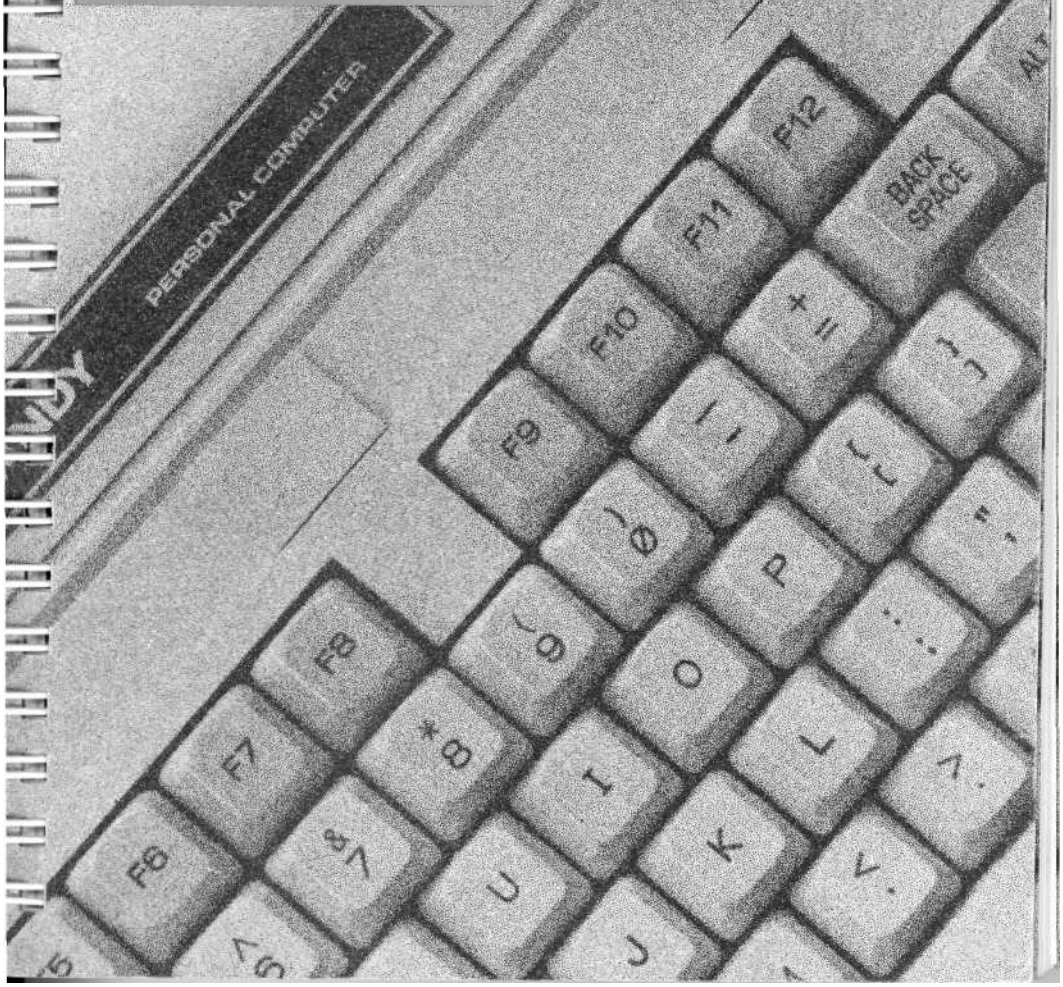
A Practical Guide to the TANDY® 1000 EX



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The FCC Wants You to Know

This equipment generates and uses radio frequency energy. If not installed and used properly, that is in strict accordance with the manufacturer's instructions, it may cause interference to radio and television reception.

It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

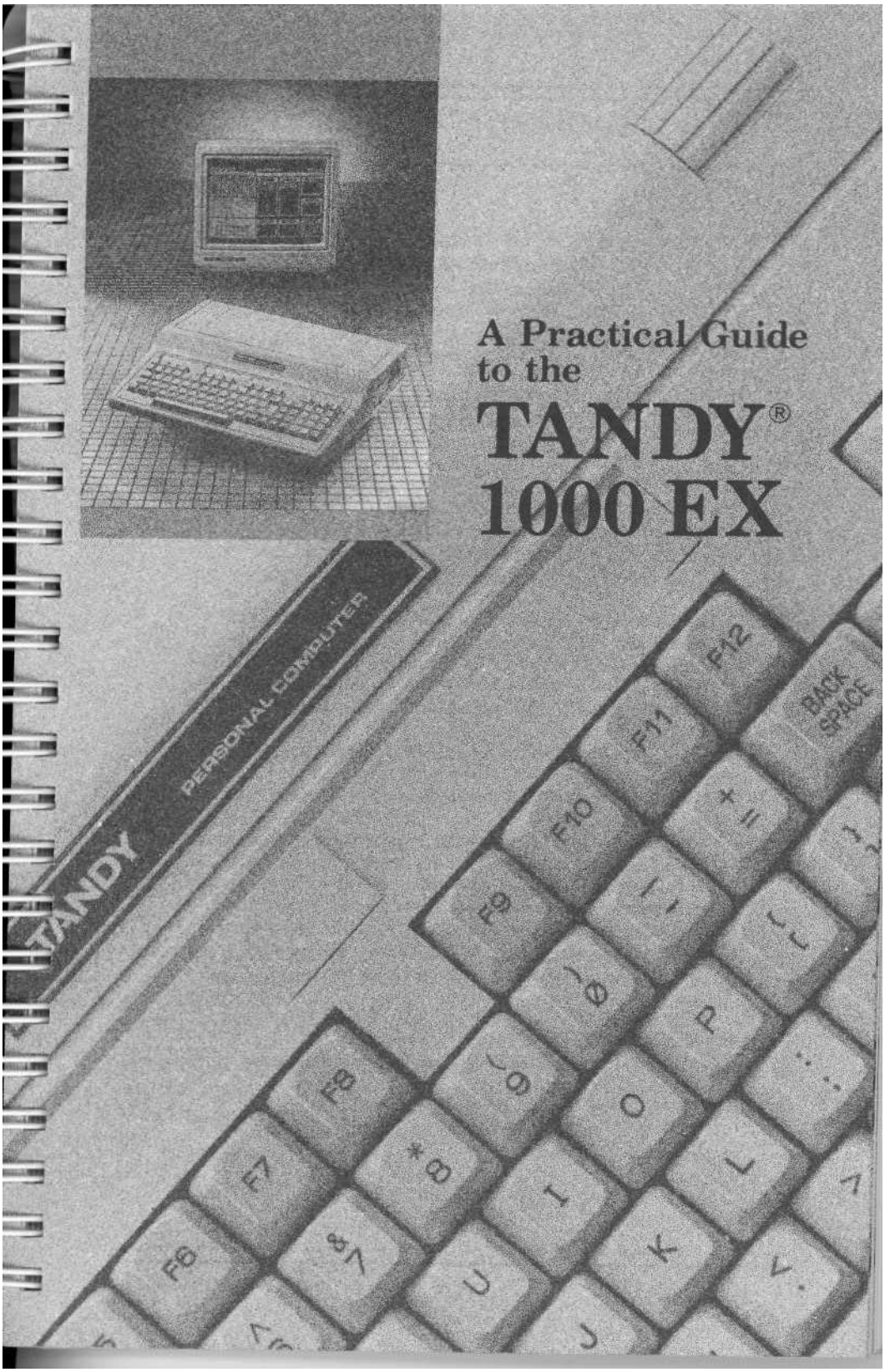
If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate the computer with respect to the receiver
- Move the computer away from the receiver
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

Warning

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

A Practical Guide to the TANDY® 1000 EX



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ABOUT THIS BOOK

Your owner's manual, *A Practical Guide to the Tandy 1000 EX*, includes:

- *Introduction to the Tandy 1000 EX*

  A general guide to your new computer, including everything you need to know to set up, operate, maintain, and expand your Tandy 1000 EX. Several illustrations are provided to help you visualize the procedures and configurations discussed.

  Introduction to the Tandy 1000 EX includes all the computer hardware information you need to run most application programs. If you require technical and/or more specific information about your hardware, consult the *Tandy 1000 EX Technical Reference Manual,* sold separately.

- *Introduction to MS-DOS*

  A guide to the operating system for your computer, including instructions for starting and exiting the operating sytem as well for preparing, using, and copying floppy diskettes. Information on some of the most commonly used MS-DOS commands is also included.

  Introduction to MS-DOS is an overview of your operating system. It includes sufficient operating system information for running your application programs on a daily basis. If you require more specific information, refer to the *MS-DOS Reference Manual* (Cat. No. 25-1508).

The *Tandy 1000 EX Quick Reference* provides you with condensed reference information for MS-DOS. A short listing of the major BASIC commands is also provided for your convenience. Refer to the *BASIC Reference Manual* (Cat. No. 25-1508) for more information on the BASIC programming language.

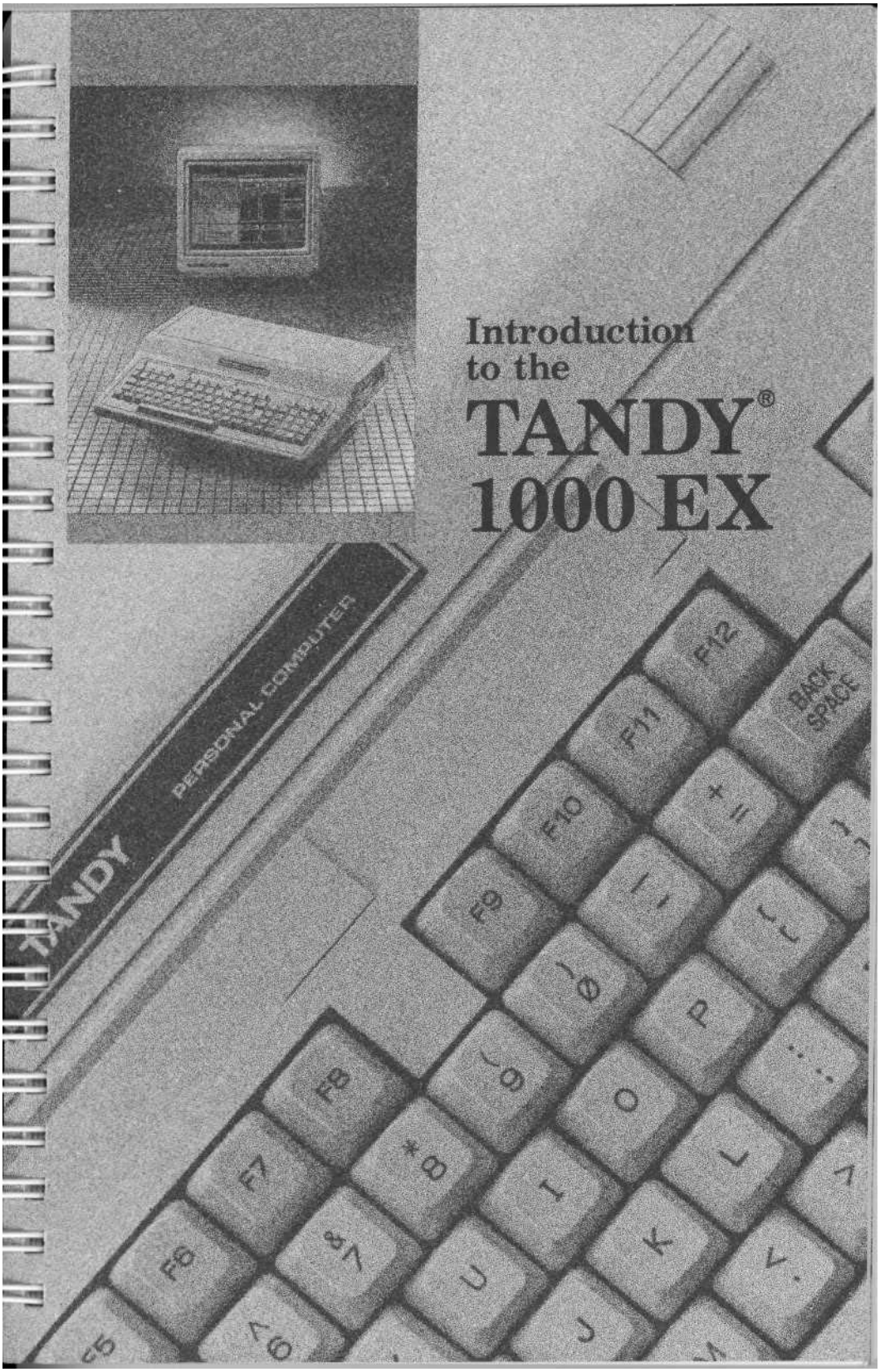
By combining the manuals in this manner, we provide you with all the information you need to get your computer "up and running" without having to wade through volumes of documentation.

PACKAGE CONTENTS

Your Tandy 1000 EX package includes:

- The main unit.
- Three diskettes:
  - The MS-DOS operating system and BASIC language diskette.
  - Two DeskMate® application diskettes.
- This manual, *A Practical Guide to the Tandy 1000 EX*.
- The *Tandy 1000 EX Quick Reference.*
- The DeskMate user's manual.
- The DeskMate quick reference.

Introduction to the TANDY® 1000 EX



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Chapter 1

INTRODUCTION

Your Tandy® 1000 Personal Computer EX is a powerful, versatile, simple-to-use computer. You can connect a monitor to your computer and immediately put it to work for you. With the Tandy 1000 EX, there is no need to purchase an operating system, additional adapters, BASIC, or even productivity software! Everything you need to begin is included with your computer.

Features

- IBM® PC software compatibility.
- A dual-speed 7.16/4.77 megahertz, 16-bit Intel 8088 CPU chip. The dual-speed lets you choose the processing speed appropriate for your software application.
- 256 kilobytes (256K) of RAM memory, expandable to 640K. (A kilobyte equals 1,024 bytes or characters of information.)
- A built-in standard 5 1/4-inch slim-line floppy disk drive that can read and write to standard, double-sided diskettes.
- Built-in support for a printer, a monochrome or color graphics monitor, and joysticks. You do not need extra adapter cards for these features.
- A three-voice sound circuit and built-in speaker for sophisticated sound and music generation.
- A full-feature, 90-key keyboard, including a numeric keypad.
- MS-DOS® Version 2.11 operating system and Version 2.02 BASIC language diskette.
- DeskMate® application software, which features built-in word processing, spreadsheet analysis, electronic filing, telecommunications, a calendar, and much more.

Monitors

You can connect your Tandy 1000 EX to any of the following monitors:

- A VM-4 Monochrome Monitor (Cat. No. 25-1020).
- A CM-5 RGBI Color Monitor (Cat. No. 25-1023).
- A CM-10 High-Resolution RGBI Color Monitor (Cat. No. 25-1022).

You can also connect your Tandy 1000 EX to a color television set for a 40 column x 25 row display. To connect your computer to a TV, you need:

- An RF Modulator (Cat. No. 15-1273).
- A video/audio cable with an RCA-type phono plug at each end.
- A 75-ohm coaxial cable with a male "F" connector at each end.

If your TV is not cable-ready (with a 75-ohm connector), you also need a 300-ohm to 75-ohm transformer (Cat. No. 15-1140).

> **Note:** Software packages that use 80-column displays require either a monochrome or color monitor.

Options

- A parallel printer. (A standard, 34-pin card edge to 36-pin plug parallel printer cable, such as Cat. No. 26-1401 or 26-1368, is required.)
- Joysticks (Cat. No. 26-3012).
- One 5 1/4-inch or 3 1/2-inch external floppy disk drive (Cat. No. 25-1060 or 25-1061).
- A DIGI-Mouse® (Cat. No. 26-1197) to use with computer-aided design (CAD) programs and other software that supports mouse operations (Microsoft® Windows, GEM, and so forth). You must install a PLUS DIGI-Mouse Controller/Calendar Board to connect a DIGI-Mouse to your computer.

- The PLUS DIGI-Mouse Controller/Calendar Board (Cat. No. 25-1015). This board lets you connect a DIGI-Mouse for use with mouse software.
- A Memory PLUS Expansion Adapter (Cat. No. 25-1062) you can install on your main logic board to expand your computer to as much as 640K memory. This board alone increases your computer's memory by 128K (384K total memory). The memory board also features connectors that let you add two additional PLUS option boards to your computer.
- A 256K Parity Memory Kit (Cat. No. 25-3062) you add to the Memory PLUS Expansion Adapter to increase memory to 640K.
- The Tandy PLUS RS-232C Upgrade Board (Cat. No. 25-1014) to connect an external modem for communications or to con nect a serial plotter/printer.
- A Tandy internal modem board, including the PLUS 300-Baud PC Modem (Cat. No. 25-1017) or the PLUS 1200-Baud PC Modem (Cat. No. 25-1018), for communications.

  Note: To take full advantage of the telecommunications features in DeskMate, you must install either the RS-232C board/external modem combination or one of the internal modems.

- The PLUS Network 4 Interface (Cat. No. 25-1019) to set up a local area network.

  Note: You can install only one option board directly on the computer's main logic board. You can, however, connect one or two additional option boards to the Memory PLUS Expansion Adapter if you install it.

Chapter 2

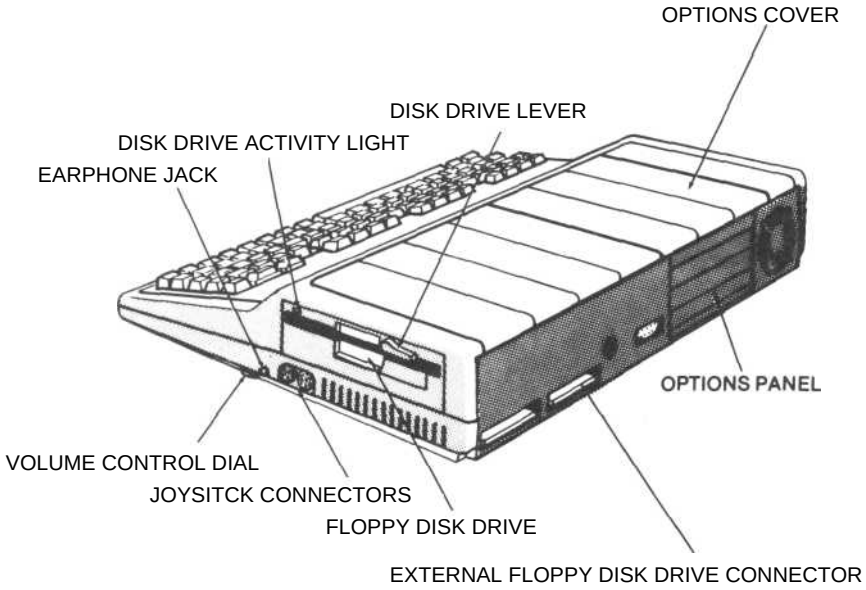
SETTING UP YOUR COMPUTER

Your computer includes built-in support for a color monitor, monochrome monitor, or a television as well as for a printer and joysticks. To set up your computer, simply connect it to a monitor, to a printer (optional), and to an AC power source.

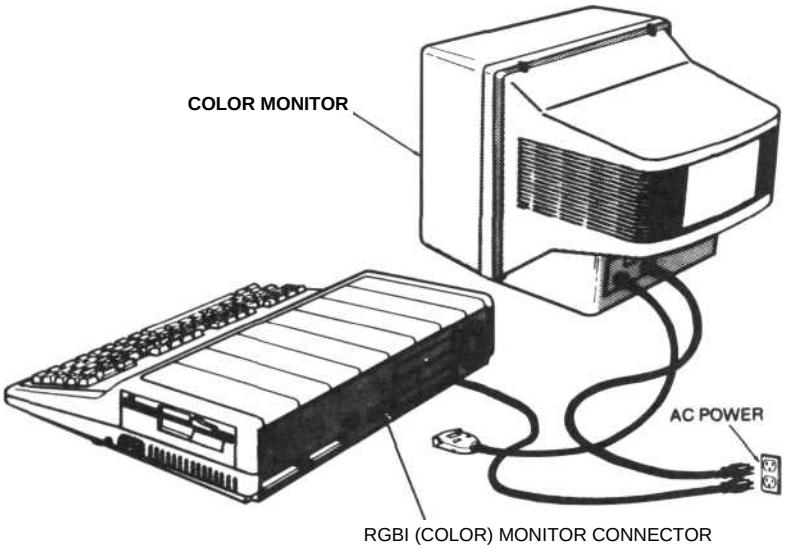
> **Note:** If you are adding any internal options, refer to Chapter 5, "Internal Options," before you set up your computer.

Follow the steps below to set up your computer:

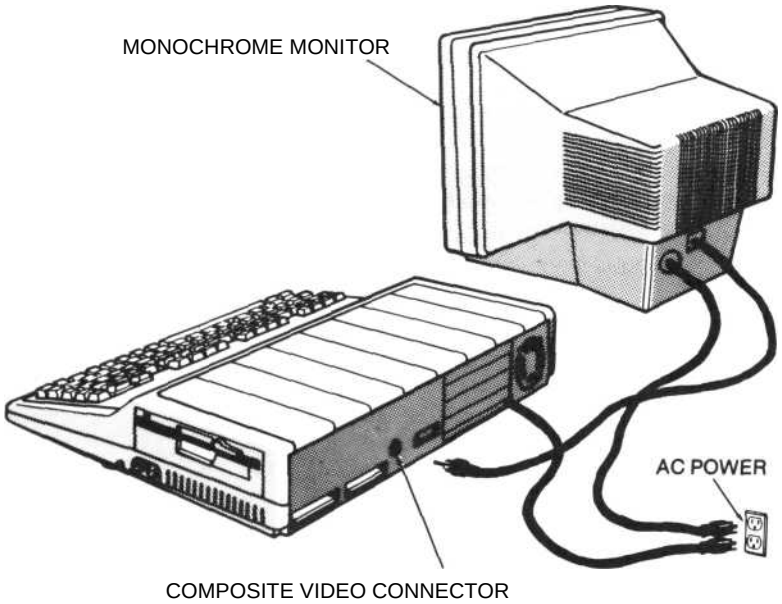
1. Set the computer on a flat surface, with the back of the unit facing you. Turn the floppy disk drive lever counterclockwise to open the disk drive, and remove the cardboard shipping insert from the drive.



2a. Color Monitor Users: Connect the monitor's computer cable to the RGBI connector on the back of your computer. Connect the monitor's power cord to an AC power source.



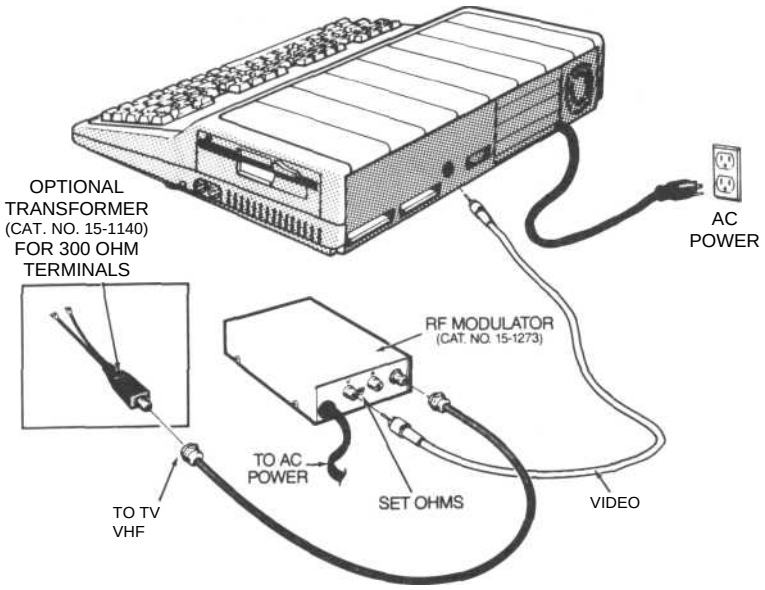
2b. Monochrome Monitor Users: Connect the monitor's computer cable to the Composite Video connector on the back of your computer. Connect the monitor's power cord to an AC power source.



2c. Color TV Monitor Users: Plug one end of the video/audio cable into the Video connector of the RF modulator, and plug the other end into the Composite Video connector on the back of your computer.

Now, connect one end of the 75-ohm coaxial cable to the coaxial connector on the RF Modulator, and connect the other end to the cable-ready connector on your TV. (If your TV is not cable-ready, connect the other end of the 75-ohm coaxial cable to a 75-ohm to 300-ohm transformer, and connect the 300-ohm twin lead of the transformer to your TV's VHF terminal.) Set the RF modulator switch to 75 for a cable-ready hookup or to 300 for a VHF antenna hookup.

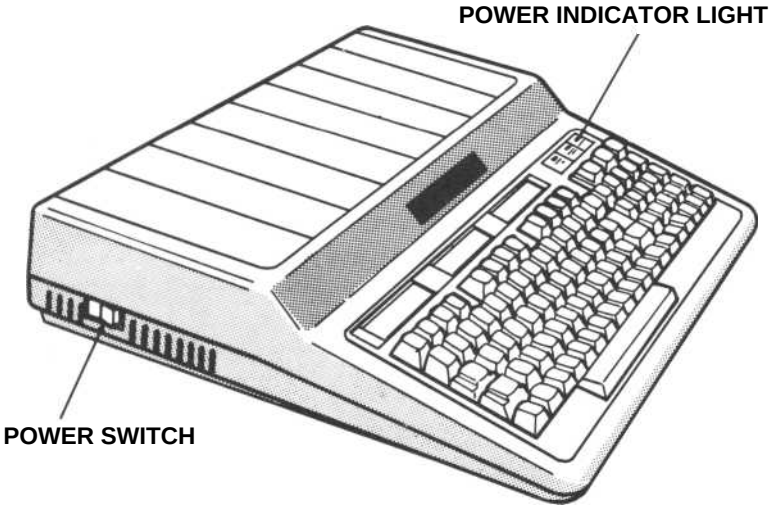
Connect the TV and RF modulator power cords to an AC power source.



3. Plug your computer's main power cord into a grounded 110 VAC 3-prong outlet. (Voltage requirements vary by country. Refer to the label on your computer.)

> **Note:** Electrical interference and power surges can destroy data. Do not plug your computer into an outlet that also powers heavy equipment (copiers, office machines, and so forth). Also, if you must use an extension, use a grounded power line filter, such as Cat. No. 26-1244.

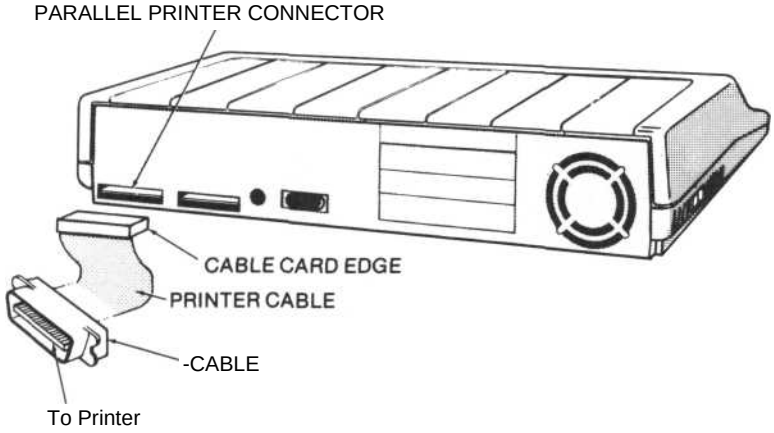
You turn your computer on and off with the power switch on the left side of the unit. Turn the computer off by toggling the switch forward. Turn the computer on by toggling the switch back. The POWER light on the top of the unit indicates when the computer's power is on.



Connecting a Printer

The Tandy 1000 EX provides a printer connector for parallel printer connection. Use the following instructions to connect a parallel printer to your computer. Refer to the documentation provided with your printer for specific information, such as special printer switch settings.

1. Connect the plug end of the printer cable to the printer as described in the printer documentation.
2. Connect the cable's card edge, cable side down, to the Par allel Printer connector on the back of your computer.



3. Connect the printer's power cord to an AC power source.

Before you start an application on your computer, you must set up the system for use with your printer. Refer to "Using a Printer With Your Programs" in *Introduction to MS-DOS* for instructions.

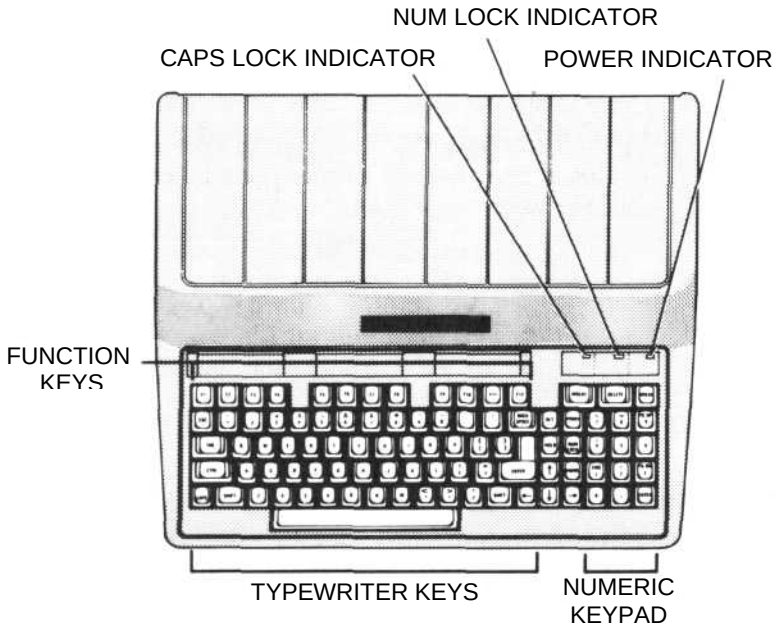
Chapter 3

THE SYSTEM UNIT

Now that your computer is set up, take a few moments to familiarize yourself with the computer's *system unit.* The system unit of the Tandy 1000 EX includes the central processing unit (CPU), the keyboard, and an internal floppy disk drive.

The Keyboard

Your computer's keyboard consists of three sections: the function keys, the typewriter keys, and the numeric keypad.



Function Keys

The function keys at the top of the keyboard are *program-specific*. Their functions depend on the program you are running. Some of these keys perform special functions when you start the computer, as follows:

Mono Mode. Tells the computer to operate in the monochrome video mode instead of the normal color/ graphics video mode.

Your computer has the capability to produce color or monochrome text and graphics. If you connect your computer to a monochrome monitor and run color-oriented software, the colors are loaded as black and white. If part of the screen display disappears or is hard to read, use the mono mode to load black, white, and high-intensity white. (You can also perform a MODE MONO ON/OFF command in MS-DOS to change between the color/graphics and mono video modes.)

TV Mode. Tells the computer to operate in the TV video mode instead of the normal color/graphics video mode.

The TV mode lets you connect a color television to your computer by changing to 200 scan lines of resolution in a 40-column, color format. The computer uses 225 scan lines and 80 columns in the normal color/graphics video mode. (You can also perform a MODE TV command in MS-DOS to change from the color/graphics video mode to the TV video mode.)

Swap Drives. Reverses the drive references of the floppy disk drives. The internal drive becomes Drive B and the external drive becomes Drive A. This feature lets you start your computer with a diskette in the external drive. Always swap drives if you want to start up from an optional 3 1/2-inch external disk drive.

Slow Speed. Changes the CPU speed to 4.77 megahertz. The normal CPU speed is 7.16 megahertz.

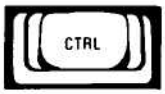
Some PC-compatible software cannot operate at the faster CPU speed. Change the CPU speed to 4.77 MHz if you have trouble loading a program at 7.16 MHz. (You can also perform a MODE SLOW or MODE FAST command in MS-DOS to change the CPU speed.)

Press the appropriate function key immediately after the computer "beeps" while starting MS-DOS. Refer to *Introduction to MS-DOS* for more information on using a function key during startup.

Typewriter Keys

The left side of the keyboard, below the function keys, 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.

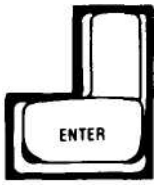
The function of the Escape key depends on the program you are running.



You use the Control key in combination with certain other keys to perform specific operations. The combinations available and their functions are program-dependent. To use a Control-key combination, hold down the Control key, and press the other key. (For example, [CTRL] [C] performs a Break or program interrupt in many programs.)

Note: Some software manuals refer to [CTRL] as [CNTRL].

When you press the Caps Lock key, the alphabet keys produce only capital letters. ([CAPS] does not affect any keys other than A-Z.) The CAPS LOCK light at the top right of the keyboard indicates that the keyboard is in caps-only mode. Press the key once to activate caps-only mode; press the key again to return to the normal keyboard mode.



The Enter key enters commands and data into the computer. After you press [ENTER], the command you entered is processed by the program or operating system you are running.

> **Note:** Some software manuals refer to [ENTER] as [RETURN] or [↵].

You use the Alternate key in combination with certain other keys to perform specific operations. The combinations available and their functions are program-dependent. To use an Alternate-key combination, hold down [ALT], and press the other key. (For example, [CTRL] [ALT] [DELETE] resets the computer.)

The function of the Hold key depends on the program you are running. In some programs, [HOLD] pauses program execution.

Pressing one of the Arrow keys moves the blinking *cursor*, a position marker, in the direction of the arrow.

When you hold down [SHIFT] and press [PRINT], many programs send all text currently on the screen to the printer.

The Number Lock key reverses the function of the keys on the numeric keypad on the right side of the keyboard. The NUM LOCK light at the top right of the keyboard indicates that number lock is on.

When number lock is on, the unshifted keys produce the numbers 0-9, a decimal, a plus (+), and a minus (-). When number lock is off, the unshifted keys have the functions described in the "Numeric Keypad" section, which follows.

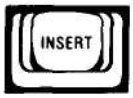
The function of the Home key depends on the program you are running. In some programs, [HOME] moves the cursor to the upper left corner of the screen.

Numeric Keypad

The numeric keypad on the right side of the keyboard is arranged the same as a calculator keypad. Number keys are normally the shifted characters on the numeric keypad. (You hold down [SHIFT] and press a number.) Press the Number Lock key to use the keypad for extensive number entry. When number lock is on, you can type numbers without pressing the Shift key.

The shifted (number lock on) values of the keys on the numeric keypad are 0-9, decimal (.), plus (+), and minus (-). A duplicate Enter key and the Break key are also on the numeric keypad.

The unshifted functions of these keys are as follows:



The function of the Insert key depends on the program you are running. In some programs, [INSERT] changes the typing mode from the normal overstrike (type-over) mode to the insertion mode so you can insert data into a line of text. Pressing the key again returns the keyboard to the overstrike mode.

The function of the Delete key depends on the program you are running. In some programs, [DELETE] erases the character at the current cursor position.

The function of the Break key depends on the program you are running. In some programs, [BREAK] halts program execution.

This key displays a backward slash (\).

This key displays a "difference" symbol, similar to a tilde (-).

The function of the Page Up key depends on the program you are running.

This key displays a broken vertical line (!). In MS-DOS, this key lets you *pipe* commands (give more than one command at a time) to the system.

The function of the End key 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.

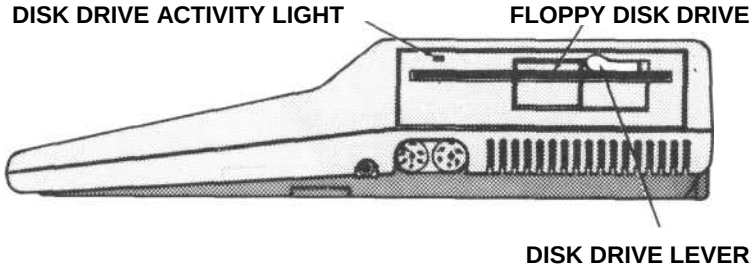
This key displays a grave mark (`).

The function of the Page Down key depends on the program you are running.

The Enter key on the numeric keypad is a duplicate of the main Enter key.

The Floppy Disk Drive

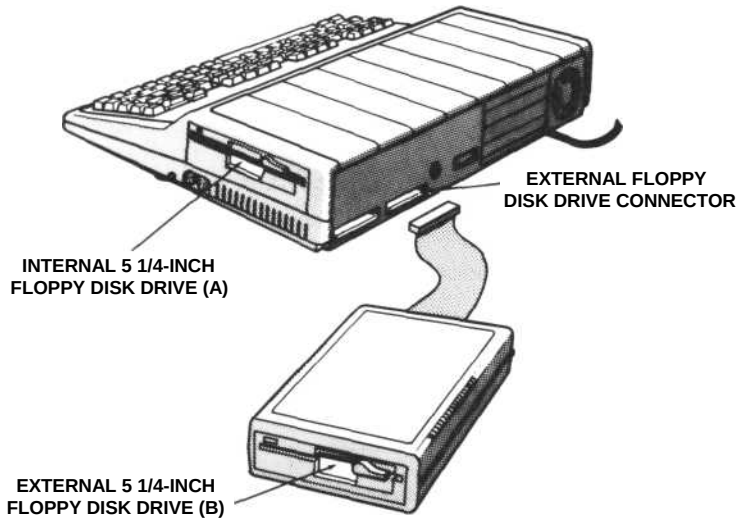
You use the floppy disk drive to store programs and data on diskettes. A drive lever opens and closes the disk drive. Turn the lever counterclockwise to open the drive. To insert a diskette into an open disk drive, gently slide it, label side up, into the drive. Turn the drive lever clockwise to close the disk drive and activate it.



The drive activity light is on whenever the floppy disk drive is reading from or writing to a diskette. **Never remove a diskette when this light is on; doing so might destroy the data on your diskette.**

To remove a diskette from the drive, be sure the drive activity light is off, turn the drive lever counterclockwise, and pull out the diskette.

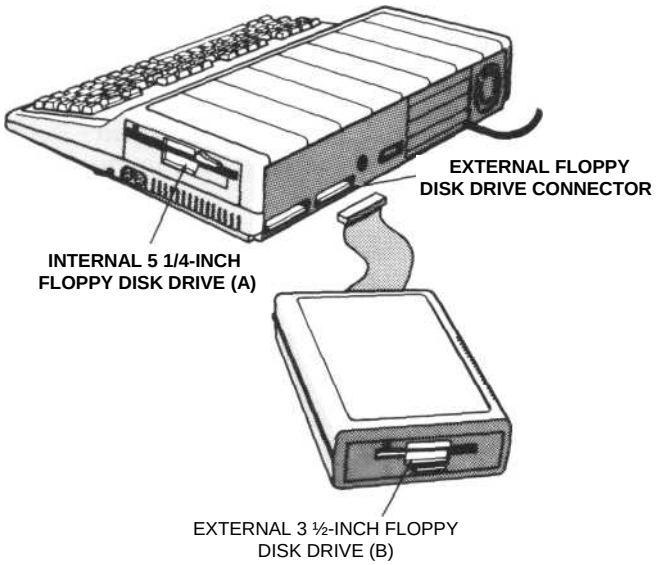
The internal floppy disk drive is the *primary* drive, usually referred to as Drive A. The optional external floppy disk drive is the *secondary* drive, usually referred to as Drive B. The operating system and most applications normally operate from the primary drive. A secondary drive is normally used for a data or utilities diskette.



Adding a Secondary Floppy Disk Drive

There are two types of external floppy disk drives that you can use with your computer: a standard 5 1/4-Inch 360K External Disk Drive (Cat. No. 25-1060) or a 3 1/2-Inch 720K External Disk Drive (Cat. No. 25-1061). You can install either drive by simply connecting it to the External Floppy Disk Drive Connector on the back of the computer. The computer powers the disk drive. You do not need to connect the drive to an electrical outlet. Refer to the documentation that comes with the disk drive for operation information.

> **Note:** Monitors and other sources of high-level radiation can interfere with the operation of your external disk drive. If you experience difficulties, move the disk drive away from the radiation source.

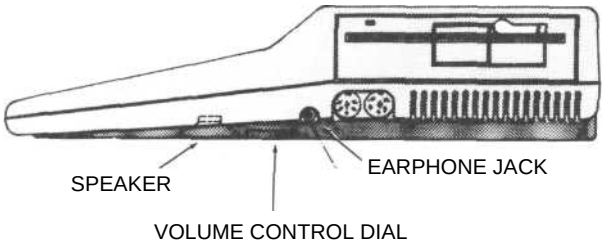


There are major differences in the format of the standard, 5 1/4-inch and the microfloppy, 3 1/2-inch drive types. You can access information from the secondary drive and copy information between the two drives regardless of drive type. However, you must use a special function key to start the system from a diskette in the secondary floppy drive.

To start the system from the secondary drive (Drive B), press F3 while starting MS-DOS. The operating system tells the computer to *swap drives,* making the external drive **Drive A** and the internal drive **Drive B.** Refer to *Introduction to MS-DOS* for more information on swapping drives.

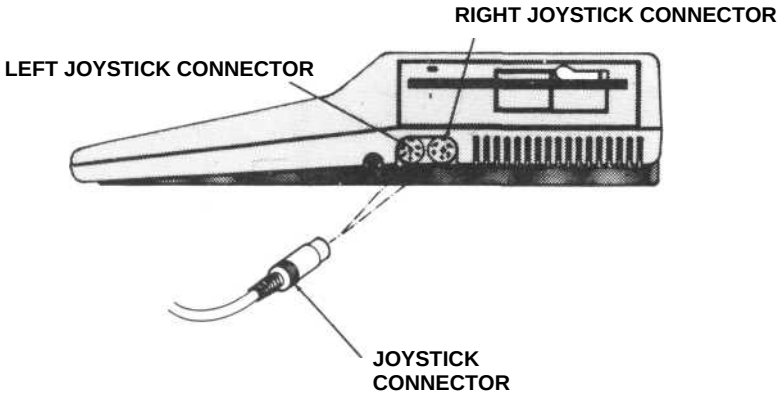
The Volume Control and Earphone Jack

The Tandy 1000 EX features a three-voice sound circuit and a built-in high-quality speaker for sound and music generation. A Volume Control Dial on the right side of the computer controls the volume of the sound emitted. You can also route the sound to the earphone jack by plugging an earphone or mini-headphones into the jack.



The Joystick Connectors

The Tandy 1000 EX provides support for games and other joystick applications programs. The two joystick connectors are on the right side of the computer. Connect a joystick or other device to the left and/or right joystick connector.

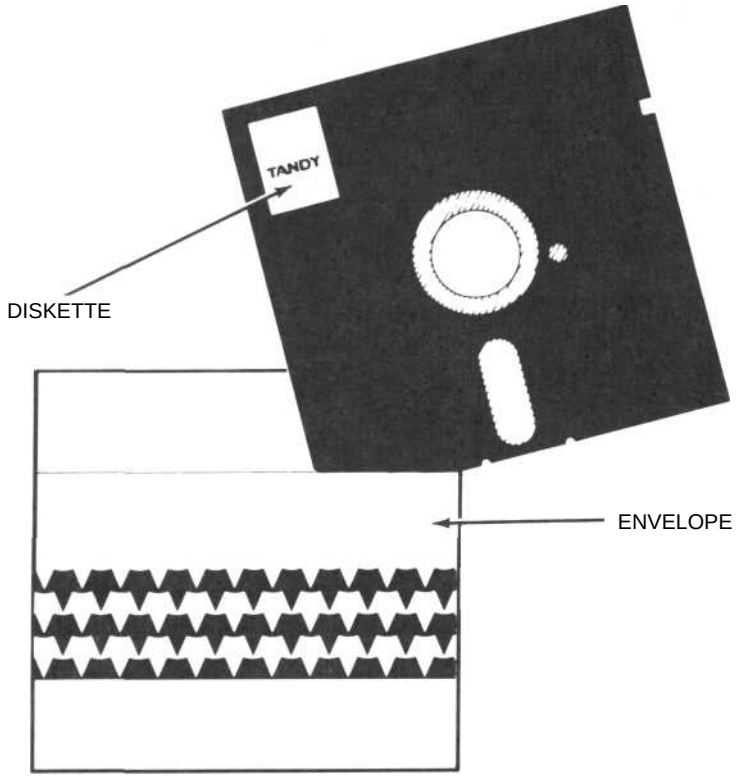


Note: The Right and Left indications on the joystick connectors are for reference only. Some application programs use these connectors interchangeably. If you use joystick software, and the program does not appear to function correctly, try reversing the joysticks.

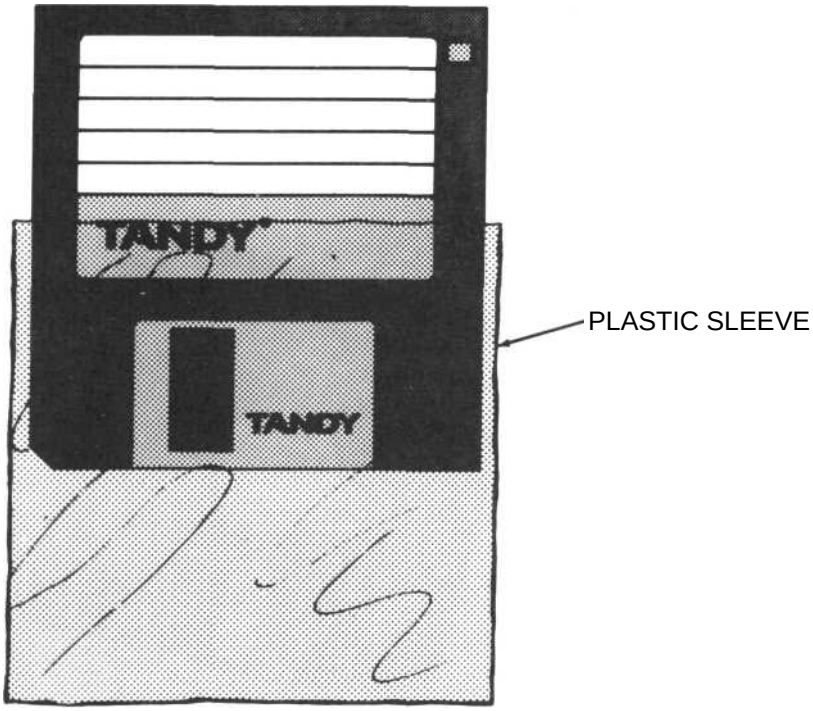
Chapter 4

THE DISKETTES

Care and Handling of Floppy Diskettes



Both the internal disk drive and the optional 5 1/4-inch external disk drive use double-sided, 5 1/4-inch, 40-track diskettes (Cat. No. 26-411 and 26-412). These diskettes can store approximately 360 kilobytes (more than 368,000 characters) of information.



The optional 3 1/2-inch external disk drive uses double-sided, 3 1/2-inch, 80-track diskettes (Cat. No. 26-415 and 26-416). These diskettes can store approximately 720 kilobytes (more than 737,000 characters) of information.

Handle floppy diskettes carefully. A scratch, small indentation, or even a speck of dust can destroy data on a diskette. To protect your diskettes (and the information they contain) from damage, follow these guidelines:

- Store diskettes in their envelopes, making certain that there is no pressure on their sides.
- Keep diskettes away from magnetic fields (such as transformers, AC motors, magnets, TVs, and radios).
- Never lay a diskette on top of or next to the computer system's console.
- Don't bend diskettes.
- Never touch a diskette's shiny exposed surface. Never try to wipe or clean the shiny diskette surface. The diskette surface scratches easily.
- Keep diskettes out of direct sunlight and away from heat.
- Keep diskettes away from cigarette ashes, dust, and other particles. In dusty areas, use filters to clean the air in the computer room.
- Don't write on the diskette label with a hard point pen or lead pencil. Use only a soft felt-tip pen.

Before you use any of the diskettes included with your computer, you should make *backups* (duplicates) of them. Refer to "Making Backups of Diskettes" in *Introduction to MS-DOS.*

The MS-DOS/BASIC Diskette

The MS-DOS/BASIC diskette provided with your computer contains the *disk operating system*, which is necessary to run application programs on your computer. The BASIC programming language for your computer is also on this diskette. You should make a backup of the system diskette **before** you use it to run your computer. Refer to *Introduction to MS-DOS* for instructions.

Refer to *Introduction to MS-DOS* and the "MS-DOS" section of the *Quick Reference* for information on using your MS-DOS system. Refer to the "BASIC" section of the *Quick Reference* for information on using the BASIC programming language.

The DeskMate Diskettes

Two DeskMate diskettes are provided with your computer. These diskettes contain the DeskMate applications programs for your computer. Refer to your DeskMate user's manual for information on using these diskettes.

Chapter 5

INTERNAL OPTIONS

You can add several internal option boards to your Tandy 1000 EX, including:

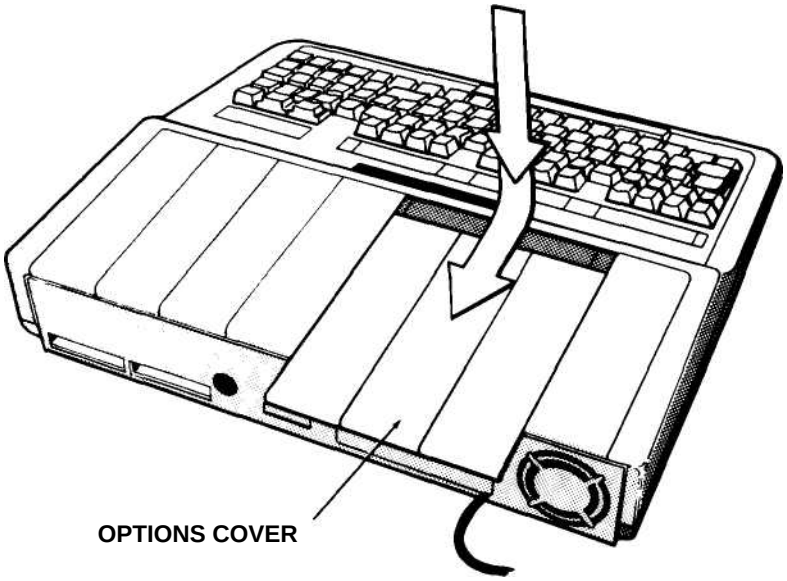
- A Memory PLUS Expansion Adapter (with or without the 256K Parity Memory Kit installed).
- An internal PLUS RS-232C Upgrade Board, along with an external modem or a serial plotter/printer.
- An internal modem board.
- A PLUS DIGI-Mouse Controller/Calendar Board, along with an external DIGI-Mouse.
- A PLUS Network 4 Interface.

You must remove the options cover and panel before you install any of the internal option boards.

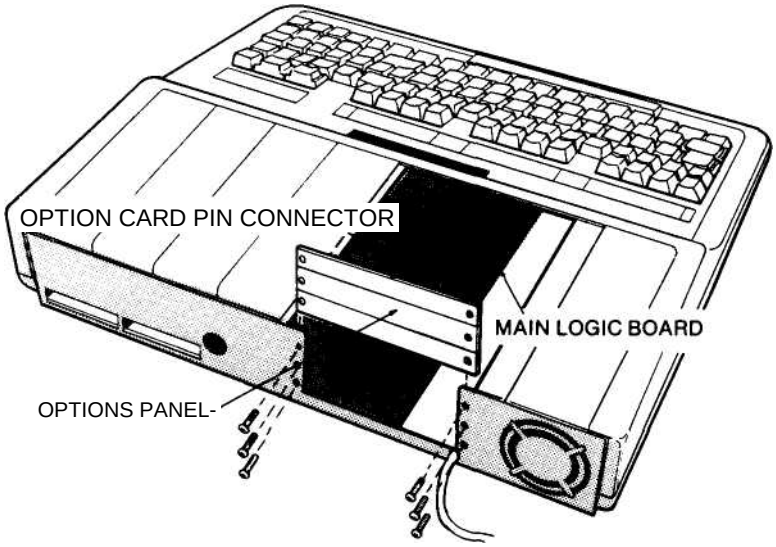
Before installing or removing an option board in your computer, turn off the computer, and disconnect the power cord from the wall outlet. Installing or removing a board with the power on can cause damage to the option board as well as to the main logic board.

Removing the Options Cover and Panel

Turn the back of the computer toward you. Remove the options cover first, by pressing down on the side of the cover nearest the front of the computer. At the same time, pull the cover toward you. Gently lift the cover up and out as it clears the tracks.



After you remove the options cover, remove the panel. You can now see the main logic board.



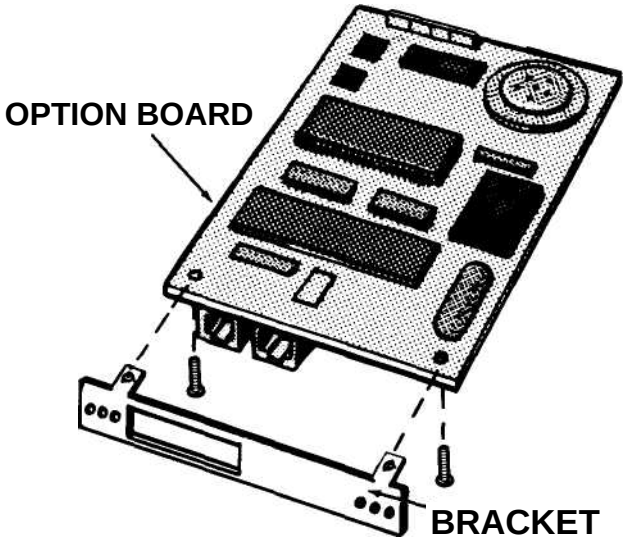
The Option Boards

You can install one option board on the connector pins on your computer's main logic board. Two additional boards can be added if you install the Memory PLUS Expansion Adapter on the main logic board. (You add the additional boards to the memory board.)

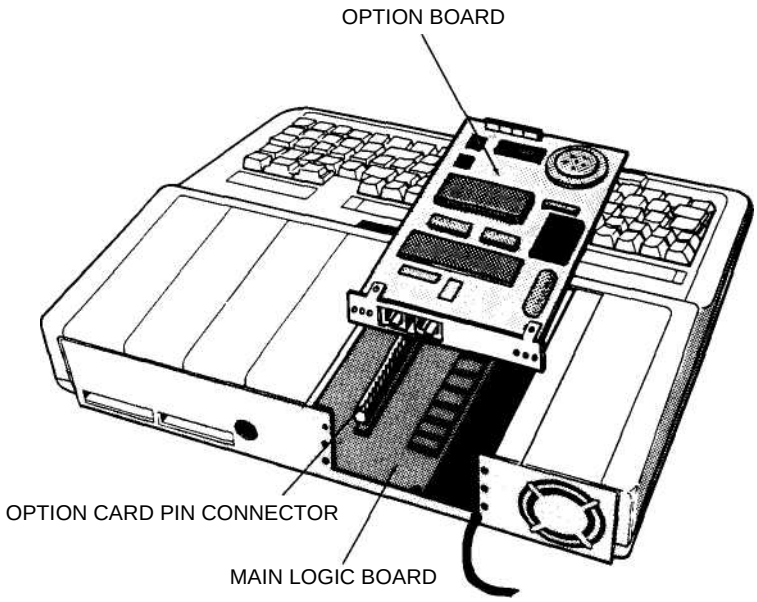
> **Note:** If you are adding the 256K upgrade to the memory board, you must add the chips before you install the board. Refer to the instructions that come with the memory board. Also note that the chip kit contains nine memory chips. You install only eight of these on the memory board. Store the other chip in a safe place.

Installing One Option Board

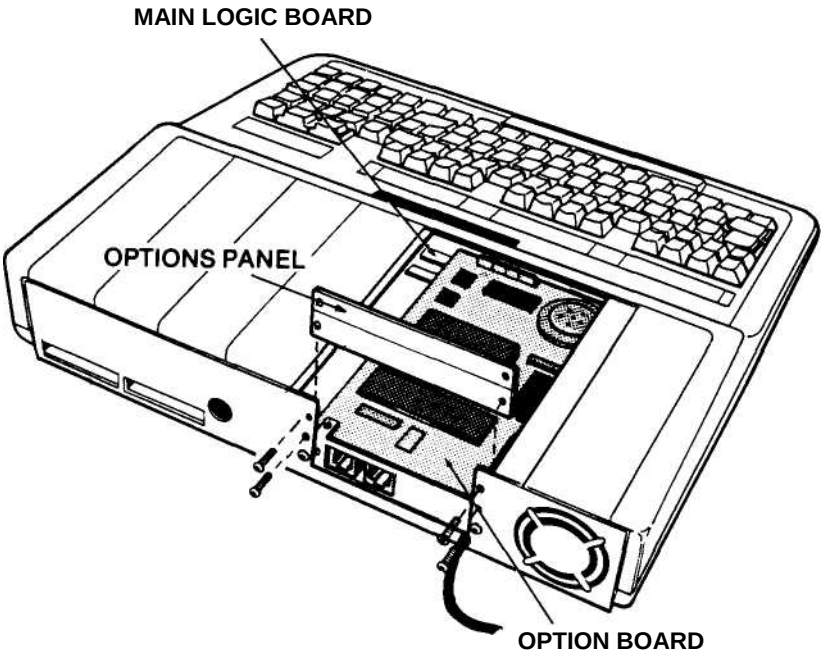
Before you install an option board, you must attach the board's metal connector bracket to it so that the cutout fits over the cable connector. The bracket is already attached to the Memory PLUS Expansion Adapter. All other PLUS-type option boards are packaged with two connector brackets. For your computer, position the flat bracket (B) over the mounting holes on the option board. Use the two screws packaged with the board to secure the bracket to the board. (Insert the screws from the bottom of the board.)



Now, carefully align the socket connector on the option board over the row of pins on the main logic board. Then, slowly lower the option board onto the connector pins, maintaining the alignment so that the pins go into the corresponding holes on the socket.



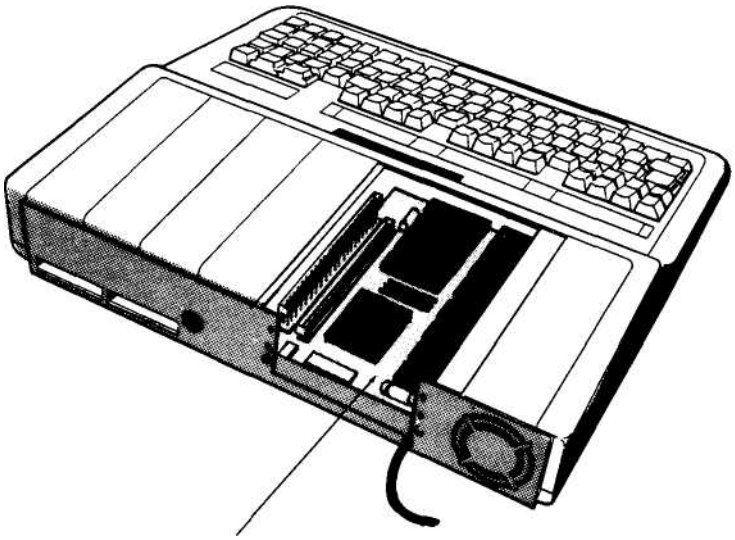
When the option board is completely seated and parallel to the main logic board, secure the bracket to the options panel area with the screws provided.



Replace the remainder of the options panel, and replace the options cover. See "Replacing the Options Panel and Cover."

Installing Additional Option Boards

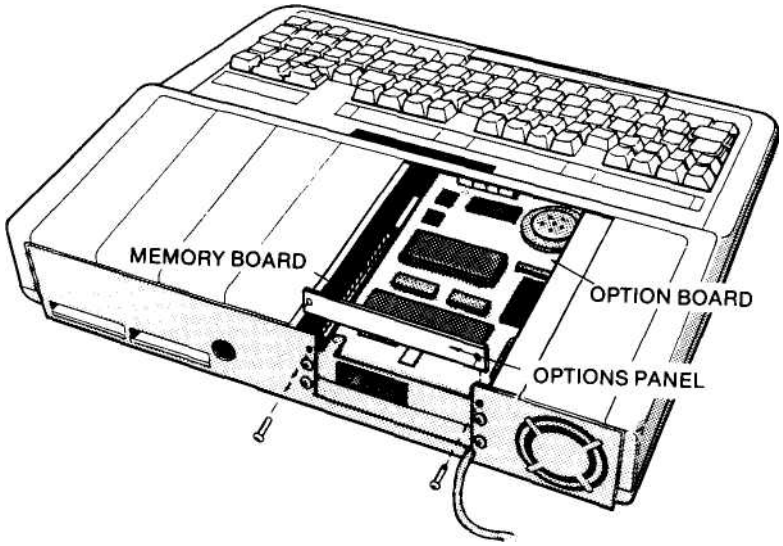
After you install a Memory PLUS Expansion Adapter, you can add one or two additional option boards to it. First, install the memory board. Follow the instructions in "Installing One Option Board."



MEMORY BOARD INSTALLED

Next, install the option board on the memory board. Carefully align the socket connector on the option board over one of the sets of pins on the memory board. (Install the first board on the bottom set of pins if you are adding two option boards to the memory board.) Then, slowly lower the option board onto the pin connector, maintaining the alignment so that the pins go into the corresponding holes on the socket.

When the option board is completely seated and parallel to the memory board, secure the bracket to the options panel area with the screws provided.



Follow these same instructions to install a second option board on the memory board.

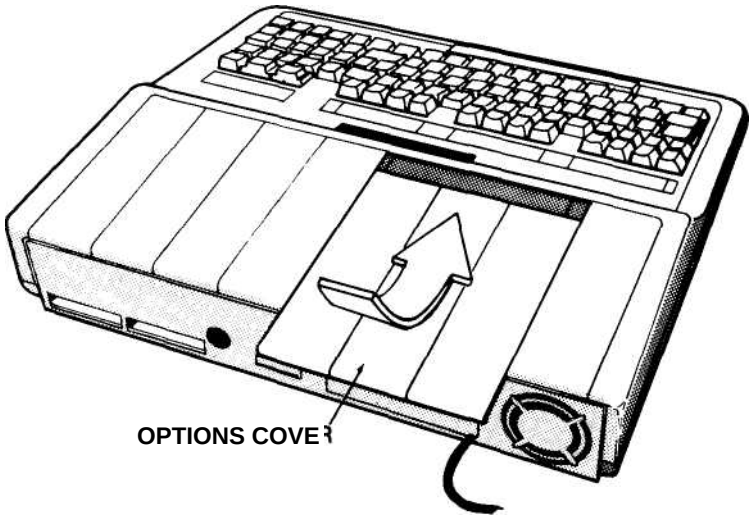
If you installed only one additional board, replace the remainder of the options panel, and replace the options cover. (See "Replacing the Options Panel and Cover.")

Replacing the Options Cover and Panel

The options panel has grooves dividing it into three parts. Remove any parts of the panel that are replaced by metal brackets. Replace the remaining part of the original panel.

Insert the panel into the case (with the lip down), and align the mounting holes on the panel with those on the case. Attach the panel with the screws provided.

Now, replace the options cover. Hold the cover at a downward angle with the lip of the cover toward you (at the back of the computer), and slide the cover down the tracks toward the front of the unit.



Now, connect the cables of all external options to the appropriate connectors on the back of the computer. Refer to the documentation that comes with the options for specific installation and operation instructions.

TROUBLESHOOTING

Video Problems

If you make all the proper monitor connections and still have trouble with your video, check for the following problems:

- Loose cables.
- Using color-oriented software with a monochrome monitor. Refer to "Function Keys" in Chapter 3.

Printer Problems

If you make all the proper printer connections and still have trouble, check for the following problems:

- Loose cables.
- The system is not set up for use with your printer. Refer to "Using a Printer With Your Programs" in *Introduction to MS-DOS.*
- The printer is not ready — off line, out of paper, out of ribbon, and so forth.

SPECIFICATIONS

System Unit

Processor: Intel 8088, 7.16 or 4.77 megahertz

Size:

Length:	370 mm (14.5 in.)
Width:	433 mm (17.0 in.)
Height:	83 mm (3.25 in.)

Weight: 5 kg (11 lb)

Power Requirements:

120 VAC, 60 Hz (U.S.)
120 VAC / 240 VAC, 50 Hz (International)
(28 watts)

Heat Output: 125 Btu/hr

Environment:

Air Temperature	
Operating	14° C - 30° C (55° F - 85° F)
Storage	-40° C - 72° C (-40° F - 160° F)
Humidity	
Operating	20% to 80% (non-condensing)
Storage	10% to 80% (non-condensing)

Internal Floppy Disk Drive

Unformatted Capacity	500 kilobytes
Formatted Capacity	360 kilobytes
Number of Heads	2
Number of Cylinders	40
Average Access Time	93 ms (includes settling time)
Track to Track Motor	6 ms
Starting Time Rotation	400 ms
Speed Media	300 RPM standard 5 1/4-inch, double-sided 40-track

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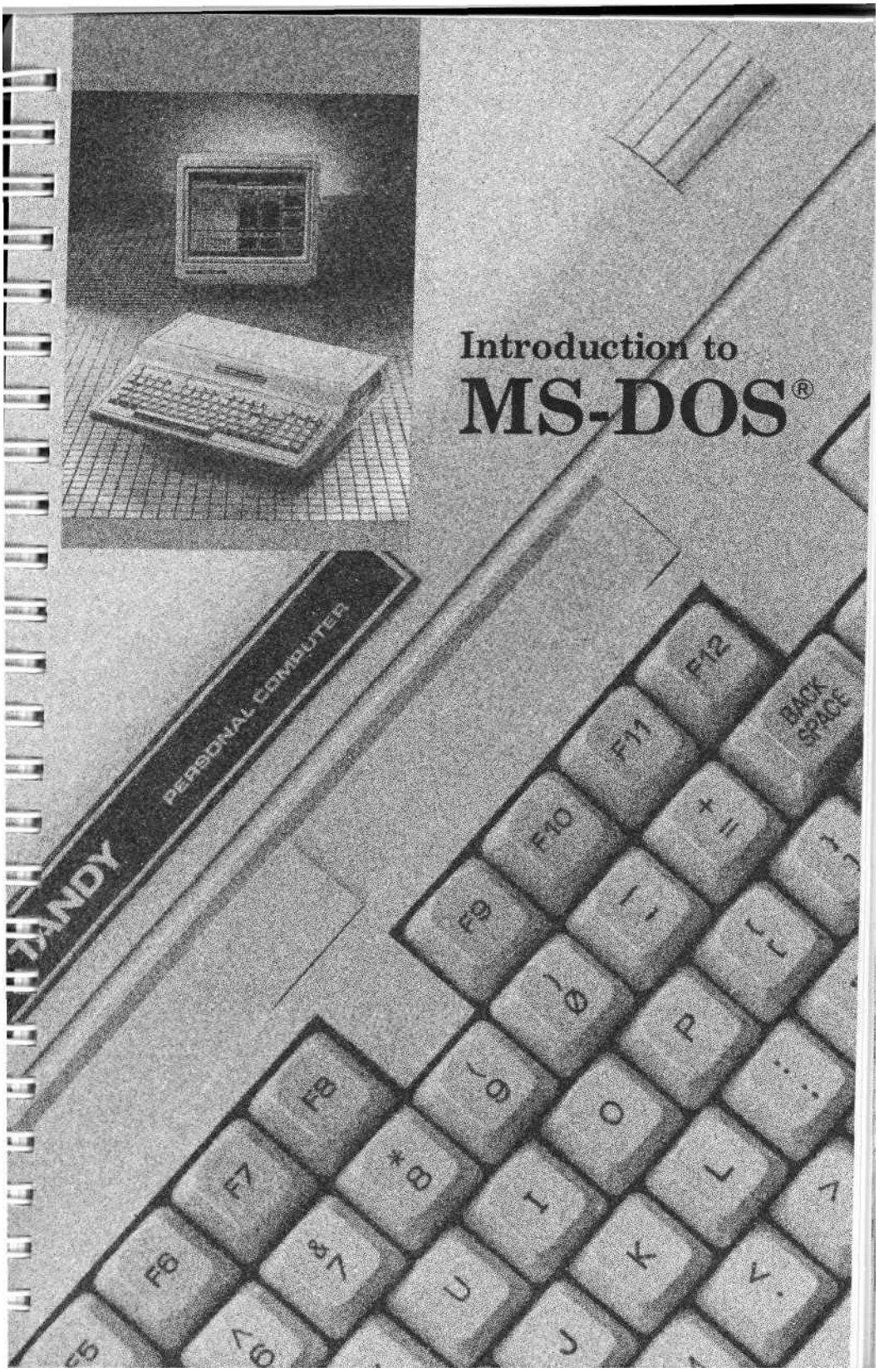

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Chapter 1

INTRODUCTION

MS-DOS is a *Disk Operating System.* An operating system is a group of programs that act as an interpreter and manager for your computer, monitor, and peripherals. Disk operating system means that the operating system can also direct and interpret information to and from disk drives. A computer can do only what you instruct it to do. The MS-DOS operating system conveys your instructions to the computer.

How much you need to know about your MS-DOS operating system depends on how you plan to use your computer. If you use your computer only for running *application programs* (software written to perform specific tasks or solve specific problems), you need to know little about the operating system. 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 operating system. Further, there are many MS-DOS command features included specifically for use with the options available for your computer. If your computer system includes options, you should familiarize yourself with any features of MS-DOS that are specific to those options.

Regardless of how you intend to use your computer, there are some basic procedures you must know. These include:

- Starting and exiting MS-DOS.
- Entering MS-DOS instructions.
- Starting an application program.
- Preparing a diskette to store information.
- Copying the operating system, program, and data files to a diskette.
- Duplicating a diskette.

This manual presents this information and a few other items you might find helpful. If you want more information, refer to the *MS-DOS Reference Manual* (Cat. No. 25-1508), which discusses the MS-DOS operating system in detail.

Entering MS-DOS Instructions

The MS-DOS instructions you give to the computer are called *commands.* You type commands at a *system prompt* (usually A>), which indicates that MS-DOS is at the *command level* (ready to accept commands).

The disk drive that MS-DOS is set up to access when you enter commands is called the *current drive.* You can access information on a drive other than the current drive by including a drive reference when you enter a command. MS-DOS regards the *primary drive* (the internal disk drive) as the current drive unless you specify otherwise. Refer to "Changing the Current Drive" if you want to change the current drive.

Because your computer carries out the MS-DOS commands exactly as you give them, your entries must be precise and have perfect *syntax* (spelling and form). You can type your instructions to MS-DOS in either uppercase or lowercase letters. However, pay special attention when typing characters that are interchangeable on a typewriter keyboard. These characters are not interchangeable on the computer keyboard. For example, never type the letter O for 0 (zero) or the lowercase letter 1 for 1 (one). Be sure you type commands exactly as they are shown.

This manual uses a simple method of notation to distinguish between what you enter and what you see on the screen.

Example	Description
[BACKSPACE]	Boxed characters represent keys that you press. These are usually function or command keys. It is not necessary to press [ENTER] after you press one of these keys.
[CTRL] [C]	Two or more boxed keys together represent a *key sequence* that you press. For a key sequence, hold down the first key shown. Then, press the second key while still holding down the first key.

format [ENTER]	Text that you type (commands and so forth) is shown in a different typeface than the body of the manual. You must press [ENTER] after you type the text. In MS-DOS, you can type in both upper-case and lowercase letters.
A>	Text that appears on the screen, such as the system prompt, is also shown in a different typeface than the body of the manual.

Chapter 2

HOW TO START AND EXIT YOUR SYSTEM

Starting MS-DOS

Starting your computer and initializing an operating system is called *booting.* The boot procedure prepares the computer for use.

To boot your system with MS-DOS, follow these instructions:

1. Turn on your computer, monitor, and any *peripherals,* such as a printer or an extra drive.
2. Remove the MS-DOS system diskette from its protective envelope.
3. Insert the diskette, label side up, into Drive A. (Be sure the diskette is not *write-protected.* Refer to "Floppy Disk Drives and Diskettes" for more information.)
4. Turn the drive lever clockwise to close the disk drive. The red light on the front of the disk drive indicates that the computer is accessing the diskette.
5. When the message asking for the date and time appears, follow the sample format on the screen to enter the information. If you do not want to change the date or time that is shown, press [ENTER] at each prompt.

   MS-DOS completes the boot procedure and displays the system prompt. The system prompt is the current drive reference, followed by a greater than symbol (A>). You can now enter operating system commands to instruct MS-DOS to perform tasks and run application programs.

   > **Note:** If you have the optional external floppy disk drive, you can change the drive references during bootup. *Swap drives* by pressing the [F3] function key immediately after you hear a beep when booting your system. The primary, internal drive becomes Drive B, and the secondary, external drive becomes Drive A. You **must** swap drives to boot a diskette in the secondary drive.

Exiting MS-DOS

Many application programs let you terminate an operation by pressing [BREAK] or [CTRL] [C]. However, abruptly halting execution of a program in this manner can sometimes result in loss of data. Further, some operations must complete their functions before you can stop the operations. Be sure the software you are using supports [BREAK] or [CTRL] [C] before you use either.

To protect your data, we recommend that you exit your application program and return to MS-DOS before you turn off your computer. When the MS-DOS system prompt is on the screen, follow these steps:

1. Remove your floppy diskettes from the disk drives, put them back in their protective envelopes, and store them in a safe place.

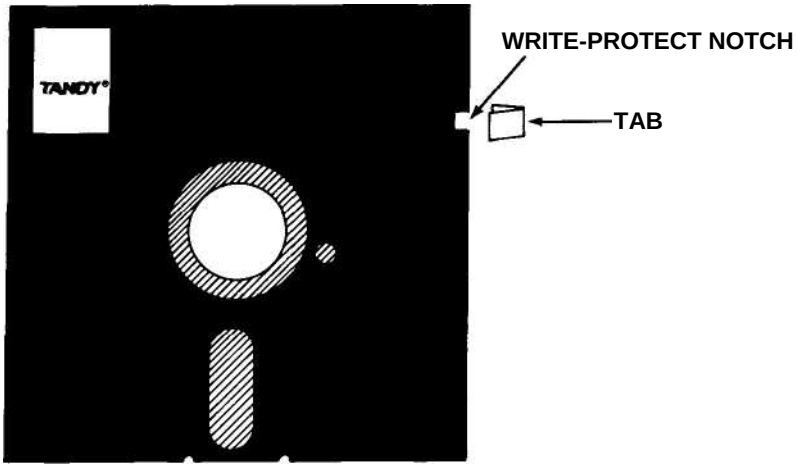
2. Turn off your computer, monitor, and any other equipment. If you plug your equipment into one power strip, you can use the power strip switch to turn off all equipment at one time.

Chapter 3

FLOPPY DISK DRIVES AND DISKETTES

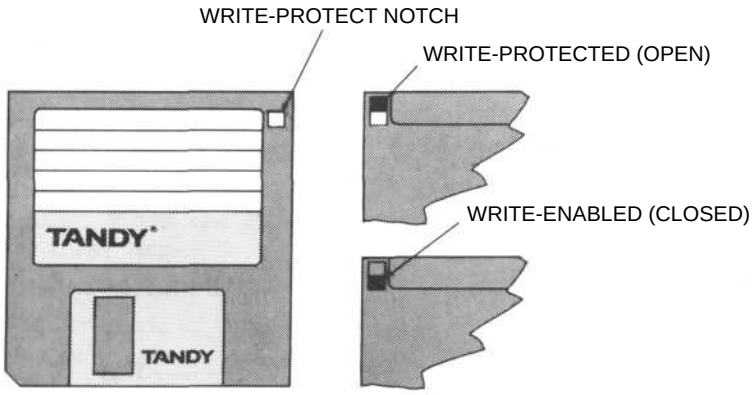
Floppy diskettes require careful handling. Be sure to read "Care and Handling of Floppy Diskettes" in the *Introduction to the Tandy 1000 Personal Computer EX* manual.

Write Protection For 5 1/4-Inch Diskettes



Most 5 1/4-inch diskettes have a square notch cut from one side. This is a *write-protect notch.* Fold one of the special adhesive tabs (supplied with diskettes) over this notch to *write-protect* the diskette. The computer can not write (store) data on a write-protected diskette. Leave the notch uncovered to *write-enable* the diskette for data storage. This feature protects diskettes from inadvertent destruction of data.

Write Protection For 3 1/2-Inch Diskettes



Microfloppy (3 1/2-inch) diskettes have a small, square hole in the upper right corner. This is the *write-protect notch.* From the back of the diskette, move the small tab (normally red or black) up so that the hole is open to *write-protect* the diskette. The computer can not write (store) data on a write-protected diskette. Move the tab down so that the hole is completely covered to *write-enable* the diskette for data storage. This feature protects diskettes from inadvertent destruction of data.

Making Backups of Diskettes

The magnetically stored information on diskettes can be destroyed by exposure to magnetic fields or by improper use or handling. You should make several *backups* (copies) of important diskettes. Should anything happen to a backup diskette, immediately make another.

> **Note:** You should now make backups of your MS-DOS/ BASIC and DeskMate diskettes.

There are two ways to back up important diskettes. You can use the DISKCOPY command, or you can use the FORMAT and COPY commands.

The DISKCOPY command creates an exact duplicate of a diskette. DISKCOPY duplicates all information, all files, and the entire directory structure of a diskette onto a new diskette. Use DISKCOPY whenever you want to exactly duplicate an operating system or other diskette.

> **Note:** You cannot use DISKCOPY to make a two-drive backup if the disk drives are different types. Use FORMAT and COPY or FORMAT and XCOPY to back up information between a diskette in a 3 1/2-inch disk drive and a diskette in a 5 1/4-inch disk drive.

The FORMAT command organizes a blank diskette so that you can copy to it. Many application programs require that you format data diskettes to store the information they produce. You must format a diskette before you can copy to it with the COPY command. You can also use the FORMAT command to create a bootable application diskette.

The COPY command duplicates the files in the current or specified directory and stores them on a formatted diskette. (Format with the /s switch if you are copying an operating system diskette). The copy is performed on a file-by-file basis. You can use COPY to back up an entire diskette or to duplicate selected files only. Use COPY to back up a diskette from one type of disk drive to another. The COPY command does not copy system files, hidden files, or files outside the current or specified directory.

The XCOPY command duplicates a diskette on a directory-by-directory basis. You can XCOPY an entire diskette or selected directories or files only. The diskette to which you XCOPY must be formatted (with the /s switch for an operating system diskette). Use XCOPY to back up an operating system or application diskette from one type of disk drive to another.

The backup procedures use two terms you need to understand. They are *target diskette* and *source diskette.* A target diskette is the diskette you select to **receive** a copy of another diskette. The source diskette is the diskette that contains the programs, system files, and/or data files that you want to copy.

> **Note:** Some application programs you buy are *copy-protected.* You cannot make copies of these program diskettes. Check the program manual for information on protecting the data on copy-protected diskettes.

Using DISKCOPY With One Disk Drive

1. If your computer is off, turn it on, and boot MS-DOS as outlined at the beginning of Chapter 2.
2. At the system prompt (`A>`), type:

   ```
   diskcopy ENTER
   ```

3. The screen displays the following prompt:

   ```
   Insert the source diskette in drive A
   Strike ENTER when ready
   ```

   To back up the system diskette, leave it in Drive A. Otherwise, insert the diskette you wish to back up into Drive A. Press ENTER

4. The screen shows:

```
Copying 9 sectors per track, 2 side(s)
```

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

```
Insert the target diskette in Drive A
Strike ENTER when ready...
```

Remove the source diskette. Be sure the target diskette is not write-protected. Insert the target diskette into Drive A, and press [ENTER].

MS-DOS might request that you swap the source and target diskettes several times before DISKCOPY is complete. Swap the diskettes each time the screen messages prompt you to do so.

DISKCOPY formats the target diskette and copies the information from the source diskette to it. When the DISKCOPY procedure is complete, this message appears:

```
Copy complete
Copy more diskettes? (Y/N)
```

5. If you wish to create more copies, press [Y], and again follow the prompts. To ensure the safety of your operating system, make at least two copies of MS-DOS.

   After you finish making copies, press [N] at the Copy more diskettes? prompt. The DISKCOPY procedure ends, and the system prompt reappears.

6. Set aside one of the backup diskettes for daily use as your *working diskette*. Store the original diskette and all additional backups away from heat, magnetic sources, electric motors, and in a relatively dust-free environment.

Using DISKCOPY With Two Disk Drives

1. If your computer is off, turn it on, and boot MS-DOS as outlined at the beginning of Chapter 2.

2. At the system prompt (`A>`), type:

   ```
   diskcopy a: b: [ENTER]
   ```

3. The screen displays the following prompt:

   ```
   Insert the source diskette in drive A
   Insert the target diskette in drive B
   Strike any key when ready
   ```

   To back up the system diskette, leave it in Drive A. Otherwise, insert the diskette you wish to back up into Drive A.

   Be sure the target diskette is not write-protected. Insert the target diskette into Drive B, and press [ENTER].

4. The screen shows:

   ```
   Copying 9 sectors per track, 2 side(s)
   ```

   This message can differ according to the diskette you are copying.

   DISKCOPY formats the target diskette and copies the information from the source diskette to it. When the DISKCOPY procedure is complete, this message appears:

   ```
   Copy complete
   Copy more diskettes? (Y/N)
   ```

5. If you wish to create more copies, press [Y], and again follow the prompts. To ensure the safety of your operating system, make at least two copies of MS-DOS.

   After you finish making copies, press [N] at the `Copy more diskettes?` prompt. The DISKCOPY procedure ends, and the system prompt reappears.

6. Set aside one of the backup diskettes for daily use as your *working diskette*. Store the original diskette and all additional backups away from heat, magnetic sources, electric motors, and in a relatively dust-free environment.

Formatting With One Disk Drive

1. If your computer is off, turn it on, and boot MS-DOS as outlined at the beginning of Chapter 2.
2. At the system prompt (A>), type:

   `format a:` [ENTER]

   (To format the diskette so that it is bootable, type: `format a: /s` [ENTER]. The /s switch tells MS-DOS to copy the hidden system files to the diskette after it is formatted.)
3. The screen displays the following prompt:

   ```
   Insert new diskette for drive A
   Strike any key when ready
   ```

   Replace the system diskette in Drive A with the blank diskette you wish to format, and press [ENTER]
4. When FORMAT is complete, a prompt appears giving you the option to format another diskette. To do so, press [Y], and repeat Step 3. Otherwise, press [N].
5. Store formatted diskettes in a safe place until you are ready to use them.

Formatting With Two Disk Drives

1. If your computer is off, turn it on, and boot MS-DOS as outlined at the beginning of Chapter 2.
2. At the system prompt (A>), type:

   `format b:` [ENTER]

   (To format the diskette so that it is bootable, type: `format b: /s` [ENTER]. The /s switch tells MS-DOS to copy the hidden system files to the diskette after it is formatted.)
3. FORMAT asks you to insert the new (target) diskette. Insert the blank diskette you want to format into Drive B, and press [ENTER].
4. When FORMAT is complete, a prompt appears giving you the option to format another diskette. To do so, press [Y], and repeat Step 3. Otherwise, press [N].
5. Store formatted diskettes in a safe place until you are ready to use them.

Copying an Entire Diskette

Note: You must format a diskette before you can use the COPY command to copy information to it. (Be sure to format with the \s switch if you are duplicating an operating system or other bootable diskette.)

1. If your computer is off, turn it on, and boot MS-DOS as outlined at the beginning of Chapter 2.
2. Remove the system diskette from Drive A, and replace it with the source diskette (the diskette you are copying).
3. If you have a two-drive system, insert the formatted target diskette (the diskette to which you are copying) into Drive B.
4. At the system prompt (A>), type:

   `copy a: *.* b:` ENTER

5. If you have a one-drive system, the COPY command tells you when to insert the Drive A (source) diskette or the Drive B (target) diskette. When prompted to do so, remove the source diskette, and insert the formatted diskette in Drive A. Continue switching the diskettes as instructed to complete the copy.

The operating system duplicates all files on the source diskette and copies them to the target diskette. See Chapter 6 for more information on the COPY command.

Xcopying an Entire Diskette

Note: You must format a diskette before you can use the XCOPY command to copy information to it. (Be sure to format with the /s switch if you are duplicating an operating system or other bootable diskette).

1. If your computer is off, turn it on, and boot MS-DOS as outlined at the beginning of Chapter 2.
2. Remove the system diskette from Drive A, and replace it with the source diskette (the diskette you are copying).
3. If you have a two-drive system, insert the formatted target diskette (the diskette to which you are copying) into Drive B.
4. At the System prompt (`A>`), type:

   `xcopy a:*.* b: /s /e` [ENTER]

5. If you have a one-drive system, the XCOPY command tells you when to insert the Drive A (source) diskette or the Drive B (target) diskette. When prompted to do so, remove the source diskette, and insert the formatted diskette in Drive A. Continue switching the diskettes as instructed to complete the xcopy.

The operating system duplicates all directories and files on the source diskette and copies them to the target diskette. The /s switch tells XCOPY to copy all directories and subdirectories that are not empty. The /e switch tells XCOPY to also copy empty subdirectories. See Chapter 6 for more information on the XCOPY command.

Changing the Current Drive

The current drive is the one that MS-DOS and your application programs normally read from and write to. You can access information on a drive other than the current one by including a drive reference when you enter an MS-DOS command. MS-DOS regards Drive A as the current drive unless you specify otherwise.

If you have two floppy disk drives, you can change the current drive to Drive B by typing:

```
b: [ENTER]
```

The screen prompt changes from `A>` to `B>`. Drive B is now the current drive.

To access a diskette in a drive other than the current one, you must include the drive name. For example, assume Drive B is the current drive. To execute a program named Myprog in Drive A, type:

```
a:myprog [ENTER]
```

> **Note:** Changing the current drive is not the same as swapping drives. When you **change the current drive,** you tell the computer which drive to access whenever you do not specify a drive in a command. When you **swap drives,** you reverse the names (references) of the floppy drives. (Drive A becomes B, and Drive B becomes A.) Remember that you **must** swap drives to boot from the external floppy disk drive.

Chapter 4

HOW TO USE YOUR PROGRAMS

Using Application Programs With MS-DOS

Application programs are designed to perform specific tasks — word processing, spreadsheet analysis, and so forth. The Desk-Mate diskette, for example, contains several application programs. Many application programs (including DeskMate) require you to use the MS-DOS diskette to start up your computer. Par these applications, you can start up with an operating system diskette, then switch to the application diskette. A few applications let you start up directly from the application diskette. Check your application program's documentation for the specific steps necessary to start your application.

When you are using an application program, the program's prompts and screens appear instead of the operating system prompt. Application programs use the operating system to help process information, and MS-DOS manages the computer's operations.

Using a Printer With Your Programs

If your application programs require the use of a printer, you must be sure the computer is set up to work with the printer you choose. Many printers automatically add a line feed after each carriage return. If your application program also adds a line feed after a carriage return, your text prints double-spaced. YOU can alleviate this problem by either turning off the printer's line feed or turning off the software's line feed.

First, determine whether you have an extra line feed by using your application program to run a printout test. If the text prints double-spaced, then turn off one of the line feeds by either setting the printer, manually setting the software, or creating a printer setup program that automatically sets the software each time you boot your computer.

Setting the Printer

Many printers (including most Radio Shack® dot matrix, DMP-series printers) have a hardware DIP switch that determines whether or not the printer adds a line feed after a carriage return. If your printer has a carriage return DIP switch, set it to CR = CR to turn off the line feed.

Setting the Software

If your printer does not include a carriage return DIP switch, you must set the software to turn off the extra line feed. Follow these steps to manually turn off the software's line feed:

1. At the MS-DOS system prompt, type:

   `lf` [ENTER]

2. Now, type:

   `mode lfoff` [ENTER]

You can turn on the line feed again by typing: mode If on. Any time you turn off or reset the computer, the system returns to the default setting, lfon.

Creating a Printer Setup Program

You can also create a program that sets your software to automatically turn the line feed on or off each time you boot your system. Use the following steps to create a printer setup program. Note that you must perform this procedure for each diskette you use to boot your computer (MS-DOS and bootable applications).

1. Insert the boot diskette into Drive A. At the MS-DOS system prompt, type `lpinst` [ENTER]. The screen shows:

   ```
   Does your printer automatically linefeed
   after a carriage return?
   ```

2. Press [Y] or [N]. If you are not sure, exit LPINST and run a printout test. If the printer double-spaces lines, return to MS-DOS, run LPINST again, and answer [Y]. Again, run a printout to be sure the printer is performing as expected.

When the procedure is complete, the MS-DOS prompt appears again.

LPINST builds an autoexec.bat file that gives your system the information it needs to use your printer. If an autoexec.bat file already exists on the diskette, LPINST appends the necessary information to that file.

Chapter 5

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 data. The information in this chapter applies both to floppy disk organization and hard disk organization. Hard disk organization is particularly important because of the greater storage capacity of a hard disk.

For the sake of simplicity, wherever the information applies to both floppy diskettes and hard disks, we refer to the media simply as *disks.*

About Files

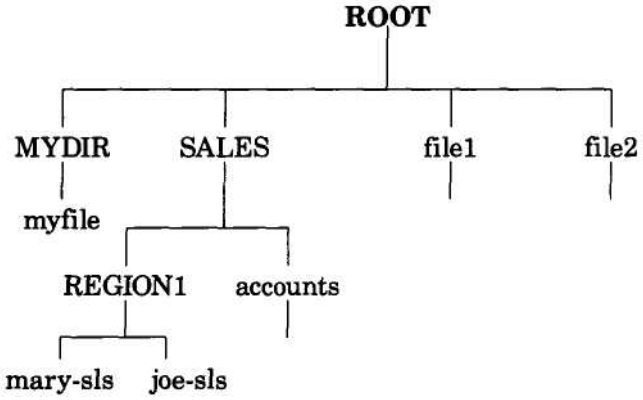
All information on disks is stored in *files.* A file is simply a collection of information. There are three main types of files:

- *System files* contain the 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 your DeskMate software.

About Directories

All files on a disk reside in a *directory.* A directory is simply a storage space for the names of your files. When you format a disk, you create one directory called the *root* directory. On your MS-DOS system disk, the commands are contained in the root directory. When you boot your computer using MS-DOS, you are automatically in (operating from) the root directory. For many purposes, especially if you are using floppy disk drives only, you do not need additional directories.

Any new directories you create branch from the root directory as *subdirectories.* You can create several levels of directories, as shown in the following example:



The uppercase names in this illustration represent the example disk's directories. The lowercase names represent the files in the various directories. The distinctions are for the example only. You can enter directory names in either uppercase or lowercase. Also, note that you can store files and subdirectories **only** in directories, not in files.

Multiple Directories

There is nothing wrong with storing all your files in the root directory. In fact, because you are always in the same directory as your files, using only the root directory makes it easy to access your files.

However, organizing a disk into multiple directories makes it easy to keep your data organized when you have many files. Because hard disks can store hundreds of individual files, such a multiple-directory organization is especially helpful when using hard disks.

About File and Directory Names

The following is a complete list of acceptable characters for directory names and filenames:

- Uppercase letters: A-Z
- Lowercase letters: a-z
- Decimal digits: 0-9
- Symbols: $ & # % ' ( ) - @ ^ { } !

When creating filenames, do not include more than eight characters. MS-DOS ignores any characters after the eighth. For example, MS-DOS regards both Accountsl and Accounts2 as Accounts. If you save both files in the same directory, MS-DOS writes over the first file with the second, destroying the first file.

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

aux	con	prn
nul	coml	com2
lptl	lpt2	lpt3

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.

Extensions can be a maximum of 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.

Examples Of Filenames

Examples of valid filenames are:

mydatal	SAMFILE
l.tst	$100GIFT
records.srt	'HELP'.fil
XXX.xx	File#l.txt
10%SALES	par@64.gam
PR0G1.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.

Chapter 6

MORE ON 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 load the operating system. Internal commands remain in memory until you reset or turn off the computer. These commands execute immediately when you enter them. COPY, DIR, PATH, TYPE, and VER are examples of internal MS-DOS commands.

MS-DOS stores its external commands on disk as program files. When you enter an external command, MS-DOS searches for the current directory, then executes it. If the command is not in the current directory, MS-DOS searches any directories or drives you specified with the PATH command. CHKDSK, DISKCOPY, and FORMAT are examples of external MS-DOS 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 com mand. They provide data needed by a 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 a valid one, MS-DOS carries out the command as you enter 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 sequences have special significance to MS-DOS.

space bar	Moves the *cursor* (the blinking underline character displayed on the screen) one space to the right and adds a space to a line.
[CTRL]	Lets you give complex commands to your computer by pressing only two or three keys. Hold down [CTRL], and press the other key(s).
[BACKSPACE] or [CTRL] [H]	Backspace. Moves the cursor left one character and erases the character in that position.
[CTRL] [C] or [CTRL] [BREAK]	Cancel. Stops the execution of an MS-DOS command or of a program that uses MS-DOS functions. If the program does not access MS-DOS, the program does not recognize this key sequence. (The computer might take a few moments before it recognizes the key sequence.)

PRINT, CTRL N, or CTRL P	Echo. Sends each character of output to the printer. Press the sequence again to stop echo.
ESC	Escape. Terminates the current line without processing it and clears the line buffer. Displays a backslash (\) and performs a carriage return. (The cursor moves down one line and returns to the left margin.) Although the system prompt does not display, the system is ready for a command.
ENTER	Execute command/carriage return. Begins processing the command line you type. ENTER also causes a carriage return. (The cursor moves down one line and returns to the left margin.)
CTRL J	Line feed. 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.
SHIFT PRINT	Print screen. Everything currently displayed on the screen is sent to the printer.
CTRL ALT DELETE	Reset. Resets your computer the same as if you turn it off, then on again.
HOLD or CTRL S	Stop scroll. Stops scrolling information on the screen to let you view it. Press HOLD or CTRL Q to resume scrolling.

Several keys and key sequences are available to edit an MS-DOS command line. These keys act on the command line in the *template* (the last command entered and executed). 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. Makes the new line the new template and executes the command line.
[ESC]	Void line. Voids the new line, but does not affect the template.
[INSERT]	Insert character. Goes into the insert mode for you to insert characters into the template. Press [F3] to end the insert mode.
[DELETE]	Delete character. Erases the next character from the template. The character is skipped and is not copied to the command line.
[→] or [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 specified character from the template. They are skipped and are not copied to the command line.
[F5]	Replace template. Makes the line you type the new template, but does not execute the command line.
[F6] or [CTRL] [Z]	End-of-file. Puts an end-of-file marker in the template.

Special Commands

You have learned about a number of MS-DOS commands that help you set up and use your computer system. There are many more commands available. This section contains information about a few 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 and directories) of a disk, use the DIR command. For example, to view the contents of the current directory, type:

```
dir ENTER
```

If a disk contains more filenames than can appear on the screen at once, all but the last 22 scroll off the top of the screen. MS-**DOS** has three ways to overcome this problem:

- Press HOLD to stop the screen from scrolling. (Press HOLD again to restart the scrolling.)
- Use the /P *switch* with the **DIR** command. A switch tells MS-DOS to execute a command in a certain manner. In this case, /P pauses the directory listing when the screen is full. Press the space bar to resume the listing. To use the /P switch, type:

  ```
  dir /p ENTER
  ```

- Use the /W switch to display the disk files in five col umns. This format usually allows all filenames to appear on the screen at once. The format for this com mand line is:

  ```
  dir /w ENTER
  ```

Use **DIR** to view any directory on a disk. For instance, to see which directories and files are in the SALES directory, specify the directory name along with the **DIR** command:

```
dir \sales ENTER
```

If you want to look at a directory on a disk drive other than the current drive, specify a complete path for MS-DOS to follow, including the disk drive name. This route through drives and directories to a file is called a *pathname*. For example:

```
dir b:\sales\region1 ENTER
```

The first backslash (\) represents the root directory of the specified drive (Drive B, in this case). The second backslash separates the two directory names. Always use backslashes to separate the *branches* (directory names, subdirectory names, and filename) of a pathname.

Creating a Directory

Before you can store data in a directory other than the root directory, you must use the MKDIR or MD command to create the directory. For instance, to create a directory named SALES on Drive B, type:

```
mkdir b:\sales ENTER
```

Then, to create the REGION1 subdirectory within the SALES directory, type:

```
md b:\sales\region1 ENTER
```

Changing The Current Directory

You can change the current directory (the default directory) by using CHDIR or CD. If you are in the root directory of the current drive and want to operate from the SALES directory, you can type:

```
chdir \sales ENTER
```

To change to a subdirectory deeper in the directory structure, such as REGION1 within the SALES directory, type:

```
cd \sales\region1 ENTER
```

Finding Files and Directories

Because of the many levels of directories possible with MS-DOS, you might forget exactly which directories and files are on a disk. You can use the TREE command to display a complete list of all directories and subdirectories on a disk.

```
tree [ENTER]
```

If there are more directories than you can display on one screen, press [CTRL] [S] to stop scrolling the display. Press [CTRL] [S] again to resume scrolling the display.

Make a note of any paths in which you are interested. Then, use the pathname to access the file you want.

Copying Files

It is easy to copy a file from one disk to another using the COPY command. The COPY command can copy files between different drive types. This command requires the following information:

- The name of the file you want to copy.
- The disk and directory where it resides.
- The name you want to give to the copy.
- The disk and directory where you want the new copy to reside.

For instance, to copy the joe-sls file from the SALES directory of Drive A to the Drive B diskette, type:

```
copy a:\sales\joe-sls b:joe-sls[ENTER]
```

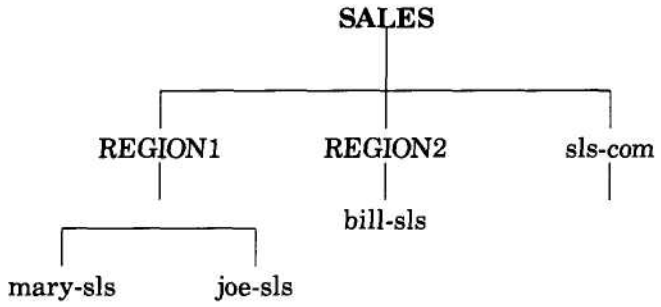
(Note that you must switch diskettes if you are making a one-drive copy.)

The COPY command has other uses as well. For instance, you can use COPY to append files and to combine files. See the COPY command in the optional *MS-DOS Reference Manual* for more information on this versatile command.

Copying Directories

The XCOPY command lets you copy one or more files, one or more directories, or an entire diskette. The XCOPY command differs from the COPY command in that COPY performs a file-by-file copy and XCOPY copies by directory. Because of this, you can use XCOPY to copy not only between different drive types, but also to copy the entire directory structure of a diskette. Include both the /s and /e switches to copy all directories and subdirectories on the specified drive or all subdirectories in the specified directory.

For instance, suppose you want to copy the SALES directory, which has the following structure:



To copy the SALES directory, its subdirectories, and all files in the directories from the source diskette to the formatted target diskette, type:

```
xcopy a:sales b:sales /s /e
```

This command copies the source diskette's SALES directory; the REGION1 and REGION2 subdirectories; and the sls-com, bill-sis, mary-sls, and joe-sls files to a SALES directory on the target diskette. (Note that you must switch the source and target diskettes if you are making a one-drive xcopy.)

If you omit /s and /e, the XCOPY command copies the specified directory and its files (SALES and sls-com), but not the associated subdirectories and their files.

Home Directories

MS-DOS remembers which directory is the current directory for any disk, even if you change the current drive. For instance, assume that Drive B is the current drive and REGION1 is the current directory. If you then set Drive A as the current drive, REGION1 becomes the *home directory* of Drive B. This means you can access a file in REGION1 without specifying the full pathname. Then, to access B:\SALES\REGION1\Mary-sls, you can type:

```
dir b:mary-sls ENTER
```

This feature is equally convenient for other commands, such as COPY. To copy a file from your current directory into the REGION1 directory on Drive B in our example, type:

```
copy thisfile b:thatfile ENTER
```

COPY reproduces the data in the file named **Thisfile** in a new REGION1 file named **Thatfile.**

Renaming Files

MS-DOS also lets you change the names of files. Suppose you have a staff change in your company. Use RENAME to give your old file a new name. For example, to change Joe-sis to Sam-sis, type:

```
rename \sales\joe-sls \sales\sam-sls ENTER
```

Establishing Paths

If you expect to use a particular pathname frequently but want to remain in your current directory, you can use the PATH command to expand the scope of MS-DOS's search for files. For instance, if you are in Drive B but want to easily access the commands in the root directory of Drive A, type:

```
path a:\ ENTER
```

Now, to access a command in the root directory of Drive A, you only need to specify the command name, such as:

```
chkdsk b: /v
```

Looking Inside Files

TYPE is a command that lets you examine files that consist of text characters. For instance, to view the Joe-sis file in the SALES directory, type:

```
type \sales\joe-s1s [ENTER]
```

The file contents appear on the screen. If there are too many lines in the file to fit on the screen, use [HOLD] or [CTRL] [S] to stop and start scrolling.

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

Deleting Directories

To delete a directory, follow these steps. (Note that MS-DOS does not allow you to delete a directory until it is empty.)

1. Use DIR to view the contents of the target directory.
2. Copy into another directory any files you want to keep.
3. Use DEL to delete all remaining files from the directory.
4. Use RMDIR or RD to remove (delete) the directory.

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 Reference Manual* 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.

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