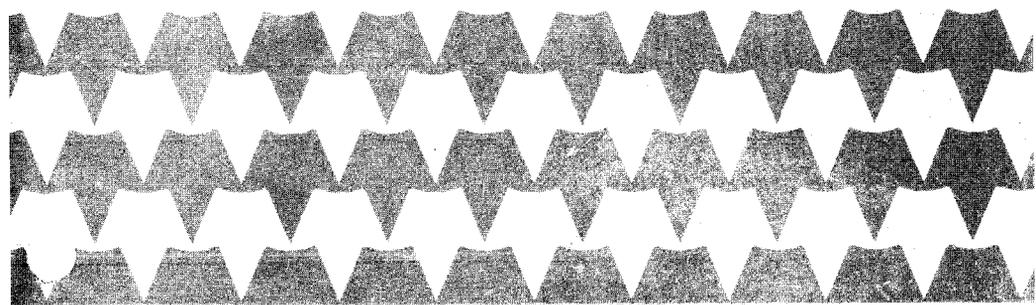


Tandy 3000

Installation and Operation Manual



TANDY®

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E 8, 9, 10 → SERIAL PORTS
15, 16, 17, 18 " "

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Installation and Operation Manual

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INTRODUCTION

The Tandy® 3000 is one of the most versatile microcomputers available today, offering the latest advances in computer technology at significantly lower prices than comparable machines.

The Tandy 3000's many advanced features include:

- True IBM® AT™ software compatibility—in both the MS-DOS® single-user mode and the XENIX® multi-user mode.
- Ten IBM AT compatible slots that you can use for standard peripherals and memory expansion.
- An 8-Megahertz, 16-bit Intel 80286 CPU chip with on-board Memory Management and Protection.
- A built-in High-Capacity 5 ¼ inch slim-line floppy disk drive with a 1.2-megabyte format, making the Tandy 3000 compatible with the IBM AT. The drive also can read standard, double-sided 360K diskettes created on the Tandy 1000, Tandy 1200, Tandy 2000, the IBM PC, PC/XT™, and AT computers.
- The Tandy 3000 HD is available with a 20-megabyte, or 40-megabyte internal hard disk that offers increased data storage. (You can also upgrade the floppy disk-based Tandy 3000 with one or two internal hard disk drives.)
- 512 kilobytes of memory (Tandy 3000 and Tandy 3000 HD with the 20-megabyte hard drive). 640 kilobytes of memory (Tandy 3000 HD with the 40-megabyte hard drive). Bus addressing supports up to 16 megabytes of memory.
- Three disk drive mounting channels that support internal storage devices. In addition to the existing floppy disk drive, you can have either one full-height optional internal hard disk drive or two half-height optional internal storage devices (such as half-height hard disk drives, half-height floppy disk drive, tape streamers, and cartridge drives).

- An External Hard Disk Cable Kit (Cat. No. 26-4063) allows the following system configurations: 1) two internal floppy disk drives, one internal hard disk drive, and one external hard disk drive, or 2) two internal floppy disk drives and two external hard disk drives.
- The Tandy 3000 supports several types of optional external hard disk drives.
- A built-in real-time clock with CMOS RAM and a battery backup.
- A standard serial/parallel I/O adapter card which supports domestic and international baud rate standards.
- Internal support for an optional math co-processor.
- An IBM AT compatible keyboard.

PACKAGE CONTENTS

Carefully unpack your Tandy 3000 or Tandy 3000 HD, and be sure you have the following items:



System Unit, Keyboard, Power Cord, *Installation and Operation Manual* (utilities diskette in the manual).

VIDEO CARD AND MONITOR INSTALLATION

To use your Tandy 3000, you must first install a video display card inside the system unit. This video card lets you connect a monitor to the system.

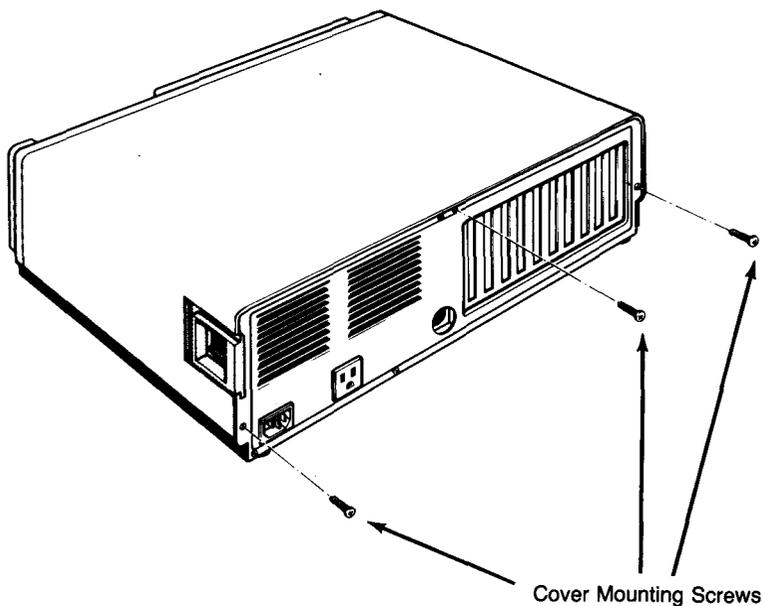
Cover Removal

To install a video display card (or any other peripheral card), you must first remove the cover of the system unit.

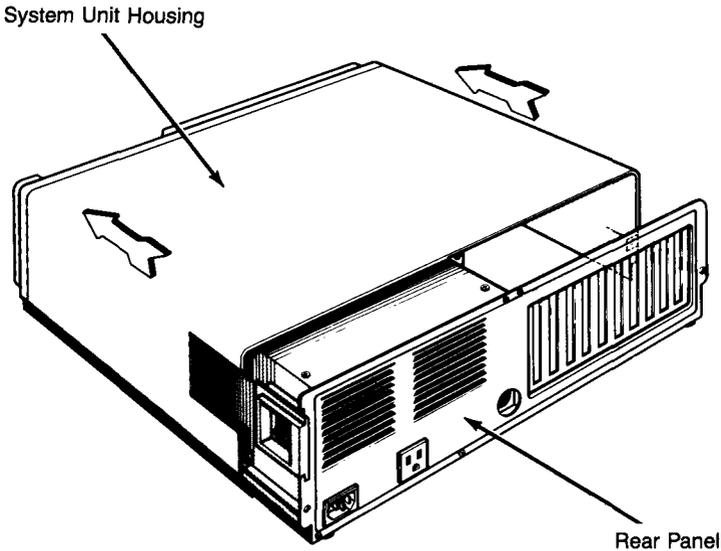
Note: If you are installing a video card for the first time, you need to follow only Steps 5 and 6. If you are installing peripheral cards on an already functioning system, you must follow **all** the instructions below.

1. Be sure the power switch on the right side of the system unit is pressed to 0 or OFF.
2. Turn off all external peripheral equipment (printer, monitor, modem, and so on).
3. Unplug the power cord from the wall.
4. Note the locations of all the peripheral cables connected to the rear of the unit. Disconnect the cables from the unit.

5. Remove the three cover mounting screws.



6. Remove the cover by sliding the entire housing toward the front of the machine.



Note: If you are now adding a math co-processor or the 128K RAM upgrade chips to your Tandy 3000, install them before installing the video adapter card. Adapter cards in Slots 1 through 7 might interfere with the installation of these options. See the “Internal Options” section of this manual.

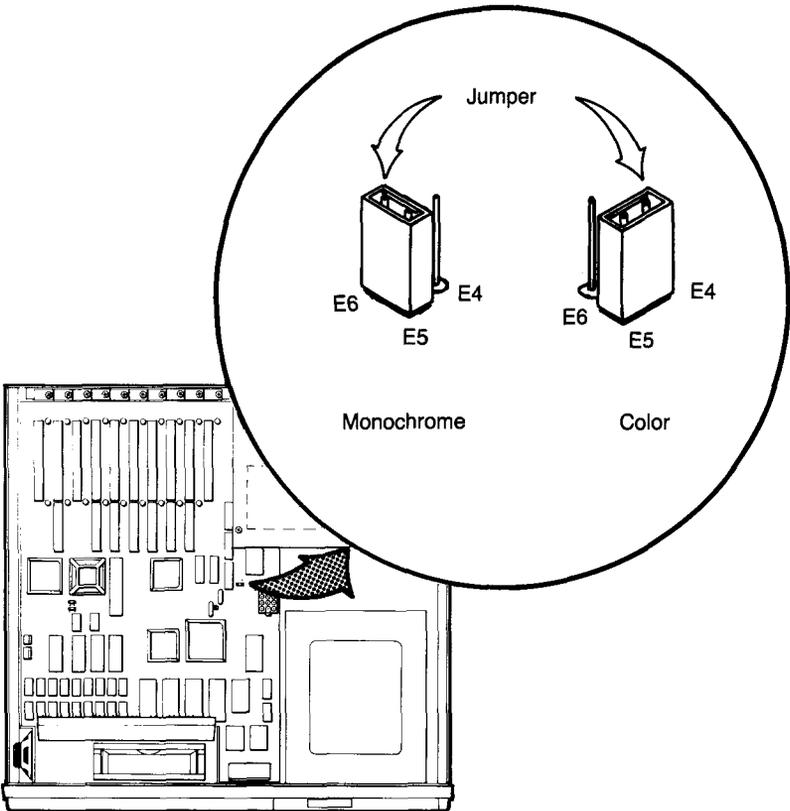
The Color/Monochrome Setting

The Tandy 3000 is set at the factory for a monochrome video display card and monitor. If you are using a monochrome card and monitor, you do not have to make the following color adjustment. Skip the rest of this section, and continue reading at the “Video Card Installation” section.

Before installing a **color** video display card, you must reposition a jumper on the computer’s main board.

Video Card and Monitor Installation

The color/monochrome jumper is located on the right side of the main circuit board, approximately halfway between the front and back. It is slightly above and to the left of the power connector (a white box), behind the disk drive chassis. Refer to the illustration for details.



You might have to move some cables out of the way to reach the color/monochrome jumper. (Do not disconnect the cables, simply lift them enough to allow access to the jumper.) The factory installs the jumper on pins E5 and E6 for a monochrome monitor. Move the jumper to connect pins E4 and E5 for a color monitor.

Video Card Installation

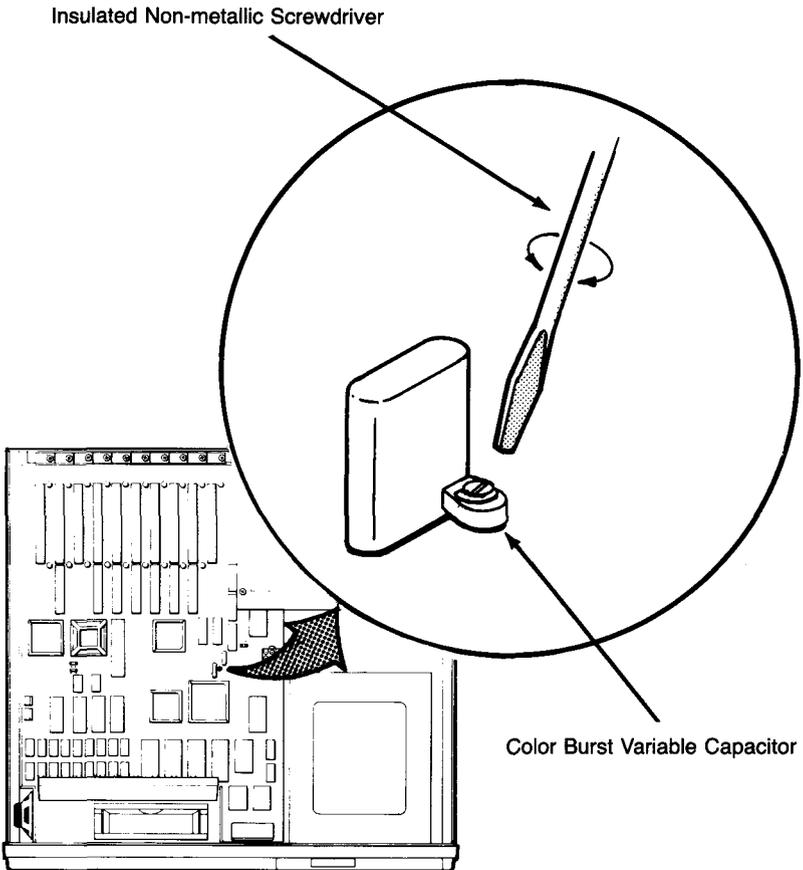
The Tandy 3000 supports several video display cards and most video monitors. The video display cards used most often are:

- The Tandy Deluxe Text Display Adapter (Cat. No. 25-3046) offers a high-resolution text character set and supports foreground and background color settings. Use with a Tandy VM-1 (Cat. No. 26-5111) or CM-1 (Cat. No. 26-5112) monitor.
- The Tandy Deluxe Graphics Display Adapter (Cat. No. 25-3047) offers both high-resolution (640 x 400 pixels) text and graphics character sets. It also supports point-addressable color graphics. Use with a Tandy VM-1 and CM-1 monitor.
- Dual Display Graphics Adapter—combination color/monochrome, graphics/text (Cat. No. 25-3045). Use with a Tandy VM-3 monochrome monitor (Cat. No. 25-3010) or a CM-10 color monitor (Cat. No. 25-1022).

Always read the instructions that come with a display card before installing the card in your computer. The cards are set at the factory for most monitors. However, you might have to change settings on a card to accommodate a particular type of video monitor.

After reading the peripheral card instructions and making the appropriate adjustments, you are ready to install the card in the computer. Remove the screw on top of Slot Cover #1 or #3 on the back panel of the system unit. Then, remove the slot cover from the panel.

Note for Composite Color Monitor/Television Users: If you install a color video card and a composite color monitor or television set, but you can't get color on the display, you might have to adjust a variable capacitor on the main board. With the system unit cover off, connect your monitor to the video card. Turn on the monitor and computer. Then, adjust the Color Burst Variable Capacitor until your monitor displays color. (See the illustration below.)



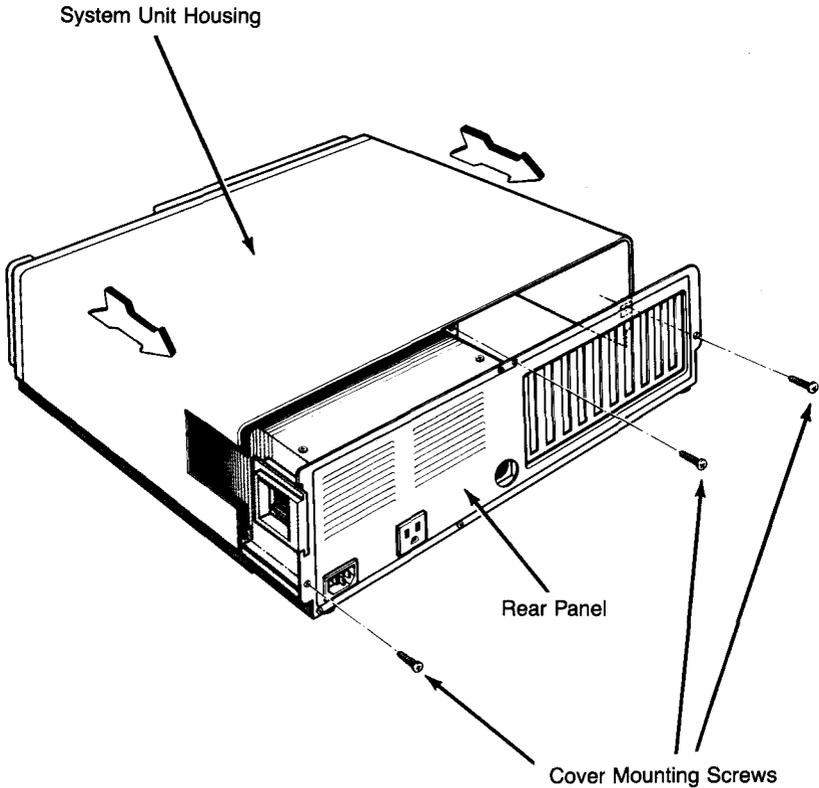
Cover Replacement

After moving the color/monochrome jumper and/or installing a video display card (and any other optional peripheral cards), follow the steps below to replace the system unit cover:

1. Be sure that all cards are seated securely on the main board and that all internal cables are connected.
2. If you have a Tandy 3000 HD with an internal hard disk, note the Drive Type Number and the hard disk Media Error Map on the top of the disk drive chassis. Write these numbers on the System Worksheet located on the inside back cover of this manual. **You need to know the Drive Type Number when you initialize your system, and you need to know the head and cylinder error numbers when you format your hard disk.**

Note: If you later add an internal hard disk drive, the Drive Type Number and Media Error Map will be attached to the new unit. Note these numbers on the System Worksheet before you install the drive. Then, follow the instructions in "System Configuration" to reset the CMOS chip memory.

3. With the lip of the cover under the computer frame's lower rail, slide the cover toward the rear of the unit.

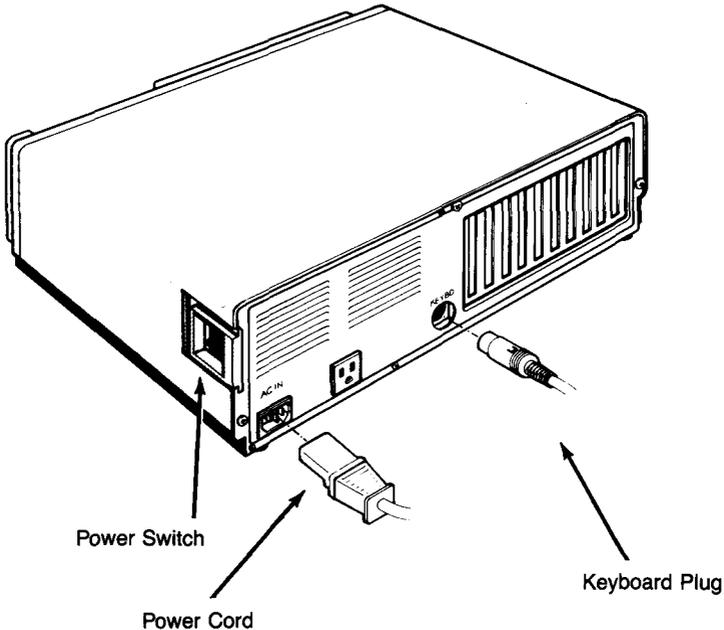


4. Replace the three cover screws.
5. Connect all peripheral cables to the appropriate peripheral cards through the slots on the back panel.

After replacing the cover, plug the monitor cable provided with your monitor into the video display card connector on the back of the system unit. Follow the instructions in your monitor manual for additional connections and adjustments.

SYSTEM UNIT OPERATION

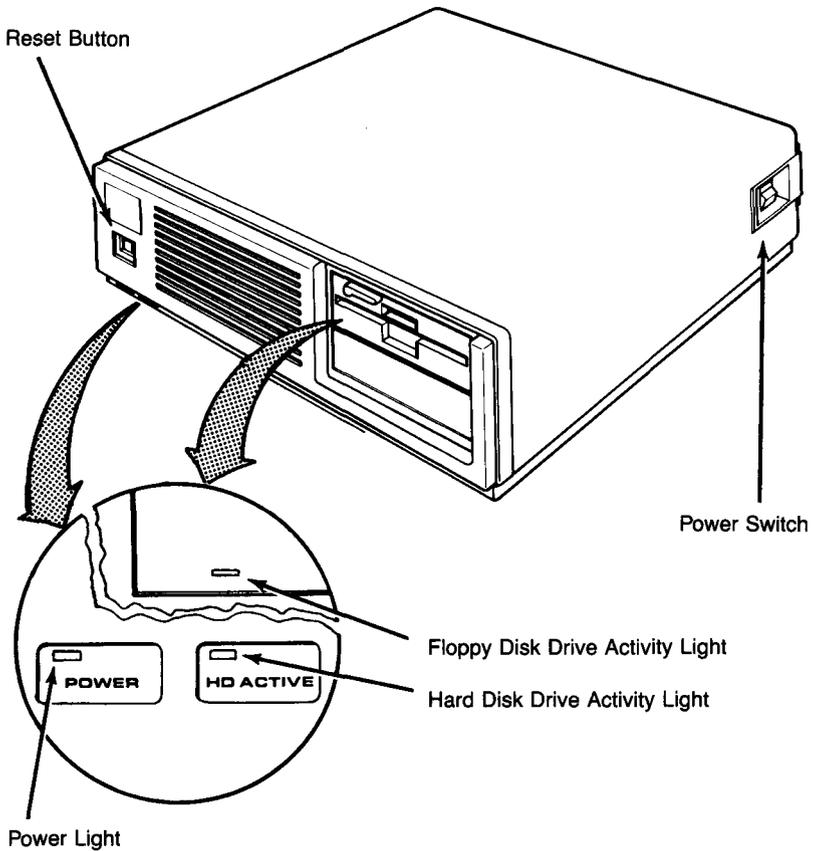
Plug the keyboard cable into the keyboard connector on the back of the system unit. (Refer to the illustration below.)



Be sure the power switch on the right side of the unit is OFF. The computer is off when the switch is at 0; it is on when the switch is at 1.

Plug the power cord into the rear of the unit. (Refer to the previous illustration.) Then, plug the other end of the power cord into a grounded, 3-prong electrical outlet. (Voltage requirements vary in different countries. See the label on your computer.) Do not use an outlet that also powers heavy machinery, copiers, office machines, and so on. If you must use an extension, use a grounded power strip, such as Radio Shack's Automatic Power Strip (Cat. No. 26-1429).

The front panel of the Tandy 3000 has three LED indicators and a Reset button. (Refer to the illustration.)



The power light is on whenever the system's power is on. Never move the unit when this light is on.

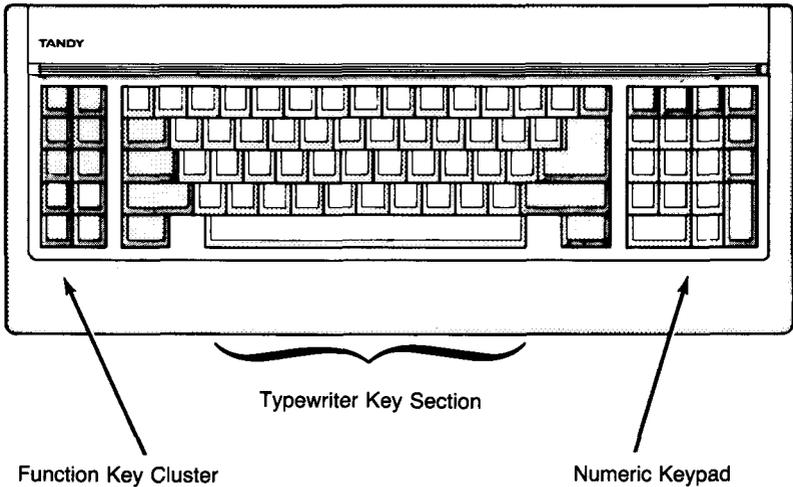
The floppy disk drive activity light is on whenever the floppy disk drive is reading from or writing to a diskette. **Never remove a diskette when this light is on; doing so might destroy the data on your diskette.**

The hard disk activity light is on whenever the hard disk drive is reading from or writing to the hard disk. **Never power down the system when this light is on; doing so might destroy data on your hard disk.**

The red Reset button on the left side of the front panel performs a cold-start reset. **When you press the Reset button, it is as if you turn off the computer, then turn it on again. This procedure erases any program stored in RAM.**

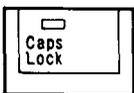
The Keyboard

The Tandy 3000 keyboard is divided into three sections: the typewriter key section, the function key cluster, and the numeric keypad.

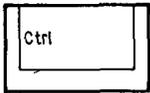


Typewriter Keys

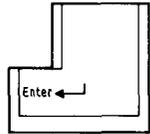
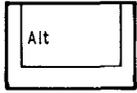
The center of the keyboard is similar to the keyboard of a standard typewriter. However, when you hold down a character or number key, the keystroke repeats automatically until you release the key.



When you press the Caps Lock key, the indicator light comes on, and the alphabet keys produce only capital letters. ((Caps Lock) does not affect any other keys.) Press the key once to activate caps-only mode; press the key again to return to normal mode.



The typewriter key section has two keys not found on standard typewriters: the Control key and the Alternate key. Both keys are used in combination with other keys. These key combinations are commands or functions in certain programs or computer languages, such as BASIC.

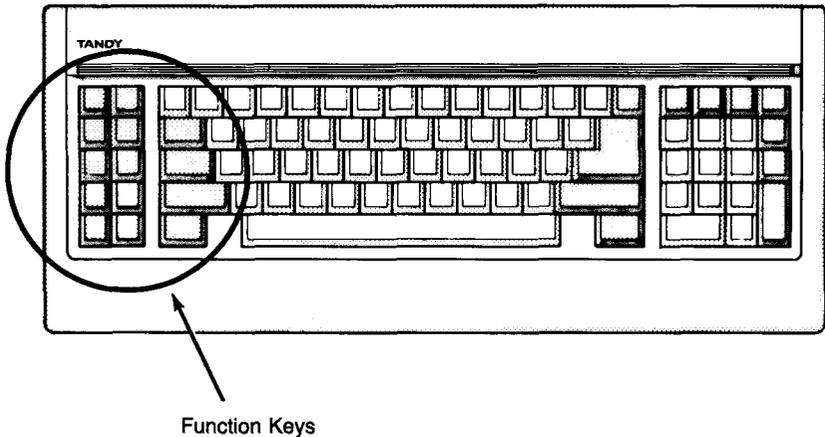


The Enter key enters commands and data into the computer for processing, and then, like a typewriter Carriage Return key, drops to a new line.

Note: Some software manuals might refer to the  key as the  key and the  key as .

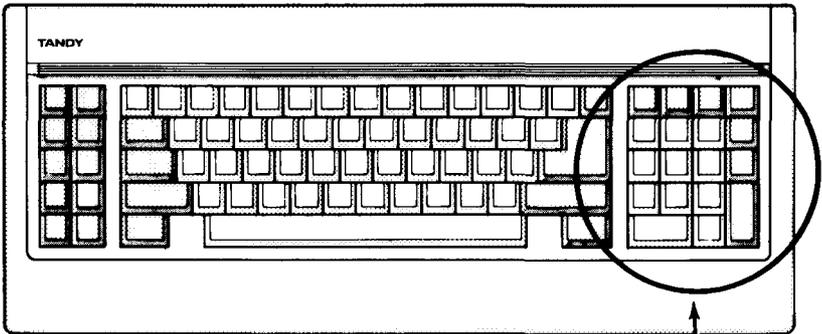
Function Keys

The function key cluster on the left side of the keyboard is a group of program-specific keys. Their functions depend on the program you are running.



Numeric Keypad

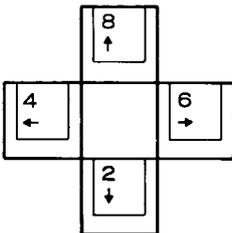
The numeric keypad on the right side of the keyboard is arranged the same as a calculator keypad to facilitate the entry of numbers. Number keys are normally the shifted characters on the Numeric Keypad (you press the shift key along with a number). Press the Number Lock key to use the keypad for extensive number entry. When number lock is on, you can type numbers without pressing the shift key.



Numeric Keypad

Note: The functions of most of the following keys depend on the operating system and program you are running. Below are some typical uses of the keys when you are running BASIC under MS-DOS.

If number lock is off, the unshifted numbers (1-8) on the Numeric Keypad control cursor movement:



Arrow keys move the blinking cursor in the direction of the arrow.



Pressing the Home key moves the cursor to the upper left corner of the screen.



Pressing the End key moves the cursor to the right of the last character in the current line.



Pressing the Print Screen key displays an asterisk. When you hold down **[Shift]** and press **[PrtSc]**, many programs print all the text currently on the screen.



The functions of the Page Up and Page Down keys depend on the operating system and the program you are running.



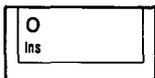
When you press the Number Lock key, the indicator light comes on, and the cursor keys on the numeric keypad produce numbers. The shift keys also work in reverse. Press the key once to activate number lock; press the key again to return to the normal mode.



The functions of the Escape and System keys depend on the operating system and the program you are running.



When you press the Scroll Lock key, the indicator light comes on, and the **[↑]** and **[↓]** arrow keys scroll text up and down one line at a time. Press the key once to activate scroll lock; press the key again to return to normal mode. (In some programs, scroll lock can be used with the Control key to halt program execution.)



Press the Insert key to insert data into a line of text; press the key again to return to the normal overstrike mode.

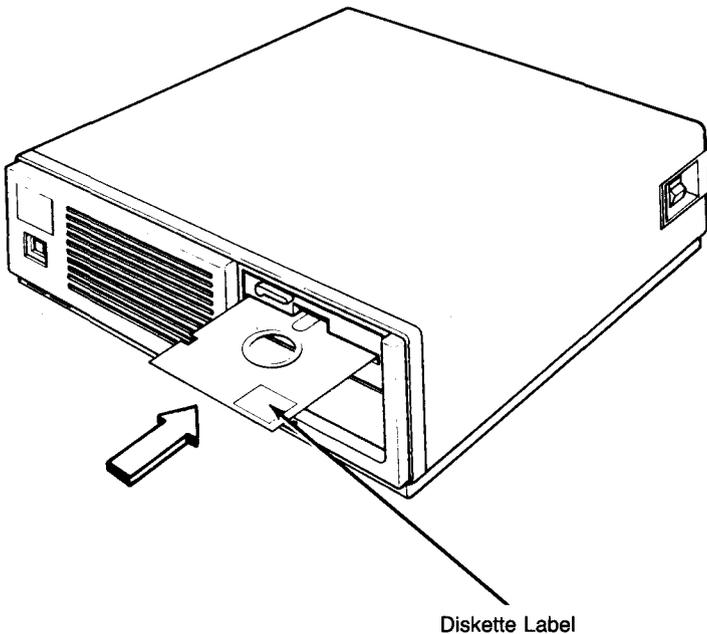


Press the Delete key to erase the character at the cursor position.

The Floppy Disk Drive

Lift the floppy disk drive lever, and remove the cardboard shipping insert from the disk drive.

To insert a diskette in the floppy disk drive, turn the drive lever counterclockwise. Then, insert the diskette with the label facing up. Gently push the diskette into the drive until it clicks into place. Turn the drive lever clockwise to close the disk drive.



The red LED light in the floppy disk drive comes on whenever the computer is reading from or writing to the diskette.

To remove a diskette from the drive, turn the drive lever counterclockwise, and pull out the diskette. **Never remove a diskette when the Drive Activity light is on.**

Note: If your Tandy 3000 has an optional second floppy disk drive, the two drives are stacked on the right side of the system unit. The top unit is the *primary* drive, and the bottom unit is the *secondary* drive. The MS-DOS operating system refers to the primary drive as Drive A and the secondary drive as Drive B. The XENIX operating system refers to the primary drive as Drive 0 and the secondary drive as Drive 1.

DISK DRIVE AND MEDIA TYPES

The primary drive, floppy disk Drive A, is always installed at the factory as a 1.2-megabyte, High-Capacity drive. (Note that the XENIX operating system refers to the primary floppy drive as Drive 0.) You can also install optional disk drives, selected from the following drive types:

- High-Capacity, 1.2-megabyte floppy disk drive
- Standard, 360 kilobyte double-sided floppy disk drive
- Hard disk drive

The type of diskette you use in a floppy disk drive depends on the drive type and whether or not you are writing to the diskette. The types of diskettes you can use in the floppy disk drives available for the Tandy 3000 are shown in the following chart:

	High-Capacity Drive		Standard Drive	
	Read	Write	Read	Write
High-Density, 1.2 Meg Diskette	Yes	Yes	No	No
Standard, D/S, 360K, 40-track Diskette	Yes	Yes*	Yes	Yes

* This situation requires a special format on the diskette. See your operating system documentation for details.

You can *read*, *write to*, and back up High-Density diskettes in a High-Capacity drive. You can also *read* standard diskettes in a High-Capacity drive. You should *write to* a standard diskette in a High-Capacity drive **only** if that diskette was originally formatted in a High-Capacity drive. Refer to your operating system manual for more information on formatting diskettes.

You can *read*, *write to*, and back up **only** standard, 360K diskettes in a standard drive. You cannot use High-Density diskettes in a standard drive.

Many software application programs are provided on standard, 360K media and are formatted for use in a standard drive. You can use the software as it is in a standard disk drive or you can copy it to another diskette (High-Density or standard) for use in a High-Capacity drive.

Before you copy the information from a standard diskette onto a High-Density diskette, format the High-Density diskette in the High-Capacity drive. (Refer to your operating system manual for instructions and restrictions.)

Before you copy the information from a standard diskette onto another standard diskette, format the target diskette in the High-Capacity drive. (Refer to your operating system manual for instructions.)

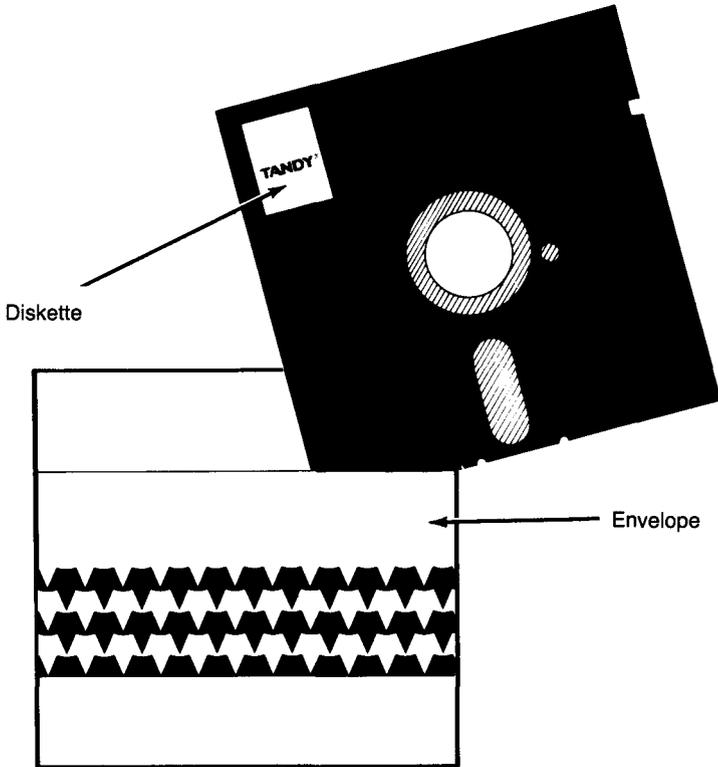
Always follow the steps outlined in your operating system manual to back up your original operating system and application software diskettes, taking care to prepare the new diskettes for use in the proper drive. **Never** use an original application diskette to run your programs.

You can create a diskette in one type of drive and use it in the other. However, we recommend that you do not write directly to a diskette created or written to in another drive type. First, make a backup of the diskette **in the new drive**. Then, use the backup diskette for operations in that drive.

You can use your computer's operating system to place files from either type diskette onto a hard disk. Refer to your MS-DOS or XENIX operating system manual for more information.

THE UTILITIES DISKETTE

Care and Handling of Floppy Diskettes



Handle floppy diskettes carefully. A scratch, small indentation, or even a speck of dust could 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) and 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—it 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.

System Configuration (Setup)

The Tandy 3000 contains a battery-powered real-time clock CMOS RAM chip that stores drive and memory information about your system. **You must set the memory of this RAM chip to your individual hardware configuration for the computer to function properly.**

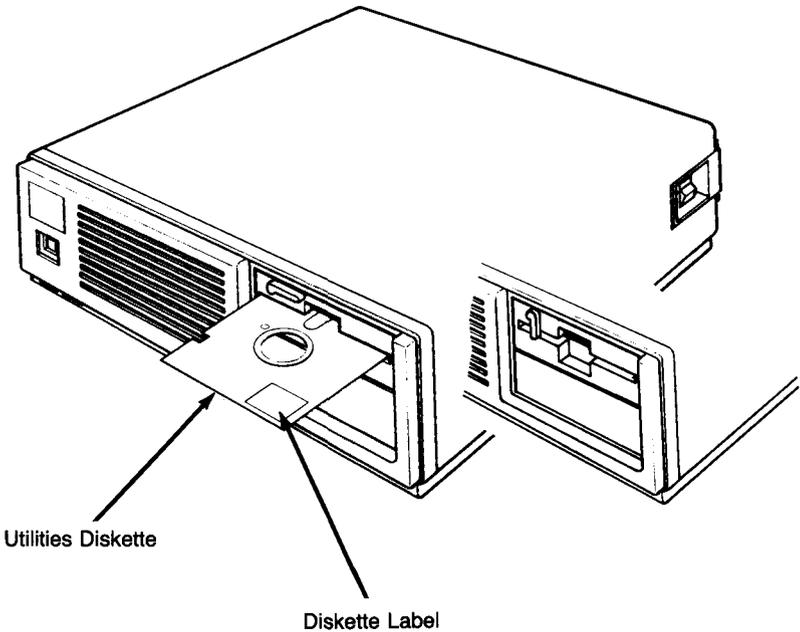
To record your hardware configuration into memory, use the Setup program on the system utilities diskette stored in this manual.

Because you can add memory and many optional peripherals to the Tandy 3000, you must run the Setup program every time you add or remove: (1) memory, (2) an optional floppy disk drive, (3) internal or external hard disk drives, or (4) a new video display card. You also must run the Setup program whenever you want to set or change the system time or date.

The computer retains this configuration memory until the battery gets weak or you change the information with the setup program.

Note: With normal system use, the battery should last three years before you need to replace it. Because the CMOS RAM chip uses the battery only when the computer is turned off, the more you use the computer, the longer the battery lasts. Storing the computer for long periods of time shortens the life of the battery. (See the “CMOS RAM Battery Removal and Replacement” section for additional information.)

1. Move the power switch on the right side of the computer to the ON position.
2. Insert the utilities diskette into floppy disk Drive A (the upper disk drive) with the label facing up. After the diskette clicks into place, turn the lever clockwise to close the drive door. (Refer to the illustration.)



The following prompt appears on the screen:

```
BIOS ROM version xx.xx.xx
Compatibility Software (C) 1985
Phoenix Software Associates Ltd.,
All Rights Reserved
Licensed to Tandy Corp.
```

```
00xxxx Base Memory, 00000k Expansion
Time-of-day clock stopped
Invalid configuration information please run SETUP program
Strike the F1 key to continue
```

The Tandy 3000 sounds one short beep when you turn it on. It sounds a long beep or a series of short beeps as a warning signal. If the computer sounds a warning when you turn on the power **and then prompts you to run Setup**, it is signal that there is a configuration problem. The computer sounds a warning the first time you turn it on because you have not yet run Setup.

Note: If, after you run Setup, the computer still sounds a warning signal and prompts you to run Setup, see the "Troubleshooting" section of this manual.

3. Press the **[F1]** function key. This message appears on the screen:

```
Phoenix Software Asc. Ltd
Configuration Setup Program Ver x.x
(C) Copyright 1985
```

```
This program is used to store system
configuration information into battery
backed memory in your computer. It is
necessary to run this program when
any memory, disk drives, or monitors
are added to or removed from your system,
or set the battery maintained time
or date.
```

```
ERRORS FOUND -
INCORRECT CONFIGURATION INFO
MEMORY SIZE MISCOMPARE
Press <enter> to continue ...
```

4. Press `Enter`. The next screens describe how to set the system date and time. Follow the instructions on the screens.
5. The last screen is for the hardware configuration. Because your system has never been set, answer no (`N`) at each prompt, and select the correct response from the choices offered. You need to know the following information to complete the configuration:
 - The floppy disk drive types for Drives A and B
 - The hard disk drive types for Drives C and D

To determine your drive type, compare the number of *cylinders* and the number of *heads* for your drive with the numbers in the following table. (Each hard disk drive comes with the information you need.) If your information exactly matches a type in the table, you have a *standard* drive. If it does not, you have a *non-standard* drive.

Type	Cylinders	Heads
1	306	4
2	615	4
3	615	6
4	940	8
5	940	6
6	615	4
7	462	8
8	733	5
9	900	15
10	820	3
11	855	5
12	855	7
13	306	8
14	733	7
15 Reserved	

If you have a non-standard hard disk, specify a type that has the same number of heads and fewer cylinders than your drive has. When you use the `FORMAT HARD DISK` utility, enter your disk's true number of heads and cylinders so that you can make full use of the disk.

- System base memory
- Expansion memory
- The primary video card

Keep a current list of this hardware information in the "System Worksheet" section on the inside back cover of this manual.

The following two system configurations are examples of the final setup screens for two typical Tandy 3000 configurations:

If you have a one-floppy Tandy 3000 with no memory upgrade and a monochrome monitor, the setup screen should look like this when you finish making your selections:

```
Diskette Drive A: is 1.2M
Diskette Drive B: is NONE
Fixed Disk Drive C: NOT INSTALLED
Fixed Disk Drive D: NOT INSTALLED
System Base memory is 512K
Expansion Memory is 0K
Prime Video Adapter is MONOCHROME
```

If you have a one-floppy, 20-megabyte hard disk Tandy 3000 with no memory upgrade and an 80-column color monitor, the setup screen should look like this when you finish your selections:

```
Diskette Drive A: is 1.2M
Diskette Drive B: is NONE
Fixed Disk Drive C: 6
Fixed Disk Drive D: NOT INSTALLED
System Base memory is 512K
Expansion Memory is 0K
Prime Video Adapter is COLOR (80 COL)
```

Note: The number that you use at the Fixed Disk Drive C: prompt is the Drive Type Number that you noted on the disk drive chassis when you took the cover off to install the video display card.

6. After you answer all the configuration questions, the following prompt appears at the bottom of the screen:

```
Are these options correct
(Reply Y or N then <enter>)
```

?

If you made an incorrect selection, press **[N]** and **[Enter]** to repeat the setup procedure. If your selections are correct, press **[Y]**. Then, press **[Enter]** to record the date, time, and hardware information in the CMOS memory.

7. Now, reboot the computer under the new hardware configuration, using one of the following two methods. (a) Press the **[Ctrl]** **[Alt]** **[Del]** keys simultaneously. (b) Press the red Reset button on the front panel of the System Unit.

The copyright page appears on the screen followed by the main menu of the utilities diskette.

Note: If you have a Tandy 3000 HD or a system with an external hard disk and haven't yet formatted the hard disk, a *hard disk failure* error message might appear on the copyright page. Press **[F1]** to display the main menu.

The next two sections describe how to use the other utilities on this diskette.

The Tandy 3000 utilities diskette programs are on a standard double-sided diskette. You can back up your system utilities disk immediately after using the Setup program for the first time. See the "Copy Diskette" section for detailed instructions.

If you have a floppy disk Tandy 3000, you are now ready to use the MS-DOS Operating System with your computer. Press **[9]** and then **[ENTER]** to exit the utilities diskette. Press **[ENTER]** again to automatically reboot the system if desired. See your *MS-DOS Handbook* for instructions on how to load and use the operating system.

If you have a Tandy 3000 HD with an internal hard disk or a Tandy 3000 with an external hard disk, you must format your hard disk before using either MS-DOS or XENIX. Read the next section for instructions on how to format the hard disk.

Formatting the Hard Disk

The utilities diskette contains the following programs:

- 1 FORMAT DISKETTE
- 2 COPY DISKETTE
- 3 PREPARE SYSTEM FOR MOVING
- 4 SETUP
- 5 FORMAT HARD DISK

- 9 END UTILITIES

To install an operating system on your hard disk, you must first format the hard disk.

1. Type 5 and press to begin. The following prompt appears:

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

2. Type C and press to format a primary hard disk drive, or type D and press to format a secondary hard disk drive.

After you make your selection, the following warning message is displayed on the screen:

```
All data on drive X will be DESTROYED!!
Do you want to continue (Y/N)
?
```

Warning:

This formatting utility erases all data from the hard disk. Use this option only when you are preparing to install an operating system on your disk for the first time.

- If you ever accidentally press at the main menu, press . Then, press to exit the formatting procedure and return to the main menu.
3. If you wish to continue with the format, press . Then, press . The formatting program displays the drive type and the number of heads and cylinders of the hard disk drive (C or D) you selected in the Setup program.

4. If you made a mistake during the setup program or want to change the interleave factor from the default of 3, press **[N]**, then press **[Enter]**.

Then, answer the prompts that follow with the correct number of heads, cylinders, and interleave factor for your hard disk drive.

5. When this information matches your hard disk drive, press **[Y]** and then **[Enter]** at the Is this correct (Y/N)? prompt.
6. Next, answer the following prompt:

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

Refer to the hard disk Media Error Map you found on the top of the disk drive chassis. If the map shows no defective tracks, press **[N]**, then press **[Enter]** to begin the formatting procedure.

If the map shows one or more defective tracks, press **[Y]**, then press **[Enter]**. The following prompt appears on the screen:

Enter next head,cylinder pair or
press <enter> to quit
?

(For example, if your Media Error Map lists Head 4, Cylinder 100 as a defective track, type: 4,100 **[ENTER]**.)

After you enter all the defective heads and tracks on the map, press **[Enter]** to begin the formatting procedure.

Do not interrupt the program while it is formatting the drive. When the format is complete, the program returns you to the main menu.

<p>You are now ready to install an operating system on your hard disk drive. See your operating system documentation.</p>
--

Additional Utilities

In addition to the setup/configuration and hard disk formatting programs, the system utilities diskette contains some other useful utility programs.

The following menu appears when you boot the utilities diskette:

- 1 FORMAT DISKETTE
- 2 COPY DISKETTE
- 3 PREPARE SYSTEM FOR MOVING
- 4 SETUP
- 5 FORMAT HARD DISK

- 9 END UTILITIES

These additional utility programs let you format and copy floppy diskettes and prepare your hard disk system for moving. The menu also includes an option for exiting the utilities diskette and returning to the operating system. The additional utilities are explained below.

Format Diskette

The Format Diskette option divides a diskette into tracks and sectors—but does not install an operating system on the diskette.

After you boot the utilities diskette, follow these steps to use the Format Diskette utility program:

1. To choose the Format Diskette utility, press at the SELECT THE ACTION DESIRED prompt. Press .
2. Answer the prompt for the drive in which you are formatting.
3. Insert the diskette you wish to format in the drive you specified, and press .

Note: Diskettes formatted with this procedure are not necessarily usable with your operating system. It is preferable to format diskettes using the appropriate command present in your operating system.

Copy Diskette

The Copy Diskette utility formats and copies a diskette exactly—including the operating system.

After you boot the utilities diskette, follow these steps to use the Copy Diskette utility program.

1. To choose the Copy Diskette utility, press **2** at the SELECT THE ACTION DESIRED prompt. Press **Enter**.
2. Answer the prompts that select the *source* and *target* floppy drives you wish to use. (Copy data **from** the source diskette in the source drive **to** the target diskette in the target drive.)

If you have only one floppy disk drive, select Drive A as both the source and target drive for the copy.

3. After you select the drives you wish to use, insert the source and target diskettes at the appropriate prompts.

Drive A is always installed at the factory as a 1.2-megabyte, High-Capacity drive. If you use the utilities diskette's Copy Diskette program to do a single-drive copy on the High-Capacity drive, you must always use a High-Density floppy diskette (Cat. No. 26-0422) as the target diskette.

You cannot use the utilities diskette's Copy Diskette program to back up a standard double-sided diskette in the High-Capacity drive. Use MS-DOS or XENIX to make backups if you have a single-drive system.

Note: You can use High-Density floppy diskettes only in High-Capacity drives.

If your Tandy 3000 has the optional, standard floppy disk drive installed as Drive B, you can copy a source diskette in Drive A to a target diskette in Drive B. See the following chart.

**Copy Diskette Utility
Drive/Media Compatibility**

If you have . . .

Then you use . . .

Source Drive	Target Drive	Source Diskette	Target Diskette
High-Capacity	High-Capacity	High-Density	High-Density
High-Capacity	Standard	Standard Double-sided	Standard Double-sided
Standard	Standard	Standard Double-sided	Standard Double-sided

Prepare System for Moving

You can use the Prepare System for Moving option only when your computer system includes a hard disk drive (internal, external, or both). Normally, the hard disk drive heads are positioned over the data area of the hard disk. This utility moves the drive heads as far as possible toward the center of the hard disk. This reduces the chance of damage to the hard disk media or loss of data while moving the computer.

After you boot the utilities diskette, follow these steps to use the Prepare System for Moving utility program:

1. To choose the utility, press **[3]** at the SELECT THE ACTION DESIRED prompt, and press **[Enter]**.
2. Turn off the computer.

When you turn on the system again, the heads automatically restore, and the hard disk drive once again becomes operational.

End Utilities

Press **[9]** at the utilities diskette menu to exit the utilities diskette. The following prompt appears:

```
PREPARE SYSTEM FOR DESIRED OPERATION  
AND PRESS "ENTER"
```

Remove the Utilities diskette if you do not need to use it further. You can now reboot using your operating system from your system diskette or hard disk by pressing **[ENTER]**. Refer to your operating system documentation.

INTERNAL OPTIONS

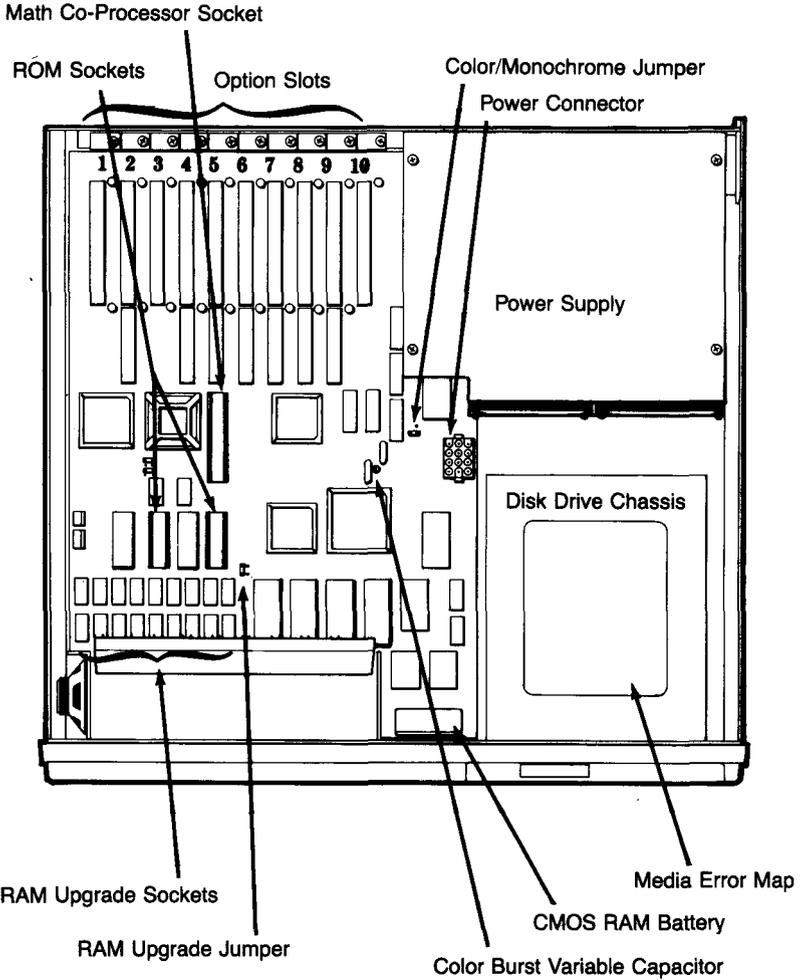
You can expand the capabilities of the Tandy 3000 in many ways:

- Ten option slots let you add peripheral cards and tailor the system to your specific home or business needs.
- The main board of the Tandy 3000 and the Tandy 3000 HD with a 20-megabyte hard disk contains 18 additional RAM sockets. You can increase on-board memory to a fully-configured 640K using the 128K Upgrade Kit (Cat. No. 26-5162). The Tandy 3000 HD with a 40-megabyte hard disk comes with a standard 640K of memory.
- An optional user-installable Math Co-Processor (Cat. No. 25-4033) speeds internal mathematical calculations and reduces computing time for many applications.
- Two additional ROM sockets permit future expansion of the Tandy 3000's internal ROM capabilities.

The diagram on the following page shows the internal map of the Tandy 3000 system unit. The drawing shows the location of the important sections of the system unit and the position of all of sockets, slots, and switches used in expanding the system.

Before installing any peripheral card or chip in the Tandy 3000, turn off the computer, and disconnect the power cord from the system unit.

Internal Options



Serial/Parallel Adapter Card Settings

The Serial/Parallel Adapter Card in Slot 10 provides two input/output ports: a 9-pin RS-232C serial port and a 25-pin parallel port.

The Serial Port

Listed below are the important features of the serial portion of the card:

- The serial portion of the card is programmable and supports asynchronous communications (allows variable intervals between transmitted characters).
- A programmable baud-rate generator lets you set the port for baud rates ranging from 50 to 9600 baud.
- The card controller lets you add or delete standard asynchronous communication bits to or from a serial data stream.
- The card provides full double buffering and the following modem controls: CTS, RTS, DSR, DTR, RI, and CD.

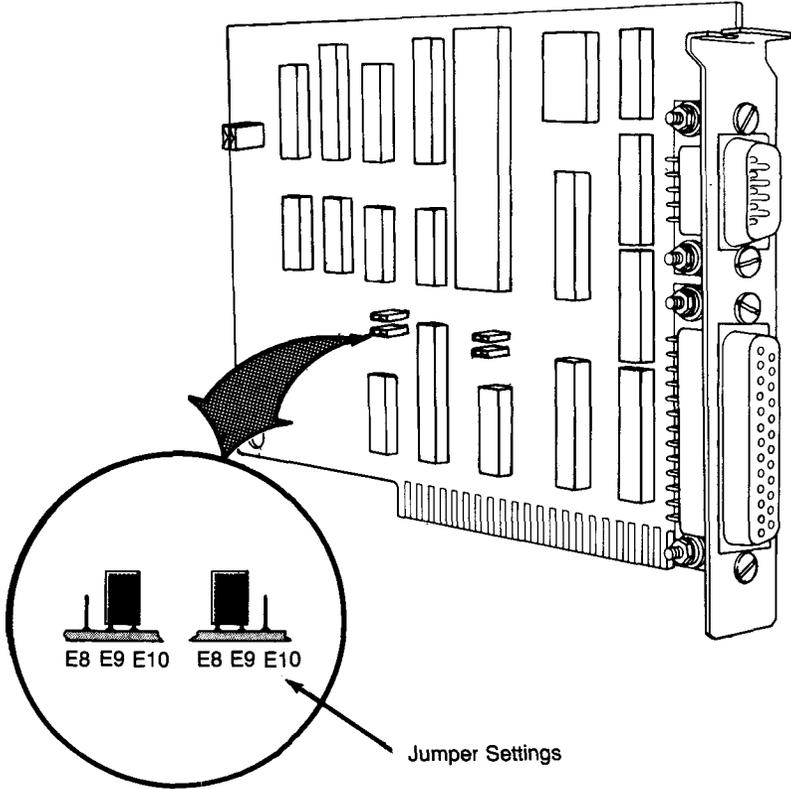
The serial port can be addressed as either communications Port 1 or Port 2. The Serial/Parallel Adapter Card is set at the factory for Serial Port 1. To change the serial portion of the adapter card to Port 2, you must remove the Serial/Parallel Adapter Card from Slot 10.

Note: To remove the Serial/Parallel Adapter Card, first remove the screw that anchors the card to the slot in the back panel of the computer. Next, hold the top of the adapter card, and pull it up and out of the slot of the main board. Place the card in a safe place; you will have to reinstall it before replacing the system unit cover.

Resetting the serial port on the Serial/Parallel Adapter Card is a two-step procedure. First, you set the serial port; then, you set the appropriate interrupt for the serial port.

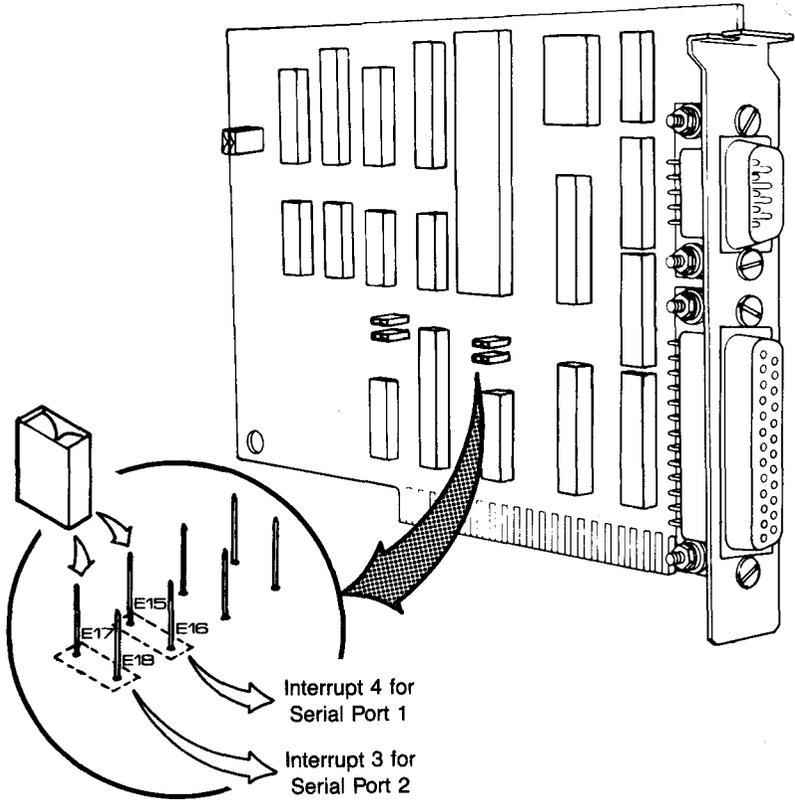
The jumper that connects pins **E9** and **E10** on the Serial/Parallel Adapter Card sets the card for Serial Port 1. To set the Serial/Parallel Adapter Card for Serial Port 2, move this jumper to connect pins **E8** and **E9**. (Refer to the illustration.)

Serial/Parallel Adapter Card



The jumper that connects pins **E15** and **E16** on the Serial/Parallel Adapter Card sets Interrupt 4 for Serial Port 1. To set Interrupt 3 for Serial Port 2, move this jumper to connect pins **E17** and **E18**. (Refer to the illustration.)

Serial/Parallel Adapter Card



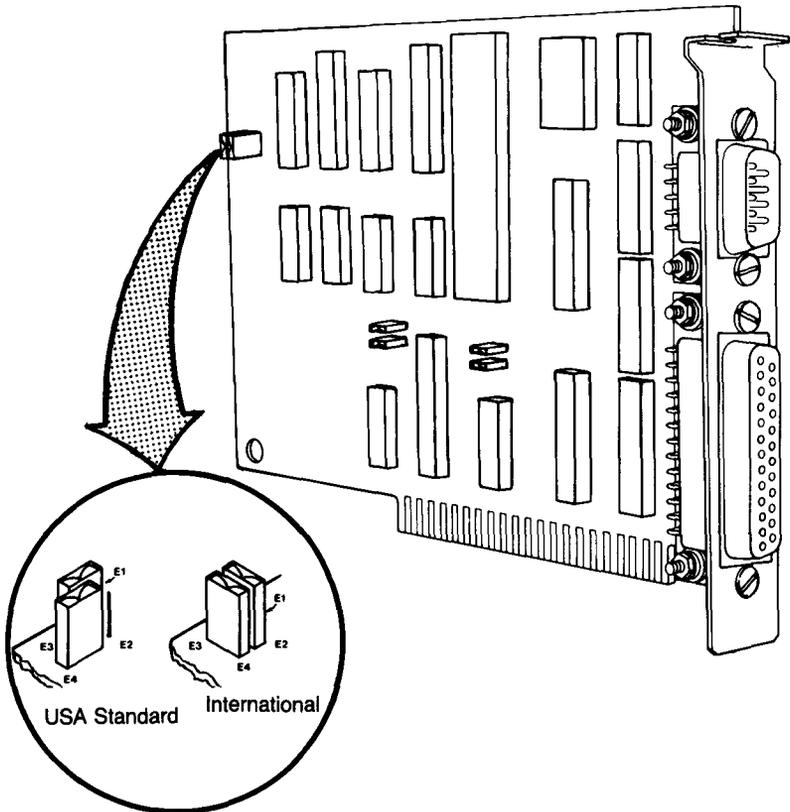
Serial port pin assignments are listed in the "Specifications" section of this manual.

Internal Options

The baud-rate generator on the serial portion of the card is set at the factory to the USA Standard which locks serial transmission and reception to the same baud rates. The jumper that connects pins **E1** and **E3** sets the adapter card to the USA Standard.

You can change the baud-rate generator to the International Standard setting in which serial transmission occurs at a higher baud rate than reception. This is a two-step procedure. First, move the jumper on pins **E1** and **E3** to pins **E1** and **E2**. Then, attach the unconnected jumper (on pin **E4**) to connect pins **E3** and **E4**. (Refer to the illustration.)

Serial/Parallel Adapter Card



The Parallel Port

The parallel portion of the adapter card provides an input/output port that lets you attach devices (usually printers) that accept eight bits of parallel data at standard TTL levels.

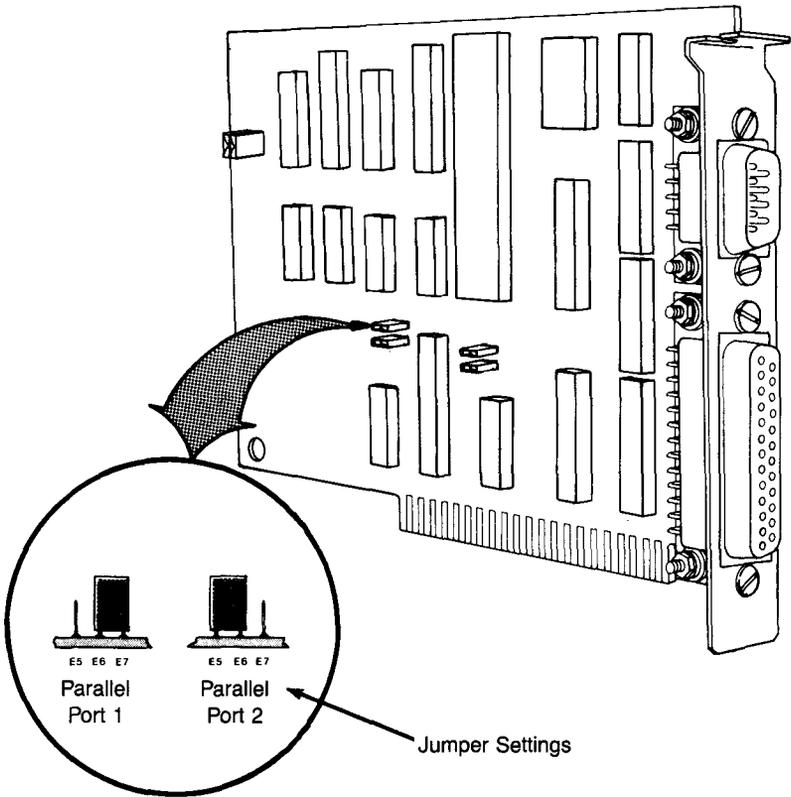
The parallel port can be addressed as either Port 1 or Port 2. The Serial/Parallel Adapter Card is set at the factory for Parallel Port 1. To change the parallel portion of the adapter card to Port 2, you must remove the Serial/Parallel Adapter Card from Slot 10.

Note: To remove the Serial/Parallel Adapter Card, first remove the screw that anchors the card to the slot in the back panel of the computer. Next, hold the top of the adapter card and pull it up and out of the slot of the main board. Place the card in a safe place; you will have to reinstall it before replacing the system unit cover.

Resetting the parallel port on the Serial/Parallel Adapter Card is a two-step procedure. First, you set the parallel port; then, you set the appropriate interrupt for the parallel port.

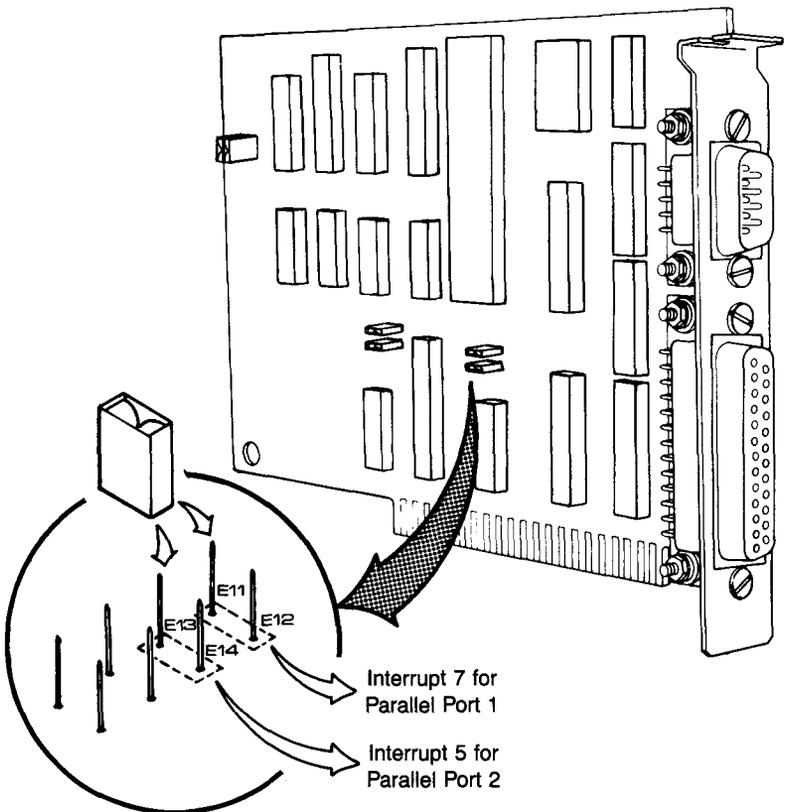
The jumper that connects pins **E6** and **E7** on the Serial/Parallel Adapter Card sets the card for Parallel Port 1. To set the Serial/Parallel Adapter Card for Parallel Port 2, move this jumper to connect pins **E5** and **E6**. (Refer to the illustration.)

Serial/Parallel Adapter Card



The jumper that connects pins **E11** and **E12** on the Serial/Parallel Adapter Card sets Interrupt 7 for Parallel Port 1. To set Interrupt 5 for Parallel Port 2, move this jumper to connect pins **E13** and **E14**. (Refer to the illustration.)

Serial/Parallel Adapter Card



Parallel port pin assignments are listed in the "Specifications" section of this manual.

CMOS RAM BATTERY REMOVAL AND REPLACEMENT

With normal system use, the battery that powers the Tandy 3000 CMOS chip should last at least three years before you need to replace it. Because the CMOS RAM chip uses the battery only when the computer is turned off, the more you use the computer, the longer the battery lasts.

Note: If you are storing the computer for long periods of time, you can extend the life of the battery by unplugging it from the main board until you are ready to use the computer again.

If the battery ever fails and the CMOS memory is erased, the following prompt is displayed when you turn on the computer:

```
Invalid configuration information - please run SETUP program  
Strike the <F1> key to continue
```

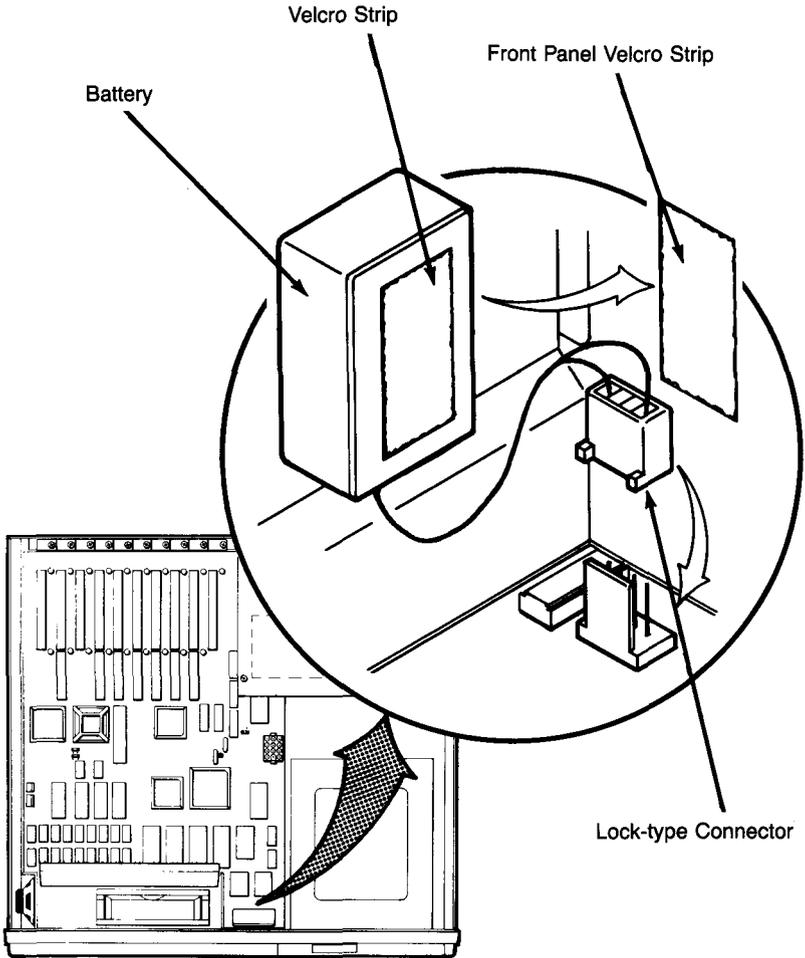
Insert the Utilities Diskette and follow the instructions in the "System Configuration (Setup)" section of this manual.

Note: If you have a battery problem that cannot be immediately corrected, you can still use the computer by running the Setup program each time you turn on the computer.

Use these steps to replace the battery:

1. Remove the system unit cover.
2. The battery is located on the inside of the front chassis panel to the left of the drives.
3. The battery is attached to the chassis panel with a Velcro strip. Carefully pull the battery away from the panel.
4. Follow the wires from the battery to the connector on the main board. (The connector location is J24.)

5. Remove the lock-type connector from the main board by pushing the lock-lip toward the front of the computer and, at the same time, lifting up on the connector. (Refer to the illustration.)



6. Be careful when disposing of this battery:

Warning: Improper handling of this special Lithium battery can cause a fire, explosion, or severe burns. Never recharge, disassemble, or heat the battery above 100°C (212°F). Never solder directly to the cell, or expose the contents of the battery cell to water.

7. Insert the new battery's connector at the J24 location on the main board.
8. Attach the new battery to the Velcro strip on the inside of the front chassis panel.
9. Replace the system unit cover.

TROUBLESHOOTING

If, after you run Setup, the computer still sounds a warning when you turn it on and prompts you to run Setup, check to see if one or more of the following areas is causing the configuration problem:

- loose cables
- improperly-seated peripheral cards
- incorrect jumper or switch settings
- incorrect hardware information used when running the Setup program

If none of the above is causing the problem and the configuration problem persists, call your local Radio Shack® Service Center.

SPECIFICATIONS

System Unit

Processor: Intel 80286, 8 megahertz

Size:

Length:	18.04 in. (45.82 cm)
Width:	18.95 in. (48.13 cm)
Height:	6.13 in. (15.56 cm)

Weight:

46 lbs.	Total (System unit, keyboard, power cord, manual, and packing material)
32.7 lbs.	System unit only (one 1.2 megabyte floppy disk drive)
35.7 lbs.	System unit only (one 1.2 megabyte floppy disk drive and one hard disk drive)

Power Requirements

105 - 130 VAC, 60 Hz (U.S.)
220 VAC, 50 Hz (International)
2.1 amps maximum current drain

Peripheral Interfaces

RS-232C serial port (DB-9 connector on peripheral card)

Pin assignments:

- 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 printer port (25-pin connector on peripheral card)

Pin assignments:

- 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

Disk drive controller for a maximum of two internal floppy disk drives (Tandy 3000)

Disk drive controller for one internal floppy disk drive and one internal hard disk drive (Tandy 3000 HD)

20 Megabyte Hard Disk Drive (Tandy 3000 HD)

Unformatted Capacity	25 megabytes
Formatted Capacity	21 megabytes
Number of Heads	4
Number of Cylinders	614 data
Average Access Time	85 ms (includes settling time)
Track to Track	18 ms

40 Megabyte Hard Disk Drive (Tandy 3000 HD)

Unformatted Capacity	51 megabytes
Formatted Capacity	42 megabytes
Number of Heads	5
Number of Cylinders	988 data
Average Access Time	28 ms (includes settling time)
Track to Track	5 ms

1.2 Megabyte Floppy Disk Drive

Unformatted Capacity	1.6 megabytes
Formatted Capacity	1.2 megabytes
Number of Heads	2
Number of Cylinders	80
Average Access Time	91 ms (includes settling time)
Track to Track	3 ms
Motor Starting Time	500 ms (600 ms max. to ready)
Rotation Speed	360 RPM
Media	5.25-inch High-Density

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SYSTEM WORKSHEET

This System Worksheet provides a convenient space in which you can keep up-to-date information about your Tandy 3000 system. Record all the hardware information you need to run the Setup configuration program. Update this list every time you add memory, hard or floppy disk drives, or a new video display card to your system.

The Worksheet also contains a section for you to record the flawed cylinders and heads for one or two hard disks.

Hardware Configuration

Floppy Disk Drives

Type of primary disk drive High-Capacity

Type of secondary disk drive _____

Hard Disk Drives

Drive type number of primary hard disk drive _____

Drive type number of secondary hard disk drive _____

Base Memory

Total base memory size: 512K or 640K

Expansion Memory

Total expansion memory size: _____ K

Video Adapter Card

Type of primary video adapter card _____

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