

TANDY 1000 TL/3

User's Guide



TANDY

17.5

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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.

Modifying or tampering with internal components can cause a malfunction and might invalidate the warranty and void your FCC authorization to operate this equipment.

Service Policy

Radio Shack's nationwide network of service facilities provides quick, convenient, and reliable repair services for all of its computer products, in most instances. Warranty service will be performed in accordance with Radio Shack's Limited Warranty. Non-warranty service will be provided at reasonable parts and labor costs.

Contents

About This Manual	1
Conventions	2
Abbreviations	2
Introduction	3
Features	3
Getting Started	9
Setting Up Your Equipment	10
Connecting a Parallel Device	11
Maintenance Tips	12
Using the System Unit Controls	13
Using the Keyboard	14
Using the Diskette Drive	16
Using MS-DOS	19
Adding Optional Equipment	21
Removing the Computer Cover	22
Main Logic Board and Satellite Board Layout	23
Slots and Connectors	24
Jumpers	25
Installing Additional Memory	27
Installing a Math Coprocessor	28
Installing Additional Drives	30
Accessing a Drive	34
Initializing a SmartDrive	35
Installing Expansion Adapter Boards	36
Installing the Line Audio Jumpers	37
Internal Real-Time Clock	39
Replacing the Cover	40
Setting System Options	41
Running the SetupTL3 Utility	42
Troubleshooting	47

Specifications	49
System Unit	49
Environment	49
Microphone/Line-Level Input	49
Earphone/Line-Level Output	49
Connector Pinouts	50
720KB Diskette Drive	52
Glossary	53
Index	57
System Record	59

About This Manual

This manual describes how to set up and use your Tandy 1000 TL/3 computer. The manual is divided into the following sections:

- | | |
|----------------------------------|---|
| Introduction | Describes each feature of the computer and directs you to the appropriate section to learn more. |
| Getting Started | Explains how to set up and use the basic system: the system unit controls, the keyboard, the diskette drive, and diskettes. |
| Using MS-DOS | Explains how to use the MS-DOS Version 3.3 operating system. |
| Adding Optional Equipment | Explains how to add optional equipment to your Tandy 1000 TL/3 system. |
| Setting System Options | Explains how to use the SetupTL3 utility to set system options. |
| Troubleshooting | Explains how to solve some system problems that you might have. |
| Specifications | Provides a technical description of the system equipment. |
| Glossary | Defines important terms used in this manual. |
| System Record | Provides space for you to record system information, such as the type of monitor used and the amount of memory added. |

Conventions

In this manual, some text is printed differently from the rest to indicate various types of information. These differences in printing are called *conventions*. The following conventions are used:

- Words printed in small bold capitals represent keys on your keyboard. For example: **ENTER**.
- Groups of keys are printed like this: **CTRL+ALT+DEL**. Press and hold the keys (**CTRL**, **ALT**, and **DEL** in this example) in the order shown.

Abbreviations

The following abbreviations are used in this manual:

- KB = kilobyte
- MB = megabyte
- MHz = megahertz
- ns = nanosecond

Introduction

A computer system is made up of *hardware* and *software*. Hardware is computer equipment, such as a diskette drive or a monitor. Software is the programs that help you to use the hardware. Your Tandy 1000 TL/3 system has some software built in. DeskMate, a powerful collection of integrated application programs, is provided on diskette with the core program built into read-only memory (ROM). ROM is a storage area for information you can read but not change. Having DeskMate in ROM makes it easy to begin using the computer as soon as you set it up.

Understanding what the features of your computer are designed to do can help you get the most out of your 1000 TL/3 system. Some features are built into the TL/3 and ready to use. Others make it easy to add optional equipment to the system. This section describes each feature and lists a section of the manual where you can learn more about it.

Features

CPU

The central processing unit (CPU), or microprocessor of the TL/3 is an Intel 80286 running at a clock speed of 10 megahertz. The CPU is the brain of your computer. It processes or prepares the information that programs use to operate. Some programs work better at a CPU speed slower than 10 MHz. Check your program documentation and refer to the "Setting System Options" section for more information.

Memory

Random-access memory (RAM) is an area of memory that temporarily stores programs and information that the CPU is working on. The TL/3 has 640KB of RAM. One kilobyte of memory can store 1,024 bytes, or characters, of information. If you run programs that require large amounts of RAM, like some desktop publishing and graphics applications, you might need to add more memory. To learn how to add memory, refer to the "Adding Optional Equipment" section.

Information in RAM is erased when you turn off the computer, so you must save your work on a diskette or an optional hard disk before you turn off the computer.

Real-Time Clock with Battery

A real-time clock is built into the computer to keep track of the time and date. Many programs, including DeskMate, use or display the system time and date. The real-time clock has a backup battery to maintain the correct time and date even if you unplug the computer or the power fails.

Video Support

Video support enables you to connect a color or monochrome monitor to the TL/3. You do not need to add extra equipment to enjoy the images produced by the programs you use. The monochrome video is compatible with Monochrome Display Adapters (MDA) or Hercules adapters. The color video is compatible with Color Graphics Adapter (CGA) boards. For information about connecting a monitor, refer to the "Getting Started" section.

Music and Sound

A three-voice sound circuit, digital sound circuits, a volume control, an earphone jack, a speaker, and a microphone jack are built into the TL/3. The earphone output is in simulated stereo. Connect an earphone, a microphone, stereo headphones, or other audio equipment. Then use your computer to record, play, and store music. The sound feature makes many popular video games and programs more fun to use. For more information, refer to the *Music and Sound* manual provided with your computer.

MS-DOS 3.3 in ROM

MS-DOS Version 3.3, the operating system that controls the basic functions of the computer, is stored in ROM. With the operating system in ROM, you do not have to load it from a hard drive or diskette. You can use MS-DOS commands as soon as you turn on the computer. For more information, refer to the "Using MS-DOS" section.

DeskMate in ROM

DeskMate is a special graphic environment that helps you move from one program to another. It provides fun and useful programs, and because it is in ROM, you can begin using it as soon as you turn on the computer. For information about using DeskMate, refer to the documentation included with your computer.

DeskMate, MS-DOS, and SetupTL3 on Diskette

DeskMate, MS-DOS, and the SetupTL3 utility are provided on diskettes. To run SetupTL3, you will need to insert the MS-DOS diskette into the diskette drive. You will need DeskMate and MS-DOS on diskette to use certain DeskMate menu options and MS-DOS commands.

RESET Button

The RESET button on the front panel restarts the system. For more information about resetting the system, refer to "Using the System Unit Controls" in the "Getting Started" section.

3 $\frac{1}{2}$ -Inch Diskette Drive

Diskettes store information for future use. The 3 $\frac{1}{2}$ -inch diskette drive reads from and writes to 720KB diskettes (Cat. No. 26-418). For more information about diskettes and the diskette drive, refer to "Using the Diskette Drive" in the "Getting Started" section.

Enhanced, 101-Key Keyboard

Many of the keys on your TL/3 keyboard work exactly like standard typewriter and calculator keys. In addition to the standard keys, there are many special keys that provide different functions depending on the applications you use. For more information, refer to "Using the Keyboard" in the "Getting Started" section.

SmartDrive Interface

The built-in SmartDrive interface makes it easy to install a SmartDrive hard drive. Your computer works faster with programs stored on a hard drive than with programs stored on diskettes. For information about installing a SmartDrive, refer to the "Adding Optional Equipment" section.

PS/2-Style Mouse Port

The built-in mouse port enables you to connect a PS/2-style mouse (Cat. No. 25-1042) without adding an adapter.

Support for Optional Storage Devices

The 5¼-inch drive bay and the 3½-inch drive platform enable you to add storage devices.

Use the 5¼-inch drive bay to add a 5¼-inch diskette drive. The TL/3 supports both standard-capacity 360KB (Cat. No. 25-1063) and high-capacity 1.2MB (Cat. No. 25-4050) 5¼-inch diskette drives.

Use the 3½-inch drive platform to add a 3½-inch hard drive or diskette drive. The TL/3 supports both standard-capacity 720KB (Cat. No. 25-1075) and high-capacity 1.44MB (Cat. No. 25-4053) 3½-inch diskette drives.

For information about adding storage devices, refer to the "Adding Optional Equipment" section.

Serial Port

Use the DB-9 serial port to connect a serial device such as a serial mouse, an external modem, or a serial printer to your computer. You can also connect another computer to the TL/3 serial port. For information about connecting devices to the serial port, refer to the "Getting Started" section.

Parallel Printer Port

Use the DB-25 parallel printer port to connect a parallel printer to your computer.

Joystick Ports

Connect a joystick or a color mouse to the joystick ports.

Four 10-Inch Expansion Slots

Use the expansion slots to install up to four 10-inch IBM PC/XT-compatible adapter boards in your computer. For example, add a memory expansion adapter or an internal modem. Refer to the "Adding Optional Equipment" section for more information.

80287 Math Coprocessor Socket

The math coprocessor socket on the main logic board enables you to install an 8 MHz, 80287 math coprocessor. Some spreadsheet and graphics programs require the CPU to perform many arithmetic calculations. Adding a math coprocessor shifts some of the work from the CPU to the coprocessor, making the calculations much faster.

Getting Started

This section guides you through setting up and using your Tandy 1000 TL/3 for the first time. If you are adding drives, expansion adapters, or other optional equipment, refer to the "Adding Optional Equipment" section before you read this section. You will learn how to use the system unit controls, keyboard, diskette drive, and diskettes after you have added any additional equipment and set up the system.

Carefully unpack your computer, checking that you have all of the following items:

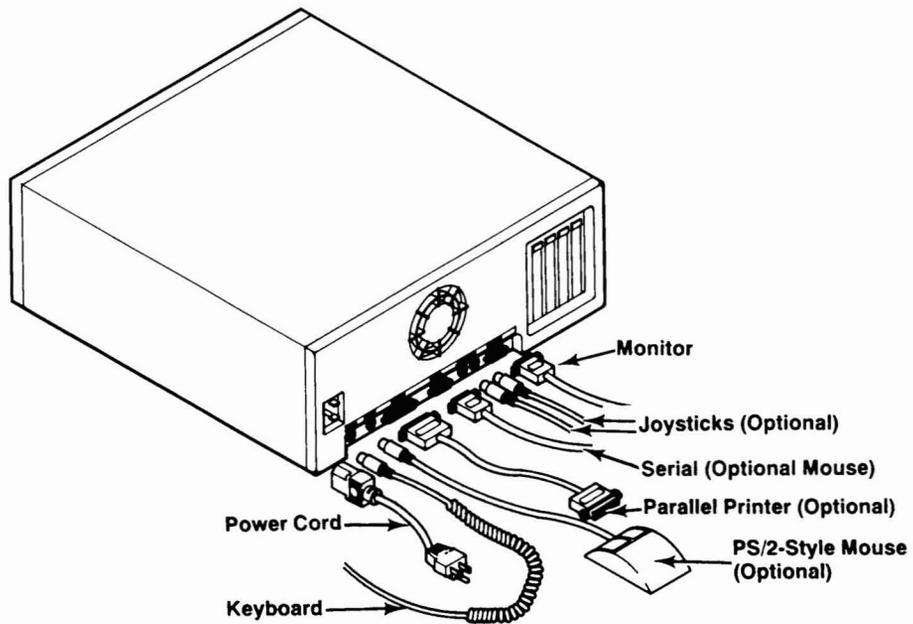
- computer
- keyboard
- power cord
- MS-DOS and SetupTL3 diskette
- Five DeskMate diskettes
- *Quick Start* brochure
- DeskMate documentation:
 - DeskMate User's Reference*
 - DeskMate Getting Started*
 - DeskMate On Your Mark*
 - DeskMate Music & Sound*

Setting Up Your Equipment

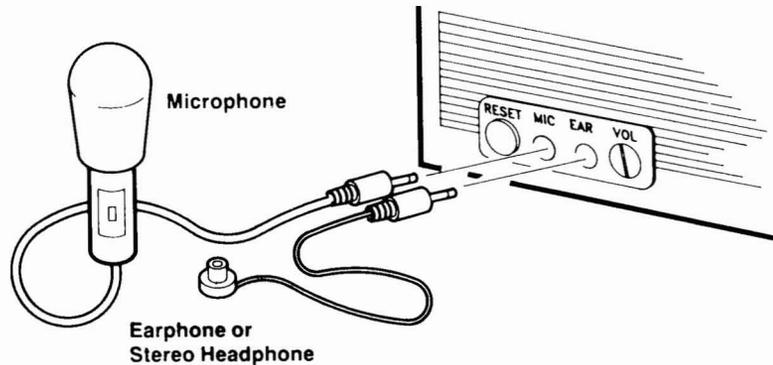
Before you set up your computer, be sure you have the correct equipment. You need:

- a color or monochrome monitor (not included)
(Cat. No. 25-1043 or 25-1024)
- a printer and a 25-pin printer cable (optional)
(Cat. No. 26-288 or 26-1258)
- a PS/2-style mouse (optional)
(Cat. No. 25-1042)

Connect all cables as illustrated:



To add an optional earphone, stereo headphone (Cat. No. 33-1000), microphone (Cat. No. 33-1060), or other audio device, connect the cables as illustrated:



Connecting a Parallel Device

The 25-pin parallel port is located on the back of your computer. This port allows either normal or extended data transfer:

- *Normal* (one-way). The computer uses the port only to send output to the parallel device. The computer does not receive input through the port.
- *Extended* (two-way). The computer uses the port both to send output to the parallel device and to receive input from the device.

MS-DOS can use either normal or extended transfer. Other operating systems, such as OS/2, use normal transfer only.

The SetupTL3 Utility lets you control the data transfer mode of the parallel port. For normal transfer, use the Normal Mode setting (default). For extended transfer, change the setting to Extended Mode.

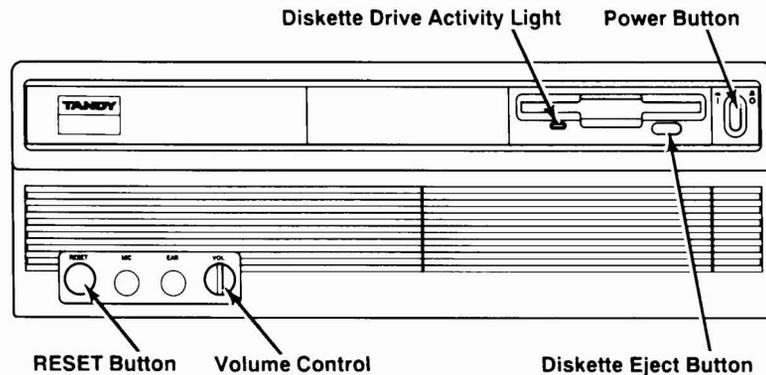
Note: If you install a parallel port adapter in an expansion slot, you might need to disable the built-in parallel port. Run SetupTL3 to change the Parallel Port setting to Disabled.

Maintenance Tips

Your computer is durable and needs little maintenance. The following tips will help you keep your computer running well:

- Read the "Adding Optional Equipment" section before you add options.
- Set the computer up in an area where it will be safe from bumps and collisions.
- Install a surge protector between your equipment and the power supply.
- Record important information on the system record.
- Keep liquids away from the equipment.
- Use a disk cleaning kit to clean diskette drives regularly.
- Use dust covers to prolong the life of your equipment, especially if it is located in a dusty area.
- Use an antistatic cloth to clean the monitor screen.
- Read "Troubleshooting" if you have system problems.

Using the System Unit Controls



The system unit of your computer has controls on the front panel. These controls enable you to operate the computer with the touch of a button and to check the status of your diskette drive. Use the controls on the front panel as described below:

RESET Button	Resets the computer. Resetting the system is much like turning the computer off and turning it back on.
Diskette Drive Activity Light	Lights up to indicate that the diskette drive is reading from or writing to a diskette.
Diskette Eject Button	Ejects a diskette from the drive.
Power Button	Turns the system unit on and off.
Volume Control	Adjusts the volume for music and sound features.

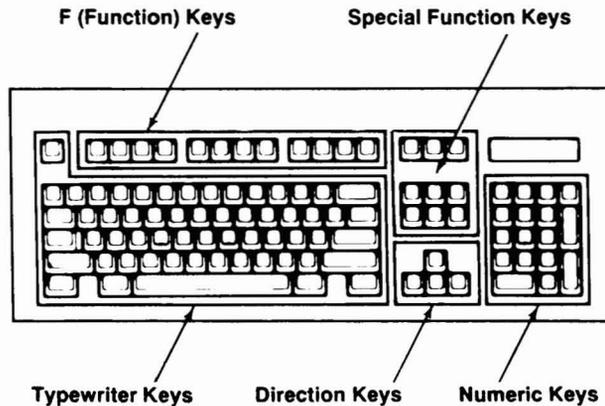
Notes

When you use the controls on the system unit, remember:

- do not move the system unit when the computer is on
- do not remove a diskette from the diskette drive when the diskette drive activity light is on
- save your work on a disk before pressing either the RESET button or the power button

Using the Keyboard

Your keyboard has five types of keys: typewriter keys, direction keys, function keys, special function keys, and numeric keys on a keypad.



The keys on your keyboard work as described below:

Typewriter Keys	Work like the keys on a typewriter. When you press and hold a key, the character is repeated automatically until you release the key.
Direction Keys	Work as directed by the program you are using. With some programs, these keys move the cursor, highlight a selection, or both.
F (Function) Keys	Work as directed by the program you are using. Press the appropriate function keys to enable up to 12 functions supported by a program.
Special-Function Keys	Work as directed by the program you are using. Press the appropriate special function keys to enable up to nine functions supported by a program.
Numeric Keys	<p>Work like the keys on a calculator keypad.</p> <p>Press the four mathematical operation keys to multiply, divide, add, or subtract. The ENTER key works like the = key on a calculator; press it to get the result of a calculation.</p> <p>Each light-colored key on the numeric keypad (except for the 5) works like two keys in one. The characters printed below the numbers indicate functions that work as directed by the program you are using.</p> <p>You press the NUM LOCK key and the light comes on to remind you that only numbers and the decimal point will be typed when you press the light-colored keys. To turn off the NUM LOCK function, press the key again.</p>

Using the Diskette Drive

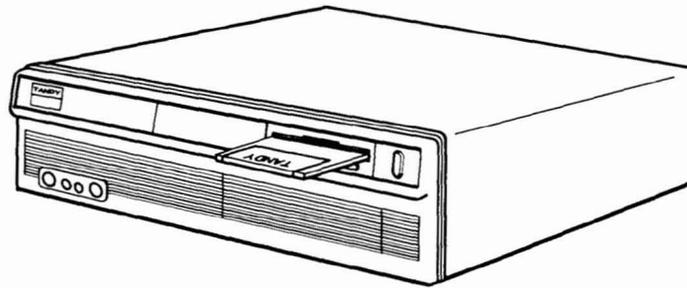
Before you use the diskette drive, be sure that you have the right type of diskettes for the computer. We suggest that you use Tandy diskettes (Cat. No. 26-418).

The following information should be listed on the diskette:

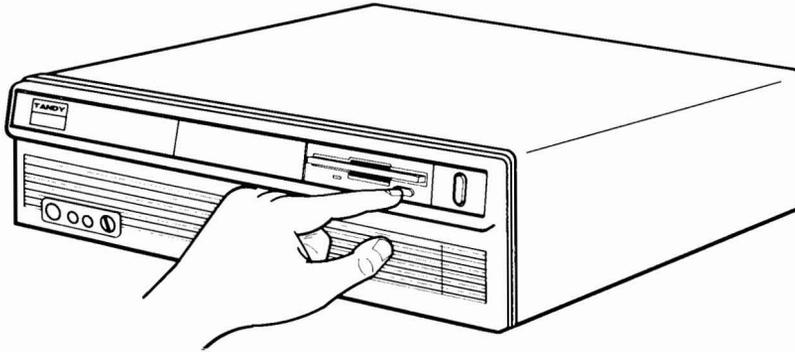
- 720KB
- 3½-inch
- 80-track
- double-sided

Review "Using the System Unit Controls" if you are using diskettes for the first time.

To insert a diskette, hold it with the label side up and slide it gently into the empty diskette drive as shown:



To remove a diskette, be sure the diskette drive activity light is off; then, press the diskette eject button.



Diskette Types

The type of diskette you use in a diskette drive depends on the drive size (3½-inch or 5¼-inch) and type (high-capacity or standard-capacity). With high-capacity diskette drives, you can use both standard-density and high-density diskettes. Standard-capacity drives use standard-density diskettes.

The diskette drive included with the computer is a 3½-inch, standard-capacity drive. Use only standard-density (720KB), double-sided diskettes. Standard-density 5¼-inch diskette drives can hold up to 360KB of data. High-density 5¼-inch diskettes hold up to 1.2MB of data. With a high-capacity 3½-inch drive, you can use both standard density and high-density (1.44MB) diskettes.

Drive Capacity	Diskette Density	Read/Write
High-Capacity	High-Density	yes/yes
	Standard-Density	yes/yes*
Standard-Capacity	High-Density	no/no
	Standard-Density	yes/yes

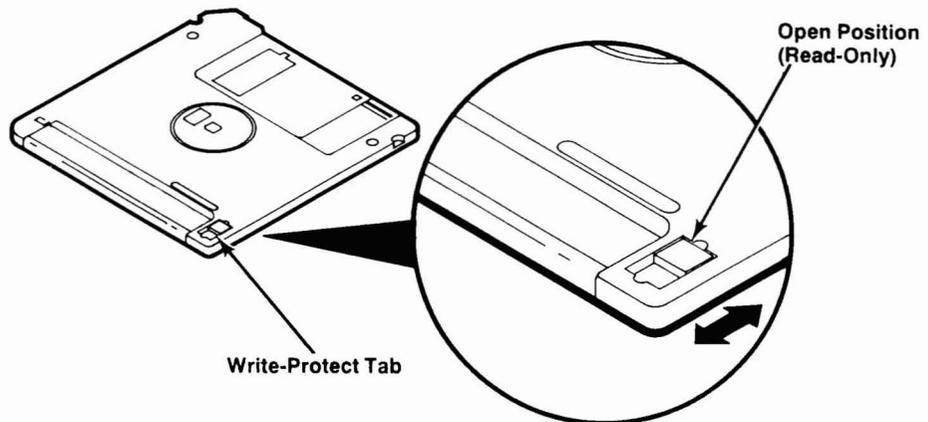
*To format a standard-density diskette in a high-capacity drive, you will need to include certain parameters in your operating system's formatting command. See your operating system documentation for details. The capacity of a standard-density diskette will not change when it is formatted in a high-capacity drive.

Note: A standard-capacity, 5¼-inch diskette drive might not be able to read a standard-density diskette that was written or formatted in a 5¼-inch, high-capacity drive.

Taking Care of Your Diskettes

Your 3½-inch diskettes are easy to care for. Diskettes work best when they are stored at a normal room temperature, away from direct sunlight. Label your diskettes clearly, so that you remember what information they contain. To avoid writing over important files, you might want to *write protect* your diskettes.

To write protect information on a 3½-inch diskette, hold the diskette with the label side down. With the point of a pen, slide the write-protect tab into the open position. When the tab snaps into the open position, a small, square opening is left in the upper left corner. You can then read information from the diskette but you cannot write information to it. If you want to write to the diskette later, snap the write-protect tab back into the closed position so that the square opening is no longer visible.



Using MS-DOS

MS-DOS 3.3 is the operating system that controls the basic functions of your Tandy 1000 TL/3. MS-DOS is stored in ROM, so you can use the operating system commands without worrying about accidentally writing over MS-DOS. The commands also work faster because they are stored in ROM instead of on a diskette or hard drive.

The diskettes shipped with your computer also contain a copy of MS-DOS 3.3. Use the MS-DOS **diskcopy** command to make extra copies of the diskettes you received with the computer. The **diskcopy** command is also a selection on the DeskMate Disk menu. You should make backup copies of other diskettes that contain important information.

How much you need to know about MS-DOS depends on how you plan to use your computer. If you plan to use advanced operating system features such as creating your own programs, you will need to take the time to learn the MS-DOS system and commands. However, to work mainly with application programs and DeskMate, you will probably use only a few basic MS-DOS commands.

Visit a Radio Shack store to choose MS-DOS documentation that will help you use the MS-DOS system.

Adding Optional Equipment

You can add optional equipment to your computer as your computing needs change. This section explains how to add some of the most popular options available for the Tandy 1000 TL/3.

Printers, mice, and microphones and other such equipment are *external options* — options that connect to the outside of the computer. To add an external option, plug the connector of the option into the appropriate connector on the front or rear panel of the computer. Refer to “Setting Up Your Equipment” in the “Getting Started” section for more information.

Some of the external options that you can use with Music and Sound require an adjustment inside the computer. Refer to “Installing the Line Audio Jumpers” before connecting any audio equipment other than an earphone, microphone, or stereo headphone.

Internal options are added inside the computer. This section contains the instructions for installing the following internal options:

- additional memory
- math coprocessor
- hard drives and diskette drives
- adapter boards
- replacement battery for the real-time clock

The TL/3 supports most equipment designed for the IBM PC/XT-compatible computers. However, we recommend installing the equipment available at Radio Shack stores. This equipment is designed especially for your computer and can be installed for you at Radio Shack Service Centers.

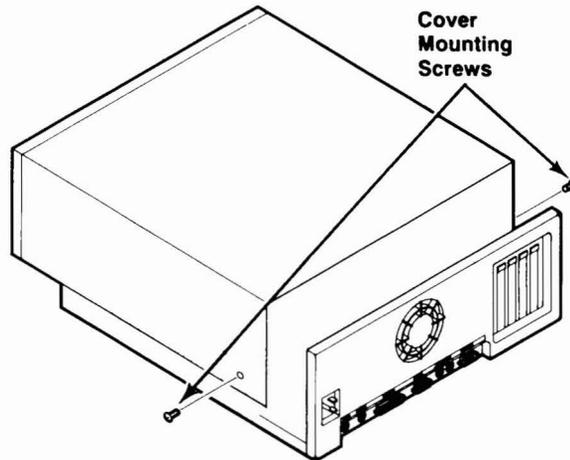
Before you install internal options, you need to remove the cover from the computer.

Caution: Static electricity can damage electrical components. Before you touch electrical components, be sure to touch a grounded metal object to discharge static electricity from your body.

Removing the Computer Cover

Before you remove the computer cover, turn off the computer and any external devices. Unplug the unit from the electrical outlet. Unplug all cables and power cords from the back of the computer.

Use a screwdriver to remove the cover mounting screw on each side of the computer. Pull the cover away from the back of the unit to release it. Lift the cover up and away from the computer to remove it.



Place the cover and the screws on a flat surface away from the work area while you are adding internal options.

Main Logic Board and Satellite Board Layout

The electrical components that make your computer work are located on the main logic board. The *satellite board* is the small board connected to your main logic board. The components that enable you to use external audio options are on the satellite board.

The diagrams in this section illustrate sockets, connectors, and jumpers you might need to find when installing optional equipment.

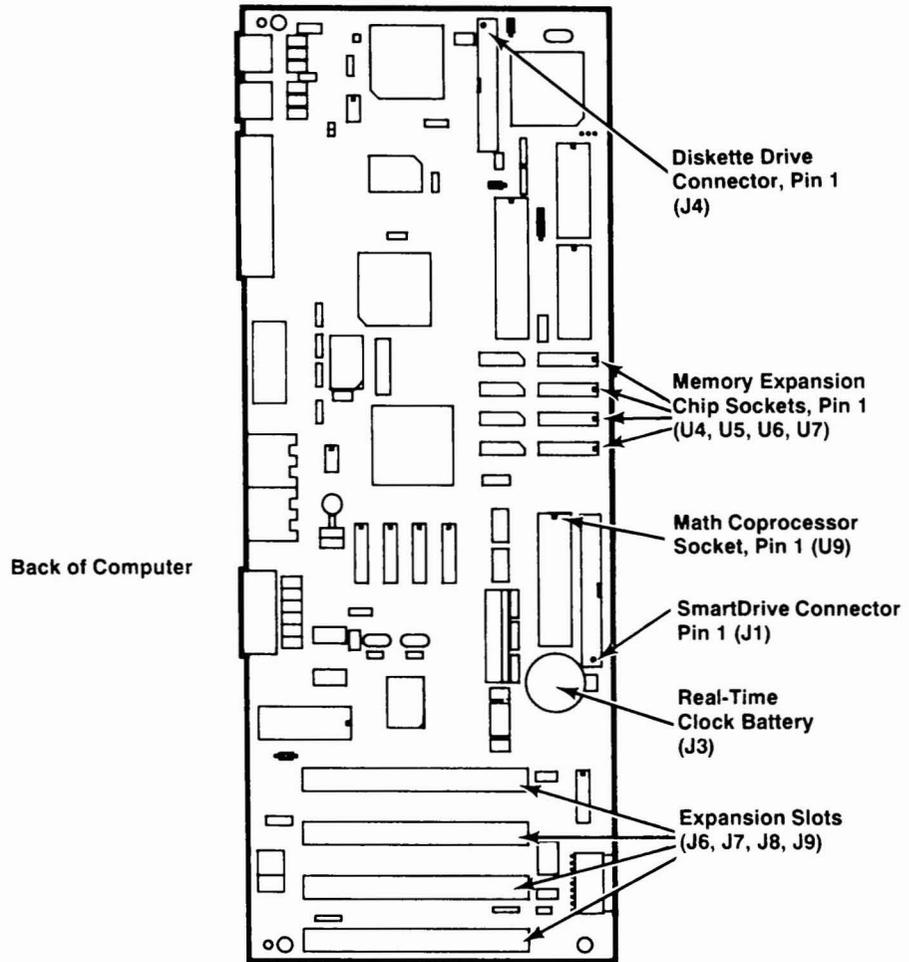
A *jumper* is a small plastic cover that contains metal contacts. A *jumper pin* is a metal peg that protrudes from a board. The TL/3 jumper pins are grouped into blocks of three pins on the main logic board. Each pin is labeled.

To install a jumper, place it over two adjacent jumper pins. This completes or bypasses a circuit, enabling or disabling a function of the computer.

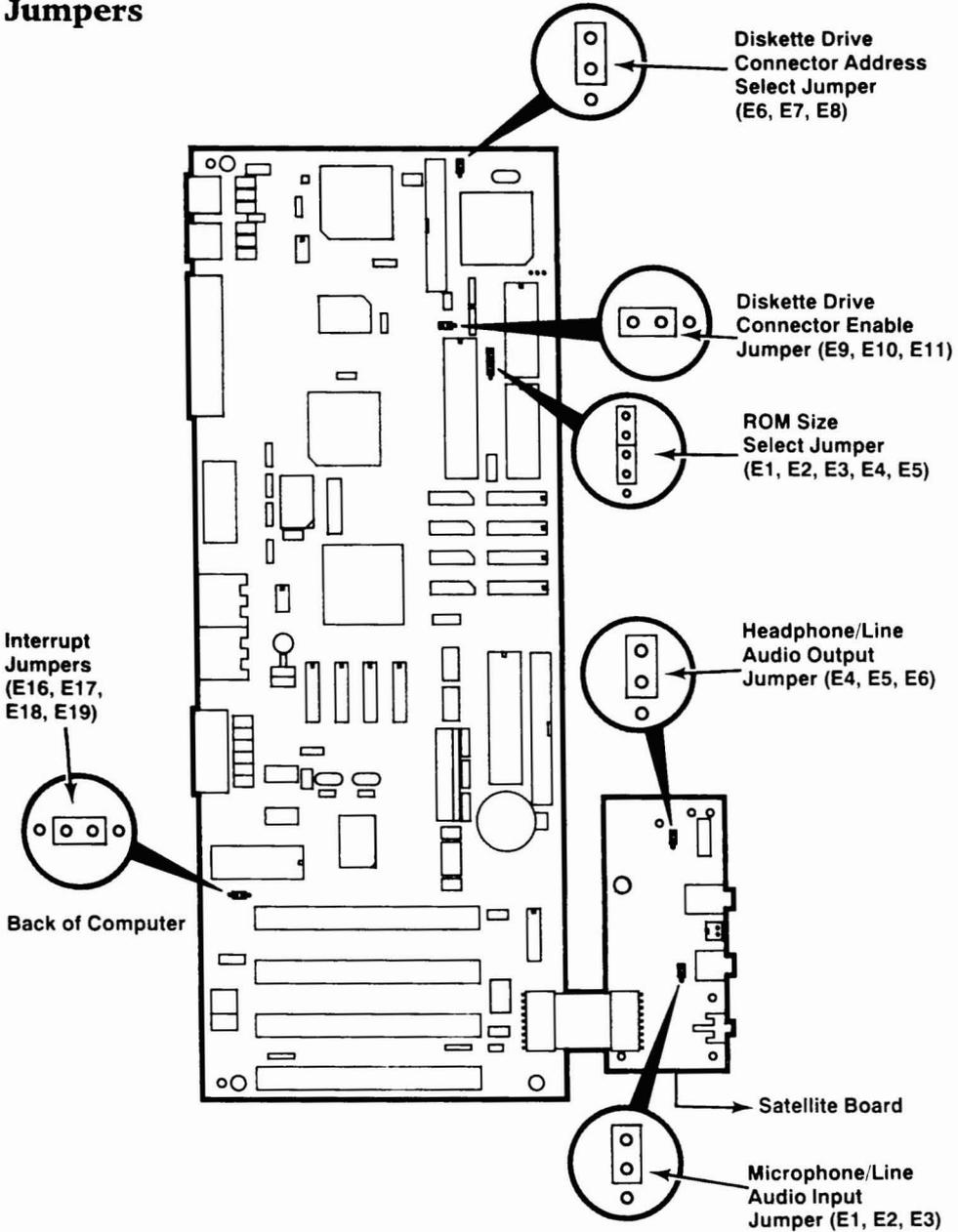


Installed

Sockets and Connectors



Jumpers



Main Logic Board Jumpers

Jumper	Settings	Description
ROM Size Select Jumper†	E1 and E2 installed E3 and E4 installed	4MB ROM enabled*
Diskette Drive Connector Address Select	E6 and E7 installed E7 and E8 installed	Primary* (I/O Ports 3F0-3F7) Secondary (I/O Ports 370-377)
Diskette Drive Connector Enable	E9 and E10 installed E10 and E11 installed	Disabled Enabled*
Interrupt Jumpers	E16 and E17 installed E17 and E18 installed E18 and E19 installed	HDIRQ=IRQ2 HDIRQ=IRQ5* VSYNC=IRQ5
*Default Setting †Reserved for factory use		

Satellite Board Jumpers

Jumper	Settings	Description
Microphone/Line Audio Input Jumper	E1 and E2 installed E2 and E3 installed	Line-level audio input enabled Microphone enabled*
Earphone/Line Audio Output Jumper	E4 and E5 installed E5 and E6 installed	Line-level audio output enabled Earphone enabled*
*Default Setting		

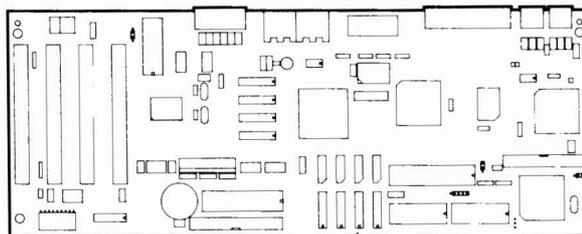
Installing Additional Memory

The Tandy 1000 TL/3 has 640KB of RAM supplied by four 100ns, 256KB x 4 memory chips. You can install 128KB of additional memory to increase the total system memory to 768KB.

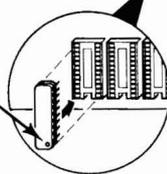
To install additional memory, you will need a 128KB Memory Kit (Cat. No. 25-1078). The kit contains four 100ns, 64KB x 4 memory chips and instructions. Be sure to read the instructions before you complete the following installation procedure:

1. Remove one of the memory chips from the special antistatic package.
2. Find the four memory chip sockets on the main logic board. These sockets are labeled U4, U5, U6, and U7. Refer to "Main Logic Board and Satellite Board Layout" to locate the sockets.
3. Find the notch or dot on the chip. (Check the kit instructions.)
4. Align the notch or dot on the chip with the notch on the memory chip socket on the main logic board.

Back of Computer



Pin 1



Memory Expansion
Chip and Sockets

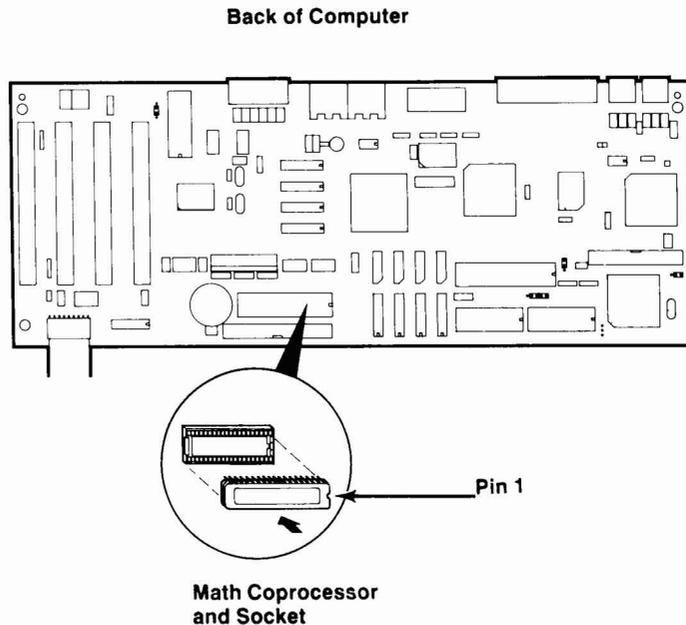
5. Gently press the memory chip into the socket.
6. Install the three remaining chips in the memory sockets on the main logic board.

Installing a Math Coprocessor

Computer-aided design packages, spreadsheet packages, and other applications that require many arithmetic calculations can tie up the CPU. A math coprocessor takes over the mathematical processing to free the CPU for other uses. Your computer requires an 8MHz, 80287 math coprocessor (Cat. No. 900-2191). The math coprocessor socket is located on the main logic board.

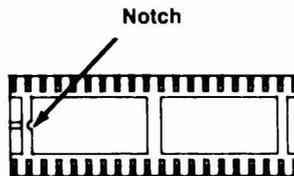
Caution: Static electricity can damage electrical components. Before you touch the math coprocessor, be sure to touch a grounded metal object to discharge static electricity from your body.

Carefully read the instructions before you place the coprocessor into the socket. Incorrect orientation or installation of the coprocessor can damage the coprocessor or the socket. Radio Shack Service Center technicians will install optional devices if you choose not to do so yourself.



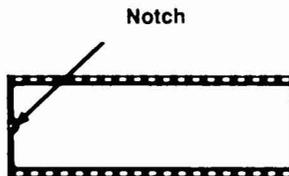
Use the following procedure to install a math coprocessor on the main logic board of your computer:

1. Orient the math coprocessor so that the notch in the end of the coprocessor aligns with the notched end of the socket, as illustrated:



**Coprocessor
Socket**

2. Press the math coprocessor into the socket, taking care not to bend or touch the metal pins.



**Installed
Coprocessor**

Installing Additional Drives

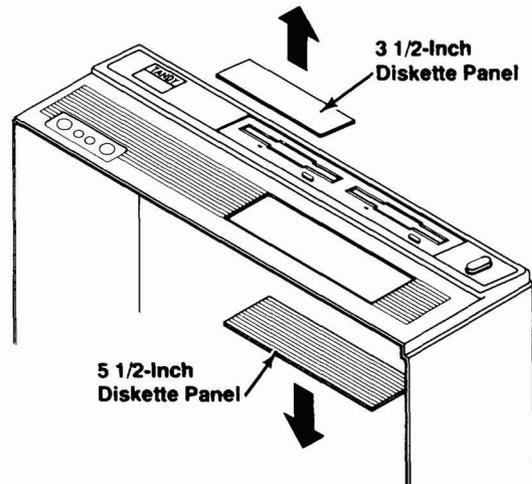
Your TL/3 has one 3½-inch 720KB diskette drive already installed. In addition, you can install one or more of the following storage devices:

- a 3½-inch diskette drive or SmartDrive in the *drive platform*, the removable pan located to the left of the factory-installed diskette drive. You can also install a 3½-inch diskette drive in the 5¼-inch drive bay, using a 3½-inch to 5¼-inch Disk Drive Adapter (Cat. No. 25-1076). You can order the SmartDrive adapter at a Radio Shack Store (from Tandy National Parts).
- a 5¼-inch diskette drive in the 5¼-inch drive bay

Note: To install a SmartDrive (Cat. No. 25-1045 or 25-1046) when you have installed devices in both the drive platform and the drive bay, you can purchase a SmartDrive mounting bracket. Using this bracket, you can install the SmartDrive in the slot on the bottom of the computer. The mounting bracket is available at Radio Shack Stores (from Tandy National Parts). The SmartDrive connector on the main logic board supports one SmartDrive.

The TL/3 supports most IBM PC/XT-compatible diskette drives and hard drives. However, we recommend the Tandy diskette drives and hard drives (SmartDrives) available at Radio Shack stores. These drives are designed especially for your computer.

If you are installing a diskette drive, remove the appropriate panel from the computer cover as illustrated:



To remove the 3½-inch panel, press down on the center tab on the inside of the cover. This panel is replaceable. To remove the 5¼-inch panel, press down on it from the outside of the cover. The 5¼-inch panel is not replaceable.

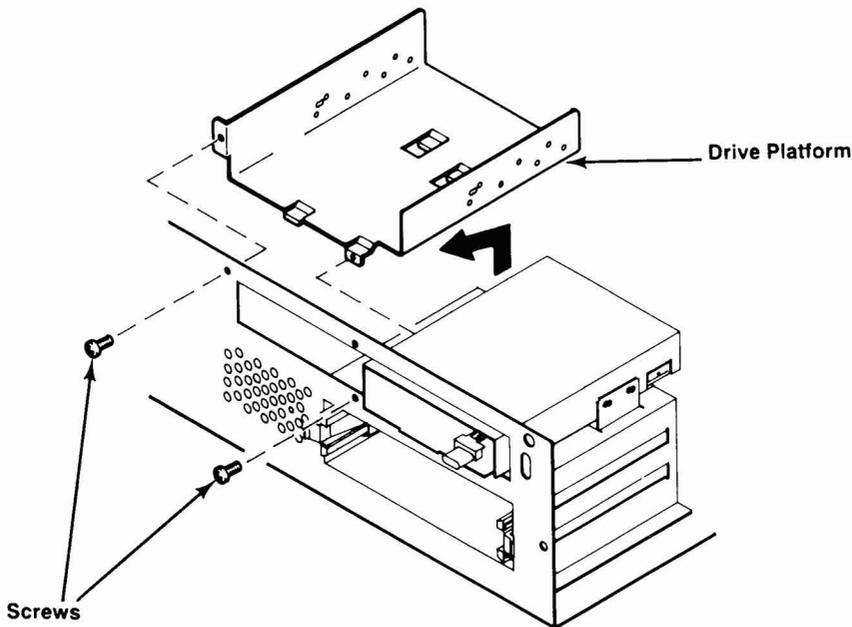
Read the appropriate procedures in this section to install optional storage devices in your Tandy 1000 TL/3.

Before installing a hard drive card in the computer, you must attach a support bracket to the hard drive card. This bracket is available at Radio Shack stores. Installing a hard drive card is similar to installing an adapter board. For more information about preparing a hard drive card for installation, refer to the installation guide included with the hard drive card.

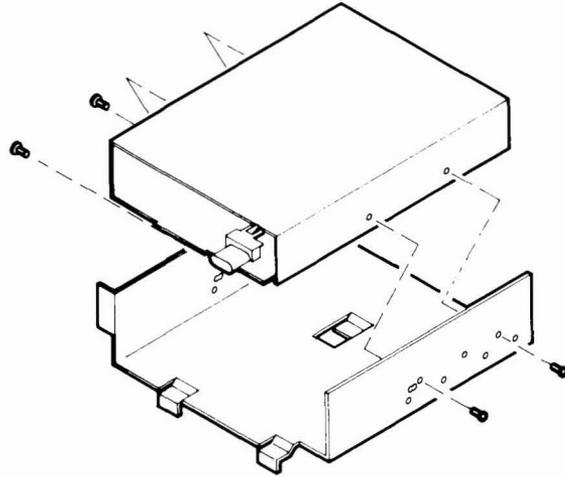
3½-Inch Diskette Drive or SmartDrive Installation - Drive Platform

To install a 3½-inch diskette drive or SmartDrive in the drive platform of the computer:

1. Use a screwdriver to remove the two front screws that attach the drive platform to the computer. Slide the platform toward the back of the computer. Remove the platform by lifting it up and out of the computer.



2. Use the four screws from the drive installation kit to attach the drive to the platform as shown:



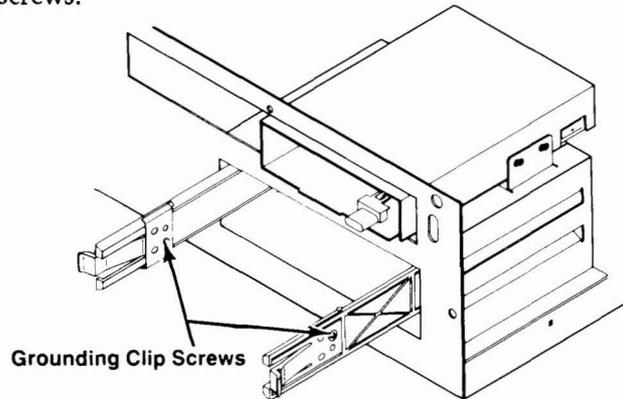
Note: There are two rows of holes on the drive platform. The illustration shows screw installation for a 3½-inch diskette drive. To install a SmartDrive, use the holes on the second row that correspond to the mounting holes on the drive. Refer to the drive installation guide for more information.

3. Use the two screws you removed in Step 1 to attach the drive platform and the drive to the computer.
4. Refer to the installation kit documentation to connect the cable to the drive, using the correct Pin 1 alignment. Connect a computer power cable to the drive, if necessary.
5. Attach the remaining cable connector to the diskette drive connector or the SmartDrive connector on the main logic board. Refer to "Main Logic Board and Satellite Board Layout" to find Pin 1 of the SmartDrive connector or diskette drive connector on the main logic board.

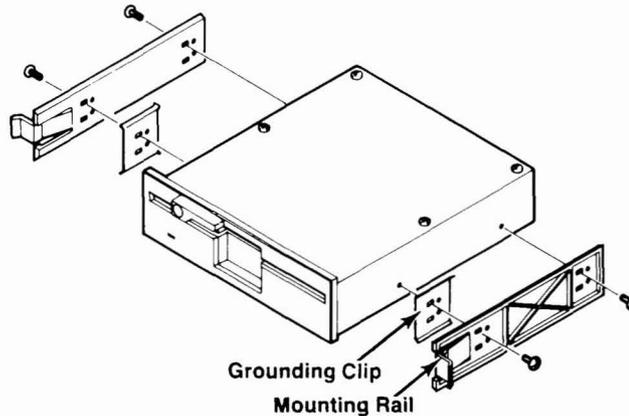
5¼-Inch Diskette Drive Installation – 5¼-Inch Drive Bay

To install a 5¼-inch diskette drive in the drive bay of the computer:

1. Press the latches of the two drive mounting rails in firmly. Slide the rails out of the 5¼-inch drive bay. Remove and discard the grounding clip screws.



2. Use a small screwdriver and the four screws included with the diskette drive to attach the rails and the grounding clips to the drive:



3. Slide the drive mounting rails and the diskette drive approximately halfway into the drive bay. Attach the drive and power cables as directed in the diskette drive installation guide.
4. Slide the drive into the bay until the latches snap into place.
5. Run the SetupTL3 utility to specify the type of the new diskette drive.

Accessing a Drive

Each diskette drive, hard drive, and drive partition in your computer has a drive identifier that is assigned by MS-DOS. A drive identifier is a letter of the alphabet followed by a colon. Use drive identifiers to access individual drives and partitions. For example, to access a diskette in the factory-installed diskette drive, type:

a:

The indicator light on the diskette drive flashes to show that the diskette drive is being accessed. The following MS-DOS prompt is displayed:

A>

This prompt indicates that you can type MS-DOS commands to access information on the diskette in the drive.

The first diskette drive in the system is always Drive A and the second diskette drive is always Drive B. Identifiers for other drives sometimes change when you install additional drives or partition a hard drive. The following table lists the drive identifiers to use when you install devices as shown:

Drives Installed	Drive Identifiers			
	Third Diskette Drive	ROM Drive	Smart-Drive	Drive Partition
One or two diskette drives	None	C:	None	None
Three diskette drives	C:	D:	None	None
One or two diskette drives and a SmartDrive	None	D:	C:	E:
Three diskette drives and a SmartDrive*	D:	E:	C:	F:

*To install a SmartDrive (Cat. No. 25-1045 or 25-1046 only) when you have installed devices in both the 5¼-inch drive bay and the 3½-inch drive platform, you can purchase a SmartDrive mounting bracket. This bracket can be ordered from Radio Shack Stores (through Tandy National Parts).

Initializing a SmartDrive

The Tandy 1000 TL/3 supports the installation of one 20MB or 40MB SmartDrive. After installing the drive, you must initialize it for use with the computer.

The initialization is done from the desktop, the first screen displayed in the DeskMate user interface. You will need a blank 720KB diskette to complete the initialization. Follow the directions below to initialize the SmartDrive:

1. Label the blank diskette "SmartDrive Installation Backup Diskette."
2. Turn on the computer and insert the blank diskette into the 3½-inch diskette drive (Drive A).
3. Press **TAB** until you highlight the PROGRAMS box. Press **↓** until you highlight HINSTALL>PDM. Press **ENTER**.
4. Follow the prompts displayed on the screen to initialize the drive.

When the program asks you to continue, press **ENTER**. If you need to stop, press **ESC** to cancel.

After you complete the initialization, store your SmartDrive Installation Backup Diskette in a safe place. You will use the diskette if you ever need to re-initialize the drive.

Your SmartDrive can be accessed as Drive C. If you installed a 20MB SmartDrive, you will need to format the drive. If you installed a 40MB SmartDrive you will need to format and partition the drive. Refer to the documentation included with the SmartDrive. For more information about installing application programs on the drive, refer to the application documentation.

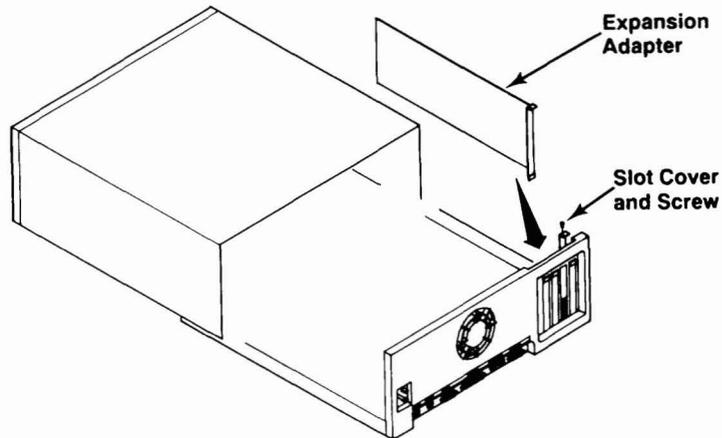
Installing Expansion Adapter Boards

You can install up to four IBM PC/XT-compatible (8-bit) expansion adapter boards in the expansion slots of your Tandy 1000 TL/3. These adapter boards can be up to 10 inches long. Many popular expansion adapter boards are available at Radio Shack stores. One type of adapter board, called a hard drive card, provides storage like a hard drive.

1. Choose the expansion slot into which you wish to install the adapter board. For a hard drive card, you should select Slot 4, the expansion slot closest to the power supply.
2. Remove the screw that secures the slot cover to the back panel of the computer. Slide the slot cover up and out of the computer.

Note: If you are installing a hard drive card, you must install a support bracket. Follow instructions included with the equipment.

3. Press the adapter board into the expansion slot as shown:



4. Use the screw you removed in Step 1 to secure the adapter board at the back of the computer.

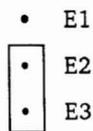
Installing the Line Audio Jumpers

Two blocks of jumper pins are located on the satellite board of the Tandy 1000 TL/3. You must reposition the jumpers that are installed on these pins to enable some audio input and output features for Music and Sound. Refer to “Main Logic Board and Satellite Board Layout” to locate the jumper pins on the satellite board and for more information about installing jumpers.

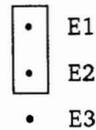
Microphone/Line Audio Input Jumper

The Microphone/Line Audio Input jumper pins are labeled E1, E2, and E3. Installing the jumper for these pins enables you to select the type of device that can be connected to the microphone connector, labeled MIC, on the back panel. The jumper installed on these pins enables you to input music and sounds from other audio devices through the computer. For example, you can connect a microphone to the connector to input your voice through the computer.

By default, the Microphone/Line Audio Input jumper is installed in the microphone position, on Pins E2 and E3, to enable the connection of a microphone. To enable the connection of a line-level audio device (and disable the connection of a microphone), install the jumper in the line-level audio input position, on Pins E1 and E2. With the jumper in the line-level audio position, you can connect a radio, tape recorder, or other device with a line-level output.



**Microphone Position
(Default)**

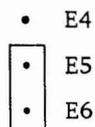


**Line-Level Audio Input
Position**

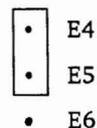
Earphone/Line Audio Output Jumper

The Earphone/Line Audio Output jumper pins are labeled E4, E5, and E6. The jumper on these pins enables you to output music and sounds from the computer to another audio device. For example, you can connect an earphone or a stereo headphone to the connector labeled EAR on the front of the computer. Music and sounds from the computer are output through the earphone so that only you can hear them. When no device is plugged into the EAR connector, music and sounds are output through the built-in speaker.

By default, the Earphone/Line Audio Output jumper is installed on Pins E5 and E6, enabling the connection of an earphone or a headphone. Install the jumper on Pins E4 and E5 to disable the connection of an earphone or a headphone and enable the connection of a line-level audio output.



**Earphone/ Headphone
Position (Default)**



**Line-Level Audio
Output Position**

Internal Real-Time Clock

The real-time clock maintains the system time and date. An internal battery powers the clock, enabling it to maintain the correct time and date when the computer power is off. Replacement batteries (Cat. No. 25-1033) are available at Radio Shack stores.

Replacing the Battery

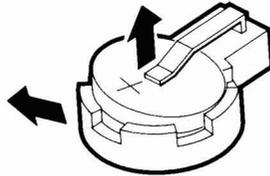
The clock battery should last at least three years with normal use. When it fails, the computer will not retain time and date information correctly.

If the computer does not restart when you turn it on or reset it, it could indicate that the battery is weak or dead. Before replacing the battery, refer to "Main Logic Board and Satellite Board Layout" to locate the battery socket.

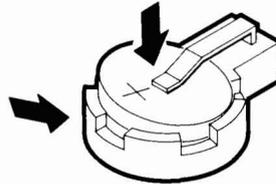
If you do not want to replace the battery yourself, a service technician at a Radio Shack Service Center will replace it for you.

To replace the battery:

1. Gently lift the battery clip and remove the old battery from the socket on the main logic board.



2. Position the new battery with the positive side (+) up and insert it as illustrated:



3. Use SetupTL3 to enter and store the system time and date.

Replacing the Cover

When you finish adding internal options, place the cover over the front of the unit. Slide it back until it snaps into place at the back of the computer. Secure the cover with the two screws you removed previously.

Setting System Options

The TL/3 runs according to the settings you choose when you run the SetupTL3 utility. The computer has original settings called *default* settings. You can use SetupTL3 on diskette to change the default settings to better suit your system needs. This section explains when and how to run the utility.

SetupTL3 lets you change the settings for the following system information:

- whether your computer runs diagnostic checks each time you turn it on
- whether the computer prompts you for the time and date each time you turn it on or reset it
- the video display mode for the monitor connected
- the data transfer mode of the parallel port
- the number of disk buffers used by MS-DOS
- the maximum number of files that can be opened under MS-DOS
- whether the system should execute the *autoexec.bat* and/or *config.sys* file automatically
- whether the computer starts from the programs built into ROM or from a diskette or hard drive
- whether DeskMate or MS-DOS will be started when you start the computer from ROM
- which drive you want to use as the primary (system default) drive
- whether the system is set for the connection of a PS/2-style mouse
- how fast the CPU runs

You can run SetupTL3 from the utilities diskette included with the computer. The DeskMate Setup Accessory enables you to perform some setup operations from a DeskMate menu. Refer to your DeskMate documentation for more information about the DeskMate Setup Accessory.

Running the SetupTL3 Utility

The first time you turn on the computer, run SetupTL3 to determine whether the default settings are appropriate for your computer. For example, if you connected a PS/2-style mouse, run SetupTL3 to change the MOUSE PORT DEVICE setting from NOT INSTALLED to INSTALLED.

Be sure to run SetupTL3 if you install additional drives in your computer. If you install a diskette drive, use one of the Diskette Drive fields to select the setting that describes the new diskette drive. If you need to change the diskette or hard drive that is accessed when you turn on the computer, change the setting of the Start-up Drive field. You will probably not need to change the other fields displayed on the SetupTL3 screen.

When you select a field on the SetupTL3 screen, a brief description of the field is displayed at the bottom of the screen. For more information about a setting, press **F1** after making a selection. The on-line help for that field is displayed.

To run SetupTL3, insert the Utilities Diskette into the diskette drive. Type **a:** and press **ENTER** to access the diskette drive, if necessary.

At the **A>** prompt, type **setupTL3** and press **ENTER**. The directions at the bottom of the screen explain how to change settings and move from one field to another.

The following sections explain each setting on the screen. Read the explanations to determine whether you need to change the default settings.

Time

Displays the system time. Hours, minutes, and seconds are displayed in the military format. To change the system time, follow the directions at the bottom of the screen.

Date

Displays the system date. The month, day, century, and year are displayed on the screen. Follow the instructions at the bottom of the screen to change the system date.

Start-Up Device

Select DISK to start the computer from a program on a hard disk or diskette. Otherwise, leave the setting at ROM to start from one of the programs built into ROM. If the Auto-DeskMate field is enabled, the computer will start from DeskMate in ROM when you turn it on. Otherwise, it will start from MS-DOS in ROM.

Video Display Mode

Select MONOCHROME if your monitor can display only two colors, such as black and white. If your monitor displays more than two colors, leave the setting at COLOR. You can also change from one video display mode to the other by pressing **CTRL+ALT+SHIFT+V**.

Operating the computer in the wrong video mode for your monitor can damage the monitor. Be sure to press **CTRL+ALT+SHIFT+V** if your monochrome monitor displays an image that does not fill the entire screen.

Mouse Port Device

Select INSTALLED if you have connected a PS/2-style mouse. Otherwise, leave the setting at the default, NOT INSTALLED.

CPU Speed

Select SLOW (5 MHz) to use an application that does not work properly with the FAST (10MHz) speed of the computer. FAST is the default setting.

Start-Up Diagnostics

Select ENABLE if you want the computer to run diagnostic tests each time you turn it on. DISABLE is the default setting. The default setting results in a faster startup.

Serial Port

Select SECONDARY to use COM2 as the serial port address. The default setting is PRIMARY, or COM1. Select DISABLE to turn off the use of the serial port.

Parallel Port

Choose **Normal Mode**, the default setting, to send output to the parallel port. Most printers use this setting. The computer will not receive input data through the port with this setting. Select **Disable** to turn off the use of the parallel port. To use normal data transfer, change the setting to **Extended Mode**. The computer will send output and receive input through the parallel port with this setting.

Diskette Drive 0

Choose a setting to specify the diskette drive type of the first diskette drive installed in the system. The following settings describe the types of diskette drives that can be installed:

- None
- 3 $\frac{1}{2}$ -inch, 720KB
- 3 $\frac{1}{2}$ -inch, 1.44MB
- 5 $\frac{1}{4}$ -inch, 360KB
- 5 $\frac{1}{4}$ -inch, 1.2MB

Leave the setting at the default diskette drive type (3 $\frac{1}{2}$ -inch, 720KB) for the factory-installed drive.

Diskette Drive 1

Choose a setting to specify the diskette drive type of the second diskette drive installed in the system. The following settings describe the types of diskette drives that can be installed:

- None
- 3 $\frac{1}{2}$ -inch, 720KB
- 3 $\frac{1}{2}$ -inch, 1.44MB
- 5 $\frac{1}{4}$ -inch, 360KB
- 5 $\frac{1}{4}$ -inch, 1.2MB

Leave the setting at **None** if you have not installed a second diskette drive.

Diskette Drive 2

Choose a setting to specify the diskette drive type of the third diskette drive installed in the system. The following settings describe the types of diskette drives that can be installed:

- None
- 3½-inch, 720KB
- 3½-inch, 1.44MB
- 5¼-inch, 360KB
- 5¼-inch, 1.2MB

Leave the setting at None if you have not installed a third diskette drive.

Start-up Drive

If you chose the DISK as the Start-up Device, choose the number corresponding to the drive from which you want to load MS-DOS (0 or 1). The MS-DOS identifier for this drive will be Drive A.

Auto-DeskMate

Select ENABLE to start the computer from the DeskMate program built into ROM. Otherwise, the system starts with MS-DOS.

Date and Time Prompts

Select YES if you want the date and time prompts to appear each time you start the computer with MS-DOS. At the prompt, enter the correct date and time or leave each field blank and press **ENTER** to use the time and date of the real-time clock. When NO is selected, the system uses the time and date from the real-time clock and does not display the MS-DOS date and time prompt at system startup. NO is the default setting.

Check for Config.sys on Drive

Some programs require you to include certain software configuration commands in the *config.sys* file. These commands are processed each time you turn on or reset the computer. When *config.sys* commands are required for a program, you must let the computer know where to find the *config.sys* file.

If you selected ROM as the start-up device, change the setting to DRIVE A or DRIVE C to search for the *config.sys* file on either of these drives when you turn on or reset the computer. Otherwise, leave the setting at the default setting, NO. When NO is selected, the system does not check for a *config.sys* file on either drive when starting from the programs in ROM.

If you selected DISK as the start-up device, the computer will automatically check for *config.sys* on the diskette or hard drive selected as the start-up drive.

Check for Autoexec.bat on Drive

The commands in the *autoexec.bat* file are processed each time you turn on or reset the computer. Some programs require that you include certain commands in the *autoexec.bat* configuration file. Change the setting to DRIVE A or DRIVE C if you want to search for the *autoexec.bat* file on Drive A or Drive C when you turn on or reset the computer. Otherwise, leave the setting at NO, the default setting.

Maximum # of Open Files (8-23)

Set this value to the maximum number of files allowed open under MS-DOS in ROM. Refer to the documentation included with any applications you use for information about the number of files needed. The default setting is 10 open files.

Number of Disk Buffers (2-17)

Set this value to the maximum number of disk buffers required by the programs you run. Refer to the program documentation for the disk buffer requirements. The default is 10 buffers.

Troubleshooting

This section describes some of the problems you might have with the Tandy 1000 TL/3 and explains how to solve them.

Problem	Possible Solutions
Blank screen	<p>Check that the monitor is turned on.</p> <p>Check the brightness or contrast control.</p> <p>Check the cable connections.</p> <p>For a monochrome monitor, press CTRL+ALT+SHIFT+V to switch between color to monochrome video mode.</p>
No printer response	<p>Check that the printer is turned on.</p> <p>Check the printer cable connections.</p> <p>Check that printer is ready (on-line/off-line control).</p> <p>Check the positions of paper and ribbon.</p> <p>Check the settings of the switches on the printer. Refer to the printer documentation.</p> <p>Be sure the application program you are using is set for the correct printer type. Refer to the application program and printer documentation.</p>
Optional equipment not working	<p>Check the installation of the device. Refer to the "Adding Optional Equipment" section of this manual and the device documentation.</p>
No keyboard response	<p>Check the keyboard cable connection at the back of the computer.</p>

Specifications

System Unit

Processor	Intel 80286, 10/5 MHz
Size	
Length:	14 in. (35.4 cm.)
Width:	15½ in. (39.4 cm.)
Height:	5¼ in (14.0 cm)
Weight:	17¼ lbs. (7.82 Kg)
Power requirements	120 VAC, 60Hz
Power consumption	130 W, 1.5A, 110 to 125V AC
Heat output	342 Btu/hour (maximum)

Environment

Air temperature	
Operating	10°C to 35°C (50°F to 95°F)
Storage	-40°C to 66°C (-40°F to 150°F)
Humidity	
Operating	20% to 80% non-condensing
Storage	10% to 90% non-condensing

Microphone/Line-Level Input

Microphone input	Full scale (20mV into 10K Ω)
Line-level input	Full scale (2.0V into 100K Ω)

Earphone/Line-Level Output

Headphone output (through EAR connector)	325mW typ into 8 Ω load
Line-level output	0.8V RMS into 47K Ω load

Connector Pinouts

The following tables indicate the pin functions to the video connectors.

Video Port Connector

Pin Assignments:

Pin	Function
1	Ground
2	Ground
3	Red Video
4	Green Video
5	Blue Video
6	Intensity
7	Green Video
8	Horizontal Synch
9	Vertical Synch



Monitor voltage levels are TTL-standard.

Monochrome-type monitors use Green Video for all video input and ignore Red Video and Blue Video.

RS-232C Serial Port Connector

Pin Assignments:

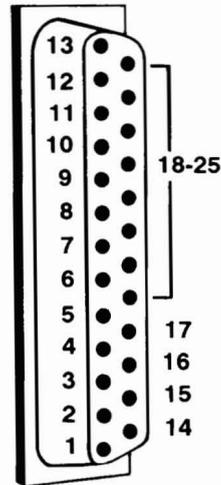
Pin	Function
1	Carrier Detect
2	Receive Data
3	Transmit Data
4	Data Terminal Ready
5	Signal Ground
6	Data Set Ready
7	Request To Send
8	Clear To Send
9	Ring Indicator



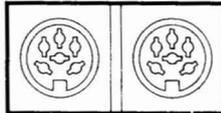
Parallel I/O Port Connector

Pin Assignments:

Pin	Function
1	Strobe
2	Data Bit 0
3	Data Bit 1
4	Data Bit 2
5	Data Bit 3
6	Data Bit 4
7	Data Bit 5
8	Data Bit 6
9	Data Bit 7
10	ACKNOWLEDGE
11	BUSY
12	PAPER END
13	SELECT
14	AUTO FEED
15	ERROR
16	INITIALIZE
17	SELECT IN
18-25	ground



Joystick Port Connectors



Pin Assignments:

Left Joystick

Pin	Function
1	Position 1
2	Position 2
3	Ground
4	Switch 1
5	Power
6	Switch 2

Right Joystick

Pin	Function
1	Position 3
2	Position 4
3	Ground
4	Switch 3
5	Power
6	Switch 4

Joystick port locations are controlled through I/O ports 200-207.

Keyboard and PS/2-Style Mouse Connectors

Pin Assignments:

Pin	Function
1	Data
2	Reserved
3	Ground
4	+5 Vdc
5	Clock
6	Reserved



720KB Diskette Drive

Unformatted capacity	1MB
Formatted capacity	720KB
Number of heads	2
Number of cylinders	80
Average access time	93 ms (including settling time)
Track-to-track access time	4 ms
Motor starting time	500 ms
Rotation speed	300 rpm
Media	3 1/2-inch, double-sided, 80-track

Glossary

- adapter** An optional board that lets the computer perform additional specialized functions. Some adapters enhance built-in features of the computer. A memory expansion adapter, for example, provides more memory so that you can run more software applications.
- autoexec.bat** A special batch file that contains MS-DOS files and commands to be executed when you *reset* or turn on the computer. Some application programs and devices will require you to add commands to this file. After you turn on or reset your computer, it will automatically search for the *autoexec.bat* file as directed by the Setup utility.
- batch file** A file that contains MS-DOS commands. Typing the name of the batch file (the portion before the *.bat* extension) at the appropriate MS-DOS prompt runs each command in the file. Batch file commands can be run automatically at reset or startup.
- chip** A small device containing several circuits. A chip has pins that must be aligned properly with the corresponding holes in a socket on a board. The chips on the main logic board of a computer contain the circuits that make the features of the computer work. You can add chips to the main logic board to improve the performance of the computer. For example, installing memory chips on the main logic board provides additional RAM to the system.
- circuit** A path that electricity will follow. Circuits on the main logic board enable your computer to work.
- command** An order that a computer processes, or carries out, immediately. For example, when you type the MS-DOS **copy** command and press **ENTER**, it copies files from one memory location to another.
- config.sys** A special file that contains information about the *operating system* environment used by MS-DOS. The commands in the *config.sys* file configure your system for MS-DOS. Some application programs and devices require you to add commands to the *config.sys* file. When you turn on or reset the computer, it automatically searches for this file as specified in the Setup utility.
- connector** A socket that lets you connect devices to a board in the computer. Connectors can be accessed on the inside as well as the outside of the computer. For example, the keyboard connector lets you to connect a keyboard to the back panel of the computer. The diskette drive connector on the main logic board lets you connect an optional diskette drive.

CPU	Central processing unit. The chip that contains circuits to perform arithmetic, logic, and control operations. These operations enable the computer to execute instructions.
default	An option or value that is assumed if no other option is specified. For example, if you do not use the Setup utility to specify a monochrome monitor, the computer uses the color monitor setting. The COLOR setting is the default.
diskette	A round, flat object that is coated with magnetic material and enclosed in a protective plastic cover. Diskettes store computer instructions (programs) and data (work files). You can write to and read from a diskette by inserting it in a diskette drive.
diskette drive	An electronic device for storing (writing) and retrieving (reading) data on a diskette. Most diskette drives are either the 5¼-inch or 3½-inch size. High-capacity diskette drives use both high-density and standard density diskettes. Standard-capacity diskette drives use standard-density diskettes.
EEPROM	Electrically Erasable Programmable Read-Only Memory. This memory is built into a chip on the main logic board of the computer. The chip can be electronically reprogrammed or erased.
EMS	Expanded Memory Specification. Used to describe software and computer circuitry designed to support the use of extended memory as expanded memory. See extended and expanded memory.
extended memory	The memory above 1MB (1024KB). Can be used as expanded memory with expanded memory support.
expanded memory	Memory used to expand the amount of memory that can be accessed by MS-DOS. The LIM Expanded Memory Specification 4.0 allows MS-DOS to access up to 32MB of memory instead of the 640KB it could access originally.
expansion adapter	A device that has chips and/or circuitry that expand the features of the main logic board of a computer. Expansion adapters must be installed in expansion slots.
expansion slot	A slot in which you can install an expansion adapter. The slot is positioned to connect the adapter to the main logic board.
file extension	The last three digits of a filename, preceded by a period. Many filenames that you type to run programs (executable files) have the .exe file extension.

hard drive	A storage device that holds large amounts of data. For example, a 20MB SmartDrive can hold more data than twenty-five 720KB diskettes.
IDE	Integrated Drive Electronics. A special type of hard disk drive that lets you store and use large amounts of data quickly. Tandy SmartDrives are IDE drives.
joystick	A handle you can move to give instructions to a computer. With many computer games, moving a joystick causes a figure on the screen to move in the same direction.
kilobyte (KB)	Specifies an amount of memory. One kilobyte is equal to 1024 bytes.
LIM	Lotus/Intel/Microsoft. Used to refer to the LIM Expanded Memory Specification jointly developed and sponsored by Lotus, Intel, and Microsoft.
main logic board	The large board inside the computer. The main logic board is the brain of the computer; it contains the components that make the computer work.
math coprocessor	A special chip that can be installed to work with the processor (CPU) on the main logic board. A math coprocessor helps the processor by performing some of the mathematical calculations required by math-intensive applications such as graphics programs.
megabyte (MB)	Specifies an amount of memory. One megabyte is equal to 1,024KB or 1,048,576 bytes.
memory	That portion of a computer that stores information. Memory is provided by chips on the main logic board. See RAM and EEPROM.
modem	Modulator-demodulator. A device that changes computer data into signals that travel through telephone cable. A modem also converts signals back into computer data. A modem lets you communicate with computers in different locations.
mouse	A device that lets you to control the movements of the cursor on the screen.
on-line	In direct communication with the computer or other equipment. For example, an on-line help system enables you to access help directly from the computer.
operating system	A program that controls and manages the work performed using the computer and the devices connected to it.
option	One of several courses of action that a computer program can take. Devices that you add to a computer are also called options.

port	A connector on the computer into which options or equipment required for computer operation can be connected. For example, a serial mouse can be plugged into the serial port.
program	Instructions for a computer. Application programs, like DeskMate, can be used to accomplish a variety of tasks.
RAM	Random access memory. The work area of a computer. Random access memory is temporary; all work done must be saved to disk before you turn off or reset the computer.
reset	Action that stops all processing and returns a computer to its original condition. After a reset, the computer reacts as if you turned it off and then turned it back on. Press CTRL+ALT+DEL to perform a soft, or partial, reset. Press the RESET button on the computer to perform a hard, or full, reset. Resetting the computer can sometimes correct problems you might have with the computer.
ROM	Read-only memory. A type of memory that can be read but not altered.
video mode	Setting that enables the video circuitry of your computer to produce images like those displayed in standard video modes such as the CGA (Color Graphics Adapter) mode.
write protect	Action that prevents the computer from writing information to a disk. For example, to write protect a 3½-inch diskette, press the write-protect tab into the open position.

Index

A

abbreviations, 2
activity light, 13
adapter boards, 7
additional drives, 30
auto-DeskMate, 45
autoexec.bat, 46

C

central processing unit
(CPU), 3
clock battery, 39
color graphics adapter
(CGA), 4
computer cover
removing, 22
replacing, 40
computer system makeup
hardware, 3
software, 3
config.sys, 45
conventions used, 2
CPU speed, 43

D

data transfer mode
extended, 11
normal, 11
default settings, 41
DeskMate, 3
Setup Accessory, 41
direction keys, 15
diskette
care, 18
types, 17
use, 16
diskette drive, 5, 13, 16,
30, 52
drive type, 17, 44, 45
eject button, 13

E

Earphone/Line Audio
Output jumper, 38
equipment, 3
80287 math coprocessor
socket, 7, 28
adapter boards, 7, 36
additional drives, 30
color graphics adapter
(CGA), 4
diskette, 16
diskette drive, 5, 16
Hercules adapters, 4
joystick, 7
keyboard, 5, 15
monochrome display
adapters (MDA), 4
mouse, 6
Music and Sound, 4, 37
parallel printer, 7
real-time clock, 4
serial, 6
SmartDrive, 6, 30, 31, 35
environment, 49
expansion adapter boards,
7, 36
expansion slot, 36
extended data transfer, 11

F

function keys, 15

H

hard drive card, 30, 36
headphone, 38
Hercules adapters, 4

I

initializing a SmartDrive,
35
installing line audio
jumpers, 37, 38
installing additional
memory, 27

J

joystick port, 7
jumpers, 23, 25, 26
Earphone/Line Audio
Output, 38
main logic board, 26
Microphone/Line Audio
Input, 37
satellite board, 26

K

keyboard, 5, 15

L

line audio jumpers, 37, 38

M

main logic board, 23
jumpers, 25
sockets and connectors, 24
maintenance, 12
math coprocessor, 7, 28
maximum number of open
files, 46
memory
RAM, 3
total, 27
memory chips, 27
microphone, 37

Microphone/Line Audio
 Input jumper, 37
monitor, 10, 50
monochrome display
 adapters (MDA), 4
mouse, 6, 10
mouse port device, 43
MS-DOS, 4, 11, 19, 43
Music and Sound, 4, 37

N

normal data transfer, 11
number of disk buffers, 46
numeric keys, 15

O

operating system, 4, 11,
 19, 43
optional equipment, 21

P

parallel port, 7, 11, 44
ports, 50
power button, 13
printer, 10
prompts
 date and time, 45
PS/2-style mouse, 6, 10

R

Radio Shack, 21, 28, 30,
 36, 39
RAM, 3
real-time clock, 4, 39, 45
RESET button, 13

S

satellite board, 23
satellite board jumpers, 26
serial port, 6, 43
setting system options, 41
setting up, 10
Setup Accessory, 41
SetupTL3, 5, 41
 auto-DeskMate, 45
 CPU speed, 43
 date, 42
 date and time prompts, 45
 maximum number of open
 files, 46
 mouse port device, 43
 number of disk buffers, 46
 parallel port, 44
 running, 42
 serial port, 44
 start-up device, 43
 start-up diagnostics, 43
 time, 42
 video display type, 43
sockets and connectors, 24
SmartDrive, 30, 35
 initializing, 35
 installing, 6, 30, 31
SmartDrive connector, 30
software
 DeskMate, 3
 MS-DOS, 4, 11, 19, 43
 SetupTL3, 5, 41,
 speaker, 38
special-function keys, 15

specifications

 diskette drive, 52
 environment, 49
 earphone, 49
 microphone, 49
 monitor, 50
 ports, 50
 system unit, 49
start-up device, 43, 46
start-up diagnostics, 43
start-up drive, 43
static electricity, 28
stereo headphone, 11, 38
system date, 42
system time, 42
system unit specifications,
 49
system unit controls, 13

T

troubleshooting, 47
typewriter keys, 15

U

utilities
 SetupTL3, 5, 41

V

video display mode, 43
video support, 4
volume control, 13

W

write protect, 18

System Record

Use this system record to keep track of information about your system options. Update this information whenever you add new equipment or memory.

Computer

Serial Number _____

System Memory

Additional Memory _____

Monitor

Type _____

Model Number _____

Serial Number _____

Diskette Drive 1 (factory installed)

Size (3 $\frac{1}{2}$ -inch) _____

Capacity _____

Diskette Drive 2

Size (5 $\frac{1}{4}$ - or 3 $\frac{1}{2}$ -inch) _____

Capacity _____

Diskette Drive 3

Size (5 $\frac{1}{4}$ - or 3 $\frac{1}{2}$ -inch) _____

Capacity _____

SmartDrive (IDE hard drive)

Capacity _____

Expansion Adapters

Slot 1 _____

Slot 2 _____

Slot 3 _____

Slot 4 _____

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