing Reset.

### *Specifications*

Power Source: AM Battery (x4)  
(23-552) AC Adapter (DC 6V,  
Center minus) (26-3804)

Weight: 3 lbs. 13.5 oz.  
(1.3608 kg)

Dimensions: 11 $\frac{3}{8}$ " (L) x 8 $\frac{1}{4}$ "  
(D) x 2" (H) (29.41 cm x  
20.95 cm x 5.08 cm)

Temperature: Operating 41 °F  
(5 °C) to 104 °F (40 °C) Storage  
-40 °F (-40 °C) to 160 °F  
(71 °C)

Humidity: Operating 20% to  
85% RH (non-condensing)  
Storage 10% to 95% RN  
(non-condensing)

Micro Processor: 80C85 (8 bits  
CPU) 2.4 MHz

### RS-232-C Interface

RS-232C Interface		
Pin No.	Symbol	Description
1	GND	
2	TXR	Transmit Data
3	RXR	Receive Data
4	RTS	Request to send
5	CTS	Clear to send
6	DSR	Data set ready
7	GND	
8	NC	
9	NC	
10	NC	
11	NC	
12	NC	
13	NC	
14	NC	
15	NC	
16	NC	
17	NC	
18	NC	
19	NC	
20	DTR	Data terminal ready
21	NC	
22	NC	
23	NC	
24	NC	
25	NC	

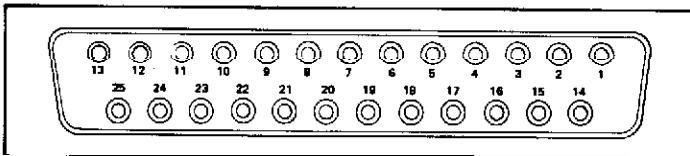
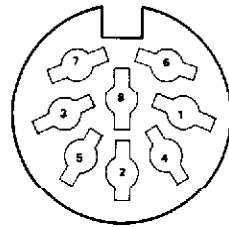
### Cassette Interface

Cassette Interface		
Pin No.	Symbol	Description
1	REM 1	Remote
2	GND	
3	REM 2	Remote
4	R x C	Receive data for CMT
5	T x C	Transmit data for CMT
6	GND	GND
7	NC	
8	NC	

Input level: Impedance 100ohm  
(800mV - 5Vpp)

Output level: Impedance 3.3Kohm  
(650mVpp)

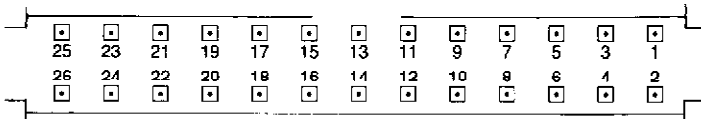
REMOte: 6 VDC 0.5A max.



## Parallel Printer Interface

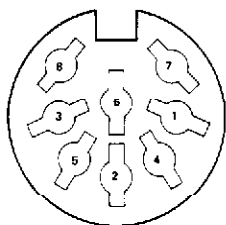
Parallel Printer Interface (Centronics)		
Pin No.	Symbol	Description
1	STROBE	Strobe pulse from the Computer to printer.
2	GND	Ground
3	PD0	Bit 0 (lsb) of output data byte
4	GND	Ground
5	PD1	Bit 1 of output data byte
6	GND	Ground
7	PD2	Bit 2 of output data byte
8	GND	Ground
9	PD3	Bit 3 of output data byte
10	GND	Ground
11	PD4	Bit 4 of output data byte
12	GND	Ground
13	PD5	Bit 5 of output data byte

Parallel Printer Interface (Centronics)		
Pin No.	Symbol	Description
14	GND	Ground
15	PD6	Bit 6 of output data byte
16	GND	Ground
17	PD7	Bit 7 of output data byte
18	GND	Ground
19	N C	
20	GND	Ground
21	BUSY	Input to Computer from Printer
22	GND	Ground
23	N C	
24	GND	Ground
25	BUSY	Input to Computer from Printer, high indicates device selected.
26	N C	



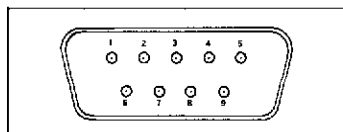
## Modem Interface

Modem Interface		
Pin No.	Symbol	Description
1	TL	Conventional Telephone Unit
2	GND	Logic GND
3	R x MD	Direct Connection to Tel Line (RING)
4	R x MC	Acoustic Coupler Connection (MIC)
5	T x MC	Acoustic Coupler Connection (Speaker)
6	VDD	RD for answering telephone
7	T x MD	Direct Connection to Tel Line (TIP)
8	RP	Ringing Pulse



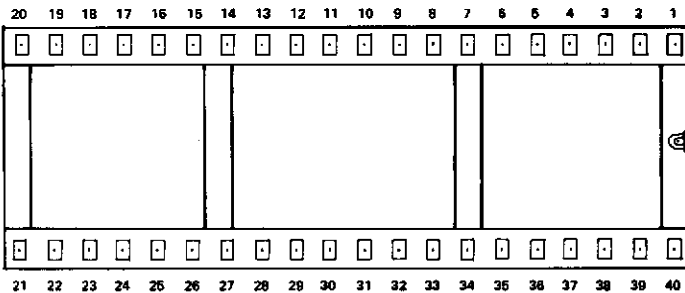
## Bar Code Reader Interface

Bar Code Reader		
Pin No.	Symbol	Description
1	N C	
2	R x DB	Receive data from bar code reader
3	N C	
4	N C	
5	GND	Ground
6	N C	
7	GND	Ground
8	N C	
9	VDD	



**40 Pin External  
Bus Signal Interface**

40 Pin External Bus Signal			
Pin No.	Signal	Pin No.	Signal
1	VDD	40	VDD
2	GND	39	GND
3	AD0	38	AD1
4	AD2	37	AD3
5	AD4	36	AD5
6	AD6	35	AD7
7	A8	34	A9
8	A10	33	A11
9	A12	32	A13
10	A14	31	A15
11	GND	30	GND
12	RD	29	WR
13	IO/M	28	S0
14	ALE	27	S1
15	CLK	26	CE for I/O Cont.
16	RD + WR	25	RESET out
17	INTR	24	INTA
18	GND	23	GND
19	RAM RESET	22	N C
20	N C	21	N C



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