TANDY 2810 HD

User's Guide

TANDY

CONTENTS

BEFORE YOU BEGIN

Note: You must immediately install and charge the supplied battery pack, as described in "Setting Up Your Computer" before you can operate your computer from the battery. Failure to do this can greatly reduce the battery's life and efficiency.

PACKAGE CONTENTS

Your Tandy 2810 HD package includes:

- Computer and the AC Adapter/Charger
- Rechargeable Battery
- Five 720KB DeskMate Diskettes
- Three 720KB MS-DOS/GW-BASIC Diskettes
- *DeskMate Getting Started*
- *Quick Start*
- Registration Card
- PC-Link Registration Card

ABOUT THIS BOOK

"Getting Started," and "Getting More," tell you about your computer and also tell you how to run programs.

Using DeskMate gives you information about how your computer operates. The DeskMate graphics-oriented desktop screen is equipped with a command menu and program icons that are easy to use. There is also an on-line help tutorial to help you understand how to use DeskMate. To run most programs, see *DeskMate Getting Started.*

In the *DeskMate Getting Started* magazine, you will find short entertaining articles about DeskMate. With DeskMate, you can do almost everything you want to do with your computer. Have fun and explore!

TEXT CONVENTIONS

This manual uses a simple method of notation to distinguish among text you type, keys you press, and what you see on the computer screen.

BACKSPACE

Key names that appear in small, heavy, capital letters represent keys that you press.

CTRL+C

Two or more keys separated by a plus sign represent what we call a *key combination*. To use a key combination, press and hold down the first key. Then, press the other key(s).

`format` **ENTER**

Characters that you type are displayed differently from the regular text in this manual. You must press **ENTER** after you type your text. With most programs, you can type in either uppercase or lowercase letters.

`A:\`

Characters that appear on the screen are also displayed differently from the regular text, like the example shown here.

INTRODUCTION
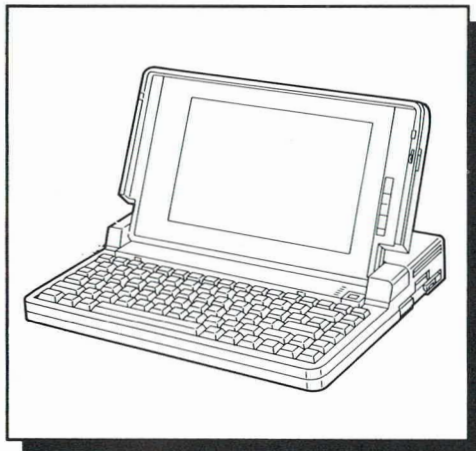
Your Tandy 2810 HD Laptop Computer is a versatile, simple-to-use computer. You can use it at home or take it with you to school, work, or as you travel, giving you instant access to useful information and productivity software. We have included everything you need to immediately begin using your computer.

STANDARD FEATURES

- IBM PC software compatibility
- Full portability
- A 2 ½-inch 20MB hard disk drive with MS-DOS and Desk-Mate installed
- A 3 ½-inch, 1.44MB diskette drive
- LCD display with fluorescent backlight
- Full-feature, 84-key keyboard with full 101-key emulation and reversible CTRL/CAPS LOCK keys
- MS-DOS version 4.01 operating system
- Serial, parallel, and other ports that let you use options such as a printer, external floppy disk drive, mouse, fax, modem, VGA monitor, and external keyboard
- Resume function
- Rechargeable battery
- 1MB RAM memory (expandable to 5MB)

OPTIONAL FEATURES

You can add options to make your computer even more useful. For example, you can add a printer to print copies of the documents you create. You can connect a mouse or an external modem to your computer's serial port. You can also add a VGA monitor, external keyboard, internal modem card (Cat. No. 25-3525), and two or four 1MB expansion RAM cards (Cat. No. 25-3507) to your computer.

For more information on adding options to your computer, refer to "Getting More" in this manual.

GETTING STARTED

"Getting Started" provides information to help you set up and begin using your computer.

Cautions:

- Be sure you install all optional devices before you turn on your computer.

- Keep a reasonable clearance space around the computer and any optional device(s) to prevent overheating.

- Avoid extreme temperature and humidity changes when using, storing, or transporting your computer.

POWER SOURCES

You can power your computer from the supplied AC adapter or from the rechargeable battery. However, the battery comes fully discharged, so you must use the AC adapter as described below until you have completely charged the battery.

Using the AC Adapter and Charging the Battery

The following procedure tells you how to install the battery and how to connect the AC adapter that powers the computer and charges the battery.

Cautions:

- Using an AC adapter other than the one supplied might harm the battery and the computer.

- Unplug the AC adapter before you disconnect it from the computer.

1. Place the computer on a flat, level surface.

2. Slide the battery into the battery compartment.
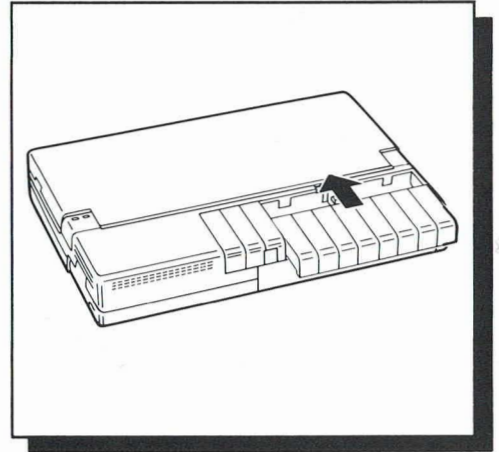
3. Insert the AC adapter's connector into the DC IN 16V jack. Then, plug the adapter into a standard AC outlet and let the battery fully charge before you use the computer on battery power. You can immediately begin using the computer on AC power.
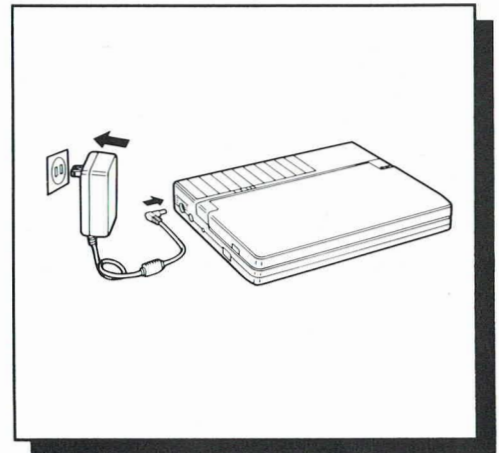
Notes:

• The battery charges in about 4 hours if you are using the computer while the battery is charging. If you are not using the computer, the battery charges in about 2 hours.

The computer's battery discharges slightly if the AC adapter is connected to the DC IN 16V jack, but not to an AC outlet.

• The adapter/charger does not charge the battery when the diskette drive turns on. Battery charging resumes when the diskette drive turns off.

• Do not store the battery in high temperature locations for extended periods.

- For more information about care and use of the battery, see "Information About Rechargeable Batteries" in this manual.

After a period of time, your computer's battery loses its ability to maintain a charge. This time period varies depending upon use, storage conditions, and several other complex factors. When this occurs, you must replace the battery. Replace the battery with only the same type of battery (Cat. No. 25-3526) available from your nearby Radio Shack Computer Center. You should also charge your new battery before you use it.

Low-Battery Indications

The BATT indicator and the computer's beeper tell you the condition of the battery in the following five ways:

- The indicator does not light during normal status
- The indicator lights green when battery is fully charged
- The indicator lights orange during charging
- The indicator lights red and a tone sounds approximately once a minute when battery power drops below the power level needed for normal operation. When this happens, save all important information and turn off the computer or connect the AC adapter.

   Note: The indicator might light red during disk operations. If the indicator turns off when the disk drive turns off, the battery still has plenty of power.

- The indicator lights orange and blinks if the battery is removed from the computer while the AC adapter is plugged in.

Caution: When the BATT indicator lights red and the tone begins sounding, you have approximately 5 minutes to save your data to the hard disk or diskette.

Connect the AC adapter or another battery if you want to continue using the 2810 HD. You must attach the adapter/charger to your computer and then to an AC outlet before replacing the battery. If the adapter/charger is not connected before replacing the battery, data could be lost. See "Using the AC Adapter and Charging the Battery" in this manual. Your computer loses all information not saved onto a disk when the power turns off.
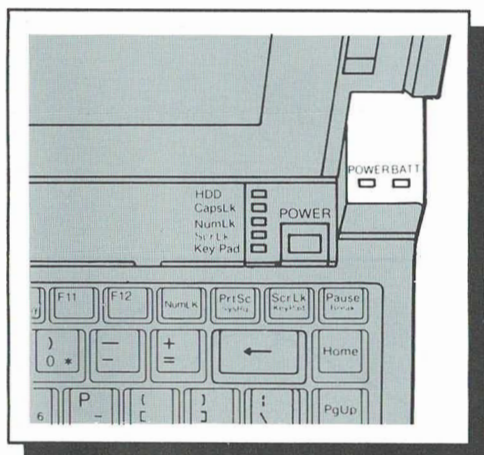
Information About Rechargeable Batteries

Your computer uses a nickel-cadmium rechargeable battery. The battery lasts longest if you occasionally—about once a month—operate the unit with battery power until the BATT indicator lights red and the computer turns off, then immediately recharge the battery. Nickel-cadmium batteries can *forget* how much power they have if you always keep them fully charged.

You can power the computer for up to 3 1/2 hours from a fully-charged battery. However, operating time will vary depending on the options installed, backlight brightness, and the amount of diskette and hard drive access. See "Changing Your Computer's Functions" in this manual.

Hints:

- You can obtain another battery (Cat. no. 25-3526) from your nearby Radio Shack Computer Center so you can use your computer longer where AC power is not available.

- Use the battery's charge indicator to remind yourself if you have charged the battery or not. Set the indicator so the red dot appears on batteries that need recharging. You must set the indicator manually—the charge indicator is not set automatically by the computer or the battery. It is a simple mechanical switch—it has no electrical function.

- Do not incinerate.

- Do not directly connect the negative and positive terminals.
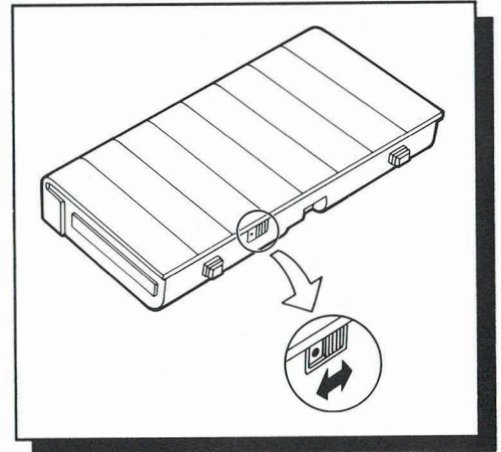
USING RESUME

Most computers require you to save programs and data to a hard drive or diskette before the battery discharges, or before you turn off the power. If the computer's battery discharges, programs and data are lost.

If your 2810 HD runs out of power, a feature called Resume temporarily remembers where the computer left off in your program. When you turn on the power again, the computer returns to where it left off.

You can use the Resume feature if you plan to continue running a program within a few hours or days.

Notes:

• The Resume feature is turned off at the factory. You must turn on the Resume feature using the Setup281 program in DeskMate or DOS before running a program. See "Changing Your Computer's Functions" in this manual.

• The Resume feature remembers where you left off in a program whether you use a battery, AC adapter, or no battery or AC adapter. The Resume feature remembers for a period of time, depending upon the amount of additional RAM installed in the computer. (See "Adding Internal 1MB RAM Cards" in this manual.

The following chart lists the amount of time the computer remembers where it left off. You can return to where the computer left off by simply turning on your computer again.

Fully charged battery (no additional RAM)	4 Weeks
Fully charged battery (4MB of additional RAM)	1 Week
No battery or AC adapter (no additional RAM)	24 Hours
No battery or AC adapter (4MB of additional RAM)	6 Hours

Notes:

• If you turn the computer on after the specified time limit for Resume to remember, the computer boots-up as it normally does.

• When using some programs, the Resume function might not operate properly and might cause the computer to lock-up. If this occurs, use the tip of a pen to press the Reset button on the left side of the computer's case.

STARTING YOUR COMPUTER

1. To open the computer, slide the spring-loaded latch on each side of the cover toward the front of the computer and raise the display panel.
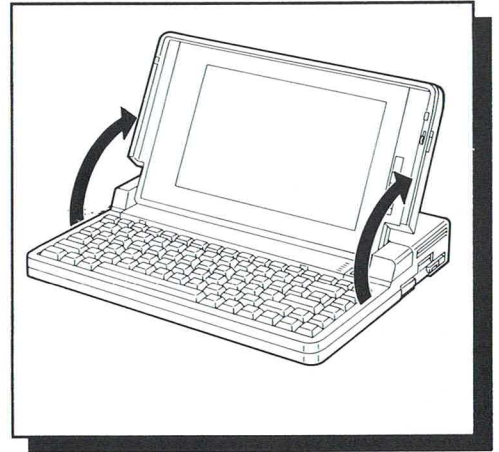
2. To turn on the computer, press and hold POWER for about one second until the power indicator lights.

   After a few seconds, the screen shows:
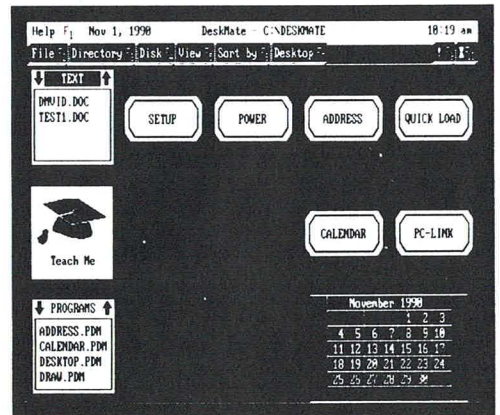
3. Tilt the screen to a comfortable viewing angle.

4. If necessary, adjust the contrast control and the three-position BRIGHTNESS switch (located on the left edge of the computer).

5. Because DeskMate is loaded onto the hard drive, you can begin using the desktop screen after the computer is turned on. See the *DeskMate Getting Started* magazine.

OPERATING YOUR COMPUTER

You do not need to know every key's function to use your computer. In fact, many keys have different functions, depending on what program you run. In general, you use the keyboard like a standard typewriter's keyboard. You use the ENTER key on the computer like the return key on a typewriter. Press BACKSPACE to postion the cursor at a previous character, or press DELETE to erase a character at the cursor's current position. Then, type the correct character.

Your computer has some keys that are not on a standard typewriter; however these extra keys have special purposes depending on which program you use. For more information about these extra keys, see "Using the Keyboard" in this manual.

You can use the DeskMate programs to easily learn your way around the keyboard. DeskMate can also show you how to store, copy, delete, move, and print documents that you create. You will enjoy exploring all the different ways that you can use your computer.
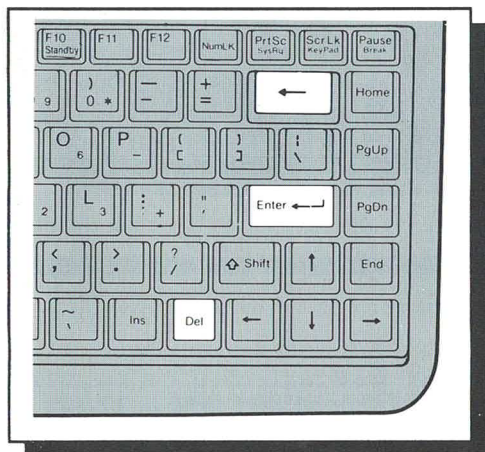
USING THE DISKETTE DRIVE

If you want to access data or programs that are on diskettes, or save data or programs to diskettes, insert a diskette squarely into the drive slot.

To remove the diskette from the drive, press the eject button until the diskette pops out.

Be sure to handle diskettes carefully. A scratch, small indentation, or dust can destroy data on a diskette. To protect your diskettes (and the information they contain) from damage, follow these guidelines.

* Never insert more than one diskette into a drive.

* Do not use damaged diskettes.

* Keep diskettes away from magnetic fields (such as transformers, AC motors, magnets, TVs, and radios).

* Handle diskettes with the metal shutter closed. Never touch the media inside the diskette.

* Keep diskettes out of direct sunlight and away from excessive heat.

* Keep diskettes away from cigarette ashes, dust, and other small particles. In dusty areas, use filters to clean the air.
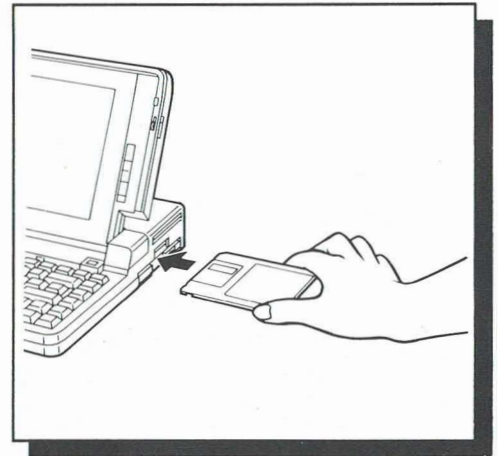
TURNING OFF YOUR COMPUTER

We recommend that you exit any program, return to the system prompt (A> or C>), and remove the diskette before you turn off your computer. Then, press and hold POWER for about one second to turn off your computer.

Cautions:

* You can exit some programs by pressing BREAK or CTRL+C. However, if you exit some programs in this way, you might lose information (See "Resume" in this manual.). We recommend you always follow the instructions in the software documentation for exiting a program.

* Do not turn off the computer while the HDD indicator or the floppy disk drive indicator is on. These indicators show that the computer is reading from or writing to the hard disk or diskette. Turning off the power at these times can cause a loss of the data.
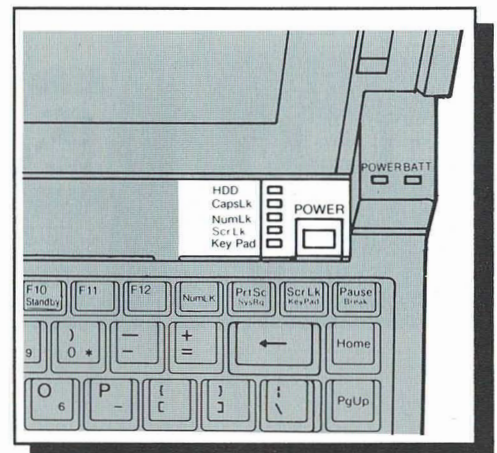
USING THE KEYBOARD

Your computer's keyboard consists of four sections: the function keys, the typewriter keys, the numeric keypad area, and the arrow keys.
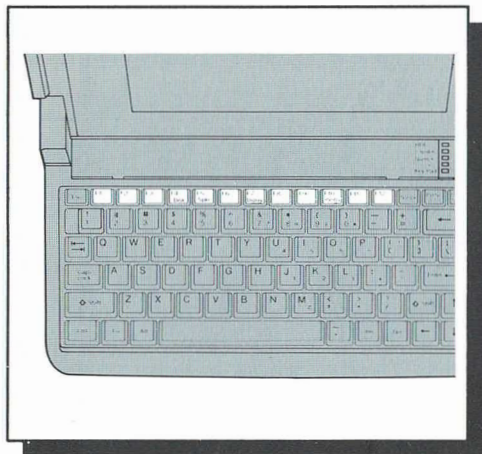
Function Keys—The way the function keys operate depends on the program that you run. Some of these keys perform special functions when the computer is not running DeskMate or another program. See "Changing Your Computer's Functions" in this manual.
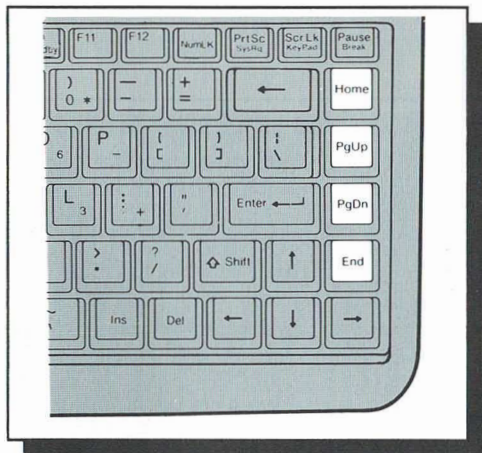
Typewriter Keys—The main part of the keyboard is similar to the keyboard of a standard typewriter. However, when you hold down a character or number key, the keystroke repeats automatically until you release the key. This section of the keyboard also contains some keys not found on a standard typewriter.

HOME	Executes a *home* function. The function depends on the program you are running. In some programs, HOME moves the cursor to the upper left corner of the screen.
END	Executes an *end* function. The function depends on the program you are running. In some programs, END moves the cursor to the right of the last character in the current line.
PGUP	Executes a *page up* function. The function depends on the program you are running.
PGDN	Executes a *page down* function. The function depends on the program you are running.

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ESC

The function of the ESC key depends on the program that you run.

CTRL

You use the CTRL key in combination with certain other keys to perform specific operations. The combinations available and their functions depend on the program that you run. To use a CTRL key combination, hold down the CTRL key, and press the other key. For example, CTRL+C performs a *break* or *program interrupt* in many programs. See "Reversing CTRL and CAPS LOCK Keys" in this manual.

Notes:

- Some software manuals refer to CTRL as CNTRL.

- In some programs, the right and left CTRL keys are not interchangeable and might be used to perform separate functions. Your 2810 HD has only a left CTRL key, but you can press FN+CTRL to emulate the right CTRL key function.
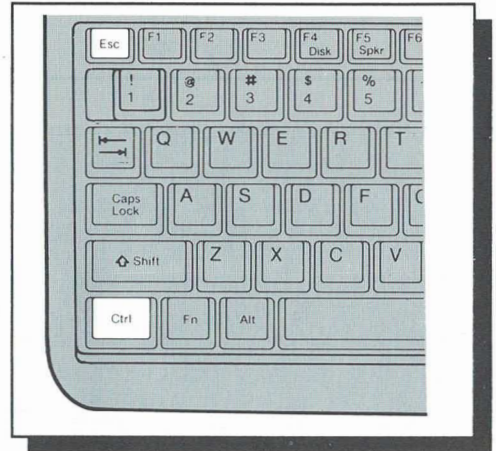
ENTER

The ENTER key enters typed commands and information into the computer. After you press ENTER, the program or operating system your computer is running processes the command you typed.

Note: Some software manuals might refer to ENTER as RETURN, CR, or ↵.
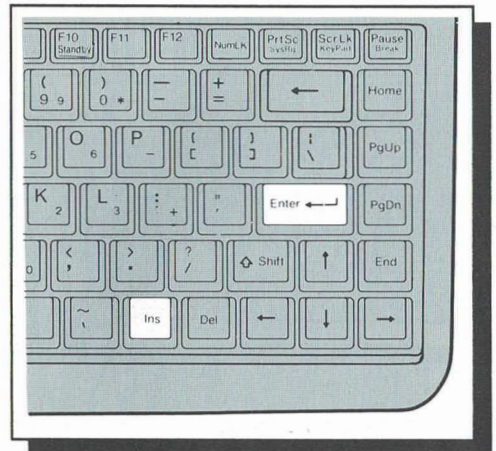
INS

The function of the INS key depends on the program you run. In some programs, this key changes the typing mode from the normal overstrike (typeover) mode to the insertion mode so that you can insert information into a line of text. Pressing the key again returns the program to the overstrike mode.
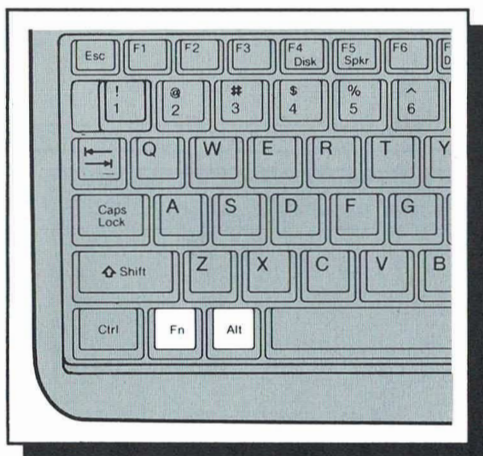
FN

Use FN in combination with certain keys to control special hardware functions of the 2810 HD.

ALT

Use the ALT key in combination with certain other keys to perform operations. The combinations available and their functions depend on the program that you run. To use an ALT key combination, hold down ALT, and press the other key.

Note: In some programs, the right and left ALT keys are not interchangeable and might be used to perform separate functions. Your 2810 HD has only a left ALT key, but you can press FN+ALT to emulate a right ALT key function.
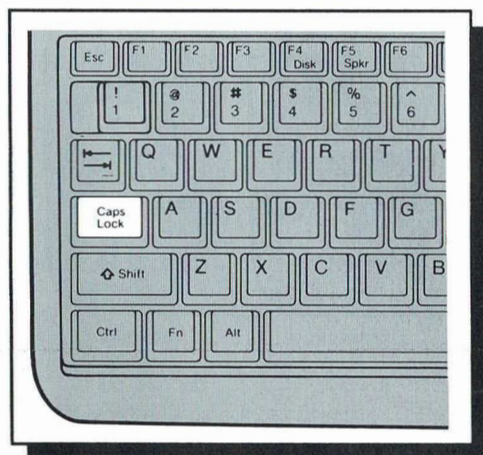
CAPS LOCK

Pressing the CAPS LOCK key causes the alphabet keys to produce only capital letters. (This function affects only the keys A-Z.) Press this key once to activate the mode. The CAPS LOCK indicator lights green. Press the key again to return to the normal typing mode. See "Reversing CTRL and CAPS LOCK Keys" in this manual.

DEL

The function of the DEL key depends on the program you run. In some programs, this key deletes the character at the current cursor position.

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FN+KEY PAD

The FN+KEY PAD key combination activates the numeric keypad area. The Key Pad indicator lights green when you press this button. The keypad area includes the numbers, operators (−, +, /, and *), and punctuation labeled in red on the keyboard. Press the combination again to return to the normal keyboard function. For information about the alternate arrow keys and other keypad functions, see "Numeric Keypad Area" in this manual.

SCRLK

The function of the SCRLK (scroll lock) key depends on the program you run. The use is defined in your operating system or program manual. When you press this key, the SCRLK indicator lights green.

PRTSC

Sends everything displayed on the screen to the printer.

CTRL+
PRTSC
or CTRL+P

Toggles the printer echo function on and off. When the printer echo is on, everything you type goes to the printer.

CTRL+SCRLK

The function of this key combination depends on the program you run. In some programs, this combination stops the program from running.
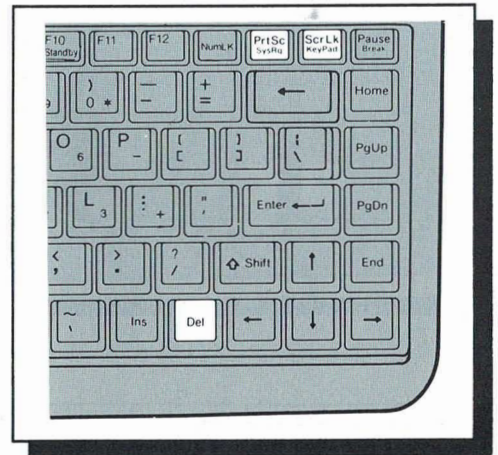
Reversing CTRL and CAPS LOCK Keys

The 2810 HD's keyboard comes with the CTRL and CAPS LOCK keys in their standard positions. However, some people prefer to reverse the positions of their keys. To do this:

1. Exit any program you might be running and turn off your computer.

2. Remove the battery.

3. Lift the compartment cover as shown.

4. Use a small pointed object, such as the writing tip of a pen, to set the position of the DIP switch.

   You can set the DIP switch in one of the following ways:

   • ON to reverse the CTRL and CAPS LOCK key positions.

   • OFF to restore the standard CTRL and CAPS LOCK key positions.

5. Close the compartment and reinstall the cover screws.

6. Reinstall the battery.
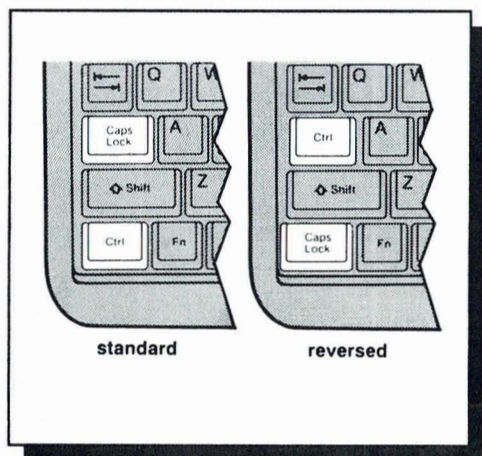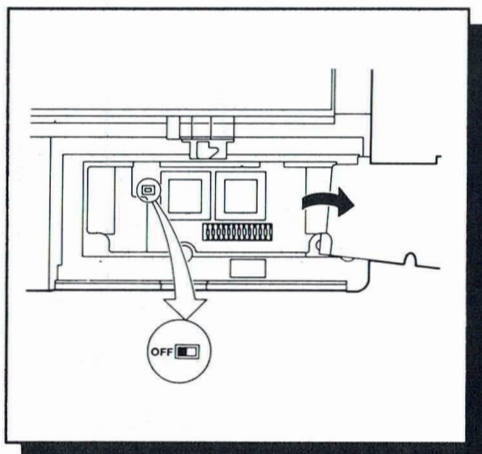
7. Remove the keytops by carefully prying up on the bottom edge of the keys. Then, reverse the keytops.

8. Turn on your computer.

standard   reversed

Numeric Keypad Area

The keyboard's numeric keypad area is similar to a calculator keyboard. Press **FN+KEY PAD** to use the keypad for extensive number entry; the KEYPAD indicators light green. If the NUM-LOCK indicator does not light, press **NUMLK**. The values of the keys on the numeric keypad are 0-9, decimal (.), plus (+), minus (–), multiplication (*), and division (/) as printed red on the keyboard. Press **FN+KEY PAD** again to return to the normal keyboard function.
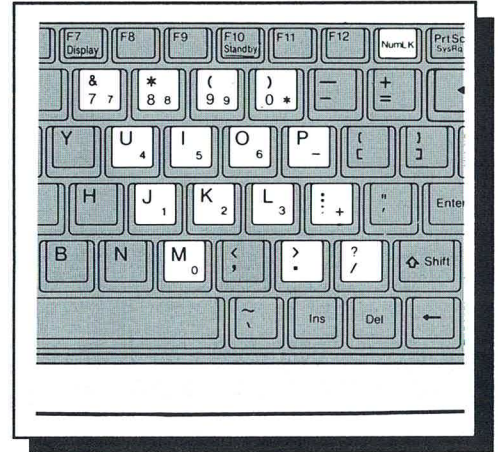
You can also use the keyboard's numeric keypad area to emulate other keypad functions of a 101-key keyboard. If you turn off the NUMLK indicator while the keypad is active, the numeric keypad area provides alternate cursor keys, **HOME**, **END**, **PGUP**, **PGDN**, **INS**, and **DEL**. Some programs require you to use the keypad area versions of these keys rather than the separately provided keys. See the diagram at right for the alternate functions. Press **NUMLK** to switch between numeric key entry and the alternate functions.
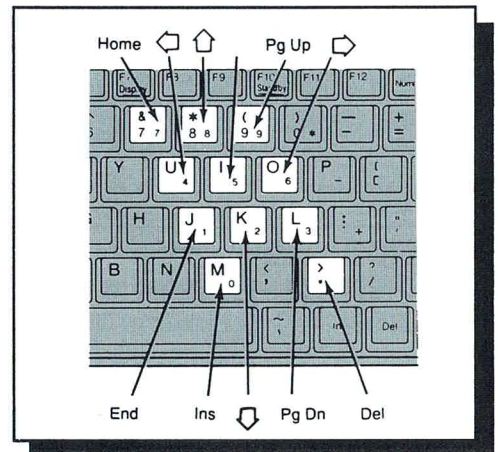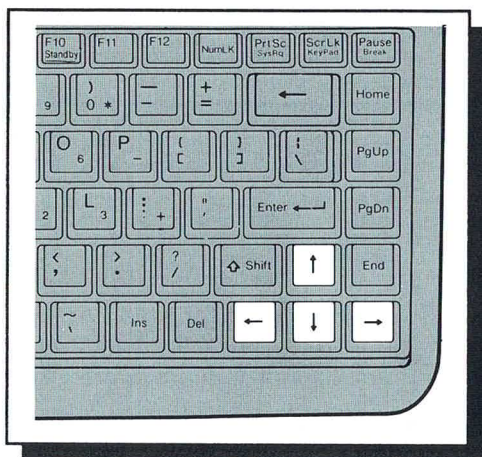
Arrow (Cursor) Keys

The arrow keys at the lower right of the keyboard move the cursor. Pressing an arrow key moves the cursor one position in the direction of the arrow. Holding down an arrow key repeats the action.

Note: In some programs, the arrow keys perform a separate function.

GETTING MORE

You can get even more from your computer by adding options such as a printer, mouse, fax, and modem. For example, you can add an optional printer to print copies of the documents that you create.

ADDING AND USING A PRINTER

You can connect a printer to your computer's parallel printer port.
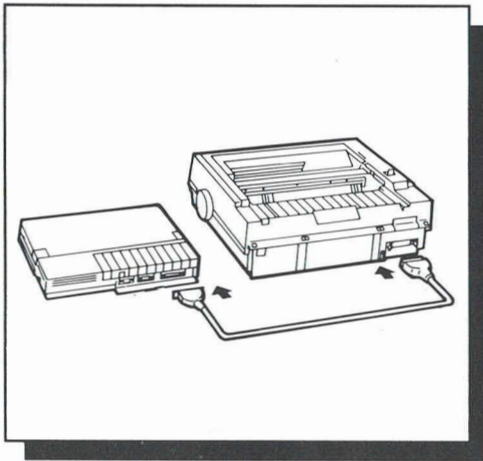
1. Prepare the printer for parallel operation according to its user's guide.

2. Turn off your computer.

3. Pull down the hinged cover for the serial/parallel/RGB port compartment.

4. Connect the printer cable's DB-25 connector to the connector in the port compartment labeled PARALLEL.

5. Connect the other end of the printer cable to the printer.

6. Turn on the computer first. Then, turn on the printer.

You can use the printer with most programs. Be sure the computer is set up to work with your printer. Check your program's documentation and your printer's user's guide for information on setting up and using your printer.

Note: To operate a printer with the computer, see "Changing Your Computer's Functions" in this manual for information about setting the computer's parallel port.

ADDING A MOUSE
OR OTHER SERIAL DEVICE

You can connect a serial mouse, fax, external modem, or other serial device to your computer's built-in serial port.

1. Prepare the serial device according to its user's guide.

2. Turn off your computer.

3. Press down the hinged cover to open the serial/parallel/RGB port compartment.

4. Connect your serial cable's DB-9 connector to the connector in the port compartment labeled SERIAL.

Note: To operate a serial device with the computer, see "Changing Your Computer's Functions" in this manual for information about setting the computer's serial port.
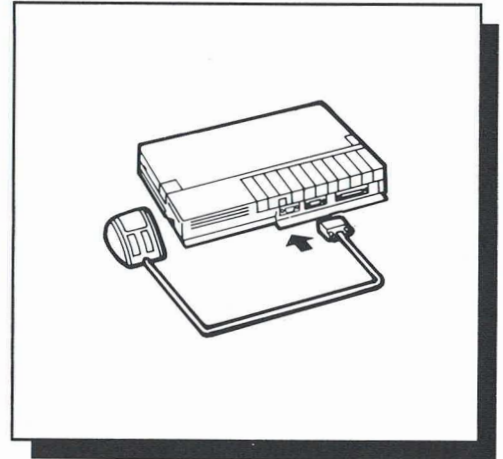
ADDING A VGA MONITOR

You can connect a VGA monitor to your computer's built in video port.

1. Prepare the monitor according to its user's guide.

2. Turn off your computer.

3. Pull down the hinged cover to open the serial/parallel/RGB port compartment.

4. Attach the monitor's cable connector to the connector in the port compartment labeled RGB.

Note: To operate an external VGA monitor with the computer, see "Power Management Key Combinations" in this manual for information about using an external video display.

ADDING AN EXTERNAL KEYBOARD

You can connect an external keyboard to your computer's built-in external keyboard port.

1. Prepare the keyboard according to its user's guide.

2. Turn off your computer.

3. Connect the Mini-Din keyboard's connector to the connector on the computer's left side labeled EXT.KB.

Note: Both the computer's keyboard and an external keyboard can be used at the same time with the computer.
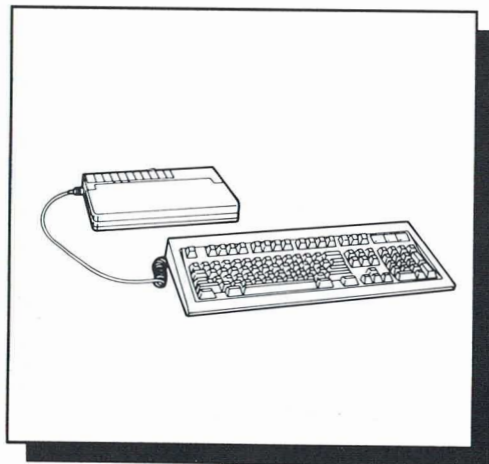
ADDING AN INTERNAL MODEM

You can install a 2400 Baud internal modem (Cat. No. 25-3525) in your computer. Refer to the modem's manual for installation instructions.

Caution: Before installing or removing a modem, turn off your computer and disconnect the AC adapter. Installing or removing a modem with the power turned on can damage the modem and your computer.

ADDING A MATH COPROCESSOR

Graphical design programs or programs that perform a large number of mathematical computations require your computer to do a lot of work. These types of programs can take additional time to run unless you have a math coprocessor in your computer. A coprocessor allows your computer to run these types of programs much faster.

Cautions:

- Once the math coprocessor is installed, you should use a special chip extraction tool if you want to remove the coprocessor. Be sure to correctly position the math coprocessor.

- Be sure you touch a grounded metal object before handling the coprocessor.

To install a coprocessor, use the following steps:

1. Exit any program you might be in and turn off your computer.

2. Remove the battery.

3. Remove the two screws from the compartment cover.

4. Orient the math coprocessor as shown in the socket. Use the small hole on the chip's top surface and the slanted corner as guides.

5. Press down the math coprocessor until it snaps into place.

6. Replace the compartment cover, and reinstall the battery.

7. Turn on your computer.
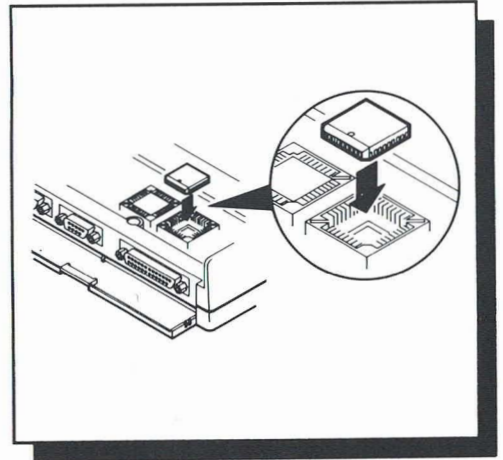
ADDING INTERNAL 1MB RAM CARDS

The RAM card (Cat. No. 25-3507) expands the computer's memory by using single inline memory modules (SIMMs®). Although the computer has 1MB of memory installed, you can expand the memory by 2MB for a total of 3MB. Or you can add 4MB for a total of 5MB.

The computer is equipped with 640KB of conventional memory and 384KB of extended or shadow RAM. Depending on the requirements of the operating system and the programs you are running, you can configure the additional memory either as expanded memory or as extended RAM. You must set aside 128KB as shadow RAM using a software driver (TEMM2810.SYS) to configure the memory as expanded memory.

Cautions:

- Use only the specified RAM card (Cat. No. 25-3507) with your computer.

- Do not drop foreign materials such as a paper clip into the opening. A short circuit can seriously damage your computer.

To install a RAM card, use the following procedure:

1. Disable the computer's Resume function (See "Changing Your Computer's Functions" in this manual), and turn off the power.

2. Find the compartment cover near the top row of keys. Then, lift up on the front edge of the cover.

3. Install a RAM card into a slot by tilting the board away from you. Then, tilt the board back towards you until it snaps into position.

4. To install an additional 2MB of memory, plug RAM cards into slots CN1 and CN2. To install 4MB of memory, plug RAM cards into slots CN1, CN2, CN3, and CN4.

5. Replace the cover. Then, turn on the computer.

6. Install the temm2810.sys file device driver using the MS-DOS Edlin command or some other text editor to place the following line in the config.sys file.

```
device=c:\dos\temm2810.sys /M:n
```

The amount of memory (RAM) you specify in the /M:n parameter of the device driver depends on the amount of extended RAM available in your computer.

The following table shows the total amounts of extended RAM, Shadow RAM, or expanded RAM, depending on the total amount of RAM installed in your computer. You can specify the device driver's memory size up to the amount of extended RAM shown in the table.

Note: Enabling and disabling the Shadow RAM in the Setup program affects the amount of extended RAM you can specify in the device driver. See "Changing Your Computer's Functions" in this manual.

Total RAM	Extended RAM	Shadow RAM Size	Max. RAM Available For Expanded Memory	Shadow RAM
1MB	384KB	0	384KB	Disabled
1MB	0	128KB	256KB	Enabled
3MB	2432KB	0	2432KB	Disabled
3MB	2048KB	128KB	2304KB	Enabled
5MB	4480KB	0	4480KB	Disabled
5MB	4095KB	128KB	4352KB	Enabled

ADDING A DISK DRIVE

You can connect a floppy disk drive to your computer's parallel port. Refer to the floppy disk drive's manual for installation instructions.

Note: To operate a disk drive with the computer, see "Changing Your Computer's Functions" in this manual for information about setting the computer's parallel port (Setup program).
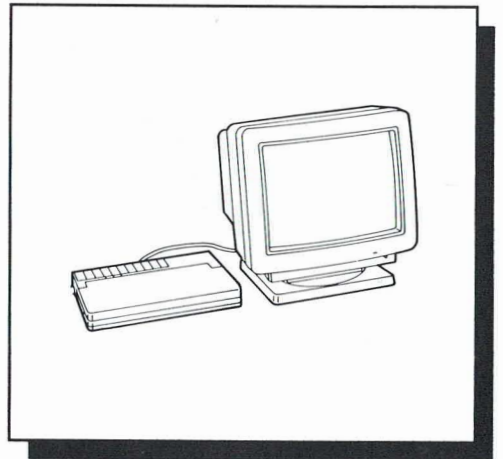
1. Prepare the disk drive according to its user's guide.

2. Turn off your computer.

3. Pull down the hinged cover for the serial/parallel/RGB port compartment.

4. Connect the disk drive's cable to the connector in the port compartment labeled PARALLEL.

   Note: Use only the cable supplied with the disk drive.

5. Connect the other end of the disk drive's cable to the disk drive.

6. Follow the power-up instructions for the disk drive. The instructions might ask you to turn on the disk drive before you turn on the computer.

Check your disk drive's user's guide for information on setting up and using your disk drive.

CHANGING YOUR COMPUTER'S FUNCTIONS

INTRODUCTION

Your Tandy 2810 HD computer comes with two programs and various key combinations that let you control some of the computer's parameters and let you set the computer to use less power when you use battery power. The programs are called *Setup281* and *Power281*.

System parameters you can control include parallel port mode, serial ports enable and disable, serial port address selection, video selections, speaker enable and disable, CPU speed, Num Lock Light default, Automatic Floppy Disk Standby, cursor type, shadow RAM enable and disable, the start-up program (MS-DOS or DeskMate) options, and date/time settings.

The power management parameters let you set the hard drive and display to automatically turn off after a selected number of minutes of inactivity. Of course, the hard drive and display turn on again whenever they are needed. You can also set the Standby mode to automatically activate when there is no disk drive, port, and display activity. See "Parameter Defaults and Descriptions" in this manual.

The Setup281 program lets you select system and power parameters, and store the parameters you select in memory. The computer uses these parameters each time you start it up. Whenever you use the Setup program, you must restart the computer to initialize the new parameters.

The Setup281 parameters are arranged in the following groups:

- **Date and Time**—These parameters allow you to set the DOS date and time.

- **Startup**—These parameters allow you to choose some of the internal settings that activate when you turn on your computer. You can use this group of parameters to select the initial program to run, the computer's speed (fast or slow), and the Shadow RAM.

- **Communications**—These parameters allow you to turn the serial ports on and off, and to set the parallel port to operate with an external printer or diskette drive.

- **Video/Speaker**—These parameters allow you to select the type of video monitor emulation and the type of cursor you want to use with your computer. You can also turn the computer's speaker on and off.

- **Power**—These parameters allow you to turn some of the computer's power saving options on and off, such as the computer's low-power *management* parameter, the floppy disk standby parameter, and the Resume mode. You can also turn on and off the VRAM Timeout feature.

- **Timeouts**—These parameters allow you to save additional battery power by instructing the computer to automatically turn off the display or hard drive if you are not using the computer for a specified period of time.

The Power281 program lets you temporarily change the power-management parameters without restarting the computer. However, changes you make using this program are not stored in memory, and when you restart the computer, it returns to the parameters you stored using the Setup281 program.

You can run Setup and Power from DeskMate or MS-DOS. In both cases, you select parameters from easy-to-use menus.

PARAMETER DEFAULTS AND DESCRIPTIONS

Now that you understand the basics of the Setup and Power programs, use the following information and procedures to set the 2810 HD to work the way you want it to.

The following chart lists the parameters that are set at the factory. After the chart are brief descriptions of each parameter.

Time and Date	Valid Time and Date
Program	DeskMate
Num Lock Light	On
CPU speed	Fast
Shadow RAM	Yes
Serial Ports	Enable
Serial Addresses	Normal
Parallel Port	Printer
Bidirectional Parallel Port	Yes
Video Mode	VGA
Monitor	LCD Color
Cursor Type	Line
Speaker	On
Power Management	Off
Resume Mode	Off
FDC Standby	On
Standby Mode Timeout	8 minutes
Hard Disk Timeout	2 minutes
Display Timeout	4 minutes
VRAM Timeout	Enabled
Suspend Mode	0 minutes

Time and Date—This parameter lets you set the computer's time and date for DeskMate and MS-DOS.

Start-up Program—Choose the startup program. For example, you can begin using DeskMate when you turn on your computer, or switch to MS-DOS.

Num Lock Light—This parameter allows you set the NumLK indicator to automatically turn on when you turn on the computer.

CPU Speed—This parameter lets you select your computer's speed. You can choose 16MHz (fast) or 8MHz (slow) to operate your computer.

Shadow RAM—Assign the shadow RAM. You can select the 384K shadow RAM to remain as shadow RAM or assign it as extended memory.

Serial Ports—This parameter lets you turn the COM1 and COM2 external serial ports on or off.

Serial Port Address—Assign the serial ports addresses. You assign either the normal addresses, or you can swap the addresses of the serial ports. The default settings assign COM1 as a mouse port and COM2 as a modem port.

Parallel Port—This parameter lets you choose from a pair of peripherals to use with the parallel port. Assign a printer or diskette drive to be connected to the parallel port.

> **Bidirectional Parallel Port**—This parameter allows you to set the parallel port for bidirectional or unidirectional operation. You select Yes or No if a printer is connected to the parallel port. See the "Parallel Port" parameter above.

> **Parallel Port Drive Selector**—If you select "floppy" as a parallel port peripheral, you can assign Drive A or Drive B in 360KB, 720KB, 1.2MB, or 1.44MB storage volumes using a 3 1/2-inch or 5 1/4-inch external drive. If you assign the external drive as Drive A, the computer automatically reassigns the internal diskette drive as Drive B.

Video Mode—Use this parameter to select the video mode VGA, CGA, EGA, or MDA for the computer's LCD display, or for an external monitor. Select the video mode specified by the program you are running.

Monitor—Use this parameter to choose the display you want to use. You can select the computer's display panel or an external monitor.

Cursor Type—Select a cursor type you prefer. You can choose a line or block style cursor.

Speaker—This parameter allows you to turn on and turn off the computer's speaker.

Power Management—Using this parameter saves battery power by operating the computer at 2MHz when there is no keyboard or disk activity.

Note: The computer might require more time to complete some operations, such as large spreadsheets, when Power Management instructs the computer to operate at 2MHz. To operate the computer fast (16MHz) or slow (8MHz), turn off the Power Management parameter in the Setup program. See "Changing Your Computer's Functions" in this manual.

Resume Mode—Using this parameter tells the computer to remember the point in the program you are at, in case the battery discharges. When you turn the power on again, the program reappears and continues running where it left off.

Suspend Mode—This parameter tells your computer to turn its power off and enter the Resume mode after a specified time period of serial port, hard disk, and screen inactivity. The Resume mode option must be turned on to enable the Suspend mode.

FDC Standby Mode—Enabling this option tells your computer to turn off the floppy disk controller when the diskette is not being accessed. You can turn off the diskette drive to conserve battery power.

Standby Timeout—Select the number of minutes of system inactivity before the display and hard drive turn off. This parameter operates only when the computer uses battery power. Press any key to turn on the computer's hardware.

Display Timeout—Use these selections to set the number of minutes of keyboard and display inactivity before the display turns off. Your computer turns off the display after 1–16 minutes. The display stays on if you select no timeout. This parameter operates only when the computer uses battery power.

Hard Disk Timeout—Select the number of minutes of hard disk inactivity before the hard disk turns off. You can timeout the hard disk after 15 seconds or 30 seconds. Or you can set the timeout for 1, 2, 4, 8, or 16 minutes. The hard disk stays on if you choose no timeout. This parameter operates only when the computer uses battery power.

Disable VRAM Timeout—You can activate (disable) this option by placing an x in the checkbox if you want the power management functions to turn off the display when there is no keyboard activity, regardless of display activity. Enabling this option by not activating the checkbox prevents the display from turning off when you run programs that require you to use a mouse instead of the keyboard, or if you run programs that update the display without you having to press keys.

USING THE SETUP PROGRAM IN DESKMATE

To run the Setup program from DeskMate, do the following:

1. Use the arrow keys to select the Setup icon. Then, press **ENTER**.

   The Setup program menu appears.
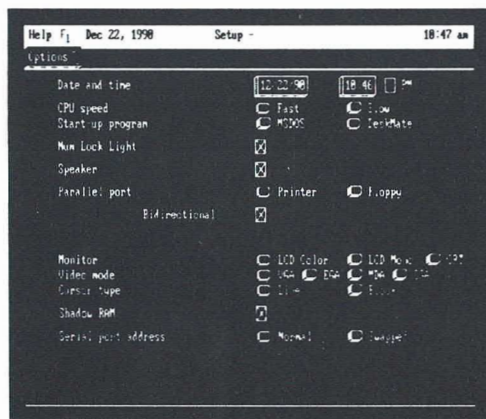
2. To change Setup program parameters, do the following:

   A. Use the arrow keys to select the parameter you want to change.

   B. Use the spacebar to *press* a button.

   Note: Some parameters are shown with a box. When you select these parameters with the spacebar, x appears in the boxes.

```
Help  F₁    Dec 22, 1990              Setup -
Options =₂
     Save
     Power management...                        ▣12
     Factory settings                            ▢
     Exit                    Esc                  ◉
     Run...                                      ⊠
     About...                                    ⊠
          Parallel port                          ▢
                    Bidirectional                ⊠
                    Diskette drive               ▣
          Monitor                                ▢
          W:J.. __J.                              ◠
```
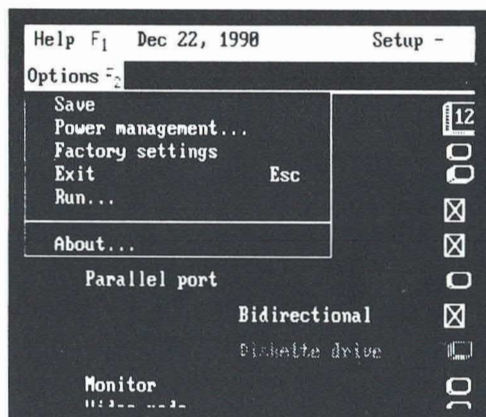
3. After you have made the desired changes, press F2. The options menu appears.

4. Use the arrow keys to highlight one of the following options:

   Save—Press ENTER to save the changes. The options menu disappears.

   Power Management—Press ENTER to display the power-management parameters. After you make changes, select OK or CANCEL with the arrow keys. Then, press ENTER.

   Factory Settings—Press ENTER twice to restore the default settings.

   Exit/Esc—Press ENTER to exit Setup if you made no changes. If you made changes to the parameters, a dialog box appears.

```
                           ▢ Fast        ▢ S
gram                       ▢ MSDOS       ▢ D
ht                             ▢
     ▒▒▒▒▒▒▒ Save Changes ▒▒▒▒▒▒▒
t    Save changes?                        F

                                          ▏

     ┌─────┐   ┌─────┐   ┌────────┐        L
     │ YES │   │ NO  │   │ CANCEL │        M
     └─────┘   └─────┘   └────────┘
                           ▢ Line        ▢ B
                    ⊠
_JJ.___            ◠ N___.J      ◠ S
```
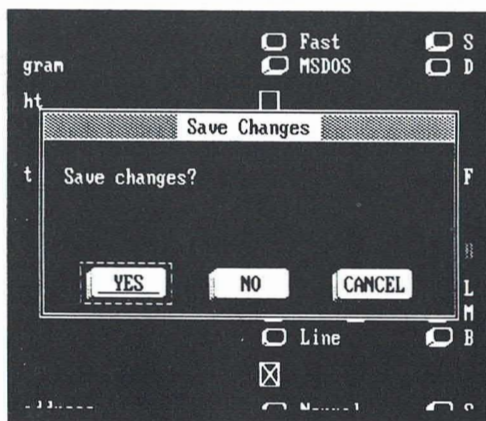
Use the arrow keys to select the option you want to activate. The options help you confirm whether or not you want to save the changes before the desktop screen reappears. You may also void the exit command and return to the Setup screen.

Choose one of the following options for your changes in the Exit/Esc command:

Yes—Use this option to save the changes. The desktop screen appears after you press ENTER.

No—Use this option to not save your changes. The desktop screen appears after you press ENTER and the previous settings remain in effect.

Cancel—Use this option to return to the Setup screen. When you press ENTER, your changes are displayed but not saved. Go back to Step 2 for information on changing the parameters.

Rebooting Your Computer

Use the following steps to activate the Setup changes:

1. Exit from DeskMate so that the MS-DOS prompt appears.

2. Press CTRL+ALT+DEL to reset your computer, or use the reset switch on the computer's left side.

> **Note:** You must exit DeskMate and reboot your computer for any changes to take effect and be stored in the computer's memory.

Other Setup Options

The options menu in Setup has two other choices you can choose from. The selections are named Run and About. The Run option lets you directly exit Setup and begin running an MS-DOS or DeskMate program from DeskMate. When you exit the specified program, the desktop screen reappears.

You can also use the About option. When you choose this option, a dialog box appears with a list of supporting programs and copyright information.

USING THE POWER PROGRAM IN DESKMATE

You can change several of the computer's power parameters by running the Power program from DeskMate. The Power program temporarily overrides the Setup program's power-management parameters.

The Power program lets you:

Enable and disable the Power Management

- Enable and disable the FDC Standby

- Enable and disable the Serial Ports

- Enable and disable the Resume Mode

- Enable and disable the Disable VRAM Timeout

- Enable and disable the Standby Timeout

- Set the Display Timeout

- Set the Hard Disk Timeout

- Set the Suspend Timeout

Notes:

- The changes you make using the Power program are immediately active.

- The changes you make using the Power program are lost when you turn off your computer.

- When you turn on your computer again, it returns to the Setup parameters.

To run the Power program, follow these steps:

1. Use the arrow keys to select the Power icon.

   Press **ENTER**. The Power Program menu appears.
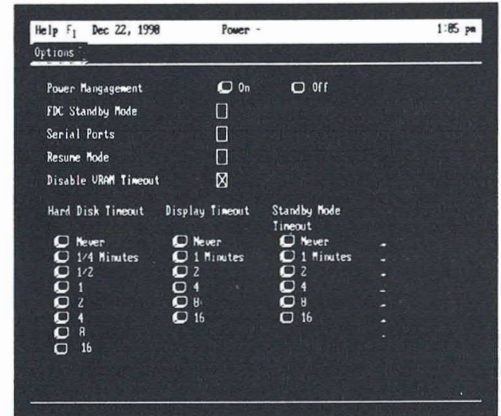
2. Use the arrow keys to select the parameter. Then, use the spacebar to *press* the desired button.

   Notes:

- When you select FDC Standby Mode, Serial Ports, Resume Mode, and Disable VRAM Timeout, x appears in the boxes.

- When you select Hard Disk Timeout, Display Timeout, Standby Mode, and Suspended Mode parameters, you can use the spacebar to choose the timeout you want.

3. When you have selected the desired parameters, press **F2**—the options menu appears. Use the arrow keys to select one of the following options:

   Save—Press **ENTER** to immediately activate the parameters you selected.

   Exit/Esc—Press **ENTER** to exit the Power program and return to the previous parameters. If you selected changes on the Power menu, an additional dialog box appears to give you one more chance to accept or reject the changes.

Other Power Options

The options menu in Power has two other choices you can choose from. The selections are named Run and About. The Run option lets you directly exit and begin running an MS-DOS or DeskMate program from DeskMate. When you exit the specified program, the desktop screen reappears.

You can also use the About option. When you choose this option, a dialog box appears with a list of supporting programs and copyright information.

USING THE SETUP PROGRAM IN DOS

The Setup Program in DOS is for you to use when you are not using DeskMate. The DOS version lets you change identical startup and power-management parameters that you are used to using in DeskMate. The DOS program is *Setup281*.

You use a different screen format in Setup281 when you change parameters. Changes you make to the parameters are done by using the arrow keys. You can use the commands at the bottom of the screen to easily select and change the parameters.

System Parameters

The Startup parameters allow you to select internal programs to automatically run when you turn on your computer.

The Startup parameters let you:

- Set the system date and time
- Select the initial startup program
- Enable and disable the Num Lock Light on startup
- Enable and disable the Shadow RAM
- Enable and disable the serial ports
- Select the serial port addresses
- Select the parallel port device and mode
- Select the video monitor type
- Select the video mode
- Select the cursor type
- Enable and disable the speaker
- Select the CPU speed

Power Management Parameters

The power management section can save battery power by automatically turning off hardware, such as the disk drives and the display, when you are not using your computer.

The power management section lets you :

- Enable and disable the Power Management

- Enable and disable the Resume Mode

- Enable and disable the Floppy Standby

- Enable and disable the VRAM Timeout

- Select the Suspend Mode Timeout

- Select the Standby Mode Timeout

- Select the Display Timeout

- Select the Hard Drive Timeout

To run the Setup program in DOS, use the following steps:

1. Exit from DeskMate (or any other program).

2. If you are not in Drive C, type:

   c: **ENTER**

3. Select the DOS directory by typing:

   cd dos **ENTER**

4. At the MS-DOS prompt, type:

   setup281 **ENTER**

   The Setup program screen appears.

```
              TANDY SETUP PROGRAM

                 TANDY 2810 HD

 ┌─────────────┐ ┌─────────────┐ ┌──────────────┐
 │ Date & Time │ │  Start up   │ │Communications│
 └─────────────┘ └─────────────┘ └──────────────┘
                 Program   [DeskMate]  Serial Ports [Enabled ]
 Date [12 21 1990] Num Lock Light [ON ]  Addresses  [Normal ]
 Time [13 54 42]  CPU Speed    [Fast]  Parallel Port [Printer]
                 Shadow RAM    [YES]   Bidirection   [YES]

 ┌─────────────┐ ┌─────────────┐ ┌──────────────┐
 │Video Speaker│ │    Power    │ │   Timeouts   │
 └─────────────┘ └─────────────┘ └──────────────┘
 Mode     [VGA]  Management   [ON ] Suspend Mode [00] Minutes
 Monitor [LCD COLOR] Resume Mode [OFF] Standby Mode [00] Minutes
 Cursor Type [Line ] Floppy Standby [ON ] Display   [04] Minutes
 Speaker   [ON ] VRAM Timeout [Disabled] Hard Drive [ 02] Minutes

 <ESC> Exit to DOS without saving setup   <CTRL-BRK> Reboot without saving
 <F1> Help for option that cursor is on  <SPACE> Toggles options
 <F2> Save setup and exit                <ARROW> Moves to next option
```

5. Use the up and down arrows to select the parameter you want and press the right and left arrow keys to choose the setting.

6. Press F2 if you want to save your changes .

• If you do not want to save changes, press **ESC**.

Note: You must exit DeskMate and reboot your computer for any changes to take effect and be stored in the computer's memory.

USING THE POWER PROGRAM IN DOS

You can change several of the computer's parameters by using the Power program in DOS within the DOS directory. The DOS program is *Power281*.

To run the Power program, use the following steps:

1. Exit from DeskMate (or any other program).

2. If you are not in Drive C, type:

   C: **ENTER**
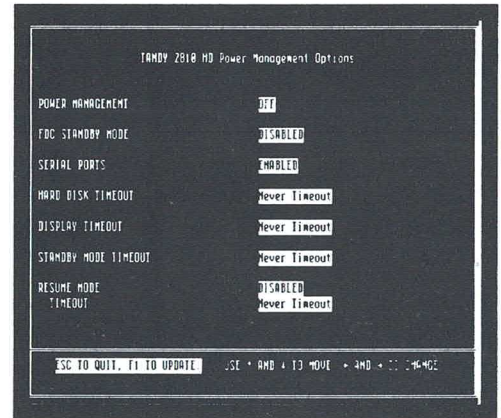
3. Select the DOS directory by typing:

   cd dos **ENTER**

4. At the prompt, type:

`power281` **ENTER**

The Power program screen appears.

Use the up and down arrows to select the parameter you want to change. Then, press the left and right arrows to select the setting for the parameter.

5. Press **F1** to save your changes.

• If you do not want to save changes, press **ESC**.

POWER MANAGEMENT
KEY COMBINATIONS

There are also some key combinations, using the keys labeled in blue, that can help you to save power as you use your computer. These key combinations override the Setup program and Power program parameters.

FN+F1 (Reverse)

With this key combination you can vary the contrast of characters and the background. Choose the setting best suited to your needs.

FN+F2 (Video)

This key combination allows you to switch between the computer's display panel and an external video display. You cannot use both displays at the same time.

FN+F3 (Speed)

You can press this key combination to select the computer's speed (16MHz or 8MHz). The power indicator lights orange when you select 8MHz.

FN+F4 (Disk)

This key combination causes the hard disk controller to turn off until accessed. No special keystrokes or commands are needed to turn the disk controller on again.

FN+F5 (Spkr)

This key combination enables and disables the speaker.

FN+F7 (Display)

You can press this key combination to turn off the backlight and the LCD. Any keyboard entry you make turns the backlight and the LCD back on. You cannot use this key combination to turn off an external video display.

FN+F8 (Serial)

This key combination enables and disables the serial ports. Both serial ports are turned on until you press the key combination.

FN+F10 (Standby)

This key combination puts the computer in a standby mode. The hard disk, LCD, backlight, and floppy disk controller are turned off until you make a keyboard entry.

USING MS-DOS

ENTERING MS-DOS COMMANDS

MS-DOS is a group of programs that manages your computer's operations and conveys your instructions to the computer. How much you need to know about the MS-DOS operating system depends on how you plan to use your computer. If you use your computer only for running programs such as DeskMate, your program can teach you almost everything you need to know to operate your computer.

On the other hand, if you plan to use advanced operating system features or create your own programs, you need to become quite familiar with the MS-DOS operating system.

If your computer system includes options such as a modem, you need to learn about those MS-DOS command features that you use with those options.

You type MS-DOS instructions, or commands, at the system prompt (C> or A>), which tells you that MS-DOS is ready to accept commands.

You must enter MS-DOS commands exactly as given. Your computer carries out MS-DOS commands exactly as you enter them. If you mistype a command, MS-DOS gives you an error message.

You can type your instructions to MS-DOS in either uppercase or lowercase letters. However, do not use substitute characters on the computer's keyboard as you might on a standard typewriter's keyboard. For example, do not type the letter O for the number 0, or the letter I for the number 1.

MS-DOS ON-LINE HELP

Your 2810 HD MS-DOS system has a Help file that lets you see on-line information about DOS commands. You can view the Topic menu that lists the DOS commands you can learn about in Help.

To enter the Help file from the DOS directory prompt, type :

help **ENTER**

The DOS Topic menu appears.
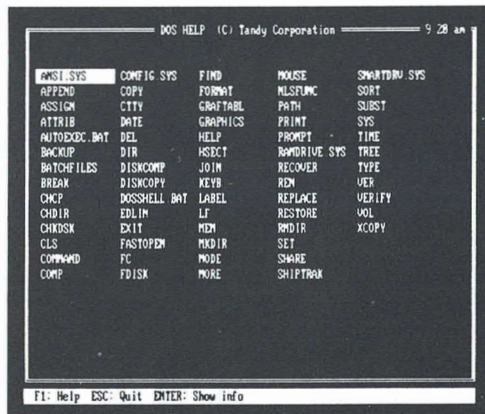
The menu bar at the bottom of the screen displays the commands you can use to get information on a topic.

* Press **F1** for information about how to to use the Help file.

* Press **ESC** to exit the Topic menu and return to the DOS prompt.

* Press **ENTER** to see information about the highlighted DOS command.

Use the cursor to select the information you want from the Topic Menu. For example, you can request information about the DOS Append command using these steps:

1. Use the cursor keys to select the topic you want specific information about.

2. Press **ENTER**.

   The topic text appears on the screen.

The command menu at the bottom of the screen tells you how to display other information or print text.

- Press **ALT+P** to print information about DOS commands

- Press **ALT+T** to return to the Topic menu

- Press **ESC** to exit the Help file

- Press **F1** for information about how to use the Help file.

Note: You can skip the Topic menu and go directly to the information you need. For example, you can get information about the MS-DOS Append command by typing the following at the C:\DOS> prompt:

help append **ENTER**

USING THE MS-DOS SHELL

MS-DOS Shell is a graphics oriented program inside MS-DOS that helps you to run programs and use MS-DOS commands. You can choose from menus by using either the keyboard or a mouse. Choosing a command is easy because you can activate the programs with the cursor and press ENTER.

The Shell uses a primary screen to help you organize your programs and use your directories and files. These screens are called *Start Programs*. You use Start Programs to organize programs, change screen colors, use the MS-DOS command prompt, and to work with files and directories.

To enter the MS-DOS Shell program, type:

dosshell ENTER

The Start Programs screen appears.
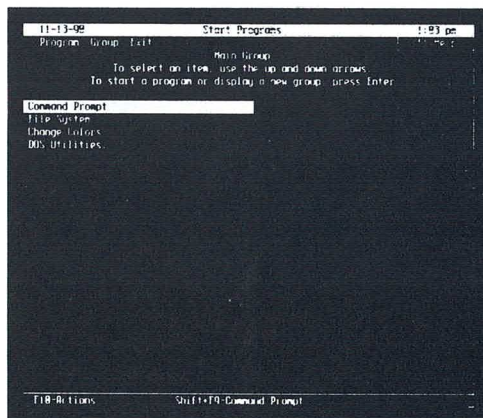
Note: You can add this command to your autoexec.bat file if you want to load the Shell everytime you turn on your computer.

The Start Programs screen displays the Main Group menu you use—Command Prompt, File System, Change Colors, and DOS Utilities.

Command Prompt—lets you access the DOS directory. At the DOS prompt, you can use all the standard DOS commands.

File System—Displays a list of the files in the current directory. This screen allows you to look at, print, rename, and delete files. You can also move files to directories you choose.

Change Colors—Lets you choose from four color schemes to use in your current session.

DOS Utilities—lets you use a group of frequently used DOS commands to change the date and time, format disks, and back up and restore disk files.

Note: For information about a highlighted topic, press **F1**. A Help dialog box displays help information about the highlighted topic or command. The dialog box menu allows you to:

• Exit the Help function

• See more information about Help

• Choose from a Shell topic index

• See information about keys you can use in the Shell

For more information about MS-DOS Shell, refer to the *Tandy MS-DOS User's Guide, Version 4.01* available at your nearby Radio Shack Computer Center.

ABOUT THE DRIVES

The Tandy 2810 HD has an internal floppy diskette drive and a hard disk drive. You can start the operating system and most application programs either from the hard disk or a diskette.

The hard disk drive is called Drive C, and can store 20 million bytes (20MB) of data. The hard disk can store much more information than a floppy disk, and it takes less time to find information on a hard disk than on a floppy disk.

When you store programs (such as MS-DOS) and other information on a hard disk, we recommend that you keep backup copies of the programs and data on a floppy disk. This prevents the loss of all your programs and data even if the hard disk is accidentally damaged.

The diskette drive is called Drive A, and uses 3 ½-inch floppy diskettes. You can use either high-density diskettes that store 1.44MB of data (Cat. No. 26-423), or double-density diskettes that store 720KB of data (Cat. No. 26-417).

USING THE HARD DISK

You seldom need to use your diskette drive except for copying files and making backups of hard disk files. You also can use this disk drive to copy your application programs to the hard disk.

BACKING UP YOUR HARD DISK

Making backups of hard disk files is extremely important. Because the storage capacity of a hard disk is so much greater, loss of data can result in the loss of thousands of hours of work.

You can use the BACKUP command to make copies of one or more directories or of the entire hard disk. For example, if you have a subdirectory named Mystuff in the root directory of your hard disk, you can use BACKUP to copy it to a diskette. With a formatted diskette in Drive A, type:

```
backup c:\mystuff a: /s ENTER
```

Note: Unless you specify otherwise, using this method causes MS-DOS to erase any files currently on the diskette used for the hard disk backup. Be sure that you are using a newly formatted diskette or a diskette containing files you do not want to keep.

To accomplish the same backup without erasing files currently on the diskette, add the /a switch to the command. The /a switch causes the BACKUP command to add the new files to any existing files on the diskette. In MS-DOS, a switch is always preceded by a slash (/) symbol. The same command with the /a switch is:

```
backup c:\mystuff a: /s/a ENTER
```

The /s switch, used in the previous command, instructs MS-DOS to back up all the files in a directory and all the directories and files that branch from that specified directory.

You can use the BACKUP command with the /s switch to back up the entire hard disk to diskettes. Before using this command, use the FORMAT command to prepare enough diskettes to hold all the files you want to back up. To back up everything on Drive C, type:

```
backup c:\ a: /s ENTER
```

The backward slash (\) is an abbreviation for the root directory of any disk. This command line instructs MS-DOS to copy all files from the root directory of Drive C (the hard disk) to the diskette in drive A. Because all directories branch from the root directory, BACKUP copies all the files in all the disk directories. For more information on BACKUP and its switches, see BACKUP in the *MS-DOS Quick Reference* manual.

RESTORING BACKUPS
TO YOUR HARD DISK

Use the RESTORE command to copy one or more backed up directories from diskette to hard disk. Use RESTORE only for those directories that were copied to diskette with the BACK-UP command.

To restore the directory Mystuff from the diskette in Drive A back to the hard disk (Drive C), type:

> restore a: c:\mystuff*.* /s ENTER

To restore all the files that were backed up from all directories of Drive C, insert the first backup diskette into Drive A and type:

> restore a: c: /s ENTER

The /s switch instructs MS-DOS to copy all files and directories that were saved on diskettes with the BACKUP command. If the backup required more than one diskette, you will be prompted to change diskettes during the restore procedure.

For more information on RESTORE and its options, see the *MS-DOS Quick Reference* manual available at a nearby Radio Shack Computer Center.

Caution: The HDD indicator lights whenever the computer accesses the hard disk. Do not turn off the computer when the HDD indication is on. The data on the hard disk can be lost or distorted.

WRITE PROTECTION

Diskettes have a special safety feature that protects recorded information from being altered. This special feature is a write-protect window.

To write-protect your diskette, slide the cover up to open the write-protect window.

To be able to edit and store information on your diskette, close the write-protect window.

Note: This write-protection feature does not prevent the information on the diskette from being lost from exposure to a magnetic field or a bulk diskette eraser.
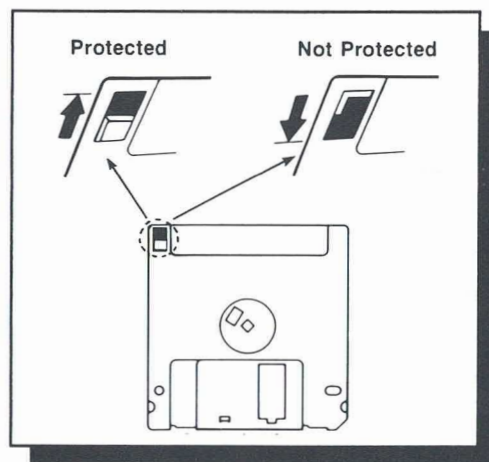
HOW MS-DOS STORES INFORMATION

If you want to learn more about how your operating system works, you need to know how MS-DOS organizes and stores information.

About Files

Your computer stores all information on the diskette in files. A file is a collection of information. These are the main types of files:

- *System files* contain operating system information that manages the computer's operations.

- *Program files* contain information that causes the computer to perform a task or set of tasks.

- *Data files* contain information you enter, such as the documents and spreadsheets you create with software.

About Directories

All files on a diskette reside in directories. A directory is simply a storage space for your files. When you format a diskette, you create one directory called the root directory. On your MS-DOS system disk, the root directory contains all command and system files. When you start up your computer using MS-DOS, you are automatically in (operating from) the root directory.

You can create other directories using the *md* command. The new directory is a subdirectory of the directory you are in when you create the directory. For instance, if you created a subdirectory named Documnts, it would reside in the root directory, and your disk organization would look like this:

```
Root directory
    |___Documnts
```

You can now store files in the Documnts subdirectory. If you change your current directory to the Documnts directory using the *cd* command, then make two more subdirectories called Letters and Invoices, your directory would look like:

```
Root directory
    |___Documnts
         |_____Letters
         |_____Invoices
```

In each subdirectory you can save files with related information. For example, save your correspondences in the Letters subdirectory of Documnts and invoices in the Invoices subdirectory of Documnts.

Your computer uses a shorter way of referring to subdirectories and files. The computer always refers to the root directory as \. Your computer refers to files and subdirectories of the root directory as that directory or file's name, preceded by \. In the above example, we would refer to the Documnts directory as \Documnts. To refer to the next level of subdirectory or a file in \Documnts, add a \, then the name of the file or subdirectory. For example, your reference is \Documnts\Letters.

There is nothing wrong with storing all your files in the root directory. Doing so makes it easy to access them, because you are always in the same directory as your files. However, dividing your files into multiple directories makes it easy to keep your files organized when you have several files, or if other people are using the same disk.

About Filenames

Following is a complete list of acceptable characters for filenames:

• Uppercase letters A through Z

• Lowercase letters a through z

• Decimal digits 0-9

• Symbols $ & # % ' ( ) @ – { } ! _~'

When creating filenames and subdirectory names, do not use more than eight characters. MS-DOS ignores any characters after the eighth. For example, MS-DOS regards both Accounts1 and Accounts2 as Accounts. If you save both files, MS-DOS writes over the first file with the second, destroying the first file. Also, MS-DOS does not distinguish between upper and lowercase letters.

Other than the ones listed above, you cannot use symbols in filenames. There are also a few special words (MS-DOS device names) that you cannot use. These are:

aux	com1	com2	com3
con	lpt1	lpt2	com4
lpt3	nul	prn	lst

Filename Extensions

Any filename can contain an extension, which further identifies the file. An extension appears at the end of a filename, preceded by a period.

Note: Directory extensions are not normally used because they can appear as a filename to an unknowing user.

Extensions can have up to three characters and can include the same characters allowed in filenames. If you attempt to give extensions more than three characters, MS-DOS uses only the first three.

If you include an extension in a filename, you must use that extension whenever you specify the file.

Note: Some programs automatically assign an extension to your filename.

Examples of valid filenames are:

mydatal	SAMPLE
1.TST	$100GIFT
records.art	'HELP'.fil
XXX.XX	File#1.txt
10%SALES	par@64.gam
PROG1.BAS	Check.bal
PROG2.bas	myprog.sor

Examples of invalid filenames are:

his*hers—The asterisk is not a valid character for filenames.

.DATA—The period is valid in a filename only when separating the filename from its extension.

regionsales—Filenames have a maximum of eight characters. MS-DOS uses only the first eight characters of the filename (regionsa).

COST+INT—The plus symbol is not a valid character for filenames.

CON.dat—CON is a word reserved by MS-DOS.

MORE ABOUT MS-DOS COMMANDS AND KEYS

The MS-DOS operating system includes both internal and external commands. MS-DOS stores its internal commands in memory when you startup your computer. Internal commands remain in memory at all times. These commands execute immediately when you enter them. COPY and DIR are examples of internal MS-DOS commands.

External MS-DOS commands are stored on the hard drive or diskettes as program files. When you enter an external command, MS-DOS searches for the command on the diskette and, if the command is found, executes it. Because all MS-DOS commands are stored on the 2810 HD's hard drive, you do not have to insert a diskette to access these external commands.

Typing Commands

You can enter a command whenever the screen displays the system prompt.

A command consists of one word, the command name. A *command line* consists of one or more command names and their associated parameters and switches.

Parameters and switches are special information you include with a command. They provide information to the command, or they determine how the command operates.

A command line can have a maximum of 127 characters, including any combination of uppercase or lowercase letters. To execute a command line, press ENTER. For example, to clear the screen, type:

```
cls ENTER
```

Editing Commands

MS-DOS tries to carry out the commands you type. If you make a typing mistake that results in an invalid command, MS-DOS tells you so with an error message. If you make a typing mistake, but the resulting command is valid, MS-DOS carries out the command as you entered it.

If you notice a typing mistake before you press ENTER, you have two choices:

- Backspace to the mistake, and retype to the end of the line.

- Press ESC to exit the line you are typing and start over.

If you use ESC to end a line, the system prompt does not reappear. Type the command line, and press ENTER to execute it.

Special Keys

The following keys and key combinations have special significance to MS-DOS.

SPACE BAR—Moves the cursor (the blinking underline or block character displayed on the screen) one space to the right, and adds a space to a line.

CTRL—Lets you give commands to your computer by pressing only two or three keys. Press and hold CTRL. Then, while you hold CTRL, press the other keys.

BACKSPACE—Moves the cursor left one character and erases the character in that position.

CTRL+C or CTRL+BREAK—Stops the execution of an MS-DOS command or a program that uses MS-DOS functions. If the program does not access MS-DOS, the program does not recognize this key combination. (The computer might take a few seconds to recognize this key combination.)

CTRL+PRTSC or CTRL+P—Sends each character of output to the printer. Press the combination again to stop print echo.

PRTSC—Sends the current display to the printer.

ESC—Terminates the current line without processing it, and performs a carriage return and line feed. (The cursor moves down one line and returns to the left margin.) Although the system prompt does not appear, the system is ready for a command.

ENTER—Executes a command and begins processing the command line you type. ENTER also causes a carriage return and line feed. (The cursor moves down one line and returns to the left margin.)

CTRL+J—Ends the current line, and moves the cursor to the next line without processing the line. Press ENTER to execute the command line when it is complete.

CTRL+ALT+DEL—Resets your computer the same as if you had turned it off and then on again.

CTRL+S or PAUSE—Stops scrolling information on the screen to let you view it. Press any key to resume scrolling.

MS-DOS provides several key combinations to help you edit an MS-DOS command line. These keys act on the command line in the last-command memory, or template. Press F3 to display the template. You can execute the command line again by pressing ENTER, or you can use the following keys to edit the command line in the template.

ENTER—Enter line. Make the new line the new template, and executes the command line.

ESC—Void line. Voids the new line but does not affect the template.

INS—Insert character. Goes into the insert mode to enable you to insert characters into the template. Press F3 to end the insert function.

DEL—Delete character. Erases the next character from the template. The character is skipped and is not copied to the command line.

F1—Copy character. Copies the next character from the template, and displays it on the command line.

F2 CHAR—Copy to character. Copies all characters in the template up to the specified character, and displays them on the command line.

F3—Template. Redisplays the entire template.

F4 CHAR—Delete to character. Deletes all characters up to the character indicated. These characters are skipped and not copied to the command line.

F5—Replace template. Makes the line you type the new template but does not execute the command.

F6 or CTRL+Z—End-of-file. Puts an end-of-file marker in the template.

Special Commands

You have learned several commands that help you set up and use your computer. There are many other commands available. This section contains information about some of the most helpful commands. Learning these commands makes it easy for you to look up other commands and functions in the *MS-DOS Reference Manual*.

Viewing a Directory

To look at the directory (a list of files) of a diskette, use the DIR command. For example, to view the contents of the diskette in the A drive, type:

```
dir a: ENTER
```

If a diskette contains more filenames than can appear on the screen at one time, all but the last 22 entries scroll off the top of the screen. MS-DOS has three ways to help you avoid this problem:

• Press **CTRL+S** to stop the screen from scrolling. (Press any key to restart the scrolling.)

• Use the /P switch with the DIR command. The /P switch tells MS-DOS to display only 23 lines of the directory at one time. Press the space bar to display another screen. To use the /P switch, type:

```
dir /p ENTER
```

• Use the /W switch to display the files in five columns. This format usually lets all of the filenames appear on the screen at once. The format for this command line is:

```
dir /w ENTER
```

Looking Inside Files

TYPE is a command that lets you examine files that consist of text characters. For instance, to view the joe.sls file, type:

```
type joe.sls ENTER
```

The file contents appear on the screen. If there are too many lines in the file to fit on the screen, use **CTRL+S** or **CTRL+PAUSE** to stop the screen from scrolling. Press any key to resume scrolling.

If you use TYPE to display a file that is not a text file, it displays meaningless data.

USING OTHER COMMANDS

MS-DOS has more than 50 commands and functions. The guidelines you learned in this manual provide the background you need to make use of MS-DOS's capabilities.

By referring to the *MS-DOS/GWBASIC Reference Manual*, sold separately, you can learn how to create and edit data files, create command files to accomplish numerous tasks in sequence, create directories, send information to your printer, and much more.

BASIC DESKMATE
COMMANDS

```
Help  =  Nov 1, 1998      DeskMate - C:\DESKMATE          18:19 AM
File  Directory  Disk  View  Sort by  Desktop
```
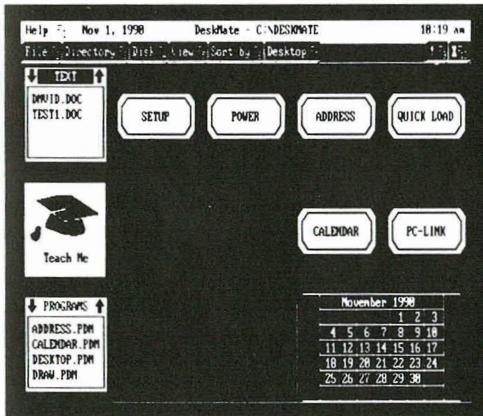
Your Tandy 2810 HD computer has DeskMate software installed that appears when your computer is turned on. Desk-Mate is a graphical interface that allows you to choose from a variety of programs with graphics-oriented screens.

The following section tells you how to do things simply in DeskMate that you used to have to do from the MS-DOS prompt. For more information about DeskMate, refer to the *DeskMate Getting Started* magazine that comes with your computer.

GETTING AROUND IN DESKMATE

You can easily move around DeskMate's desktop screen by using the arrow keys, or the tab key. These keys allow you to select an application box in the current drive that contains a program and a list of any created files for that program.

After choosing an application box, you can also use the arrow keys to select the file you want to open. Both the program name and the file name will be shaded with the arrow.

CHANGING THE CURRENT DRIVE
AND DIRECTORY

The current drive and directory is the one that the desktop screen and your programs normally read from and write to. You can access information on a drive and directory other than the current one by entering a drive reference with a DeskMate command. DeskMate regards the drive and directory from which the system is started up as the current drive and directory.

Caution: The FDD indicator lights whenever the drive is reading from or writing to a diskette. Do not remove the diskette when the FDD indication is on. The data on the diskette can be lost or distorted.

To change the current drive to another drive, follow these steps:
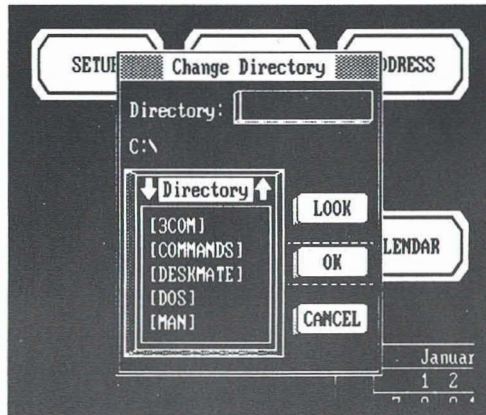
1. Press F3 to select the Directory menu. A menu appears.
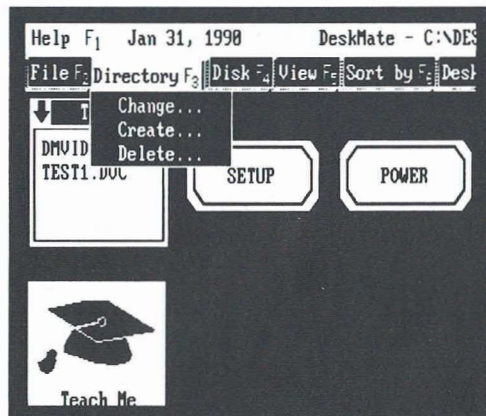
2. Use the arrow keys to select Change. Then, press **ENTER**. A dialog box appears.

3. Use the arrow keys to highlight a drive or directory, or at the Directory: prompt, type the drive and directory that you want to use.

   For example, you can choose a directory called Letters on Drive A by typing:

   a:\letters

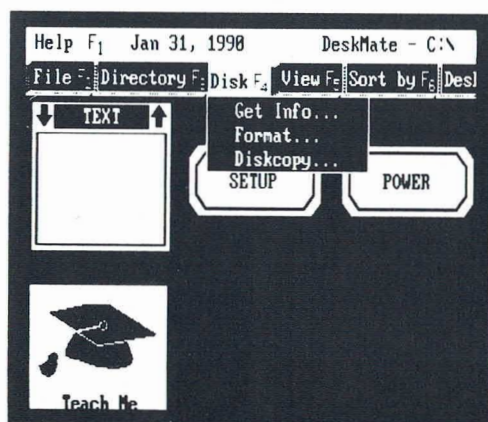4. Use the arrow keys to select OK. Then, press **ENTER**.

The desktop screen displays the new current drive and directory.

Note: To access a disk in a drive other than the current one, you must first change to the drive that has the disk you want to access.

FORMATTING A DISKETTE

Before you can store information on a diskette, you must format the diskette. To format a diskette from DeskMate, do the following:

1. Press F4 to select the Disk menu. A dialog box appears.

2. Select Format and press **ENTER**. A dialog box appears.

3. Type A in the drive box. Then, use the tab key and arrow keys to select the disk type.

   Note: If you format a diskette with the wrong disk type setting, data on the diskette might be lost, and other computers might not correctly read the diskette.

4. Use the tab key to select OK and press **ENTER**.

   Your system displays:

   ```
   Insert new diskette for drive A:
   and press ENTER when ready...
   ```
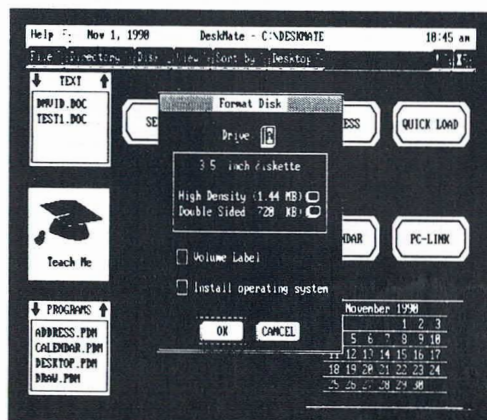
5. Insert the diskette you want to format. Then, press **ENTER**.

    Caution: if you format a disk with information stored on it, your computer erases all the information.

    When your system finishes formatting the diskette, it displays:

    ```
    format complete
    Volume label (11 characters, ENTER for none)?
    ```

6. Press **ENTER**. Your computer displays disk space information and automatically assigns a volume serial number. Then, your computer displays:

    ```
    Format another (Y/N)?
    ```

7. To do so, press Y, and repeat Step 4 . Otherwise, press N.

8. Remove the formatted diskette from the disk drive.

9. Store formatted diskettes in a safe place until you need them.

COPYING FILES

You can copy programs or data files using DeskMate. To copy files in DeskMate, you must be in the drive that holds the file you are wanting to copy. The current drive is shown above the menu.

For example, if your current drive is the floppy disk drive, the system would display:

DeskMate — A:\

If the file to be copied is in a separate drive, you should first change the current drive and directory by following "Changing the Current Drive and Directory" in this manual. This allows you to access the file you want to copy. To copy a file, follow these steps:

1. Use the arrow keys to select the file you wish to copy. The file will be displayed in a list box.
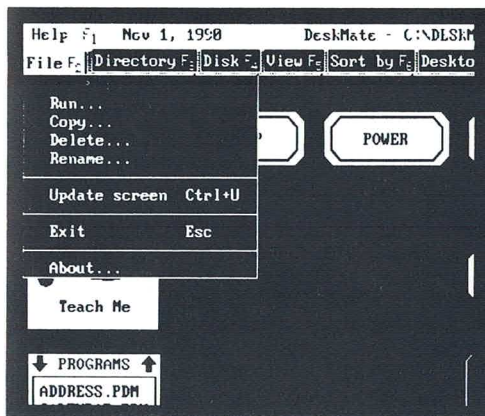
2. Press F2 to select the File menu. A dialog box appears.

3. Select Copy, then, press ENTER.

4. Select the Copy To box and type the drive where you want to copy your file to.

   • If you want the copied file to have the same name as the original file, type in a drive and a directory name.

   • If you are copying to a new filename using the same drive and directory, type in only the new filename.

5. Select OK, then press ENTER.

DeskMate will copy your file to the drive you specified. After the file has been copied, the desktop screen appears.

RENAMING FILES

DeskMate also lets you change the names of files. You can use Rename to give your old file a new name.

If the file you are renaming is in a separate drive and directory, you should first change the current drive and directory by following "Changing the Current Drive and Directory" in this manual.

To rename a file, follow these steps:

1. Select the file you want to rename. The file is displayed in a list box.

2. Select the File menu. A dialog box appears.
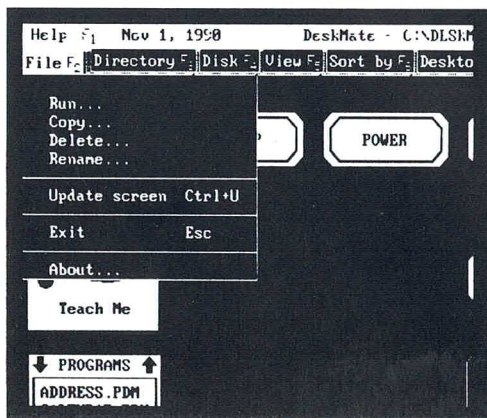
3. Select Rename and press ENTER. A dialog box appears.

4. Type the new file name and extension in the To box and use the arrow keys to select OK. Then, press ENTER.

DeskMate renames your file and the desktop screen appears.

COPYING DISKETTES

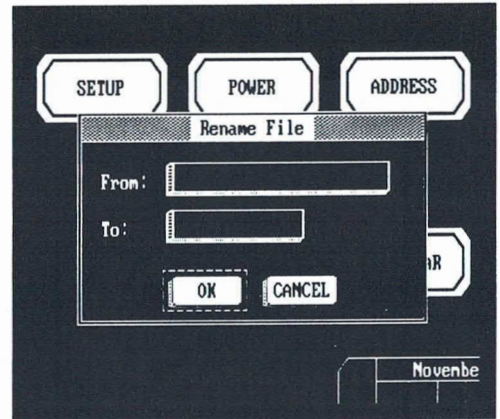Exposing a diskette to magnetic fields or improperly using or handling a diskette can destroy the information on the diskette. In DeskMate, use the following procedure to make several copies of important diskettes. If anything happens to a copy, immediately make another.

Some programs you purchase may be copy-protected. You cannot make copies of these program disks. Check the program manual for information on protecting the data on copy-protected disks.

Notes:

- The diskette that you copy is called the source diskette. The new diskette is called the target diskette.

- You must use the same type of diskette for the source and target diskettes. If the source diskette is a 720K double-density type, the target diskette must also be a 720K double-density type.

To copy a diskette, use the following steps:

1. Press F4 to select the Disk menu.

2. Select Diskcopy and press ENTER. A dialog box appears.

```
┌──────────┐  ┌──────────┐  ┌──────────┐
│  SETUP   │  │  POWER   │  │ ADDRESS  │
└──────────┘  └──────────┘  └──────────┘
      ▓▓▓▓ Copy Disk ▓▓▓▓
        From: ▯
                        ▯
        To:   ▯         LENDAR
      ┌────────┐ ┌────────┐
      │   OK   │ │ CANCEL │
      └────────┘ └────────┘

                    Novem
```
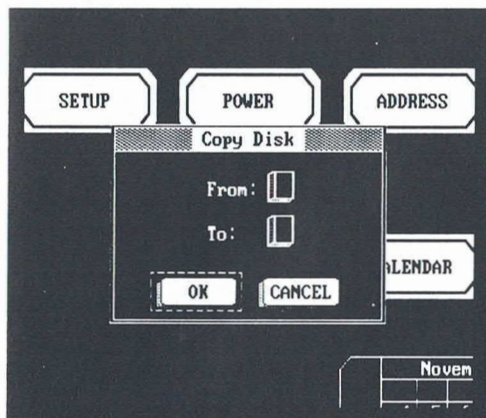
3. Type A in the From and To drive boxes.

4. Select OK and press ENTER. MS-DOS uses DISKCOPY to copy your diskettes.

   The screen displays:

   ```
   Insert SOURCE diskette in drive A:
   Press any key to continue ...
   ```

5. Place the diskette you want to copy in the drive. Then, press a key. The screen displays:

   ```
   Copying 80 tracks
   18 Sectors/Track, 2 Side(s)
   ```

   This message can differ according to the diskette you are copying. After a few moments, the screen displays:

   ```
   Insert TARGET diskette in drive A:
   Press any key to continue ...
   ```

6. Remove the source diskette and insert the target diskette into the drive, and press any key. Be sure the target diskette is not write-protected (window should be closed).

Diskcopy formats the target diskette (if not already formatted) and copies the information taken from the source diskette to the target diskette. In some instances, MS-DOS might ask you to swap the source and target diskettes one or more times. When the Diskcopy procedure is complete, this message appears:

```
Copy another diskette (Y/N)?
```

7. To create more copies, press Y ENTER, and follow the prompts again.

After you finish making copies, press N at the Copy another diskette? prompt. You now automatically return to Desk-Mate.

Use one set of the copies for daily use. Store the original diskettes and all additional copies in a safe place until you need them.

RUNNING NON-DESKMATE PROGRAMS FROM DESKMATE

Programs perform specific tasks such as word processing, spreadsheet analysis, and creating graphics. You can use the following procedure to add non-DeskMate programs to the DeskMate desktop so that you can run the programs by simply selecting a DeskMate list box or icon.

When the desktop appears, you can create a list box and run non-DeskMate programs by following these steps:

1. Press F7 to select the desktop menu.
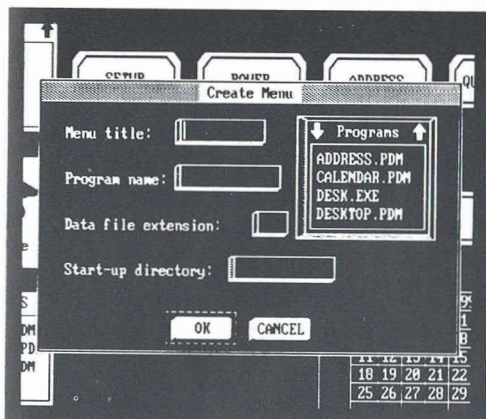
2. Select Create, and press ENTER. A dialog box appears.

3. In the Menu title type the title that you want to appear on the desktop, using ten or fewer characters.

4. In the program name prompt, type the prompt and command you normally use to run the program from MS-DOS.

5. In the Data File Extension prompt, type the extension the program normally assigns to files.

   Note: If your program does not create files, leave this prompt blank to display an icon instead of a list box.

6. In the Start-up directory box, type the prompt and path for the directory you want to use when you run this program.

   Note: If you leave this box blank, the program runs from the current directory displayed at the top of the desktop. The desktop uses the directory information to find the filenames for the list box.

7. Select OK and press ENTER. A dialog box appears.
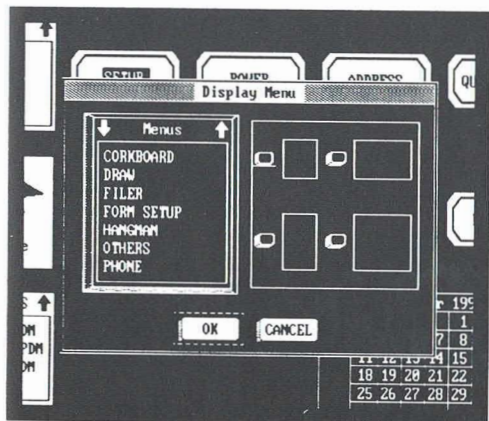
8. Choose the list box size you want to appear on the desktop.

9. Press **ENTER**. The desktop reappears, displaying a dotted box.
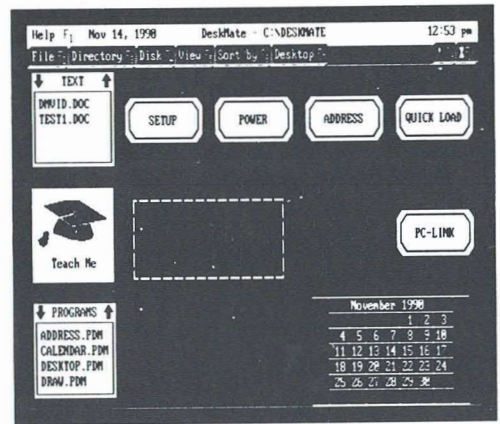
10. Use the arrow keys to position the box in a blank area on the desktop, and press **ENTER**.

You can now run your program by simply highlighting the list box or icon and pressing **ENTER**.

HARD DISK FORMATTING

The hard disk in the 2810 HD is pre-formatted, and you should not need to use this procedure in most cases. But if you want to reformat the hard disk for a different version of DOS, add partitions, or reformat for any other reason, use the following procedure.

Caution: Formatting the hard disk erases all information on the drive.

The initialization process has three steps. To perform the three steps, use the following three commands found on the MS-DOS Install diskette:

1. Run HSECT to low-level format the drive.

2. Run FDISK to partition the drive.

3. Run FORMAT to high-level format the drive.

USING HSECT

Caution: The HSECT command initializes the hard disk's tracks and sectors, and erases all information on the disk. Before you use HSECT, be sure you have copied all data from your hard disk to diskettes. Then, follow these steps:

1. Insert the MS-DOS Install diskette in the diskette drive and type this command at the A> prompt:

   ```
   hsect
   ```

   Then, press ENTER.

   The following prompt appears:

   ```
   Which hard drive do you
   want to format (C/D)
   ?
   ```

2. Type c and press ENTER to format the hard disk drive.

   The screen displays the following warning:

   ```
   All data on drive c will be
   DESTROYED!!

   Do you want to continue (Y/N) ?
   ```

3. Type N and press **ENTER** to exit the formatting procedure, or type Y and press **ENTER** to continue.

If you continue, Hsect prompts:

```
Hard drive is type 6
Number of heads = 4
Number of cylinders = 615
Is this correct (Y/N)
?
```

4. Type Y and press **ENTER**.

The following prompt is displayed:

```
Do you want to flag defective
tracks (Y/N)
?
```

5. Type N and press **ENTER**.

The following prompt is displayed:

```
Formatting...
```

The formatting procedure begins. Do not interrupt HSECT while it is formatting the drive.

When the format is complete, HSECT displays
`Format complete!`

After using HSECT, use FDISK. Then, use FORMAT to complete the hard disk format process.

USING FDISK

To prepare the hard disk for the MS-DOS operating system, you must create a DOS partition. Using FDISK, you can do the following:

- Create an MS-DOS partition

- Display partition information

Caution: Reconfiguring the hard disk with FDISK destroys all existing files. Be sure to have backup diskettes for all files on the hard disk before you run FDISK.

The FDISK utility is easy to use because it uses menus to lead you through each procedure. To start FDISK, place the MS-DOS Install diskette in Drive A. Then, type `FDISK` and press **ENTER**.

In response, FDISK displays its main menu on your screen. This menu lists four choices.

```
Disk Options

Current Fixed Disk Drive: 1

Choose one of the following:

1. Create DOS Partition or Logical DOS Drive
2. Set active partition
3. Delete DOS Partition or Logical DOS Drive
4. Display partition information

Enter choice: [1]

Press ESC to return to DOS
```

Note: The following sections describe Options 1 and 4. Options 2 and 3 are not necessary to the operation of the Tandy 2810 HD's hard disk, so they are not described here. However, detailed explanations are available in many MS-DOS manuals.

To return to MS-DOS from the main menu, press ESC. You can also use the ESC key to return to the main menu from any FDISK menu.

Most FDISK menus display a default value. To choose the default value, press ENTER. To choose another value, simply type the value you want, and press ENTER.

How to Create a DOS Partition

Choose the first option on the main menu. FDISK displays a screen like the following. If no extended partitions exist, the third option is not displayed:

```
                FDISK options

Current Fixed Disk Drive: 1

1. Create DOS Partition or Logical DOS Drive
2. Set active partition
3. Delect DOS Partition or Logical DOS Drive
4. Display partition information

Enter choice: [1]

Press Esc to exit FDISK
```

Selection 1: Create Primary DOS Partition

Press **ENTER** to accept the default selection (1) and create a primary MS-DOS partition.

The Create Primary DOS Partition menu appears next:

```
Create Primary DOS Partition

Current Fixed Disk Drive: 1

Do you wish to use the maximum available
size for a Primary DOS partition and make
the partition active
(Y/N). ........................? [Y]
```

```
Press ESC to return to FDISK Options
```

Press **ENTER** to accept the default selection (Y).

FDISK pauses and then displays the following message:

```
System will now restart

Insert DOS diskette in drive A:
Press any key when ready . . .
```

Leave your MS-DOS Install diskette in Drive A, and press any key to restart MS-DOS.

Now that you have created your MS-DOS partition, you must format your hard disk so that MS-DOS can use it. Enter the FORMAT command as outlined in "Using Format", if you intend not to use the Display Partition Data option.

How to Display Partition Data

If you choose the fourth option on the main menu, FDISK displays a menu that contains information about each of the partitions on your hard disk.

For example, the Display Partition Information menu might look like this:

Parti- tion	Status	Type	Size in Mbytes	Percentage of Disk Used
C: 1	A	PRI DOS	20	100%

```
Total disk space is 20 Mbytes
(1 Mbyte = 1048576
```

```
Press Esc to return to FDISK Options
```

This information screen shows the partition's number, status, type, starting and ending cylinder numbers, and size (in cylinders).

USING FORMAT

The FORMAT command prepares the hard disk to accept MS-DOS files by creating the disk's directory and file allocation tables. You must use this command to format all new disks (hard disks or diskettes) before MS-DOS can use them.

Caution: Formatting destroys any previously existing data on a disk.

To start the FORMAT command, follow these steps:

1. With the MS-DOS Install diskette in Drive A, type the following command and press ENTER:

   ```
   format c:/s
   ```

   In response, FORMAT displays the following:

   ```
   WARNING, ALL DATA ON NON-REMOVABLE DISK DRIVE
   C: WILL BE LOST!
   ```

   ```
   Proceed with Format (Y/N)?_
   ```

2. To format the hard disk, type Y. Then, press ENTER.

When formatting is complete, the FORMAT command displays a message showing the total disk space, any space marked as defective, the total space used by the operating system, and the space available for your files.

REINSTALLING MS-DOS AND DESKMATE ON THE HARD DRIVE

After formatting the hard disk, you can recreate a DOS directory and recopy the MS-DOS and DeskMate files to the hard drive. To do so, use the following steps:

1. Insert the MS-DOS Install diskette into Drive A and press **CTRL+ALT+DEL**. Then, follow the instructions for installing MS-DOS.

2. Remove the MS-DOS Install diskette.

3. Insert the DeskMate installation diskette labeled STARTUP DISK, INSTALL, CALENDAR into Drive A and type:

    a: **ENTER**

4. Type:

    install **ENTER**

5. Follow the instructions given by the DeskMate installation program.

6. Remove the DeskMate installation diskette.

7. Insert the MS-DOS Install diskette and type:

    copy a:autoexec.dsk c:autoexec.bat **ENTER**

8. Remove the MS-DOS Install diskette.

For more information on organizing the hard disk, see the *MS-DOS Quick Reference.* Many MS-DOS books are also available for sale at Radio Shack Computer Centers.

COMPUTER CARE

Your computer is an example of superior design and craftsmanship. The following suggestions will help you care for and enjoy your computer for years.

* Keep your computer and its diskettes dry. If they get wet, wipe them dry immediately. Liquids can contain minerals that can corrode electronic circuits.

* Handle your computer gently and carefully. Dropping your computer can damage circuit boards, the display, case, and can cause your computer to work improperly.

* Use and store your computer and its diskettes only in normal temperature environments. Temperature extremes can shorten the life of electronic devices, damage batteries and diskettes, and distort or melt plastic parts.

* Keep your computer and its diskettes away from dust and dirt, which can cause premature wear of parts.

* Wipe your computer with a dampened cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean your computer.

Modifying or tampering with your computer's internal components can cause a malfunction and might invalidate your computer's warranty. If your computer is not performing as it should, take it to your local Radio Shack Computer Center. Our personnel can assist you and arrange for service, if needed.

SPECIFICATIONS

Processor CS80C286-16MHz

Dimensions . . . . 1 5/8" x 12 3/16" x 10" [HDW]

Weight . . . . 6.2 lbs

Power Requirements . . . . 120-volt AC/60Hz, AC adapter/charger

Battery Type & Life . . . . Nickel-Cadmium rechargeable,
Apprx. 3.1 hours (full brightness),
Apprx. 3.5 (dim brightness),
90% backlight duty,
10% HDD, 1% FDD,

Temperature

Operating . . . . 40°F-100°F (4°C - 38°C)

Storage . . . . − 40°F - 150°F (-40°C - 66°C)

Humidity

Operating . . . . Max 80%

Storage . . . . Max 80%

Display Type . . . . VGA LCD see-through type,
dark blue characters/white background
with FL backlight

Screen Size . . . . 640 dots x 480 pixels, 80 characters x 25 lines(VGA)

Hard Disk Drive . . . . . . 2 1/2-inch, 20MB capacity with 23 msec seek time

Diskette Drive Capacity . . . . 1.44MB/720KB (formatted)

Media Standard . . . . 3 1/2-inch, double-sided,
720KB, 80 tracks, 9 sectors
1.44MB, 80 tracks, 18 sectors

Interface . . . . . . Serial DB-9, Parallel DB-25, VGA video, PS/2® keyboard

INDEX

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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful radio and TV interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed in accordance with the instructions, may cause harmful interference to radio communications. There is no guarantee that interference will not occur in a particular installation.

If this equipment does interfere with radio or television reception, which you can tell by turning the equipment off and on, you are encouraged to try to correct the interference. Use one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the distance between the equipment and the radio/TV.

- Connect the equipment to an outlet that is on a different circuit from the one used for the radio/TV.

- Consult the dealer or an experienced radio/TV technician for help.

Shielded cables must be used with this equipment. If you add or replace any cables, the new cables must have shielding capabilities equal to or higher than those provided by the dealer.

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