

**TOSHIBA**

# T1100 PLUS PORTABLE PERSONAL COMPUTER

## User's Manual



PAD8645-1

## **The T1100 PLUS User's Manual**

This manual explains how to use your T1100 PLUS Portable Personal Computer. The information described here is subject to change without notice and does not represent a commitment on the part of Toshiba America, Inc.

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## FCC NOTICE

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate the computing device with respect to the receiver
- move the computer away from the receiver
- plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communication Commission helpful:

How to Identify and Resolve Radio-TV Interference Problems  
U.S. Government Printing Office  
Washington, D.C. 2040  
Stock Number 004-000-00345-4

### **WARNING**

*This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 FCC Rules. Only peripherals certified to comply with the Class B limits may be attached to this computer. Operation with noncertified peripherals or peripherals not operated by Toshiba is likely to result in interference to radio and TV reception. Shielded cables and ferrite core must be used on all interface cables with the equipment.*

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# INTRODUCTION

## Chapter 1/INTRODUCTION

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# Chapter 1

# INTRODUCTION

The Toshiba T1100 PLUS personal computer is compact, light, and easily portable. Small but mighty, this powerful tool is compatible with all popular IBM PC software.

Various accessories, including an external diskette drive, color monitor and printer, let you add hardware to fit your needs.

Whether you are an experienced computer user or a beginner, we know you will be impressed by the superb quality and versatility of the T1100 PLUS.

## The T1100 PLUS User's Manual

This manual introduces you to the Toshiba T1100 PLUS Portable Computer.

If you've used a computer before, we suggest you review the material in this manual as it includes information specific to the T1100 PLUS. If this is your first experience with a computer, read each chapter carefully. A little time spent learning about the T1100 PLUS will save you time later and enable you to use it to its fullest extent.

**Quick Start** is a shortcut startup procedure. If you are familiar with personal computers, use this chapter to get started before reading further. More detailed setup and operating procedures are in the chapters entitled 'Setting up the Computer' and 'Operating the T1100 PLUS.'

**Setting up the Computer** explains in detail how to set up and begin operating the T1100 PLUS. It includes a discussion of computer parts. Whatever your level of experience, we recommend you read

through this chapter as it contains important information regarding the T1100 PLUS.

**Diskette Drives and Diskettes** contains all you need to know about diskette drive options and how to care for 3 1/2" and 5 1/4" diskettes.

**Operating the T1100 PLUS** takes you step by step through loading the operating system (MS-DOS) and making a backup copy of your system diskette. It explains the keyboard, how to turn the computer on and off and concludes with a discussion of care and maintenance.

**Using MS-DOS** gives a brief explanation of Microsoft's Disk Operating System (MS-DOS), discusses using the keyboard with the operating system and provides step by step procedures for the most frequently used MS-DOS commands. A more extensive discussion of MS-DOS is in the MS-DOS Manual.

**Using Software on the T1100 PLUS** discusses converting software from the 5 1/4" format to the T1100 PLUS's 3 1/2" format and gives tips on running software with the T1100 PLUS.

**T1100 PLUS Options** covers installing and using the additional hardware options available for use with the T1100 PLUS.

**Diagnostics** guides you through problem solving procedures. Use this chapter to troubleshoot malfunctions before calling your dealer. It also describes the Diagnostic Test program, its function and how to use it as an aid in troubleshooting.

The **Glossary** provides definitions to help you understand the more technical aspects of this User's Manual.

The **Index** lists reference words by page number.

**Appendix A, The CHAD Command**, tells you how to use the CHAD command to set screen attributes.

**Appendix B, The ASCII Character Table**, shows the ASCII character set.

## How to Read this Manual

Each chapter begins with a fold out flap that contains illustrations and the chapter's table of contents. Before you begin reading a chapter, turn to its table of contents and open the flap. The illustrations referred to in the text are on the flap and are identified by capital letters.

Italics are used to identify variables you need to replace. For example, when the manual discusses entering the time and date it refers to the hours and minute as *hh:mm*. This means you are to replace the *hh* with the current hours and the *mm* with the current minutes.

Keypops are shown as you see them on the keyboard. Computer parts are referred to by the abbreviations used on the computer. For example, the parallel port is called the PRT/FDD since that is the name on the back of the computer that identifies it.

Combinations of keys are occasionally referred to by key name and a plus (+) sign. For example, **Ctrl + Break** means you must hold down the **Ctrl** key and at the same time press the **Break** key.

## Definition of Terms

Throughout the manual the following terminology is used:

- Diskette** refers to 3 1/2" or 5 1/4" floppy diskettes that are inserted and removed from the computer.
- Disk** refers to a hard, or fixed disk. (The T1100 PLUS does not come with a fixed disk, but is capable of supporting one through the expansion chassis.)
- Current drive** refers to the drive the computer is currently accessing, frequently drive A.
- Alternate drive** refers to the drive the computer is not currently accessing, frequently drive B.



## Computer Capabilities

The IBM compatible Toshiba T1100 PLUS Portable Computer is one of the most advanced personal computers on the market. Weighing less than 10 lbs, it incorporates the following features.

- 256K bytes or 640K bytes of Random Access Memory (RAM) make it unnecessary to buy more memory to run most software packages.
- Two internal double sided, double density 3 1/2" diskette drives hold 720K bytes of information each.
- A high resolution liquid crystal display (LCD) with 80 columns and 25 lines, 640 horizontal and 200 vertical pixels is one of the sharpest in the industry.
- A Centronics-type parallel printer port compatible with IBM PC parallel printer cables will enable you to connect your T1100 PLUS to any IBM compatible printer. Toshiba's 3-in-One printers provide exceptional letter quality print and excellent graphics for use with the T1100 PLUS.
- A serial port enables you to connect serial devices (such as a mouse or serial printer) to the computer.
- A keyboard with 81 keys provides complete compatibility with IBM software.
- An integrated numeric keypad provides easy numeric data entry.
- A built-in rechargeable Nickel-Cadmium battery provides up to 8 hours of operating power, enabling you to use the computer wherever you go.
- An AC adapter with power cord recharges the computer and provides power when the batteries are low.
- An external diskette drive port lets you attach an external 5 1/4" diskette drive.
- Two external display connectors for both RGB color and composite monochrome monitors let you attach an external monitor to the T1100 PLUS.

## Options

The following hardware options are available from Toshiba.

- An AC powered 5 1/4" external diskette drive allows the T1100 PLUS to read from and write to 5 1/4" diskettes that are interchangeable with IBM PC and compatible computers.
- A user installable 1200 bps Hayes-compatible internal modem allows you to access any of the consumer information services or dial into computer bulletin boards.
- The Floppy Link allows you to use one of the 5 1/4" diskette drives in your IBM PC, PC/XT or PC AT (or compatible) with the T1100 PLUS.
- An expansion chassis allows you to install up to 5 IBM compatible cards.
- An automobile power adapter allows you to recharge the battery from your car.

## Benefits

The T1100 PLUS is flexible and includes many user friendly benefits.

- It is compact, light and easily portable, and fits into many briefcases.
- It has an easy-to-use keyboard.
- The LCD screen has a multi-position hinge that allows it to lie flat, providing easy access to an external monitor.
- It is powered by a high power capacity, rechargeable battery.
- A low battery indicator light alerts you when it is time to charge the battery.
- It is IBM PC compatible, allowing you to run PC software.
- It comes with this User's Manual and an MS-DOS Reference Manual.

## **Accessories and Supplies**

Your dealer can provide interface cables, 3 1/2" double sided, double density diskettes and 5 1/4" double sided, double density diskettes for use with the T1100 PLUS.

# Chapter 2 QUICK START

QUICK START

Chapter 2/QUICK START



2/A



2/B



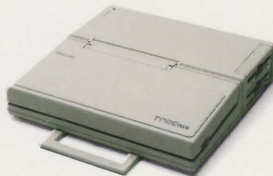
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# Chapter 2

## QUICK START

This chapter is for experienced computer users. If you are familiar with MS-DOS, diskettes, and loading and unloading software, 'Quick Start' will enable you to begin using the T1100 PLUS within minutes of unpacking.

If you are new to computers, however, we strongly recommend that you read the next chapter, 'Setting up the Computer' and use this chapter as a reminder once you have become familiar with the steps.

This quick start procedure assumes:

- The battery is not charged.
- A working copy of the 3 1/2" MS-DOS operating system diskette is at hand.
- You are running the computer with the AC adapter.
- You are not using an external drive.

Take the following steps:

- 1 Set the computer on a flat surface with the words 'T1100 PLUS' facing you.
- 2 Insert the round end of the AC adapter cable into the DC IN jack on the back of the computer. The DC IN jack is on the right side of the computer next to the on/off switch as you face it from the rear.
- 3 Insert the two-prong end into a standard 120V wall outlet.
- 4 Check that the indicator light on top of the computer is on. The light indicates the adapter is correctly attached to the computer and a working wall outlet.
- 5 Locate the power on/off switch on the right side as you face the back of the computer and check that it is off.

- 6 Let the battery charge for at least five minutes. Leave the AC adapter connected while operating the computer.
- 7 Pull the two latches on either side of the computer forward and lift the display screen.
- 8 Check that the A B PRT switch on the left side of the computer is set at PRT.
- 9 If the drives contain cardboard protectors, remove them.
- 10 Turn the computer on.
- 11 The computer performs a self test followed by the message:



Place system disk in drive  
Press any key when ready.

- 12 Insert the MS-DOS system diskette in drive A and press any key to load the operating system.

**NOTE**

*You may insert the system diskette in the drive before the message 'Place system disk in drive' appears on the screen. The program is then automatically loaded following the self test.*

- 13 Answer the date and time questions.
- 14 The 'A>' prompt appears on the screen. Eject the system diskette.

You are ready to load your software and get to work.

# Chapter 3 SETTING UP THE COMPUTER

## Chapter 3/SETTING UP

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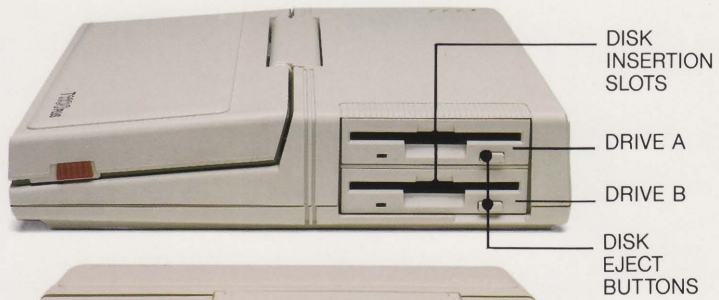




3/A



3/B



3/C



3/D



3/E



3/F

# Chapter 3

# SETTING UP THE COMPUTER

This chapter describes the computer's parts, discusses charging the battery and explains how to connect all the parts in preparation for operation.

## Equipment Checklist

The following is a list of the equipment that has been included with the T1100 PLUS. If any of the items are missing or damaged, notify your dealer immediately.

- T1100 PLUS portable computer
- AC adapter with power cable
- 3 1/2" diskette containing the Microsoft MS-DOS operating system programs
- T1100 PLUS User's Manual and MS-DOS Manual

## What to Do in Case of Equipment Damage

Should you discover any faults in the computer due either to damage caused during shipping or defects in manufacturing, notify your dealer right away. It is the dealer's responsibility to resolve any such

problems with Toshiba. However, should your dealer's response prove unsatisfactory, contact Toshiba at the address below:

**United States**

Toshiba America, Inc.  
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## Computer Part Identification

This section introduces the various computer parts. Become familiar with them before you begin operating the computer.

**Left Side**

Figure 3/B is a photograph of the left side of the computer. Notice the latch lever. There is one like it on the right side. Sliding these two levers forward together lifts the LCD, allowing access to the keyboard.

The **A B PRT** switch is a slide switch. If you attach a 5 1/4" external drive to the T1100 PLUS, this switch must be set on **A** or **B**. If you are not using an external drive this switch must be on **PRT**.

For a more detailed discussion on diskette drives and how to specify them, see the chapters, 'Diskette Drives and Diskettes' and 'Using MS-DOS.'

The **LCD contrast** dial controls the contrast of the Liquid Crystal Display (LCD) screen. Adjust the angle of the screen first, then use the LCD contrast dial to fine tune the display to your satisfaction.

## Right Side

The right side of the computer is illustrated in Figure 3/C. Notice the latch lever, corresponding to the one on the left side. Sliding these two latch levers forward together opens the computer.

Two 3 1/2" **diskette drives** are located at the rear. The upper drive is drive A and the lower drive is drive B. Each drive includes a diskette insertion slot, a drive indicator light and a diskette eject button.

The **insertion slot** is a narrow, horizontal opening in the middle of each drive. Diskettes are inserted here.

Each drive's indicator light comes on when the diskette drive is being accessed by the system. When the light to the left of drive A comes on, drive A is in use. When the light to the left of drive B comes on, drive B is in use.

### **CAUTION**

*When a diskette drive indicator light is on, the T1100 PLUS is actually reading or writing data. The diskette should not be removed or the computer turned off while the light is on.*

Each drive's eject button releases the diskette so it can be removed from the drive. As you press the button, the diskette pops partially out of the slot allowing you to remove it by hand.

## Back

Figure 3/D shows the computer's back panel. The parts are described from left to right as you face the back of the computer.

The 9-pin RS-232-C serial (communications) port, **COMMS**, lets you connect a serial device such as a mouse or serial printer to the T1100 PLUS.

The 25-pin **PRT/FDD** port is for a printer or an external diskette drive. It receives a Centronics-type cable used to connect the computer to a parallel printer (parallel and serial printers are discussed in the section 'Connecting the Computer's Parts'). It also receives the cable for an external 5 1/4" diskette drive.

The **RGB** port is used to attach a color display such as an IBM PC color monitor to the computer. This type of display is often referred to as a Cathode Ray Tube (CRT).

The composite jack, **COMP**, is used to attach a black and white composite CRT display.

### **NOTE**

*The standard IBM PC monochrome monitor is not a composite monitor and therefore cannot be connected to the T1100 PLUS.*

The **DC IN** jack connects to the DC output of the AC adapter. It is used to recharge the computer's battery.

The **power on/off** switch is a slide switch. Facing the computer from behind, press it to the right to turn the computer on, and to the left to turn it off.

The expansion slot, **EXP**, holds either an expansion chassis interface card or a 1200 bps internal modem.

## Top with Cover Open

Figure 3/A shows the computer with the LCD lifted, ready to work. References to 'left' and 'right' in the following discussion assume you are sitting in front of the computer.

The **liquid crystal display (LCD)** is the screen on which data from the computer is shown. It contains a thin nematic layer of liquid crystal pressed between two glass plates.

The image displayed on the T1100 PLUS's LCD consists of 640 x 200 pixels (80 columns and 25 lines of characters). A pixel is a 'dot' on the screen. When you press keys the computer sends signals to certain pixels turning them 'on' to form the letters and symbols you see.

The LCD is a single color (black and white) screen; in other words, whenever a pixel is 'on' it always shows the same dark color. As a result, what you usually see are dark letters on a light background. While the T1100 PLUS cannot display in color on the LCD, it is compatible with an IBM PC with a Color Graphics Adapter (CGA).

### NOTE

*Some software packages will look best specially configured for the LCD. See the chapter entitled 'Using Software on the T1100 PLUS' and your software user's manual for instructions on how to do this.*

The **latch hooks** are located on each side of the LCD. They lock the LCD in the closed position. The hooks are released by pulling the latch levers forward.

The **LCD hinge** is designed so that the screen can be angled at any position for optimal viewing.

Underneath the hinge, to the right, is a 'screen closed' sensor. If you leave the T1100 PLUS on and close the top cover, you will hear a 'beep' for approximately five seconds. This is to warn you that the computer is on. Turn it off to avoid draining the battery unnecessarily.

The **keyboard** is composed of 81 keys. How the keys work is discussed in the chapter entitled 'Operating the T1100 PLUS.'

The **Power/Speed** light has two functions:

- It indicates whether the computer is on or off.
- It tells you if the computer is operating at fast (7.16 MHz clock rate) or normal PC speed (4.77 MHz clock rate). If the light is green, the computer is set to operate at fast speed. If the light is red, the computer is set to operate at normal speed (see the chapter entitled 'Operating the T1100 PLUS' for an explanation of fast and normal operating speeds and how to change them).

The **Upper** and **Lower Disk in Use** lights come on when the internal diskette drives are in use. If a diskette in drive A (the upper drive) is being accessed, the light on the left comes on. If a diskette in drive B (the lower drive) is being accessed, the light on the right comes on.

#### **NOTE**

*When an Upper or Lower Disk in Use light is on, the T1100 PLUS is actually reading or writing data. The diskette should not be removed or the computer turned off while the light is on.*

The **CRT** light tells you that the LCD is deactivated and the computer is set for an external monitor.

The **Low Battery** light comes on when the battery needs recharging. When this happens, immediately save whatever work you are doing and recharge the battery. Detailed information on the battery is given in the next section.

## **Built-In Battery and AC Adapter**

The T1100 PLUS is powered by an internal rechargeable battery or by power from an AC adapter attached to a wall outlet. The internal

battery is recharged by the AC adapter. This section discusses powering the computer with the AC adapter and the battery.

### Powering the Computer with the AC Adapter

Figure 3/E is a photograph of the T1100 PLUSAC adapter. The cord with the white stripe ends in a small tubular connector. This is the DC output end of the AC adapter. The all-black cord ends in a standard, two-prong plug.

Keep in mind the following points when using the adapter:

- The AC adapter does not have a power on indicator. The power on indicator is found on the top left hand corner of the computer as you face it from the front. If the light is on, it indicates that the adapter is attached to the computer and a working wall outlet.

#### **NOTE**

*The AC adapter can cause the power on indicator to come on for a few seconds even if it is not connected to a working AC wall outlet. Double check the indicator a few seconds after you connect the adapter.*

- You can use the computer with the AC adapter connected even if the battery power is low. However, the adapter will not recharge the battery while the T1100 PLUS is on. The computer must be turned off if the battery is to be recharged.
- You may connect or disconnect the AC adapter while the computer is operating without interrupting normal operations.

If the computer is off, the AC adapter begins recharging the battery. If the computer is on, it can be used as long as the AC adapter is plugged in. With the computer on the AC adapter recharges the battery slowly, if at all.



## Powering the Computer with the Battery

The Nickel-Cadmium (Nicad) battery is light weight, compact and has a long operating life. The battery is inside the computer and does not need to be replaced by you.

## Charging the Battery

The battery must be initially charged before it is ready to power the computer for the first time. If the battery has not been used for a long time, or if the **Low Battery** indicator light comes on, the battery must be recharged.

From the time the **Low Battery** indicator light comes on you have approximately 20 minutes until power is completely gone. This should give you enough power to save any work you are doing. If you continue using the computer with the **Low Battery** light on, power will eventually run out and your work will be lost.

Keep the following points in mind about battery charging:

- When charging the battery, use the AC adapter provided. It is designed specifically for the T1100 PLUS. Using another adapter could damage the computer.
- If the input voltage is lower than the 120V, charging takes longer than the times indicated below.
- When the AC adapter is connected to the computer and the power switch is on, the battery recharges very slowly, if at all. When the diskette drives are operating, indicated by the **Disk in Use** light, no charging takes place.
- When the battery is completely drained, even the **Low Battery** light does not work. It is important to recharge the battery at least five minutes before turning the power switch on. After five minutes, the computer is operable with the AC adapter connected.

All computer operating times in the following table assume the diskette drives are used 10% of the time. Approximate charging and operating times are:

### Recharging Table

Charging Time:	1.0 hrs	2.0 hrs	4.0 hrs	8.0 hrs
Operating Time:	1.2 hrs	2.4 hrs	4.7 hrs	7.5 hrs

Operating times do not change when an external diskette drive is added to the system because the external drive draws power from its own power supply. Operating times are reduced when the internal modem is on.

#### NOTE

*It is normal for the AC adapter to become warm during recharging. Do not worry about this. The adapter will not overheat, and the charging circuits are designed not to overcharge the battery.*

## Connecting the Computer's Parts

Follow these steps to connect the computer in preparation for operation.

### Step 1. Connecting the AC Power Adapter

Insert the round end of the AC adapter cable into the **DC IN** jack on the back of the computer. The **DC IN** jack is to the left of the on/off switch as you face the computer from the rear.

Insert the two-prong end into a standard 120V AC wall outlet.

### Step 2. Charging the Battery

Make sure the computer is switched off. Let the battery charge for at least five minutes. Leave the AC adapter connected while operating the computer for the first time.

### Step 3. Connecting a 5 1/4" External Drive

If you have a 5 1/4" external diskette drive, follow the steps in the chapter entitled 'Diskette Drives and Diskettes' for instructions on how to connect the drive to the computer.

### Step 4. Connecting a Printer to the T1100 PLUS

The T1100 PLUS comes with a parallel printer port and a serial port built in.

#### **NOTE**

*For a parallel printer to work with the T1100 PLUS, the A B PRT switch on the left side of the computer must be set at PRT.*

### Connecting a Parallel Printer

The T1100 PLUS can be connected to any standard Centronics compatible printer.

The term 'parallel' means that data is transmitted to the printer one character or 'byte' at a time. (The terms 'character' and 'byte' are synonymous.) One character consists of eight binary digits or 'bits'. In other words, parallel interfacing means the computer transmits eight bits side by side through the cable to the printer.

The most commonly used parallel interface conforms to a standard developed by Centronics, a printer manufacturer.

A standard IBM PC parallel printer cable is all that is required to connect a parallel printer to your T1100 PLUS. Your dealer can supply one or you can purchase one at any computer store.

The two ends of the cable are constructed in such a way as to make it impossible for them to be connected incorrectly. Insert one end into the **PRT/FDD** connector on the computer and the other into the printer (see Figure 3/D). The computer end of the cable contains screws with

which to fasten it to the T1100 PLUS. The printer end can be attached with clips found on the printer port receptacle.

## Connecting to a Serial Printer

The **RS-232-C** serial communications port (**COMMS**) lets you connect a device such as a serial printer to the T1100 PLUS. Information on how to connect another serial device such as a mouse or bar code reader is given in Chapter 8.

The term 'serial' means that information is transmitted to the printer (or other serial device) sequentially, one bit at a time, rather than in parallel, eight bits at a time.

Two things are required to connect a serial printer to the T1100 PLUS: a cable that is compatible with both the T1100 PLUS and the printer, and software that supports a serial printer. Your software user's manual tells you whether the software will support a serial printer or not.

### **NOTE**

*The discussion below assumes the printer you wish to connect is a standard DTE device and you have set the necessary communications parameters. If it is a DCE device, a special cable is required.*

See the section entitled 'Connecting Serial Devices' in Chapter 8 for more information on serial interfacing, DTE and DCE signaling arrangements and setting serial parameters.

The T1100 PLUS has a 9-pin port identical to the IBM PC AT's serial port. The printer you wish to attach may have a 9-pin connector, or it may have a 25-pin connector.

If your printer cable has 25-pin connectors on both ends, you will need to purchase a new cable from your dealer or local computer store.

Toshiba manufactures a 2-foot RS-232-C cable for this purpose. Its part number is: PC-1PA7434U. Longer cables are available at your local electronics store.

Take the following steps to connect the cable to the T1100 PLUS and the printer:

- 1 Connect the 9-pin end of the cable to the RC-232-C (COMMS) port. Use a screwdriver to attach it firmly.
- 2 Connect the 25-pin end to the printer and firmly attach the cable by tightening the cable's screws.

Once the computer is set up and you have loaded the operating system, MS-DOS, you will need to:

- Define the operating system's output device so that information to be printed is sent to the RS-232-C serial port rather than the PRT/FDD parallel port.
- Set serial communications parameters to configure the T1100 PLUS for your serial printer.

See the section in Chapter 8 entitled 'Connecting Serial Devices' for instructions on how to perform these two functions.

# Chapter 4

# DISK DRIVES & DISKETTES

## Chapter4/DISK DRIVES AND DISKETTES

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**Inserting and Removing 5¼" Diskettes . . . . . 4/12**

**Write Protecting 5¼" Diskettes . . . . . 4/13**

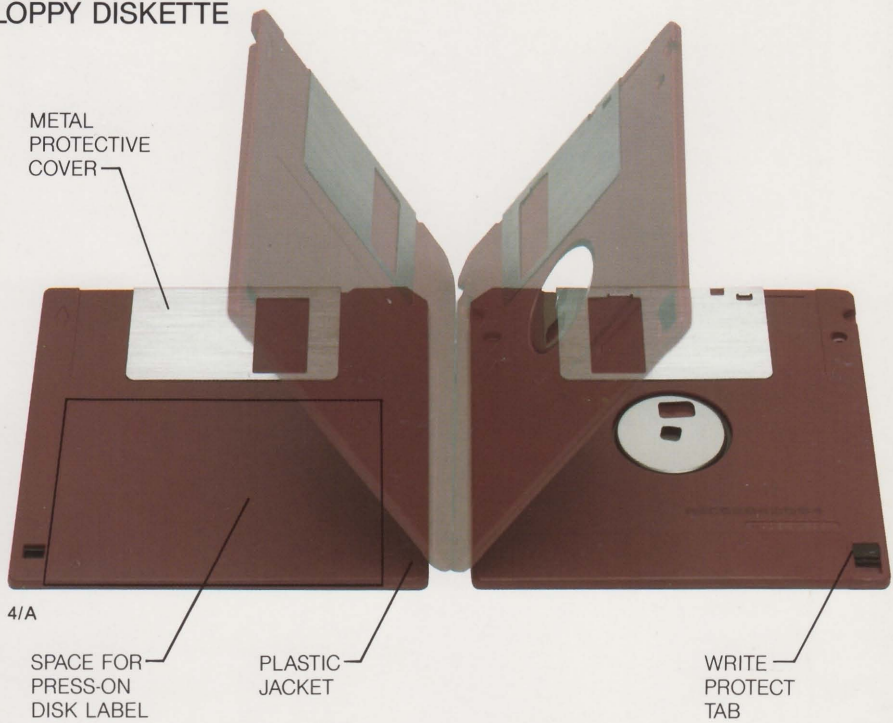
**Labeling 5¼" Diskettes . . . . . 4/13**

**The External 5¼" Diskette Drive . . . . . 4/14**

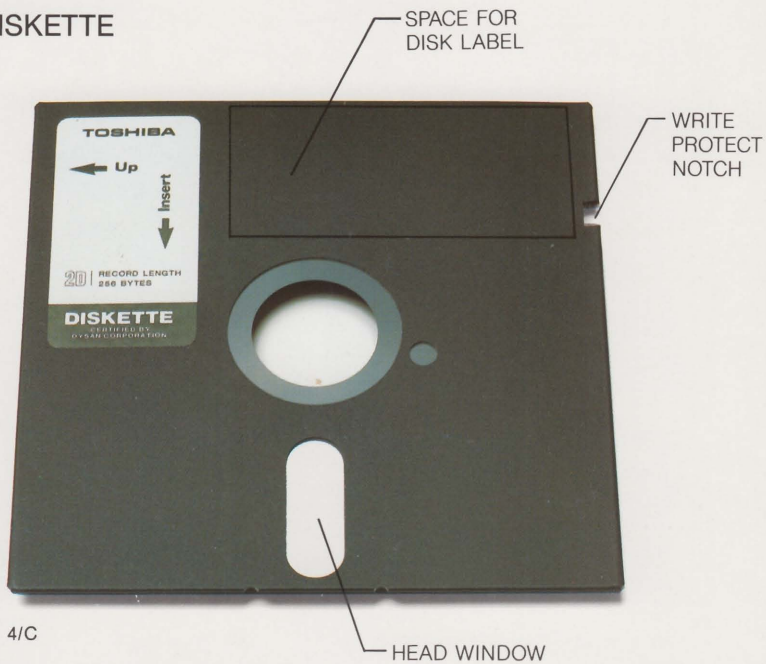
**Diskette Drive Parts . . . . . 4/14**

**Connecting an External Diskette  
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# 3 1/2 INCH FLOPPY DISKETTE



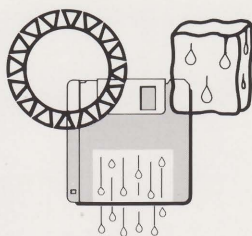
# 5 1/4 INCH FLOPPY DISKETTE



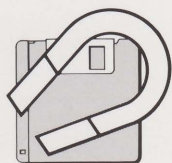




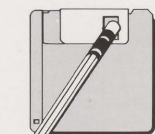
4/B



DO NOT  
SUBJECT DISKS  
TO EXTREME  
TEMPERATURES  
OR HUMIDITY



DO NOT USE A  
MAGNET NEAR  
YOUR DISKS



DO NOT LET  
ERASURE DUST  
SETTLE UNDER  
THE METAL  
PROTECTIVE  
COVER



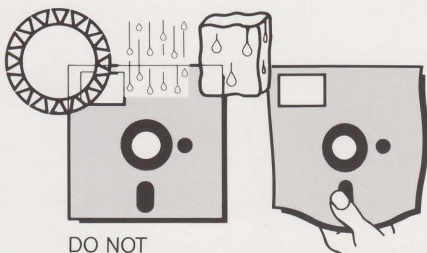
DO NOT  
RETRACT  
THE METAL  
PROTECTIVE  
COVER AND  
TOUCH THE  
DISK SURFACE



DO NOT CLEAN  
THE DISK WITH  
SOLVENTS OR  
HEAD CLEANER

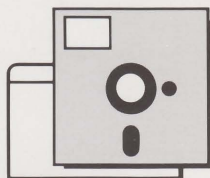


4/D

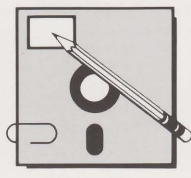


DO NOT  
SUBJECT DISKS  
TO EXTREME  
TEMPERATURES  
OR HUMIDITY

DO NOT BEND  
DISK OR  
TOUCH THE  
DISK SURFACE



DO NOT  
STORE DISKS  
OUTSIDE THE  
PROTECTIVE  
ENVELOPE



DO NOT WRITE  
ON THE DISK  
WITH PENCIL  
OR PEN; USE  
FELT TIP ONLY



DO NOT CLEAN  
THE DISK WITH  
SOLVENTS OR  
HEAD CLEANER



DO NOT USE A  
MAGNET NEAR  
YOUR DISKS



4/E

DISK EJECT BUTTON      DISK INSERTION SLOT      DRIVE INDICATOR LIGHT



4/F

POWER ON/OFF



# Chapter 4

## DISK DRIVES & DISKETTES

This chapter introduces the T1100 PLUS's storage devices. It begins with general concepts for users who are new to computers. The chapter concludes with a discussion of the storage options available on the T1100 PLUS and explains how to install and use each.

### Memory and Diskette Drives

Two essential elements of any computer are its temporary and permanent storage devices. The computer's random access memory (RAM), commonly called 'memory,' temporarily stores information during processing. Data in memory is overwritten when a new program is loaded, and is lost when the computer is turned off. More permanent storage is provided by diskettes.

Figure 4/B shows a 3 1/2" diskette being inserted in the T1100 PLUS's lower drive. Diskette drives function like tape recorders, reading and writing magnetically coded information. Each diskette drive has a read/write head that makes contact with the diskette. The head records new information and retrieves stored information.

### Drive Options

The T1100 PLUS has two internal 3 1/2" diskette drives. You can connect the following external drive options:

- A 5 1/4" diskette drive.
- A 5 1/4" diskette drive in an IBM PC, PC/XT or PC AT (or compatible) computer using the Floppy Link.

- A fixed disk drive using the expansion chassis capability.

It is also possible to set aside part of the T1100 PLUS's memory to function as a very fast disk drive. This is called a RAM disk or virtual disk (VDISK). It is most useful for computers with 640K bytes of memory.

RAM disk can be used in conjunction with the internal and external drives.

## Drive Identifiers

Drives are identified by letters (for example A, B or C). The letters you use depend upon how many drives you are working with. On the T1100 PLUS the upper drive is A and the lower drive is B. If you are using a fixed disk or RAM disk, it is referred to as drive C.

After entering a valid date and time at computer start-up (see the section entitled 'Loading the Operating System' in Chapter 5 for information on loading MS-DOS into the computer and entering the date and time), the screen displays:



A>

This is the MS-DOS system prompt. It indicates that A is the drive the computer is currently accessing. MS-DOS assumes you are referring to drive A (the current drive) in a command unless you explicitly type in another drive indicator such as B or C.

## Managing Drives

Organizing drives for efficient, effective use requires planning. You need to consider where to store applications programs and data files. The following comments are general guidelines. The chapter entitled 'Using Software on the T1100 PLUS' gives more specific information on how to organize your program and data files.

### Using the T1100 PLUS with Two Internal 3 1/2" Drives

You can work with the T1100 PLUS's two internal drives using the system as you would any dual drive personal computer. Most dual drive system users store application programs on the diskette in drive A and work with data files on the diskette in drive B.

### Using the T1100 PLUS with an External 5 1/4" Drive

If you are using an external 5 1/4" drive, you must set the **A B PRT** switch on the left side of the computer to A or B. When this switch is set on A or B, the external drive is taken into account and the **PRT/FDD** port cannot be used to connect a printer.

The following drive combinations are possible:

Switch set on A	Upper Drive	B
	Lower Drive	Not in use
	External Drive	A
Switch set on B	Upper Drive	A
	Lower Drive	Not in use
	External Drive	B
Switch set on PRT	Upper Drive	A
	Lower Drive	B
	External Drive	Not in use

Whenever you change the **A B PRT** switch setting, you must restart the system. Turn the computer off and back on again or press **Alt + Ctrl + Del**. This tells the computer you have changed the drive identifiers. See the section entitled 'Connecting an External Drive to the T1100 PLUS' for more information on how to perform a restart.

#### **NOTE**

*You can cause the T1100 PLUS to load MS-DOS into the computer from drive B by leaving drive A empty. The system looks for MS-DOS in drive A then goes to drive B.*

*This is useful when you encounter a program that must be run on a 5 1/4" diskette in drive A, if the 5 1/4" diskette does not contain the MS-DOS programs.*

## Using the T1100 PLUS with the Floppy Link

If you connect the T1100 PLUS to an IBM PC (or compatible) using the Floppy Link, one of the PC's diskette drives becomes an external drive for the T1100 PLUS. (See the user's manual accompanying the Floppy Link for more information on how to use the Floppy Link.)

Set the INT/EXT switch on the back of the IBM PC (or compatible) to EXT. Set the A B PRT switch according to the instructions given in the section above, 'Using the T1100 PLUS with an External 5 1/4" Drive.' Use the IBM PC's (or compatible's) diskette drive as you would any 5 1/4" external drive.

## Using the T1100 PLUS with a Fixed Disk

If you attach a fixed disk to the T1100 PLUS using the expansion chassis capability, the fixed disk becomes drive C. Drives A and B remain the same.

Instructions on how to use a fixed disk are given in the MS-DOS manual.

## RAM Disk

A RAM (Virtual) disk allows you to use some of the computer's memory as if it were another diskette drive. The advantage of a RAM disk is that you improve the speed of the system since your programs do not have to access a mechanical drive.

The disadvantage of a RAM disk is that when you turn off the T1100 PLUS, nothing stored on the RAM disk is saved. If you are using RAM disk to store data files, remember to occasionally copy the files (using the MS-DOS COPY command) to a diskette. Be sure to copy the final versions of the files before you turn off the computer.

Your MS-DOS Manual gives step by step instructions on how to set up a RAM disk.

## Using Diskettes

A diskette is a small, flexible (floppy) plastic disk. It is coated with magnetic material and encased in a sturdy jacket.

Like phonograph records, diskettes are divided on each side into a series of concentric circles called tracks. Each track is divided into sectors.

Each item of information on a diskette has a certain 'address' composed of its side, track and sector numbers. In this way the computer's operating system, MS-DOS, knows where to go to locate specific data.

The procedure by which the computer divides the diskette into tracks and sectors is called 'formatting.' Every new diskette must be formatted by the T1100 PLUS before it can be used. Formatting is discussed in the chapter entitled 'Using MS-DOS.'

### The System Diskette

The system diskette that comes with your T1100 PLUS contains all the program files needed to get your system started. It is the first diskette you insert in the current diskette drive during start up.

The steps in Chapter 5, 'Operating the T1100 PLUS,' describe how to make a backup copy of your system diskette as part of the initial start up procedure. Keep the backup copy for daily use and store the original in a safe place.

Chapter 6, 'Using MS-DOS,' describes the contents of the system diskette and how it is used.

### Data Diskettes and Program Diskettes

Following start up, you are ready to go to work. Many applications function best when the programs used to enter data are stored on one

diskette and the data itself on another diskette, hence the terms program diskettes and data diskettes.

## Working Diskettes

Most software packages either provide you with a second copy of the program diskette(s) or instruct you to make a working copy of your program diskette(s) before you begin. Store the original program diskette(s) with the original MS-DOS diskette in a safe place.

## Saving Data on Diskette

Data entered in the computer may not be automatically stored on the diskette. For example, most word processing software maintains a copy of the document you are working on in the computer's memory. When you are finished editing, it is your responsibility to save the document to diskette.

How to save data depends on the type of software you are using. Save your work frequently. With the T1100 PLUS you cannot lose data due to the failure of an external power source, but you may experience a software or hardware error that could cause data loss.

## Backing Up

Backing up critical data is one of the most important administrative tasks associated with using a microcomputer. It involves making a duplicate copy of important data and program files. It's like making a photocopy of important papers to store in a separate file in case something happens to your primary filing system.

Backing up is necessary because diskettes get old; they become corrupted by dust; they may even be damaged by accident. Backing up should be done once a week or even once a day depending on how many changes you have made and how important the data is to you.

Should you ever have a problem with your working diskettes, having a backup means you'll be able to recover from the problems and continue



processing quickly. Backup procedures are described in detail in Chapter 6, 'Using MS-DOS.'

## Write Protecting Diskettes

Microcomputers provide built-in safeguards to make sure you do not accidentally delete data. One of these safeguards is the mechanical ability to 'write protect' diskettes. When a diskette is write protected you cannot delete files from it or add files to it. Only diskettes that are unprotected can be changed.

The system diskette is usually a write protected diskette. This is because you don't want to delete any system files by accident. Program diskettes are also frequently write protected for the same reason. Data diskettes are not protected unless you wish to use them to look up information only.

## 3 1/2" Diskettes

Figure 4/A shows the front and back of a 3 1/2" diskette enclosed in its sturdy plastic jacket. Notice these parts:

- Plastic jacket
- Metal protective covering over the head window
- Write protect tab
- Diskette label

During use, the diskette spins inside the jacket. The metal protective covering moves aside and the diskette drive's read/write head makes contact with the magnetic surface of the diskette through the head window.

### Care of 3 1/2" Diskettes

Diskettes are very important to your computer system and should be handled with care. If one becomes damaged you may lose valuable information. A few precautions will ensure your data is not lost:

- Store diskettes in the container they came in, or purchase a container specifically designed to hold 3 1/2" diskettes.
- Do not attempt to clean the surface of a diskette. Cleaning fluid can prevent the diskette drive from properly reading the information stored on the diskette.
- Do not attempt to take the diskette apart, or move the metal protective cover to expose the head window.
- Protect the head window from fingerprints and the diskette from dust and smoke.
- Do not write on the diskette with a pencil. Pencil lead is like dust to the read/write heads in the diskette drive.
- Diskettes should not be dropped, bent or twisted.
- Keep diskettes away from direct sunlight, extreme heat and cold.
- Do not use an eraser on a diskette label or near a diskette. Eraser dust can easily get beneath the protective jacket.
- Keep diskettes away from all magnetic sources, such as speakers, microwave ovens, television sets and motors.
- Do not place heavy objects on diskettes.
- Do not transport your T1100 PLUS or diskette drive with a diskette in the drive.

## Inserting and Removing 3 1/2" Diskettes

Figure 4/B shows the correct way to insert a 3 1/2" diskette into the drive. Follow these steps:

- 1 Hold the diskette with the insert-arrow side up. Your fingers should be holding the label with the metal protective cover pointing away from you.
- 2 Insert the diskette into the diskette insertion slot. When it is almost in, there is a slight resistance. Give the diskette a gentle push to secure it firmly in the drive.
- 3 Press gently down on the diskette inside the slot to ensure it is firmly in place.

### **NOTE**

*If you insert the diskette upside down or back to front, it does not completely enter the diskette drive, but keeps popping out.*

*Do not attempt to force a diskette into or out of the drive. If it does not go in easily, take it out and check that you are inserting it properly. If it does not come out easily, have it removed by a trained repair person.*

*Be sure to perform Step 3. If you do not do so, you may experience a read error when attempting to access the diskette.*

Remove the diskette by pressing the diskette eject button. The diskette pops halfway out for easy removal by hand. Store it in a diskette storage box.

**CAUTION**

*Never remove a diskette from the T1100 PLUS or turn off the computer when either of the **Disk in Use** lights is on. This light indicates when the diskette is in use; if a diskette is removed when the computer is accessing or retrieving data, information on the diskette may be damaged.*

**Write Protecting 3 1/2" Diskettes**

3 1/2" diskettes have a plastic write protect tab located on the corner of the diskette (see Figure 4/A). To write protect a 3 1/2" diskette, slide the tab to uncover the small hole. When this hole is exposed, the computer cannot alter the information on the diskette.

To remove write protection, slide the tab to cover up the hole.

**Labeling 3 1/2" Diskettes**

Each box of diskettes comes with press-on labels in multiple colors for your labeling convenience. Diskettes that contain programs or data should be labeled immediately. Points to keep in mind when labeling diskettes are:

- The external labels discussed in this section are not to be confused with the internal diskette label put on the diskette with the **FORMAT** command.
- Only use press-on labels designed for use on diskettes; most diskette manufacturers include labels with the diskettes they sell.
- If you need to write on a label after it has been put on a diskette, use only a soft, felt-tip pen. Writing with a ball point pen or pencil can damage a diskette.

## 5 1/4" Diskettes

Figure 4/C shows the front of a 5 1/4" diskette enclosed in its protective jacket. Notice these parts:

- The head window
- Write protect notch
- Space for diskette label

During use, the diskette spins inside the jacket. The diskette drive's read/write head makes contact with the magnetic surface of the diskette through the head window.

### Care of 5 1/4" Diskettes

Diskettes are very important to your computer system and should be handled with care. If one becomes damaged you may lose valuable information. A few precautions will ensure your data is not lost:

- Store diskettes in the container they came in, or purchase a container specifically designed to hold 5 1/4" diskettes.
- Always return diskettes to their envelopes as soon as they are removed from the diskette drive. Do not leave them lying around or store them out of their envelopes.
- Never touch the magnetic recording surface.
- Protect the diskette from dust and smoke.
- Do not attempt to clean the surface of a diskette. Cleaning fluid can prevent the diskette drive from properly reading the information stored on the diskette.
- Do not attempt to remove the diskette's protective jacket.
- Do not drop, bend or twist a diskette.
- Keep diskettes away from direct sunlight, extreme heat or cold.

- Do not use an eraser on a diskette label or near a diskette. Rubbing a diskette with an eraser can damage the diskette and eraser dust can easily get beneath the protective jacket.
- Do not write on the label of a diskette with anything other than a soft felt-tip pen.
- Do not use paper clips or rubber bands on diskettes.
- Keep diskettes away from all magnetic sources, such as speakers, microwave ovens, television sets and motors.
- Do not place heavy objects on diskettes.

### Inserting and Removing 5 1/4" Diskettes

Figure 4/D shows the correct way to insert a 5 1/4" diskette into the external drive. Follow these steps:

- 1 Make sure the cardboard protector has been removed from the drive.
- 2 Hold the diskette with the label side up. Your fingers should be holding the label with the head window pointing away from you.
- 3 Insert the diskette into the diskette insertion slot. When it is almost in, there is slight resistance. Give the diskette a gentle push to secure it firmly in the drive.

#### **NOTE**

*Do not attempt to force a diskette into or out of the drive. If it does not go in easily, take it out and check that you are inserting it properly. If it does not come out easily, have it removed by a trained repair person.*

Remove a diskette by pressing the diskette eject button. The diskette pops halfway out for easy removal by hand. Return the diskette to its envelope and store it in a diskette storage box.

**CAUTION**

*Never remove a diskette from an external drive or turn off the drive or computer when the indicator light is on. This light indicates when the diskette is in use, and if a diskette is removed when the computer is accessing or retrieving data, information on the diskette might be damaged.*

**Write Protecting 5 1/4" Diskettes**

Figure 4/C shows the 5 1/4" write protect notch located in the upper right hand corner of the diskette. To write protect a 5 1/4" diskette, cover the notch with a small press-on tab. Most diskette manufacturers include these tabs with each package of diskettes they sell. When the hole is covered, the computer cannot alter the information on the diskette.

To remove write protection, carefully peel off the sticky tab.

**Labeling 5 1/4" Diskettes**

Most diskette manufacturers provide press-on labels to be used to identify diskette contents. Diskettes that contain programs or data should be labeled immediately. Points to keep in mind when labeling diskettes are:

- Only use press-on labels.
- Write the label first before applying it to the diskette.
- If you need to write on a label after it has been put on a diskette, use only a soft felt-tip pen. Writing with a ball point pen or pencil can damage a diskette.

## The External 5 1/4" Diskette Drive

A 5 1/4" external diskette drive is available. Figures 4/E and 4/F show the front and back of the drive.

The drive comes encased in a metal box with a connecting cable and an AC adapter. It uses 5 1/4" double sided, double density diskettes with an information storage capacity of up to 360K bytes, and is capable of reading and writing IBM PC formatted 360K byte diskettes.

### Diskette Drive Parts

The external 5 1/4" drive is composed of the following parts:

The **disk insertion** slot is a narrow opening in the middle of the drive into which a diskette is inserted.

The drive is packed for shipping with a **cardboard protector** that protects the magnetic head from vibration. Always remove it before turning the power on. Insert it when the drive is being carried.

The **disk eject button** releases the diskette (or cardboard protector) so it can be removed from the drive.

The **drive cable** connects to the **PRT/FDD** port on the back of the computer and the 25-pin port on the external drive.

The **AC adapter** must be used with the 5 1/4" external drive as the drive does not have a battery. Use the adapter specifically designed for the drive. It is different from the computer's AC adapter.

Connect the drive end of the adapter to the **DC IN** jack on the back of the drive and the two-prong end to a standard AC wall outlet.

The **power on/off** switch is a rocker switch. From the front of the drive, press it to the rear to turn the power on. Press it to the front to turn the power off. Before turning the switch off, always check that the drive is not in operation.



The **drive indicator light** comes on whenever the external drive is in use. Do not remove the diskette or shut off power to the diskette drive when this light is on.

**CAUTION**

*Be careful not to accidentally disconnect the AC adapter or drive cable while operating the external drive. You may lose data or damage a diskette.*

*When switching off the power supply, check that the drive is not in operation.*

## Connecting an External Disk Drive to the T1100 PLUS

You can connect the external diskette drive with the computer off ('cold start') or on ('warm start'). The important thing is to let the operating system, MS-DOS, know you are using another drive.

When you connect the drive with the computer off, the startup procedure automatically takes the external drive into account. When you connect the drive with the computer on, you must perform a restart to let MS-DOS know you have connected an external drive.

To connect an external diskette drive to the T1100 PLUS, take the following steps:

- 1 If the computer is on, save any work you wish to keep on the internal drive. If you do not do so, you will lose it when restarting the computer.
- 2 Position the drive next to the computer so that the cable is within easy reach of the drive and the computer and front of the drive are facing you.
- 3 Insert the drive end of the cable into the port located at the back of the drive.
- 4 Insert the other end of the cable into the **PRT/FDD** port on the back of the computer and attach it with the screws provided.

- 5 Check that the **A B PRT** switch on the left side of the computer is set for your requirements. If you want the external drive to be designated 'Drive A,' the switch should be on **A**. If you want the external drive to be designated 'Drive B,' set the switch on **B**.
- 6 Make sure the DC end of the drive's AC adapter is connected to the **DC IN** jack on the back of the drive and the AC end is plugged into an AC power source.
- 7 If the drive contains a cardboard protector, remove it.
- 8 Set the drive's on/off switch to the on position.
- 9 If the computer is not on, set the on/off switch to the on position. If the computer is already on, press **Ctrl + Alt + Del**. The T1100 PLUS performs a restart, taking the external drive into account.

**NOTE**

*Some software packages may instruct the T1100 PLUS not to restart by pressing **Ctrl + Alt + Del**. This is rare, but if you take the above steps and the T1100 PLUS does not restart, turn the computer off, wait five seconds and turn it back on.*

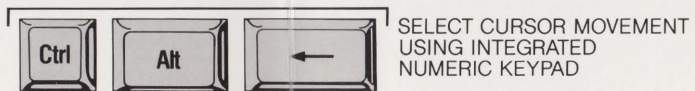
# Chapter 5 OPERATING THE T1100 PLUS

## Chapter 5/OPERATING THE T1100 PLUS

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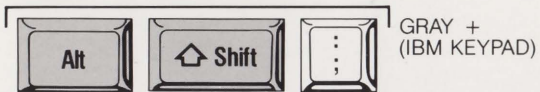
SELECT CHARACTER DISPLAY



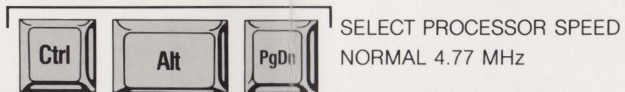
SELECT CURSOR MOVEMENT USING INTEGRATED NUMERIC KEYPAD



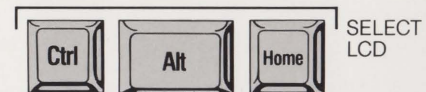
SELECT CRT



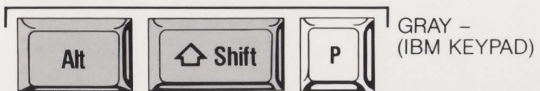
GRAY + (IBM KEYPAD)



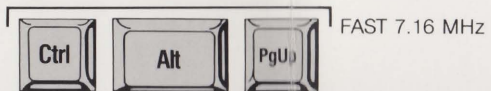
SELECT PROCESSOR SPEED  
NORMAL 4.77 MHz



SELECT LCD



GRAY - (IBM KEYPAD)



FAST 7.16 MHz

# Chapter 5

## OPERATING THE T1100 PLUS

The Toshiba T1100 PLUS portable computer is easy to operate. This chapter discusses many of its features, including an explanation of the keyboard, loading the operating system into the computer, and computer maintenance.

### Before You Begin

Before you begin, make sure that:

- The computer is on a flat working surface at a comfortable height.
- The computer's battery 1) is fully charged if you are using it without the AC adapter, or 2) has been charged for five minutes before using it with the AC adapter.
- The adapter is connected to a working wall outlet (if you are using it).
- If the drives came with cardboard protectors, remove each protector before operating the computer.
- The A B PRT switch is on PRT.

#### **NOTE**

*If you are using an external drive the A B PRT switch must be set on A or B. See Chapter 4 for information on using an external drive.*

- The MS-DOS system diskette is at hand.
- Several blank 3 1/2" diskettes are available.
- Any external options such as a 5 1/4" diskette drive or a printer are connected and on.

## Step 1. Turning the System On

If you are using an external drive or printer, turn it on before turning on the computer.

Turn the system on by setting the on/off switch to the on position. The screen darkens for a few seconds then returns to normal.

### **NOTE**

*If you turn the computer on and see no change on the screen, the battery may not be sufficiently charged. Turn the computer off and recharge the battery for five minutes. Remember: even if you are using the computer with an AC adapter, you must charge the battery for at least five minutes.*

*If the computer still does not come on, refer to Chapter 9, 'Diagnostics.'*

## Step 2. Self Test

When the computer is turned on, it automatically performs a self test indicated by the following message in the top left-hand corner of the screen:



MEMORY TEST xxx KB

This is a test of the computer's memory. The message remains on the screen for several seconds as the xxx increases until it equals the amount of memory in the computer (640K bytes or 256K bytes).

If the test fails, the screen displays:



MEMORY ERROR

In a second the screen clears. Refer to Chapter 9, 'Diagnostics,' to resolve the problem.

### Step 3. Adjusting the LCD Screen

While the computer is performing the self test, adjust the screen by moving it to a suitable angle. The hinge is flexible, designed to hold the screen in whatever position you choose. You can readily find an easy-to-read, comfortable position that will minimize reflection no matter where your external light source is located.

Once the screen is positioned, adjust the LCD contrast dial for the best readability.

### Step 4. Loading the Operating System

If the self test completes successfully, a short beep sounds and the following message appears:



Place system disk in drive  
Press any key when ready

Insert the system diskette in drive A and press any key. MS-DOS is loaded and the computer displays (with the cursor next to 'Enter new date:'):



Toshiba Personal Computer (Rxxxxx)  
(c) Copyright Toshiba Corporation 1983, 1986  
(c) Copyright Microsoft Corporation 1981, 1986  
Current date is (Fri. 1-08-1988)  
Enter new date (mm-dd-yy):

**NOTE**

*If you insert the system diskette in drive A before the self test is completed, the message 'Place System Disk in Drive' is not displayed and MS-DOS is loaded automatically.*

*If you insert the system diskette in drive B rather than drive A, the computer first looks for the diskette in drive A and then goes to drive B and loads the operating system.*

**Step 5. Entering the Date and Time**

Enter the date in the *mm-dd-yy* format. Use only numerals. You can separate month, day and year with a dash (-), slash (/) or period (.). You do not need to type leading zeros. The following options are allowed:

*mm* can be any number from 1-12

*dd* can be any number from 1-31

*yy* can be any number from 80-99, or 1980-2099

Type the date and press **Enter**. The screen displays:



Current time is 0 : 00 : 58.94

and prompts:



Enter new time:

Type the time in the format *hh:mm:ss* using military or 24 hour time. This means, for example, that 3 p.m. is entered as 15:00; 8 p.m. is 20:00, etc.

The hours, minutes and seconds must be separated from each other by a colon (:).



You do not have to specify seconds or type leading zeros. The following options are allowed:

*hh* can be any number from 0-23

*mm* can be any number from 0-59

*ss* can be any number from 0-59

If you make a mistake entering the date or time:

- Use the left arrow key to back up, deleting a character at a time, or
- Press **Esc** to delete the entire entry.

**NOTE**

*Once the current date and time are entered, you do not have to reenter them every time you start the computer unless they are wrong. The built-in clock automatically displays the correct date and time.*

*At the prompts press **Enter** to accept the displayed date and time.*

*If the date and time are incorrect, they can be changed any time you are at the system prompt. Use the MS-DOS commands **DATE** and **TIME**.*

Entering the date and time allows the computer to keep track of when you modify the files you use. This way, the next time you display a directory listing of the files on diskette you will know automatically when each was last changed.

Following the date and time, the computer displays the MS-DOS system prompt:



A>

It tells you the T1100 PLUS is waiting for a command from among the program command files stored on the diskette in the internal drive.

More information on how to use MS-DOS and command files is in chapter 6, 'Using MS-DOS.'

**NOTE**

*There are three ways to speed up the startup procedure:*

- 1) You do not have to wait for the computer to ask you to place the system diskette in the drive. You can insert it as soon as the computer is turned on.*
- 2) You do not have to wait for the self test to run. If you turn the computer on and off frequently during the day, run the self test once, at the beginning of the day. To avoid the self test, press any key when the memory test begins. The rest of the self test is canceled and MS-DOS loads immediately.*
- 3) You do not have to enter the date and time every time you load MS-DOS. If you have a batch command file called AUTOEXEC.BAT, the date and time are bypassed. See the section on batch files in the MS-DOS Manual for instructions on how to create an AUTOEXEC.BAT file.*

## Step 6. Making a Working Copy of the System Diskette

**NOTE**

*This step is performed the first time you use your T1100 PLUS and does not need to be done again, unless you need to create a new system diskette.*

Before you begin work, make at least one working copy of your system diskette. Store the original system diskette in a safe place. The following steps describe how to create a working system diskette using the MS-DOS command, DISKCOPY.

- 1 Make sure the system diskette is write protected by sliding the write protect tab so that the small hole appears in the corner of the diskette.

- 2 Put your original system diskette in drive A. Put a blank diskette in drive B. Type:

**DISKCOPY A: B:**

The computer prompts:



```
Insert SOURCE diskette in drive A:  
Insert TARGET diskette in drive B:  
Press any key when ready...
```

- 3 Press a key. The screen displays:



```
Copying 80 cylinders  
9 sectors per track, 2 sides(s)
```

When the copy is complete, the computer displays:



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

- 4 Press **N**. The T1100 PLUS returns to the system prompt. You are ready to go to work.

## Step 7. Formatting Diskettes

Each new diskette must be formatted by the T1100 PLUS before it can be used. Note the following points regarding formatting:

- You can reformat previously formatted diskettes, however when you reformat a diskette, all information on that diskette is lost.
- The T1100 PLUS automatically formats 3 1/2" diskettes to hold 720K bytes of information.
- The T1100 PLUS automatically formats 5 1/4" diskettes to hold 360K bytes of information.

The steps below take you through the basic formatting procedure.

For further information on formatting, including how to make a system diskette, see the **FORMAT** command in Chapter 6, 'Using MS-DOS.'

**CAUTION**

*It is important that you specify the correct drive when formatting. If you do not, you could unintentionally destroy data on your system diskette or on another diskette.*

*To make sure this doesn't happen, be sure the system diskette is write protected before formatting begins.*

## Formatting 3 1/2" Diskettes

To format a 3 1/2" diskette, take the following steps:

- 1 Follow the startup procedure until MS-DOS is loaded and the system prompt appears.
- 2 At the A> prompt, type:



**FORMAT B:**

and press **Enter**. The screen displays:



Insert new diskette for drive B:  
and press ENTER when ready

- 3 Insert a blank diskette in drive B and press **ENTER**. The screen displays:



Formatting 80 cylinders  
9 sectors per track, 2 side(s)  
Head : n Cylinder : nn

- 4 When format is finished, the screen displays:



```
Format complete
730112 bytes total disk space
730112 bytes available on disk
```

Format another (Y/N)?

- 5 Type the letter **N** for 'no' and press **Enter**. The system prompt appears and format is done.

### Formatting 5 1/4" Diskettes

To format a 5 1/4" diskette you must use an external 5 1/4" drive. The following steps assume that you are using the optional external 5 1/4" drive and have set the **A B PRT** switch on **B** so that the internal drive is identified as drive A and the external 5 1/4" drive is drive B. Take the following steps:

- 1 Follow the startup procedure until MS-DOS is loaded and the system prompt appears on the screen.

#### **CAUTION**

*It is important that you specify the correct drive when formatting. If you do not, you could unintentionally destroy data on your system diskette or on another diskette.*

*To make sure this doesn't happen, be sure the system diskette is write protected before formatting begins.*

- 2 At the **A>** prompt, type:



```
FORMAT B:
```

and press **Enter**. The screen displays:



Insert new diskette for drive B:  
and press ENTER when ready

- 3 Insert the diskette to be formatted into the external 5 1/4" drive and press any key. The screen displays:



Formatting 40 cylinders  
9 sectors per track, 2 side(s)  
Head : n Cylinder : nn

- 4 When format is finished, the screen displays:



Format complete  
362496 bytes total disk space  
362496 bytes available on disk

Format another (Y/N)?

- 5 Type the letter **N** for 'no' and press **Enter**. The system prompt appears and format is done.

## The Keyboard

The T1100 PLUS keyboard is shown on the fold-out flap. It has most of the same keys as the IBM PC keyboard, rearranged slightly so the computer fits easily in your lap.

The keys are 'typematic,' that is, they repeat as long as you hold them down.

Two factors affect the use of the keyboard: the type of software you are working with and the operating system (MS-DOS). As a general rule, key interpretations assigned by software override MS-DOS key interpretations.

There are also special key combinations built in to the T1100 PLUS that activate certain features. These are called 'soft switches' and are described below.

## The Keyboard and Software

The tasks keys perform and the way they work varies depending on the type of software you are using.

See your software user's manual for an explanation of the various functions assigned to keys and key combinations that enable you to use the keyboard with the software.

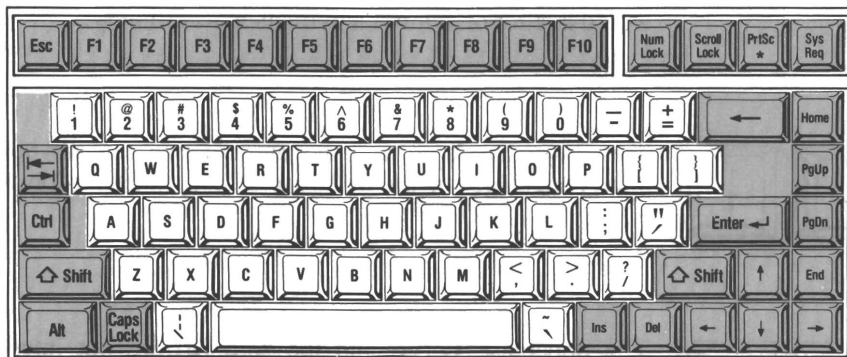
## The Keyboard and MS-DOS

To run MS-DOS programs on the T1100 PLUS, key functions specific to MS-DOS are used. These functions are explained in detail in the MS-DOS manual.

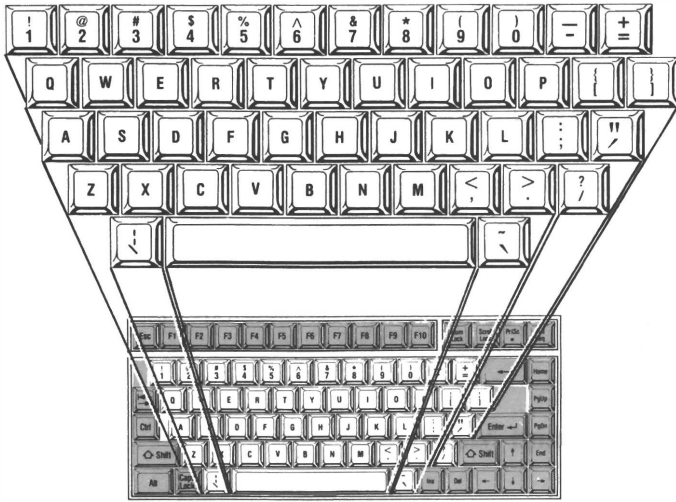
A brief discussion of how some of the keys work with MS-DOS is given in the 'Computer/Keyboard Control Keys' section of this chapter.

## Using the Keyboard

The keyboard can be divided into three sections: typewriter keys, the integrated numeric keypad and computer/keyboard control keys.



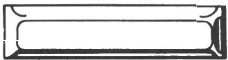
## Typewriter Keys



The light gray keys in the center of the keyboard operate much the same as those on a typewriter, that is, they produce characters and symbols that appear on the screen.

There are a few differences, however, between typewriter keys and the keys on the T1100 PLUS:

### (Space)



When the space bar is pressed, the computer does not just create a blank area as a typewriter does. With MS-DOS (and most software) you do not see anything on the screen, but the computer recognizes the space as it would a letter or symbol and treats it accordingly.



The lowercase **L** (l) and the number one (**1**) are not interchangeable on the T1100 PLUS as they are on a typewriter.

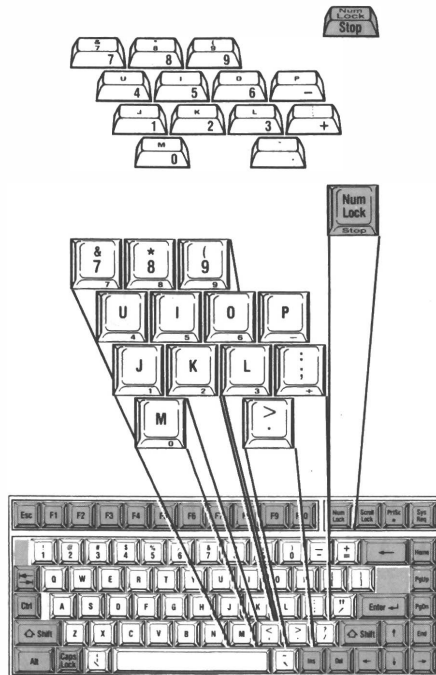


The uppercase **O** (O) and the zero (**0**) are not interchangeable on the T1100 PLUS as they are on a typewriter.



Some dark gray keys perform both typewriter and computer tasks. These are tab, backspace, **Enter**, left and right **Shift** and **Caps Lock**. They are discussed later.

## The Integrated Numeric Keypad



The integrated numeric keypad is overlaid on the data keys **7, 8, 9, U, I, O, P, J, K, L, ;** (semicolon), **M** and **.** (period). When **Num Lock** is pressed, these become numeric keypad keys, allowing you to enter numbers. To deactivate the keypad, press **Num Lock** again.

Some software packages use the numeric keypad **+** (plus) and **-** (minus) to perform certain operations. (These keys are sometimes referred to as 'gray plus' and 'gray minus.' They are located on the right side of a standard IBM PC keyboard.) To achieve the 'gray plus' and 'gray

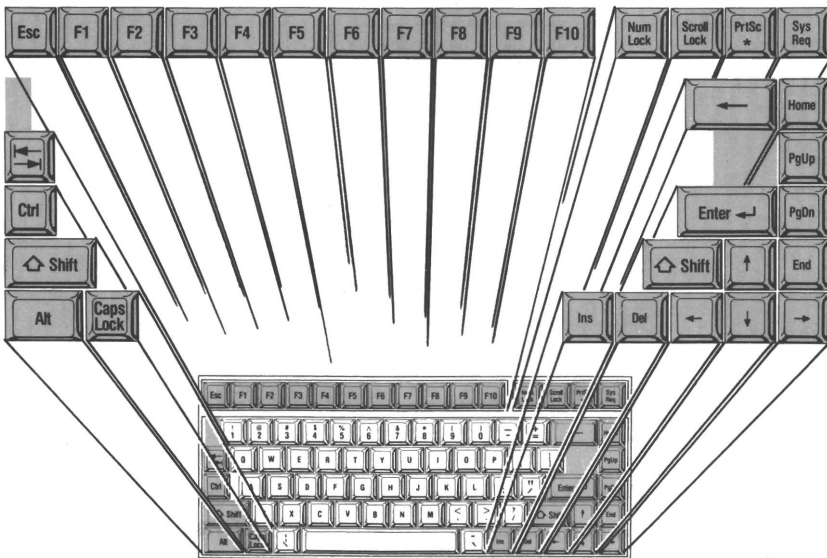
minus' on the T1100 PLUS, activate the integrated numeric keypad or use the following key combinations:

PLUS                    **Alt + Shift + ;**

MINUS                  **Alt + Shift + P**

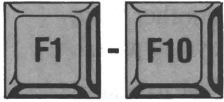
The integrated numeric keypad can also be used to control cursor movement by pressing **Ctrl + Alt + Backspace**. See the section below on soft switches for more information.

### Computer/Keyboard Control Keys



Keys that perform computer tasks are dark gray on the keyboard.

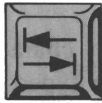
The explanation which follows discusses briefly how some of the computer/keyboard control keys work with MS-DOS.



MS-DOS uses **F1** to **F5** for editing a command line and for editing text in the Line Editor program, EDLIN. **F6** to **F10** are not used by MS-DOS.



**Esc** is used by MS-DOS to cancel a command before **Enter** is pressed.



Tab is similar to the tab key on a typewriter. In MS-DOS it advances the cursor to the next tab stop (every eight characters).



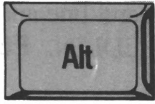
**Ctrl** is always used in conjunction with another key. Hold it down while pressing the key or keys required. For example, MS-DOS uses **Ctrl + C** or **Ctrl + Break** to cancel the current command, and **Ctrl + S** or **Ctrl + Stop** to suspend the screen display.



There are two **Shift** keys, one on each side of the keyboard. The **Shift** keys perform two tasks:

1) When **Shift** is held down while another key is typed, the case, either uppercase or lowercase, is changed. Normally this key creates uppercase letters as a typewriter shift does. However, if **Caps Lock** is engaged, using **Shift** creates lowercase letters.

2) **Shift** can be used with other keys to perform computer functions. For example, MS-DOS prints the contents of the screen on the printer when you hold **Shift** and press **PrtSc**.



**Alt** is always used in conjunction with another key. Hold it down while pressing the key or keys required.

For example, MS-DOS uses **Ctrl + Alt + Del** to restart the system.



**Caps Lock** is a toggle key. When pressed, it stays engaged until you press it again. It differs from a standard typewriter keyboard in two ways:

1) It only affects the alpha (A-Z) characters. Punctuation marks and symbols must be typed with **Shift** held down, even when **Caps Lock** is engaged.

2) When **Caps Lock** is engaged, holding **Shift** down creates lowercase letters.

You can use upper or lower case letters when entering MS-DOS commands.



**Num Lock/Stop** has two functions:

1) **Num Lock** is a toggle key. When it is engaged, all the keys on the integrated numeric keypad are shifted to keypad keys. They remain that way until **Num Lock** is pressed again.

2) **Stop** is used in conjunction with **Ctrl**. While holding down **Ctrl**, press **Num Lock/Stop** to temporarily stop an MS-DOS display. Press any key to restart the display.



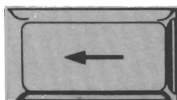
**Scroll Lock** is not used by MS-DOS. It is used by some software packages.



**Break** is used in conjunction with **Ctrl**. While holding down **Ctrl**, press **Scroll Lock/Break** to stop an MS-DOS command.



MS-DOS uses **PrtSc** in conjunction with **Shift** to send the contents of the screen to the printer. Without **Shift** this key types an asterisk (\*).



In MS-DOS, **Backspace** moves the cursor one character to the left. As it moves, it deletes the character to the left of the cursor.



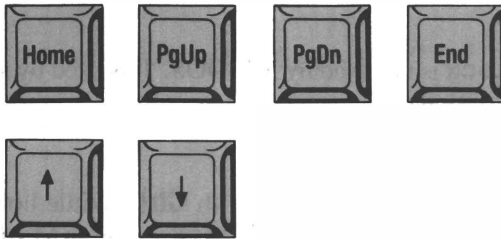
**Enter** tells MS-DOS you are finished entering a command and are ready to run it. In some cases, pressing **Enter** is like pressing the carriage return on a typewriter. It advances one line and moves the cursor back to the left hand side of the screen.



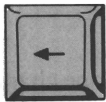
In MS-DOS, **Ins** is a toggle key regulating insert and overwrite modes. When in overwrite mode what you type replaces the original text. Press **Ins** to go into insert mode. New characters are now inserted in front of the existing text. Press **Ins** again to return to overwrite mode.



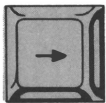
MS-DOS uses **Del** to delete the character at the cursor's current position.



**Home, PgUp PgDn, End** and the **up**, and **down arrow** keys are not used by MS-DOS. In most software packages, these cursor control keys move the cursor in the direction indicated on the keytop.



In MS-DOS the **left arrow** key performs the same function as the **backspace** key.



In MS-DOS the **right arrow** key performs the same function as the **F1** key.

## Soft Switches

Soft switches are key combinations that perform certain functions specific to the T1100 PLUS. There are six soft switches used by the computer: two control the speed of the processor, two activate and deactivate the LCD or CRT, one controls character display and one controls cursor movement using the integrated numeric keypad.

## Selecting Processor Speed

The 80C86 processor in the T1100 PLUS operates at a fast speed ('clock rate') of 7.16MHz. By setting a soft switch you can slow down the 80C86 processor to the normal PC speed of 4.77MHz. The normal speed may be required by some software for compatibility .

To change the processor to normal speed, press: **Ctrl + Alt + PgDn**.

To return to fast speed, press: **Ctrl + Alt + PgUp**.

If normal speed is selected, the **Power/Speed** indicator shows a red light. If fast speed is selected, the indicator shows a green light.

Whenever you turn the T1100 PLUS off and back on again, the system goes to fast speed.

### Selecting the Display

If you attach an external monitor to the T1100 PLUS, you need to use a soft switch to deactivate the LCD and select the CRT. Press: **Ctrl + Alt + End**.

To return to the LCD, press: **Ctrl + Alt + Home**.

If a CRT is selected, the **CRT** indicator shows an amber light.

Whenever you turn the T1100 PLUS off and back on again, the system selects the LCD.

### Selecting Character Display

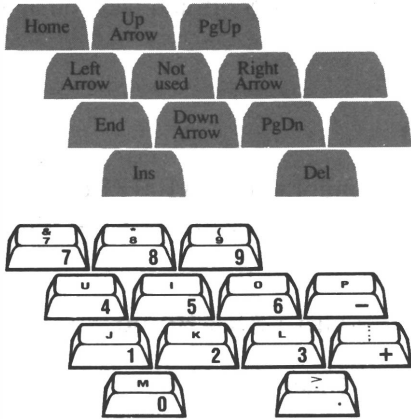
On the T1100 PLUS characters can be displayed composed of a single row of pixels (dots) or a double row of pixels.

At computer start up, the screen shows normal characters composed of a double row of pixels and intensified (highlighted) characters composed of a single row of pixels.

To reverse the character display, press the soft switch **Ctrl + Alt +→**. This causes the screen to show normal characters composed of a single row of pixels and intensified characters composed of a double row of pixels.

Press **Ctrl + Alt +→** to return to the first character display mode.

## Selecting Cursor Functions using the Integrated Numeric Keypad



To use the integrated numeric keypad for cursor movement, press: **Ctrl + Alt + Backspace**.

The table below lists the keys on the numeric keypad and their equivalent cursor movement:

<u>Numeric Keypad</u>	<u>Cursor Movement</u>
1	End
2	Down Arrow
3	PgDn
4	Left Arrow
5	Not used
6	Right Arrow
7	Home
8	Up Arrow
9	PgUp
.	Del
0	Ins

Press **Ctrl + Alt + Backspace** to toggle back to alpha keys.



## Turning the Computer Off

You can turn the T1100 PLUS off at any time. The most important points to remember are:

- Any work you wish to keep is lost unless you have saved it onto a diskette.
- The system must not be turned off while a drive is in use.
- Remove the diskettes from the drives when the system is not in use.
- If you are using RAM disk to hold data files, be sure you not only save your files before you exit from the program you are using, but also copy them from the RAM disk to the internal or external drive.

Turn the power on/off switch to the off position. The LCD darkens and two black lines appear before the screen goes blank.

### **NOTE**

*Do not turn the computer back on again immediately. If you want to turn it on, wait a few seconds before doing so.*

## Taking Care of the Computer

The T1100 PLUS is designed to provide trouble free service for a long time. It is solidly constructed and rarely breaks down. As with any machine, however, the best performance is achieved only if some basic cautions are observed:

- Operate the T1100 PLUS in a room with an ambient temperature of 41-95 degrees Fahrenheit (5-35C), and a relative humidity of 30% - 80%. If you are comfortable, so is the computer.

- Avoid extreme temperature changes. If the computer is taken from a cold to a warm environment, let it warm up before you begin using it.
- Keep the computer away from heat sources (such as electric heaters).
- Do not spill liquids on the computer.
- Do not drop the T1100 PLUS, or subject it to undue shocks while it is in use, or while it is being transported.
- Do not pick up the T1100 PLUS by its display screen.

Your T1100 PLUS may be cleaned by using a slightly damp cloth. A glass cleaner may be used to clean it. Never spray cleaner directly on your T1100 PLUS or let liquid run down between the LCD and the frame surrounding it. Spray a small amount of cleaner on a soft, clean cloth and then wipe the screen gently with the cloth.

# Chapter 6

## USING MS-DOS

### Chapter 6/USING MS-DOS

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# Chapter 6

## USING MS-DOS

The purpose of this chapter is to give you a basic understanding of MS-DOS and how it relates to computer use. It does not discuss MS-DOS in depth. See your MS-DOS Manual for more detailed information.

### What is MS-DOS

Microsoft's Disk Operating System (MS-DOS) is a group of programs that come with the T1100 PLUS and are stored on the computer's system diskette. It communicates with the hardware; it controls the LCD, other monitors, the diskette drives, the RAM disk, printers, memory, and the heart of the computer - the 80C86 processor.

The programs that are part of MS-DOS are the tools you use to make your T1100 PLUS perform administrative tasks such as displaying diskette contents, deleting files, setting system options, etc.

Some of the procedures already discussed, such as typing the date and time at startup, are part of MS-DOS.

### Files and Directories

A file is a collection of related information stored on a fixed disk or diskette. It is comparable to a file folder in a desk drawer. Just as you might have different files in the same drawer, so you have different files on diskette.

There are two basic kinds of files: program files and data files.

Program files include:

- Programs found on your MS-DOS diskette used to execute MS-DOS commands.
- Programs in commercially available software packages.
- Programs written by you.

Data files include:

- Letters
- Memos
- Spreadsheets

and other data created and saved by you through software.

A file is produced whenever you type and save data or text, and each time you write and save a program.

MS-DOS includes file commands that let you manage diskette files similar to the way you manage paper files. There are MS-DOS commands that:

- List the names of files on a diskette in a directory (the DIR command). This directory is like a table of contents at the front of a filing cabinet or drawer.
- Display a file's contents (the TYPE command). This is one way to 'open' a data file and 'read' what is inside.
- Copy a file (the COPY command). This is like making a photocopy of documents in a specific file.
- Remove a file from a diskette (the DEL command). This is the same as destroying a file.
- Print a file (the PRINT command). This command is unique to a computer system. It allows you to produce a printout of information stored on a diskette.

A diskette directory is like a card catalog in a library. It contains an entry for each file on the diskette. The information stored in the directory includes the file size, the file location and the date the file was created or last updated.

In an office you separate files by putting them in different folders and filing cabinets. You accomplish the same thing on the T1100 PLUS in two ways. The method you choose depends on the number of files you are creating:

- 1 You can use a different diskette or group of diskettes for each category you require.

This is the most common way to organize diskette files. The categories you choose depend on how you wish to arrange your work.

MS-DOS automatically creates one directory per diskette. See the DIR command for instructions on how to view the files listed in the directory.

- 2 You can set up multiple directories on the same diskette, one for each category you require.

Multiple directories (and subdirectories) are usually used if you are working with a fixed disk rather than diskette drives. Because the T1100 PLUS is capable of formatting diskettes to hold 720K bytes of information, you may wish to set up a diskette with multiple directories to organize your files.

Pathnames are used to help you find files in multiple directories and subdirectories. See your MS-DOS Manual for further information.

## Identifying Files

The discussion below assumes you are organizing your files with one directory on each diskette.

### **NOTE**

*If you organize your files with more than one directory on each diskette you must designate a pathname whenever you specify a file.*

*Your MS-DOS manual gives information on pathnames and pathing.*

Files on diskettes have two parts: a drive identifier and the filename.

### Drive Identifier

When you access a file (or files) you must tell the computer which drive contains the diskette holding the file you wish to work with. This is done by typing the letter **A** designating the upper drive or **B** designating the lower drive, followed by a colon (:). You can type the letter in uppercase or lowercase. The colon separates it from the rest of the file specification. For example,



```
A>DIR B:filename.ext
```

tells the computer to go to drive **B** and look for a file with the name 'filename.ext.' If you do not type **B:**, the computer looks for the file on the diskette in drive **A**.



## Filename

When naming files, note the following points:

- Filenames are from 1 to 8 characters long and can have an optional extension which is 3 characters long. The extension is separated from the rest of the filename by a period (.).
- A space (made with the spacebar) must not be included in the filename. The computer recognizes a space as it does a letter or symbol and does not accept it as part of a filename.
- Two or more files in the same directory cannot have the same name.
- Filenames can be typed in uppercase characters, lowercase characters or a combination of both cases.
- Filenames may include the following symbols:

A-Z	0-9	\$	&	#	%	'	(	)
-	@	~	[	]	^	!	-	

- There are certain names reserved by MS-DOS that must not be used for filenames. They are:

COM1  
 or AUX Used with MS-DOS commands that regulate input from or to a communications device.

CON Used with MS-DOS commands that regulate keyboard input and screen (console) output.

LPT1  
 or PRN Used with MS-DOS commands that regulate connection and use of a parallel printer.

NUL Used when you do not want to create a particular file, but the command requires an input or output filename.

COM2 Used with an internal modem.

LPT2  
 or LPT3 Reserved but not normally used.

Once you add an extension to a filename belonging to a data file, you must include the extension whenever you specify the filename.

MS-DOS uses file extensions to indicate types of program files, for example:

.ASM Assembly Source File

.BAT Batch File

.EXE Execution File

.SYS System File

When you specify an MS-DOS program filename, you do not need to include the extension.

Some programs also use file extensions to indicate types of data files, for example:

.DOC Document File

.BAK Backup File

.WKS Worksheet

**NOTE**

*Two special characters called wild cards can be used when working with filenames and extensions. These are the asterisk (\*) and the question mark (?). See the MS-DOS Manual for information on wild cards and how to use them.*

## MS-DOS Commands

MS-DOS commands are tools you use to manage your T1100 PLUS computer system. Whenever you want to copy a file, format a diskette or read a directory you use an MS-DOS command. They are stored in files found on your MS-DOS system diskette.

There are two types of MS-DOS commands: internal and external.

### Internal Commands

Internal commands are loaded into the computer's memory automatically when you start MS-DOS and are immediately accessible. They are the most frequently used commands. Whenever you need them, you access them from the computer's memory, not the diskette.

The following is a list of the MS-DOS internal commands:

BREAK	CHDIR	CLS	COPY
CTTY	DATE	DEL(ERASE)	DIR
ECHO	EXIT	FOR	GOTO
IF	MKDIR(MD)	PATH	PAUSE
PROMPT	REM	RENAME(REN)	RMDIR(RD)
SET	SHIFT	TIME	TYPE
VER	VERIFY	VOL	

### External Commands

External commands are not as frequently used as internal commands. They remain on the system diskette and are loaded into the computer's memory only when you type the name of the command. To run one of these commands, the program file for the command must be on the diskette in the current drive or the drive you specify. If it is not, MS-DOS displays the message:



Bad command or file name.

The following is a list of MS-DOS external commands:

ASSIGN	ATTRIB	BACKUP	CHAD	CHKDSK
COMMAND	COMP	DISKCOMP	DISKCOPY	EXE2BIN
FDISK	FDISKOFF	FIND	FORMAT	GFTABLE
GRAPHICS	JOIN	LABEL	MODE	MORE
NOW	PRINT	RECOVER	REPLACE	RESTORE
SELECT	SHARE	SORT	SUBST	SYS
TREE	XCOPY			

The application programs used to do word processing, spreadsheets, accounting, games, etc. are also 'external' commands. They are permanently stored on diskette. The diskette must be in one of the computer's drives before they can be used. They are loaded into memory as soon as you type their filename.

## Working with MS-DOS Commands

The explanation below tells you how to work with MS-DOS commands. For further discussion, see your MS-DOS manual.

### How to Issue a Command

The following points apply to all MS-DOS commands:

- To execute a command, type the name of the command and press **Enter**.
- When specifying a command, use uppercase characters, lowercase characters or a combination of both cases.
- Include any delimiters. Delimiters separate the command name, filename and/or other parameters present in the file specification. The most common delimiter is a space (made with the spacebar). See your MS-DOS manual for more information on delimiters.

- When MS-DOS displays the message



Press any key

press any alpha (A-Z) key, numeric (0-9) key, or the spacebar.

- When specifying a command, you do not need to type the extension of a command filename. For example, the SORT command is contained in a file called SORT.EXE. To issue the command to SORT, at the system prompt type:



**SORT**

and press **Enter**. Do not type the .E E as part of the command.

- When the command file is not on the current drive, you must tell MS-DOS where to find it by entering a drive identifier. For example, if the SORT command is located on a file in drive B, type:



**B:SORT**

and press **Enter**.

## How to Correct a Mistake

If you make a mistake when typing in a command name, before you press **Enter**:

- use backspace to back up and correct the error, or
- press **Esc** to reenter the command.

If you press **Enter** before correcting an error, or if the program file containing the external command you want to use is not on your current diskette, MS-DOS displays the message:



Bad command or file name

and returns you to the system prompt. Type the correct name and press **Enter**.

## How to Interrupt a Command

To interrupt a command that is already processing, press **Ctrl + C** or **Ctrl + Break**. Once a command is cancelled, MS-DOS returns you to the system prompt.

### **NOTE**

*Some commands cannot be interrupted at some points.*

## How to Pause Screen Output

Some MS-DOS commands display information on the screen too quickly for the eye to follow easily. To temporarily stop the screen display, press **Ctrl + S** or **Ctrl + Stop**.

To continue the command, press any key except **Ctrl + C** or **Ctrl + Break**.

## How to Change the Current Diskette Drive

The system prompt is a letter with a greater-than (>) sign next to it. It indicates the drive you are currently accessing and tells you that MS-DOS is ready to accept a command. It first appears after you enter the date and time when MS-DOS is loaded into the computer at start up.

The T1100 PLUS has two internal drives, therefore, the system prompt is either A> or B>. If you attach a fixed disk drive using the optional expansion chassis, the fixed disk has its own drive identifier, usually C>.

- A> indicates the computer is accessing drive A and is ready to accept a command.

- B> indicates the computer is accessing drive B and is ready to accept a command.

Take the following steps to change the current drive. Assume the current drive is A and you want to access drive B:

- 1 Next to the system prompt type the letter **B**.
- 2 Following the letter B type a : (colon). Do not put any spaces between the letter and the colon.



B:

- 3 Press **Enter**. The screen displays:



B>

You are now accessing drive B.

## How to Restart the Computer

Occasionally you may need to interrupt processing and restart the computer without turning it on and off at the on/off switch. Take the following steps:

- 1 Make sure a system diskette is in the drive the computer accesses at startup (usually drive A).
- 2 Press **Ctrl + Alt + Del**.
- 3 Enter the date and time when prompted to do so.

Performing a restart using **Ctrl + Alt + Del** is called a 'warm start' in computer jargon. Starting the computer by turning on the on/off switch is called a 'cold start.'

Keep the following points in mind when performing a restart:

- If you have to restart you may have a software problem that should be investigated further. Before you restart, print the screen contents using **Shift + PrtSc**.
- Some programs, as part of their normal operation, do not allow you to use **Ctrl + Alt + Del**.

## Common MS-DOS Commands

This discussion includes the most commonly used commands, sufficient for most computing needs. They are listed in alphabetical order.

If you require further information on these and other MS-DOS commands, see your MS-DOS manual.

### **NOTE**

*The discussion below assumes: 1) Your current drive is A and your alternate drive is B. 2) You are not using multiple directories on one diskette.*

## **COPY**

This is an internal command. Use it to copy files on the same diskette or from one diskette to another.

Note the following points regarding the COPY command:

- You must tell the computer where the file to be copied is coming from (source) and where the copy is to be stored (target).

The source and target filenames are separated from each other by a space.

- You cannot have two or more files with the same name on the same diskette.



- A file from a source diskette copies over a file on a target diskette if the file on the target diskette bears the same filename.
- When you copy a file (or files) from one diskette to another the target diskette must be formatted.

The following steps tell you how to copy a file on the source diskette, how to copy a file to a target diskette without changing its name, how to copy a file to a target diskette and change its name and how to copy all the files from one diskette to another diskette.

The explanation assumes you are copying a file called 'oldname' to a file called 'newname.' You can substitute your own filenames for 'oldname' and 'newname.'

### How to Copy a File on the Source Diskette

- 1 Make sure your source diskette is in drive A.
- 2 At the system prompt type:



**COPY OLDNAME NEWNAME**

- 3 Press **Enter**

The computer copies the file 'oldname' to another file called 'newname' keeping the files on the same diskette. The contents of both files are the same.

### How to Copy a File to a Target Diskette Without Changing its Name

- 1 Make sure your source diskette is in drive A and the formatted target diskette is in drive B.
- 2 At the system prompt type:



**COPY FILENAME B:**

- 3 Press **Enter**

The computer copies the file 'filename' found on drive A to drive B. The name remains unchanged.

### How to Copy a File to a Target Diskette Changing its Name

- 1 Make sure your source diskette is in drive A and the formatted target diskette is in drive B.
- 2 At the system prompt type:



**COPY OLDNAME B:NEWNAME**

- 3 Press **Enter**

The computer copies the file 'oldname' found on drive A to a file called 'newname' on drive B.

### How to Copy all the Files from a Source Diskette to a Target Diskette

- 1 Make sure your source diskette is in drive A and a formatted target diskette is in drive B.
- 2 At the system prompt type:



**COPY \*.\* B:**

- 3 Press **Enter**

All the files on the diskette in drive A are copied onto the diskette in drive B.

**Note**

*Follow the above steps to copy files from a 5 1/4" diskette formatted for 360K bytes to a 3 1/2" diskette formatted for 720K bytes.*

## DEL (ERASE)

This is an internal command. Use it to delete one or more specified files from a diskette.

Before you use the DEL command, note the following points:

- You can either use the letters DEL or the word ERASE when issuing the command. The letters DEL are used in this explanation.
- If you do not specify a drive, MS-DOS assumes you are deleting a file on the current drive. It is a good idea to always specify the drive containing the file you are deleting to avoid accidentally erasing files you wish to keep.
- If the filename contains an extension, you must include the extension when you specify the file.
- You cannot delete files that are stored on a write protected diskette.

The following steps tell you how to delete a file on the current drive, how to delete a file on an alternate drive and how to delete all the files on a diskette. The explanation assumes you are deleting a file called 'filename.ext.'

### How to Delete a File on a Diskette in the Current Drive

- 1 Make sure the diskette containing the file you are deleting is in drive A.
- 2 At the system prompt type:



**DEL A:FILENAME.EXT**

- 3 Press **Enter**.

The computer erases the file 'filename.ext' from the diskette in drive A.

## How to Delete a File on the Alternate Drive

- 1 Make sure the diskette containing the file you are deleting is in drive B.
- 2 At the system prompt type:



**DEL B:FILENAME.EXT**

- 3 Press **Enter**.

The computer erases the file 'filename.ext' from the diskette in drive B.

## How to Delete all the Files on the Current Diskette Drive

- 1 Make sure the diskette containing the files you are deleting is in drive A.
- 2 At the system prompt type:



**DEL A:\*.\***

- 3 Press **Enter**. The computer prompts:



Are you sure (Y/N)?

- 4 Press **Y** to delete all the files on the diskette in drive A.  
Press **N** to cancel the command.

## DIR

This is an internal command. Use it to display a directory of the files on a diskette.

Note the following points regarding the DIR command:

- The DIR command lists the names of files (and subdirectories if any), the sizes of files in bytes and the time each file was last modified.
- Filenames are automatically displayed in a single column on the left side of the screen unless otherwise specified.
- If the directory is large, filenames can be displayed a page at a time or you can select wide display to show them in columns of five. Refer to the MS-DOS Manual for more information on these options.
- You can specify which files you want displayed in a directory without displaying the whole directory.
- To pause a directory display, press **Ctrl + Stop** or **Ctrl + S**. Press any key to restart the display.

The following steps tell you how to display the directory on the current diskette drive and how to specify certain files for display.

### How to Display the Directory on the Current Drive

- 1 Make sure the diskette containing the directory you wish to display is in drive A.
- 2 At the system prompt type:



**DIR**

- 3 Press **Enter**.

The computer displays the directory of files on the diskette in drive A.

## How to Specify Certain Files for Display

- 1 Make sure the diskette containing the files you wish to display is in drive A.
- 2 At the system prompt type:



**DIR A:FILE\***

- 3 Press **Enter**.

The computer displays all the files beginning with the word 'file' on the diskette in drive A.

## DISKCOPY

This is an external command. Use it to copy the contents of one diskette to another.

Note the following points regarding the DISKCOPY command:

- It is faster than using the COPY command to copy the entire contents of a diskette.
- It formats the target diskette as it copies.
- You must tell the computer where the source diskette is located and where to find the target diskette.
- Do not use DISKCOPY to copy files from a 3 1/2" drive to a 5 1/4" drive. The two drive formats are not compatible. Format the 5 1/4" diskette and use the COPY command instead.
- Do not use DISKCOPY to copy files on diskettes that have experienced a lot of file creation and deletion. Use the COPY command instead.

The following steps tell you how to copy an entire diskette.

**CAUTION**

*DISKCOPY destroys the original contents of the target diskette. To be safe, protect the source diskette to prevent accidentally erasing information.*

**How to Copy a Diskette**

- 1 Put your MS-DOS system diskette in drive A.
- 2 At the system prompt type:



**DISKCOPY A: B:**

- 3 Press **Enter**. The screen displays:



Insert SOURCE diskette in drive A:  
Insert TARGET diskette in drive B:  
Press any key when ready...

- 4 Remove the MS-DOS system diskette from drive A and insert the source diskette.
- 5 Insert the target diskette in drive B and press any key. The screen displays:



Copying 80 cylinders  
9 sectors per track, 2 sides(s)

After a few seconds the following message appears:



Formatting while copying

When the asterisks have filled the space between the brackets, formatting and copying are complete. The screen displays:



Copy another diskette (Y/N)?

- 6 If you press **Y**, the next DISKCOPY is performed on the drives you originally specified. DISKCOPY prompts you to insert the diskettes and waits until you press any key before starting the next copy.

If you press **N**, the command is ended and the screen displays the system prompt.

## FORMAT

This is an external command. Use it to prepare a diskette for use by the T1100 PLUS.

Note the following points about formatting:

- Every new diskette must be formatted by the T1100 PLUS before it can be used.
- You can reformat previously formatted diskettes.
- When you reformat a diskette all the information on that diskette is lost.
- The T1100 PLUS automatically formats 3 1/2" diskettes to hold 720K bytes of information and 5 1/4" diskettes to hold 360K bytes of information.
- If you do not specify a drive, the diskette in the current drive is formatted.

### **CAUTION**

*Formatting destroys all data on the diskette. Be very careful when using this command. Once the diskette to be formatted is inserted in the drive, it is a good idea to remove any other diskettes.*



The following steps tell you how to format a 3 1/2" diskette, how to format a 5 1/4" diskette and how to format a system diskette.

### How to Format a 3 1/2" Diskette

- 1 Put your MS-DOS system diskette in drive A.
- 2 At the system prompt type:



**FORMAT B:**

- 3 Press **Enter**. The screen displays:



Insert new diskette for drive B:  
and press ENTER when ready

- 4 Insert the diskette to be formatted in drive B.
- 5 Press **Enter**. The screen displays:



Formatting 80 cylinders  
9 sectors per track, 2 side(s)  
#>Head : n Cylinder : nn

FORMAT shows you its progress by displaying which head (0 or 1) and which cylinder (0-79) it is formatting.

- 6 When FORMAT is complete the screen displays:



Format complete  
  
730112 bytes total disk space  
730112 bytes available on disk  
  
Format another (Y/N)?

- 7 Press **Y** if you wish to format another diskette and follow the prompts. Press **N** if you are finished formatting. The system prompt returns to the screen.

## How to Format a 3 1/2" System Diskette

If you need to make a diskette that can be used to start the computer, you must prepare a blank diskette capable of becoming a system diskette. During the system diskette format, special MS-DOS files are copied onto the newly formatted diskette making it a system diskette.

- 1 Put your MS-DOS system diskette in drive A.
- 2 At the system prompt type:



**FORMAT B:/S**

- 3 Press **Enter**. The screen displays:



Insert new diskette for drive B:  
and press ENTER when ready

- 4 Insert the diskette to be formatted in drive B.
- 5 Press any key. The screen displays:



Formatting 80 cylinders  
9 sectors per track, 2 side(s)  
#>Head : n Cylinder : nn

FORMAT shows you its progress by updating the head and cylinder numbers as it formats them.

- 6 When **FORMAT** is complete the screen displays:



```
Format complete
System transferred
```

```
730112 bytes total disk space
69632 bytes used by system
660480 bytes available on diskette
```

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

- 7 Press **Y** if you wish to format another diskette and follow the prompts. Press **N** if you are finished formatting. The system prompt returns to the screen.

### How to Format a 5 1/4" Diskette

- 1 Make sure your external 5 1/4" drive or Floppy Link is properly connected and the necessary switches are set.
- 2 Remove all diskettes from the 3 1/2" drives.
- 3 Put your MS-DOS system diskette in drive A.
- 4 At the system prompt type:



```
FORMAT B:
```

- 5 Press **Enter**. The screen displays:



```
Insert new diskette for drive B:
and press any key when ready
```

- 6 Insert the diskette to be formatted in drive B.

7 Press any key. The screen displays:



```
Formatting 40 cylinders
9 sectors per track, 2 side(s)
Head : n Cylinder : nn
```

FORMAT shows you its progress by updating the head and cylinder numbers as it formats them.

8 When FORMAT is complete the screen displays:



```
Format complete

362496 bytes total diskette space
362496 bytes available on diskette

Format another (Y/N)?
```

9 Press **Y** if you wish to format another diskette and follow the prompts. Press **N** if you are finished formatting. The system prompt returns to the screen.

## RENAME

This is an internal command. Use it to rename files on a diskette.

Before you use the RENAME command, note the following points:

- You cannot have two or more files on a diskette with the same name. If you attempt to use a filename already present on the diskette, MS-DOS displays the error message:



```
Duplicate file name or File not found
```

- To rename a file you can either use the word RENAME or the letters REN. The letters REN are used in this explanation.

The following steps tell you how to rename a file on a diskette in the current drive and how to rename a file on a diskette in an alternate drive. The explanation assumes you are changing a file named 'oldname' to a file called 'newname.'

### How to Rename a File on a Diskette in the Current Drive

- 1 Make sure the diskette containing the file to be renamed is in drive A.
- 2 At the system prompt type:



**REN OLDNAME NEWNAME**

- 3 Press **Enter**.

The computer changes 'oldname' to 'newname' on the current drive A.

### How to Rename a File on a Diskette in an Alternate Drive

- 1 Make sure the diskette containing the file to be renamed is in drive B.
- 2 At the system prompt type:



**REN B:OLDNAME NEWNAME**

- 3 Press **Enter**.

The computer changes 'oldname' to 'newname' on the alternate drive B.

## TYPE

This is an internal command. Use it to display the contents of a file without modifying the file.

Before you use the TYPE command, note the following points:

- Data is displayed unformatted except for tab characters.
- Only text files should be displayed using this command. Displaying other files such as MS-DOS program files causes control characters (for example, bells and form feeds) to be displayed.
- If the screen display moves too quickly, use **Ctrl+Stop** to pause. Press any key to continue screen output.

The following steps tell you how to use the TYPE command with current and alternate drives. The explanation assumes you wish to display the contents of a file called 'filename.'

### How to Display File Contents on the Current Drive

- 1 Put the diskette containing the file to be displayed in drive A.
- 2 At the system prompt type:



**TYPE FILENAME**

- 3 Press **Enter**.

MS-DOS displays the contents of the file on the screen.

### How to Display File Contents on the Alternate Drive

- 1 Put the diskette containing the file to be displayed in drive B.
- 2 At the system prompt type:



**TYPE B:FILENAME**

- 3 Press **Enter**.

MS-DOS displays the contents of the file on the screen.

## SETTING UP A BATCH FILE

As you use the T1100 PLUS, you may find yourself typing the same sequence of commands over and over to perform frequently used tasks. Using MS-DOS, you can put the commands governing these tasks into a special file called a batch file. When you type a batch filename, the T1100 PLUS reads the commands in the file and performs them just as if you had typed them yourself.

A special batch file called AUTOEXEC.BAT has particular meaning for MS-DOS. If an AUTOEXEC.BAT file is on the system diskette (in the root directory) at computer start up, MS-DOS automatically reads the AUTOEXEC.BAT file and performs the commands contained in it. For example, you can set up an AUTOEXEC.BAT file to automatically enter the date and time at computer start up.

Batch files can be set up using a word processor or the COPY command. See your MS-DOS manual for information on how to set up a batch file.

## BACKING UP

It is very important to make backup copies of diskettes. If a diskette becomes damaged or files are accidentally erased you still have all the information on the backup diskette.

Make backup copies of diskettes frequently. A good time to do so is at the end of a working day, or whenever you are finished with a diskette. Make it part of your working routine to take the time to make backup copies of all the work you have done. Sooner or later it will save you time should a diskette become damaged and you cannot access the files contained on it.

Use the DISKCOPY command to make backup copies of diskettes.

**Note**

*If you have a fixed disk in the expansion chassis, use the BACKUP command. Refer to the MS-DOS Manual for information.*

Note the following points when using the DISKCOPY command to make backup copies of diskettes:

- The DISKCOPY command formats a diskette as it copies.
- DISKCOPY copies an entire diskette, working faster than the COPY command.
- Do not use DISKCOPY to make a backup from a 3 1/2" diskette to a 5 1/4" diskette.

The following steps tell you how to make a backup copy of a diskette.

- 1 Write-protect your original diskette and your MS-DOS system diskette.
- 2 Insert the MS-DOS diskette in drive A.
- 3 At the system prompt type:



**DISKCOPY A: B:**

- 4 Press **Enter**. The screen displays:



```
Insert SOURCE diskette in drive A:
Insert TARGET diskette in drive B:
Press any key when ready...
```

- 5 Put your original diskette in drive A and your backup diskette in drive B.



- 6 Press a key. The screen displays:



Copying 80 cylinders  
9 sectors per track, 2 side(s)  
Formatting while copying

- 7 When DISKCOPY is complete, write protect the backup copy you have just made.
- 8 Put the original system diskette in a safe place and use the backup copy for every day work.



# Chapter 7

# USING SOFTWARE

# ON THE T1100 PLUS

## Chapter 7/USING SOFTWARE ON THE T1100 PLUS

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# Chapter 7

## USING SOFTWARE ON THE T1100 PLUS

The T1100 PLUS's 720K byte 3 1/2" diskettes provide more storage capacity than is provided by most other personal computers. They are compact and easy to use.

The first part of this chapter discusses procedures for converting software that is normally sold on 5 1/4" diskettes to the 3 1/2" diskette format.

The second part talks about running software on the T1100 PLUS. It includes some helpful hints on how to organize your programs and data.

### Converting Software to Run on the T1100 PLUS

Ideally, you should purchase software already on a 3 1/2" diskette. This way no conversion is required.

Software that comes on a 5 1/4" diskette may or may not be copy protected.

#### Software that Comes on a 5 1/4" Unprotected Diskette

If you have a T1100 PLUS with an optional external 5 1/4" drive or Floppy Link, follow these steps:

- 1 Format a 3 1/2" diskette making sure you follow the procedure given in the chapter entitled 'Using MS-DOS.'

If you wish to be able to start your T1100 PLUS with this diskette, follow the instructions for formatting a 3 1/2" system diskette.

- 2 Set the A B PRT switch on B.
- 3 Restart the T1100 PLUS with the external drive attached.
- 4 Put the blank, newly formatted diskette in drive A (the current drive). Put the software diskette in the external 5 1/4" drive.
- 5 Type:



**COPY B:\*. \* A:**

and press **Enter**. This creates your working copy of the software diskette.

- 6 Label the new 3 1/2" diskette and make a backup copy of it using DISKCOPY. You are ready to go to work.

If you do not have an external 5 1/4" drive, your dealer may be able to do this for you.

## Copy Protected Software

Software manufacturers sometimes use copy protection schemes to discourage users from copying and reselling their products for profit, and from distributing their products free of charge. Many different copy protection methods are used.

If you cannot find a particular software package in 3 1/2" format, first check with your dealer. The popularity of the 3 1/2" diskette format is growing, and it is possible that the software manufacturer can provide you with a 3 1/2" version of the package.

It is also possible that the software manufacturer can send you a diskette that is not copy protected. Many manufacturers are eliminating copy protection schemes because they restrict flexibility and discourage sales.

If the software manufacturer provides the software package only on a 5 1/4" diskette in copy protected format, you have two options:

- Use the software diskette on an external 5 1/4" drive.
- You or your dealer can use a copy utility program to make a 3 1/2" version of the package.

Making a copy of a package you have purchased for use on your T1100 PLUS does not violate copyright law per se. Remember, however, when you buy a software package, you frequently are buying a license to use it on one and only one computer system at a time, and sometimes, only on one computer.

**NOTE**

*It is your responsibility to review the license agreement of the software package carefully. Be sure that you are in compliance with your obligations under that agreement. If you have any questions about the agreement, contact the software manufacturer.*

Copy utility programs generally copy the source diskette track by track, including or ignoring the copy protection information. Consequently, they usually have one major limitation: following the copy, the source and target diskettes end up with the same storage capacity.

This means that if you are copying from a 5 1/4" 360K byte diskette you will only be able to access 360K bytes on the 3 1/2" diskette following the copy. A few copy programs can actually remove the copy protection allowing access to the entire 720K bytes on the new diskette.

## Running Software on the T1100 PLUS

Many software packages perform differently on different computers. When you use these packages on your T1100 PLUS, there are two parts of the operation that may need modification: the screen display, and the diskette utilization.

### Screen Display and Graphics

The display adapter built into the T1100 PLUS is equivalent to the IBM color graphics adapter (CGA). However, the LCD behaves slightly differently from a CRT. Although most software works very well on the LCD without any modification, you may wish to configure some packages to adapt to the LCD.

Colors are not visible on an LCD display. If you run a software program that uses colors to distinguish between displays, the differences may not be visible on the LCD screen. For example, a word processing software package might use white on black for normal characters, red on black for highlighted characters and white on green for italic characters. On the LCD, you need to show highlighted characters using high intensity and italics using reverse video. To distinguish normal, highlighting and italics in this manner, the screen output may need adjusting.

There are two ways to adjust screen output: through the software and with the CHAD command.

### Using Software to Change Display Attributes

If you have problems with the display on the LCD, refer to the software documentation. There is probably a program you can run or a command you can give to reconfigure the software. Typically this program or command is called 'SETUP,' 'INSTALL' or 'CONFIG.'

This program may give you a choice of a few basic display types, or it may allow you to set colors. If both choices are offered, start by changing the display type.



The LCD has three video attributes that can be used to distinguish different displays:

- Narrow or wide characters
- Steady or blinking
- Black on white or white on black

Character width corresponds to intensity on a CRT. White on black is known as reverse video. These attributes can be combined to get eight different types of display:

- White, wide characters on a black background
- White, narrow characters on a black background
- Black, wide characters on a white background
- Black, narrow characters on a white background
- White, wide, blinking characters on a black background
- White, narrow, blinking characters on a black background
- Black, wide, blinking characters on a white background
- Black, narrow, blinking characters on a white background

Software display setup programs usually offer these three choices:

- Monochrome
- Color
- Black and white (B & W)

Other types may be offered as well. If available, the best choice is black and white.

If you must choose between monochrome and color, choose color. Never choose monochrome. Although monochrome and black and white seem like they are the same, monochrome refers to an IBM monochrome screen. This type of screen is so different from the LCD

that the software is unlikely to work at all if this display type is selected.

Do not select any non-IBM display types (such as Hercules, etc.).

Choosing the correct display type solves most of the display problems you may encounter with different software packages. If the display is wrong even after selecting the appropriate display type, try to set the colors individually.

### Using CHAD to Change Display Attributes

CHAD is an external MS-DOS command. It allows you to change the way color-on-color and color-on-black attribute combinations are shown on the LCD. Using combinations of wide, narrow, black on white and white on black attributes, you can adjust screen display to suit your software needs.

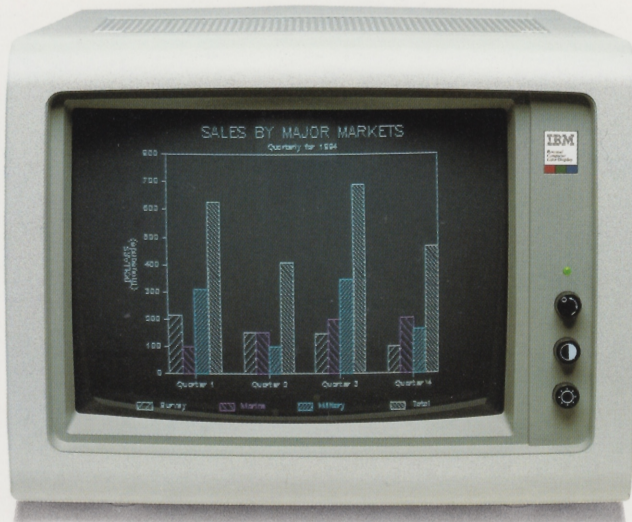
Step by step instructions on how to use the CHAD command are given in Appendix A of this manual.

# Chapter 8

# T1100 PLUS OPTIONS

## Chapter 8/T1100 PLUS OPTIONS

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# Chapter 8

## T1100 PLUS OPTIONS

Your T1100 PLUS has several options available that expand its capabilities:

- 5 1/4" 360K byte external diskette drive, AC powered
- Modem board for a 1200 baud modem
- External RGB (color) or composite (monochrome) CRT monitor
- Serial devices
- Floppy Link
- Expansion chassis

### 5 1/4" External Diskette Drive

The external 5 1/4" diskette drive option gives the T1100 PLUS the capability of reading from and writing to 5 1/4" diskettes as well as 3 1/2" diskettes.

Installation and use of the external 5 1/4" diskette drive is discussed in Chapter 4, 'Disk Drives and Diskettes.'

### Modem Board

The user installable Modem Board option allows you to connect a 1200 baud modem to the T1100 PLUS. You can communicate with other computers or terminals, access automatic banking services, community bulletin boards and on-line services. It is compatible with most communication software packages.

Installation and use of the modem board is discussed in the Modem Manual that comes with the board.

## External RGB or Composite Monitor

Standard RGB and composite ports at the rear of the T1100 PLUS give you the options of using an RGB (color) or composite (monochrome) CRT with the T1100 PLUS.

The LCD screen folds flat, allowing easy access to an external monitor.

### Connecting the T1100 PLUS to an RGB Monitor

Take the following steps to connect the T1100 PLUS to an RGB (color) monitor:

- 1 Insert the 9-pin end of the cable from the monitor into the RGB port on the back of the T1100 PLUS.
- 2 Tighten the screws provided.
- 3 Press **Ctrl + Alt + End** to activate the RGB monitor. The CRT light above the keyboard indicates the PLUS is using the monitor.

To return to LCD press **Ctrl + Alt + Home**.

### Connecting the T1100 PLUS to a Composite Monitor

Take the following steps to connect the T1100 PLUS to a composite (monochrome) monitor:

- 1 Insert the cable from the monitor into the COMP jack on the back of the T1100 PLUS.
- 2 Press **Ctrl + Alt + End** to activate the composite monitor. The CRT light above the keyboard indicates the PLUS is accessing the monitor.

To return to LCD press **Ctrl + Alt + Home**.

## Serial Devices

The serial port lets you connect a serial device such as a serial printer, mouse, or bar code reader to the T1100 PLUS. Connecting a serial printer is discussed in Chapter 3, 'Setting up the Computer.' This section contains information necessary to connect a variety of serial devices to the computer.

The term 'serial' means that data is transmitted one bit at a time using electronic pulses. The bits are collected until a byte, a unique character, is formed.

The most common serial interfacing standard in the microcomputer industry was established by the Electronic Industries Association and is called EIA RS-232-C. Most devices that meet the RS-232-C standard can be attached to the T1100 PLUS.

When connecting a serial device, note the following points:

- The T1100 PLUS serial port requires a DTE/DCE signaling arrangement. (The T1100 PLUS is a DTE device.)
- If you are attaching a serial printer, the system's output device must be defined so that information from the computer is sent through the serial port rather than the parallel port.
- Serial communications parameters must be set to ensure the T1100 PLUS is compatible with the serial device.

### DTE-DCE Signaling Arrangements

There are two kinds of signaling arrangements used by RS-232-C connections: Data Terminal Equipment (DTE) and Data Communications Equipment (DCE). Signaling may occur through a DTE/DCE arrangement or a DCE/DTE arrangement. The T1100 PLUS requires a DTE/DCE arrangement.

Signaling arrangements allow the computer to communicate with a serial device. For example, if you connect a serial printer, the computer (DTE) sends the printer (DCE) a signal that data is ready to be transmitted. The printer receives the signal and sends one back telling the computer it is ready to receive data.

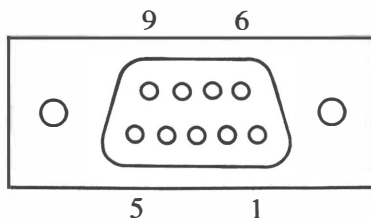
Signals are sent from a data terminal device (the computer) to a data communications device (for example, a printer or mouse) through a serial cable. The connectors on each end of the cable must have at least 9 pins for serial communications to occur. A connector may have space for 25 pins, but only nine are actually used.

Pins in the connectors are assigned certain functions. These pin assignments must be compatible with the computer and the serial device. If the pin assignments are not compatible, signaling does not occur. For example, the T1100 PLUS is designed to transmit data (DTE) on pin 2. The serial device must receive the data (DCE) on pin 3. Connecting a T1100 PLUS to another DTE device does not work because it is impossible for both sides to transmit on pin 2 and receive on pin 3.

The pin assignments for the T1100 PLUS serial port are listed in the table below.

### T1100 PLUS Serial Port Pin Assignments (IBM PC/AT Compatible)

<u>Pin</u>	<u>Signal</u>	<u>I/O</u>	<u>Description</u>
1	DCD	I	Data carrier detect
2	RD	I	Serial receive data
3	SD	O	Serial transmit data
4	DTR	O	Data terminal ready
5	GND		Signal ground (0 V)
6	DSR	I	Data set ready
7	RTS	O	Request to send
8	CTS	I	Clear to send
9	RI	I	Ring indicator





If the serial hardware you wish to attach to the T1100 PLUS is a DTE device, you need a 'null modem' cable. A null modem cable is a cable designed to connect two DTE devices together. Consult your dealer or the serial device's manual for further information.

## Defining the Output Device for a Serial Printer

Most software packages automatically send output through a device called LPT1. LPT1 usually directs data to a parallel port (PRT/FDD) on the T1100 PLUS. To use a serial printer with the T1100 PLUS, LPT1 must be reassigned to direct output to the RS-232-C serial communications port (COMMS). This is done using the MS-DOS MODE command.

Take the following steps:

- 1 Load MS-DOS into the computer.
- 2 At the system prompt type:



```
MODE LPT1:=COM1:
```

- 3 Press **Enter**.

All output previously directed through LPT1 to the parallel port is now directed through LPT1 to the RS-232-C serial port.

## Setting Serial Parameters

You may need to set serial communications parameters to ensure that the T1100 PLUS is compatible with the serial device. The parameters determine the form data takes when it is sent to the serial device. Both the computer and the device attached must have the same values for these parameters or communication does not take place. The parameters are: baud rate, parity, number of data bits and number of stop bits.

**Baud rate** is the speed of transmission. A baud rate of 300 means 300 bits per second (bps) are being transmitted between the computer and the serial device.

**Parity** is a bit added by the transmitting device to each byte transmitted. It can give the byte an odd or even number of bits, or no parity may be used. If a parity bit is added, the receiving device ensures it receives the same parity bit, providing a basic form of error detection.

The **number of data bits** defines how many bits are used to create a byte. Seven or eight bits may be used.

**Stop bits** separate bytes as they are transmitted. They signal the end of a character.

When you start the T1100 PLUS the communications parameters are automatically assigned the following values:

Baud rate	=none
Parity	=even
Number of data bits	=7
Stop bits	=2 (if the baud rate is 110) =1 (other baud rates)

You may be able to set these communications parameters in three ways: in the serial device, through the software and with the MODE command.

### In the Serial Device

Refer to the manual accompanying the serial device for instructions on setting communications parameters.

#### **NOTE**

*Setting parameters in the serial device does not affect the parameters set in the computer. You must still set the computer's parameters to agree with those of the serial device.*

## Through the Software

Communications parameters are usually set by the software package and you do not need to use the MODE command. Typically, software packages do this automatically. Refer to your software user's manual for instructions.

## With the Mode Command

The MODE command is most often used to set communications parameters for use with a serial printer.

### NOTE

*Many communications programs and serial device drivers override the MODE command. See your software user's manual and the manual accompanying the serial device for further information.*

The syntax of the MODE command is:



**MODE COM1:** *baud rate, parity, data bits, stop bits, printer*

Before you begin, define the parameters you need to set: the baud rate, parity, the number of data bits, the number of stop bits and whether or not the serial device you are using is a printer.

Note the following points:

- Values must be entered in the order given above.
- You must specify a baud rate. Legal values are 110, 150, 300, 1200, 2400, 4800 and 9600. Only the first two digits need to be entered.
- Parity is optional. Legal values are N (none), O (odd) or E (even).
- Data bits are optional. Legal values are 7 or 8.

- Stop bits are optional. Legal values are 1 or 2.
- Include a P in the syntax if you are specifying parameters for use with a serial printer.
- Separate each parameter with a comma (,).
- If you do not need to enter a value for a parameter, insert a comma (,) in place of the parameter (see the third example below).

Take the following steps to set serial communications parameters with the MODE command:

- 1 Define the parameters you wish to set.
- 2 Insert the MS-DOS system diskette in the current drive.
- 3 At the system prompt type:



#### **MODE COM1:**

followed by the parameters you wish to set.

- 4 Press **Enter**.

#### **NOTE**

*Serial communication parameters set using the MODE command are not retained when the computer is turned off or a restart is performed.*

*If you wish to retain the settings, put them in an AUTOEXEC.BAT file. They are then automatically entered into the computer's memory at startup.*

Some examples of using the MODE command to set parameters are:

- To set the baud rate at 300 bps (bits per second), specify no parity, 8 data bits, 2 stop bits and the printer option, at the system prompt type:



**MODE COM1:30,N,8,2,P**

and press **Enter**.

- To set the baud rate at 9600 bps and specify no parity, leaving the rest of the parameters at their current values, at the system prompt type:



**MODE COM1:96,N**

and press **Enter**.

- To set the baud rate to 2400 bps and specify the printer option, leaving parity, data bits and stop bits at their current values, at the system prompt type:



**MODE COM1:24,,,,P**

and press **Enter**. The last three commas indicate that parity, data bits and stop bits are to be left at their current values.

## Floppy Link

The Floppy Link consists of a board that fits in one of the expansion slots of an IBM PC, PC/XT, PC AT or compatible computer, and a cable. The cable and board connect to the diskette drive controller inside the PC, PC/XT, PC AT or compatible, allowing your T1100 PLUS to use one of the IBM's (or compatible's) 5 1/4" 360 Kbyte diskette drives.

With this option you can transfer information and programs from your IBM system to your T1100 PLUS without purchasing an external 5 1/4" diskette drive.

The Floppy Link is documented in a separate manual that comes with your purchase of the option.

## Expansion Chassis

The user installable expansion chassis gives you the option of installing up to 5 IBM cards. Operation and installation instructions come with the expansion chassis.

# Chapter 9

# DIAGNOSTICS

## Chapter 9/DIAGNOSTICS

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# Chapter 9

## DIAGNOSTICS

The T1100 PLUS is designed to give trouble free performance. However, should problems occur, follow the procedures in this chapter to determine the cause.

### Problem Determination Procedures

The general procedure to follow for problem resolution is to:

- Stop what you are doing.
- Observe what is happening to the system.
- Write down the steps you took immediately prior to the problem occurring.
- If possible, create a hard copy of the problem using **Shift + PrtSc.**

Follow the suggestions in this chapter. You may need to run the Diagnostics Test program. It is on your MS-DOS operating system disk.

If in the end you feel you need to consult your dealer, be able to reproduce the problem for the field technician.

## What to Watch For

When a problem occurs, always keep the following in mind:

- What appears on the screen? Write down any messages, characters or gibberish displayed.
- Do any lights come on? Which ones? Do they stay on or do they blink?
- Do you hear any 'beeps?' How many? Are they long or short?
- Do your disk drive(s) keep spinning? Which ones? How long?
- Is your printer working properly?

## Software Errors

Keep in mind that you may encounter a problem caused by the software you are using.

If you cannot load a software package, the software itself may be damaged. See your software user's manual.

Your system disk is also subject to damage. Try loading another copy of MS-DOS.

If an error message appears while you are using a particular software package, check the error message in the problem solving section of your software user's manual to see if the problem lies with the software and not the computer.

Next, check the error message in the T1100 PLUS MS-DOS Manual. If the problem is still not resolved, follow the procedures outlined below.

## Basic Computer Problems

The discussion in this section deals with areas in which problems may occur. Some of the solutions involve the Diagnostics Test. The next section in this chapter, 'Running the Diagnostics Test Program,' takes you through it step by step.

Basic computer problems dealt with in this section occur in the following areas:

- Battery
- Computer start up
- Self test
- Electrical connections and switch settings
- MS-DOS system diskette
- Calendar clock
- External 5 1/4" diskette drive
- External monitor (black and white or RGB)
- Diskettes
- Keyboard
- LCD
- Floppy Link
- Printer
- Modem board
- RAM disk (VDISK)

## Battery Errors

The battery is designed to last for the life of the T1100 PLUS. However, if the charge does not seem to last as long as it should (see the battery charging table in the chapter entitled 'Setting Up the Computer'), take the following steps to test the battery:

- 1 Make sure the computer is off. Connect the AC adapter to a working wall outlet and to the T1100 PLUS and let the battery charge for at least eight hours.

### **NOTE**

*Do not worry if the adapter gets warm. This is normal. It cannot overheat and you cannot overcharge the battery.*

- 2 Unplug the AC adapter from the computer.
- 3 Turn the computer on. Do not insert a diskette.
- 4 Do not use the computer. Watch for the Low Battery light to come on. If the Low Battery light comes on before 6 hours have passed, the battery is faulty. Take the T1100 PLUS to your dealer and have the internal battery pack replaced.

## Computer Start Up Errors

If you turn the T1100 PLUS on and nothing happens, take the following diagnostic steps:

- 1 If you are using an AC adapter, check that it is firmly plugged into the DC IN jack on the back of the computer and that it is also plugged into a working wall outlet. Let the battery charge for approximately five minutes before turning the computer on.

### **NOTE**

*If the battery is completely discharged, the Low Battery light does not come on and the computer does not operate even with the AC adapter connected.*

- 2 Adjust the LCD contrast dial. It may be positioned incorrectly.
- 3 If you are using a CRT, check that it is properly connected to the T1100 and that the CRT light is on. If it is not, press Ctrl + Alt + End, the soft switch that activates the CRT.

If you are not using a CRT, check that the CRT light is not on. Press Ctrl + Alt + Home, the soft switch that deactivates the CRT.

- 4 If you are using the AC adapter, check that it is properly connected between a working wall outlet and the computer. Make sure the red indicator light at the rear of the computer is on.

If you go through the above steps and the computer still does not come on, take it to your dealer for servicing.

## Self Test Errors

After you successfully complete the computer start up procedure, the T1100 PLUS begins its standard self test. On the LCD the message



MEMORY TEST XXX KB

is displayed. The message remains on the screen for a few seconds as the xxx value increases until it equals the amount of memory in the computer (640K bytes or 256K bytes depending on which option you have purchased).

Following successful completion of the self test, a short beep is heard.

If any of the following conditions occur, the computer self test has failed:

- The self test stops before the value displayed equals the amount of memory in the computer and nothing happens.
- The beep sounds and after a few seconds no new message appears.
- An error message is displayed.

- Random characters appear on the screen and normal function is lost.

Take the following steps:

- 1 Write down what occurred, including any error messages.
- 2 Check all cable and electrical connections.
- 3 Check all switches.
- 4 Turn the computer off and start it again. If the system fails again, take it to your dealer for servicing.

If the self test is successfully completed but the computer does not give a short beep, the speaker in the T1100 PLUS is faulty (this does not affect normal computer operation). Take it to your dealer for servicing.

### Electrical Connection and Switch Errors

Follow the steps below to eliminate the possibility of improper electrical connections and switch errors.

- 1 Make sure the A B PRT switch is set correctly. If you are using a printer, the switch must be set on PRT.

If an external drive is connected and you want it to be designated drive A, the switch must be set on A. If you want the external drive to be B, the switch must be set on B.

- 2 Make sure all cables are correctly attached and the battery is not completely drained. If you are using an external drive, make sure it is connected to a working wall outlet.
- 3 Check that the soft switches are set for your requirements. When the computer is turned off and back on again, or you perform restart, the soft switches are automatically set as follows:

- Character display consists of normal characters composed of a double row of pixels and intensified (highlighted) characters composed of a single row of pixels.
- Fast processor speed is selected.

- The LCD is selected.
- Cursor movement using the electronic integrated keypad is not selected.

See the 'Keyboard' section in Chapter 5, 'Operating the T1100 PLUS,' for information on soft switches.

- 4 If you are using a printer, make sure it is properly connected to the computer.

When you have verified all electrical connections and switch settings, try operating the computer again. If the failure persists, check the other areas discussed in this chapter where problems might occur.

## MS-DOS System Diskette Errors

Following the successful completion of the memory test at computer start up, if the system diskette is not in the drive the computer displays the following message:



Place system disk in drive  
Press any key when ready

If this message does not appear on the screen, note the following points:

- 1 If nothing appears on the screen, have the system serviced.
- 2 If an error message appears on the screen, for example: ERROR XXXX:XX, FDD ERROR or NO KEYBOARD, have the system serviced.
- 3 If a long beep is sounded or spurious characters appear on the screen, have the system serviced.

If all is correct, insert the MS-DOS operating system diskette in the drive and press any key. The Upper and Lower Disk in Use lights come on as MS-DOS is loaded into the computer. The following message appears:



## Toshiba Personal Computer

(c) Copyright Toshiba Corporation 1983, 1986

(c) Copyright Microsoft Corporation 1981, 1986

Current date is Mon 5-16-1988

Enter new date (mm-dd-yy):

**NOTE**

*If you have set up an AUTOEXEC.BAT file, the date and time prompts may not appear on the screen.*

If either of the lights do not come on but the message quoted above appears on the screen, the indicator light is faulty. Take the T1100 PLUS to your dealer and have the indicator light serviced.

**NOTE**

*If the indicator does not light up but the message appears, normal operation of the system is not affected*

If you insert the MS-DOS system diskette in the drive but the screen remains blank or an error message appears, take the following diagnostic steps:

- 1 Check that the MS-DOS operating system diskette is inserted properly in the correct drive.
- 2 Make sure the MS-DOS operating system diskette is not faulty by inserting another MS-DOS operating system diskette in the drive.
- 3 If the problems persist, have the computer serviced.



## Clock Errors

If you do not encounter any errors in loading MS-DOS, the cursor is positioned next to the message:



Enter new date (mm-dd-yy):

Enter the date (see Chapter 5 for instructions on how to enter date and time) and press **Enter**. The computer displays:



Current time is 0:00:14:32  
Enter new time:

Enter the time and press **Enter**. The system prompt appears on the screen. The operating system is ready to receive further instructions.

If the clock does not keep the correct date and time, take the following diagnostic steps:

- 1 Make sure you are booting from the MS-DOS system disk that came with the computer.
- 2 Reset the date and time using the MS-DOS DATE and TIME commands.

If problems persist, take the computer to your dealer for servicing.

## External Drive Errors

If you are using an external 5 1/4" diskette drive or fixed drive and are unable to access the drive properly, take the following steps:

- 1 Check that the cable connecting the external drive to the T1100 PLUS is properly connected. Make sure the ends are not reversed.
- 2 Make sure the power switch to the external drive is on.

- 3 Make sure the external drive's adapter is connected to a working wall outlet.
- 4 Make sure the A B PRT switch is correctly set to A or B.  
If you want the external drive to be A, the switch must be set on A.  
If you want the external drive to be B, the switch must be set on B.
- 5 Turn the computer off and restart it with the external drive connected and turned on.
- 6 Run the Diagnostics Test.

If the problem persists, take the T1100 PLUS and the external drive to your dealer for servicing.

### External Monitor (Black and White or RGB) Errors

If you connect the T1100 PLUS to an external monitor, turn the computer on and the screen does not respond correctly, take the following diagnostic steps:

- 1 Check that the cable connecting the CRT to the computer is firmly attached.
- 2 Make sure the **Ctrl + Alt + End** soft switch is set for CRT. If it is, the CRT light is on.
- 3 Check that the monitor is connected to a working power source.
- 4 Look in the problem solving section of the user's manual accompanying the monitor to see if the fault lies with the CRT.
- 5 If the color quality of the RGB monitor is in doubt, run the Diagnostics Test.

If you follow these steps and the problem persists, take the T1100 PLUS and the monitor to your dealer for servicing.

## Diskette Errors

If you insert a diskette into the diskette drive slot and the following message appears when you attempt to access the diskette,



```
Not ready error reading drive A:  
Abort Retry Ignore ?
```

check to make sure the diskette fits firmly into the drive.

If you suspect a diskette you are using is faulty due either to a factory error or damage to the diskette, run the MS-DOS command, CHKDSK. See your MS-DOS Manual for instructions.

## Keyboard Errors

If you are experiencing keyboard problems, take the following diagnostic steps:

- 1 Make sure the software you are using is not 'remapping' the keyboard (see your software user's manual).
- 2 Check that **Num Lock** or the integrated keypad is not accidentally selected. Restart the computer to make sure.
- 3 Run the Diagnostics Test program.

If the problem persists, take the computer to your dealer for servicing.

## LCD Errors

If you encounter problems with the LCD during computer operation, take the following diagnostic steps:

- 1 Check your software user's manual to determine if the software you are using is causing the problem.
- 2 Press **Ctrl + Alt + Home** to make sure the computer is not set for CRT. The CRT light should be off.
- 3 Make sure the contrast dial is properly set.

#### 4 Run the Diagnostic Test.

If the problem persists and you determine it is not due to the software, have the T1100 PLUS serviced.

### **Floppy Link Errors**

If you have installed the Floppy Link and have connected the T1100 PLUS to another computer's diskette drives, take the following diagnostic steps should any problems occur:

- 1 Check that the cable linking the computers is connected properly.
- 2 Make sure the IBM PC, PC/XT or PC AT (or compatible) is turned on.
- 3 Make sure the IBM PC, PC/XT or PC AT (or compatible) is not attempting to access its drives at the same time.
- 4 Make sure the Floppy Link switch is set to Ext.
- 5 Run the Diagnostics Test.

If the problem persists, take both computers to your dealer for servicing.

### **Printer Errors**

If the T1100 PLUS seems to be operating correctly but you are having trouble with the printer, take the following diagnostic steps:

- 1 Make sure the cable linking the computer to the printer is not damaged and is connected properly.
- 2 Check that the printer's power is on.
- 3 Make sure you are selecting the correct printer: a parallel printer must be connected to the parallel port and a serial printer to the serial port. Make sure each end of the cable to the serial printer is connected to the correct port.
- 4 If you are using a parallel printer, make sure the A B PRT switch is set on PRT.

- 5 Make sure the software you are using is configured for the printer you are accessing.
- 6 Refer to your printer user's manual.
- 7 Run the Diagnostic Test.

If the printer still does not work properly, take it to your dealer for servicing.

### Modem Errors

If you encounter problems with the modem, take the following steps:

- 1 Check that the cable linking the telephone plug to the computer is connected to the correct jack. It should be inserted in the 'jack,' plug, not to the 'phone' plug.
- 2 Make sure the card is properly installed in the slot.
- 3 Refer to the Modem Manual for further diagnostics instructions.

If problems persist, take the computer and modem to your dealer for servicing.

### RAM Disk (VDISK) Errors

If you have assigned part of your internal memory to VDISK and it does not work, take the following diagnostic steps:

- 1 Make sure you are booting from an operating disk with the VDISK.SYS program on it and that the CONFIG.SYS file contains the line:



```
device=vdisk.sys
```

See your MS-DOS Manual for information on VDISK.SYS and CONFIG.SYS.

- 2 Make sure you leave enough room in the computer's memory for your programs to run.

- 3 If you suspect a memory problem, run the Diagnostics Test program.

If problems persist, consult your dealer.

## Running the Diagnostics Test Program

The steps listed below take you through the Diagnostics Test program.

Before you begin the Diagnostics Test, remember that should any errors occur during the running of the test, check first to make sure the following are in order:

- All cables are properly connected
- All switches are properly set
- The battery has enough power

The steps below assume drive A, the upper drive, is the current drive and drive B, the lower drive, is the alternate drive.

### Step 1. Loading MS-DOS

Begin the Diagnostics test program by loading MS-DOS into the computer. See Chapter 5, 'Operating the T1100 PLUS,' for instructions on how to load MS-DOS.

### Step 2. Loading the Diagnostic Test Program

At the system prompt, type the word **TEST**. This is the name of the Diagnostics Test program. Press **Enter**. The Diagnostics Test program is loaded into the computer and the diagnostics menu appears on the screen.

If the diagnostics menu does not appear on the screen, the MS-DOS system disk is faulty. Try another MS-DOS system disk. If the diagnostics menu still does not appear, have the computer serviced.

When the Diagnostics Test program is loaded, the following menu appears on the screen:



TOSHIBA personal computer T1100 PLUS DIAGNOSTICS  
version 2.10 (c) Copyright Toshiba Corporation 1986

DIAGNOSTICS MENU :

1-DIAGNOSTIC TEST  
8-SYSTEM CONFIGURATION  
9-EXIT TO MS-DOS

PRESS [0]-[9] KEY

Choose an option based on the type of problem you wish to resolve:

**1-Diagnostic Test**

Choose this option to test the basic components of the computer, LCD and printer.

**8-System Configuration**

Choose this option if you are experiencing computer memory problems or diskette drive problems.

**9-Exit to MS-DOS**

Choose this option to return to the system prompt.

To make a selection, type the number of the option of your choice (1, 8 or 9) and press **Enter**.

### Step 3. System Configuration

When you select the system configuration option, the screen appears as follows:



SYSTEM CONFIGURATION

- \*-XXXXKB MEMORY
- \*-LCD
- \*-2 FLOPPY DISK DRIVE(S)
- \*-1 ASYNC ADAPTER
- \*-0 HARD DISK DRIVE(S)
- \*-1 PRINTER ADAPTER
- \*-0 MATH CO-PROCESSOR

PRESS [ENTER] KEY

**XXXXKB MEMORY**

This test indicates memory size. If the correct memory size (640KB or 256KB) is not displayed, turn the computer off and have the system serviced.

**LCD DISPLAY**

This test indicates whether you are accessing the computer's LCD or an external monitor.

**2 FLOPPY DISK DRIVES**

This test indicates the number of diskette drives accessed by the computer. If two diskette drives are not indicated, turn the computer off and have the system serviced.

**1 ASYNC ADAPTER**

This test indicates an RS-232-C serial port is available. If a serial port is not indicated, turn the computer off and have the system serviced.

**0 HARD DISK DRIVE(S)**

This test indicates whether a fixed disk drive is attached to the computer. If a fixed disk drive is not attached, a 0 should be indicated. If the display is incorrect, turn the computer off and have the system serviced.



**1 PRINTER ADAPTER**

This test indicates a parallel printer port is available. If a parallel port is not indicated, turn the computer off and have the system serviced.

 **0 MATH CO-PROCESSOR**

This test indicates that the system does not have an 8087 coprocessor. If it does not indicate 0, turn the computer off and have the system serviced.

When you complete the system configuration test, press **Enter** to return to the diagnostics menu.

**Step 4. Selecting Diagnostic Test Options**

From the diagnostics menu select the diagnostic test option (1) and press **Enter**. The question



Test the FDD (Y/N)?

is displayed. If you wish to include testing the diskette drives (floppy disk drives) as part of the diagnostics test, type **Y** and press **Enter**. If you do not want to include testing the diskette drives, type **N** and press **Enter**.

**NOTE**

*If you select number 1, be sure you have two blank, formatted diskettes ready to insert in the diskette drives. These diskettes are required to test the drives.*

When you have made your selection, the question:



Test the HDD (Y/N)?

is displayed. If you wish to include testing a fixed disk (hard disk drive) as part of the diagnostics test, type **Y** and press **Enter**. If you do

not want to include testing a fixed disk, type **N** and press **Enter**.  
The question



Test the printer (Y/N)?

is displayed. If you wish to include testing the printer as part of the diagnostics test, type **Y** and press **Enter**. If you do not want to include testing a printer, type **N** and press **Enter**.

If you choose to test the printer, the following question appears:



Compatible with IBM printer (1:Yes/2:No)?

If the printer you wish to test is IBM compatible, type the number **1** and press **Enter**. If the printer you wish to test is not IBM compatible, type the number **2** and press **Enter**.

The IBM compatible printer test prints characters understood only by IBM compatible printers. If the printer you are using is not IBM compatible, the characters printed will be garbled.

The non-IBM compatible printer test can be used with any printer, even an IBM compatible printer

#### **NOTE**

*If you own a Toshiba printer with dual emulation, you may use either printer test. However, the IBM compatible printer test does not automatically switch your Toshiba printer to compatibility mode. Refer to your Toshiba printer manual for instructions on how to switch compatibility modes.*

The diagnostics tests are automatically carried out in the following order:

- 1 System test
- 2 Memory test
- 3 Display test
- 4 FDD (diskette drive) test
- 5 HDD (fixed disk drive) test
- 6 Printer test

### Step 5. System and Memory Testing

After you have chosen whether or not to test the printer, the screen displays the message:



TEST NAME IN PROGRESS XXXXXX

The system test and memory test are automatically conducted during a period of approximately 40 seconds.

If an error is detected during testing, the test stops and an error message is displayed on the screen. Write down exactly what you see on the screen and press any key to return to the diagnostics menu. Turn the computer off and take it to your dealer for servicing. Show him or her the messages you wrote down.

**Note**

*You may not see the words 'System Test' appear on the screen. However, the system test does take place. If there is a problem, an error message appears.*



If you are testing a monochrome CRT, check the troubleshooting section of the CRT user's manual to determine if the fault lies with the monitor. If you cannot resolve the problem, have the CRT and T1100 PLUS serviced.

The columns displayed below the characters test an RGB monitor. The first column shows background color, the middle column shows foreground color and the last column shows intensified color. The first two columns should be of equal intensity, while the last column should be brighter on a CRT.

**Note**

*Yellow may appear brown in the two left columns.*

If any of the colors displayed are incorrect, check the troubleshooting section of the monitor's user's manual to determine if the fault lies with the monitor. If you cannot resolve the problem, have the monitor and T1100 PLUS serviced.

If all the character attributes displayed are correct, press **Enter** to go to the next step of the Diagnostic Test.

## Step 7 . Testing Character Sets

Two character set modes are tested: 40 x 25 and 80 x 25. The 40 x 25 mode is tested first.

A set of characters is displayed on the screen. Make sure all the characters are correct before pressing **Enter** to move on to the next test.

The second character set test displays characters in the 80 x 25 mode. Make sure all the characters are correct before pressing **Enter** to move to the next test.

If characters displayed during either test are garbled, take the computer in for servicing.

## Step 8. Testing the Graphics Display

Two graphics modes are tested: 320 x 200 and 640 x 200.

The 320 x 200 mode is tested first, followed by the 640 x 200 graphics mode. If problems occur, have the system serviced.

### **Note**

*On most RGB monitors the two areas on the left of the screen are gray. No vertical lines appear as on an LCD.*

Press **Enter** following successful completion of the graphics test. If problems occur, have the system serviced.

## Step 9 . Testing Diskette Drives

If you did not choose the FDD (floppy diskette drive) test option, this test does not run and the test designated next begins.

If you chose the FDD test option, the system automatically begins the next phase. This test determines if a problem you are experiencing lies with a diskette drive. The screen appears as follows:



```
FLOPPY DISK                50300
Mount work disk(s) on drive(s),
then press [ENTER] key.
```

```
[Warning : The contents of disk(s)
will be destroyed]
```

Remove the MS-DOS operating system diskette and insert blank formatted diskettes into both drive A and drive B.

If you are testing an external 5 1/4" drive, put a blank diskette in the 5 1/4" drive. Make sure the A B PRT switch is on A or B and the external drive's power is on.

**Note**

*The diskettes must be formatted for the T1100 PLUS before they can be used in this test.*

*If you do not have a blank diskette or do not want to proceed with this test, put in a write protected diskette or leave the drive empty. The test soon aborts. Press any key to return to the diagnostics menu.*

When the diskettes are loaded, press **Enter**. The test begins and the screen displays the message:



FLOPPY DISK      IN PROGRESS      XXXXXX

The computer alternates access to each drive.

If an error message appears on the screen, or the test aborts, take the following steps:

- 1 Check to see if the diskettes are write protected. If they are, the test aborts.
- 2 Make sure the diskettes are properly formatted. Reformat them and try the test again.
- 3 Check to see if a diskette drive is empty. If one is, the test aborts.
- 4 If there is still an error message, run the test with several other diskettes to determine if the fault is with the diskette. If the error message persists, have the T1100 PLUS serviced. If the error message appears only when a certain diskette is tested, the diskette is faulty.

## Step 10. Testing the Hard (Fixed) Disk Drive

If you did not choose the HDD (hard disk drive) test option at the beginning of the diagnostics test program, this test does not run and the test designated next begins.

If you chose the HDD test option, the system automatically begins the next phase. This test determines if a problem you are experiencing lies with a fixed disk connected to the T1100 PLUS through the expansion chassis.

The following message appears on the screen:



HARD DISK IN PROGRESS XXXXXX

If the hard disk drive test does not run or an error message appears, write down any messages displayed and take the computer, expansion chassis and fixed disk for servicing.

## Step 11. Testing the Printer

If you did not choose the printer test option at the beginning of the diagnostics test program, the diagnostics menu appears on the screen.

If you choose the printer test option, the following message appears on the screen:



PRINTER TEST IN PROGRESS XXXXXX

If the print test does not run or an error message is displayed, take the following diagnostic steps:

- 1 Check that the printer's power cord is connected to a working wall outlet.
- 2 Make sure the printer's power switch is turned on.
- 3 Check that the printer's cable is properly connected.



- 4 Make sure the printer's ribbon, paper feeding mechanism and control switches are set up properly. (See your printer user's manual for instructions on solving printer problems.) When you are satisfied the printer is properly set up, turn it off, back on again and repeat the test.
- 5 Make sure you did not choose the IBM-compatible test for a non-IBM compatible printer.

If the problems persist after running the print test, write down any error messages and consult your dealer.

When the test is successfully completed, the diagnostics menu appears on the screen. You are now finished with the Diagnostics Test program. Choose the 'Exit to MS-DOS' option by typing the number **9** and pressing **Enter**.

## Stopping the Diagnostics Test Program

To stop the diagnostics test at any time, take the following steps:

- 1 Press **Ctrl + Break**.
- 2 When the diagnostics menu appears, select the 'Exit to MS-DOS' option by typing the number **9** and pressing **Enter**.
- 3 The system prompt appears on the screen.



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# Appendix A

## THE CHAD COMMAND

CHAD (CHAnge Display) is an external command. It allows you to change the way color-on-color and color-on-black screen attribute combinations are shown on the LCD.

Although most software works very well on the T1100 PLUS without any modifications, some packages may need to be configured to adapt to the LCD. Use the CHAD command to make the necessary adjustments.

### **NOTE**

*Before using the CHAD command, see your software user's manual for instructions on how to make screen adjustments through the software.*

*If the software you are using operates in graphics mode, CHAD will not work.*

Changes made to screen attributes using CHAD are not permanent unless you store them in the computer's memory. The following instructions tell you how to change screen attributes and how to make the changes permanent.

### **Changing Screen Attributes**

There are two ways to change screen attributes using CHAD: through the CHAD menu and by using the CHAD command.

Use the CHAD menu to experiment with changing screen attributes. Once you decide on the parameters you need, use the CHAD command to enter them if you do not permanently store the changes in memory. You can also use the CHAD command to store them in memory if you wish to make the changes permanent.

## Using the CHAD Menu

Take the following steps to make screen attribute changes using the CHAD menu:

- 1 Load MS-DOS into the computer.
- 2 At the system prompt type:

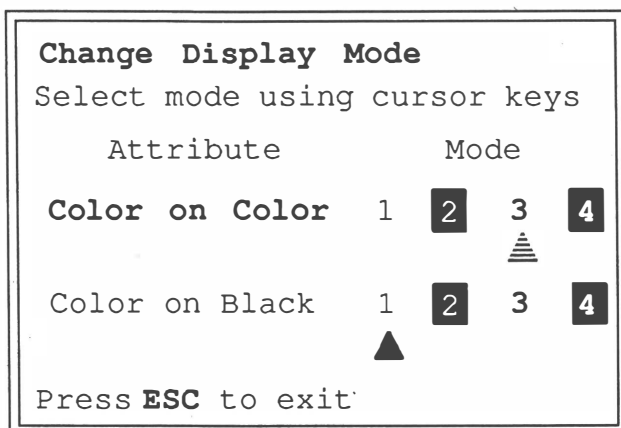
### CHAD

and press **Enter**. CHAD is loaded into memory, the screen displays the message:

```
CHAD installed
```

followed by the system prompt.

- 3 Load your software into the computer.
- 4 Press the **Sys Req** key. The Change Display Mode menu appears on the right side of the LCD. (You can change the position of the menu if you wish by pressing **Scroll Lock** and the arrow keys.)



**NOTE**

*If the computer beeps instead of displaying the CHAD menu, your software is in one of the graphics modes. CHAD has no effect on graphics displays and cannot be activated from a graphics mode.*

- 5 Find the triangles. Each triangle is located below a number in the Mode column. The positions of the triangles indicate the current screen attribute settings.
- 6 Using the arrow keys, move each triangle to select color attribute combinations. Experiment with different combinations until you find one you want.

The numbers in the Mode column have the following meanings:

- 1 Normal (two rows of black dots on a white background)
- 2 Reverse (two rows of white dots on a black background)
- 3 Intense (a single row of black dots on a white background)
- 4 Intense reverse (a single row of white dots on a black background)

**NOTE**

*You can change normal character display using **Ctrl+Alt+ →**. See the section entitled 'Selecting Character Display' in Chapter 5 for more information.*

Use the Color on Color line to select attributes for characters your software normally displays using a combination of foreground and background colors (for example green on red or blue on white).

Use the Color on Black line to select attributes for characters your software normally displays using any color on black.

- 5 Press **Esc** to make the CHAD menu disappear after you have defined the display modes.

## Using the CHAD Command

When you have decided on the color modes you need, you can change configuration values directly through the CHAD command.

The syntax of the CHAD command is:

CHAD c,b,W

where **c** is the number of the display mode you wish to use for Color on Color and **b** is the number of the display mode you wish to use for Color on Black. **W** is optional. If you add a **W** to the command, the changes become permanent.

Before you begin, note the following points:

- Always enter the value for color on color first, followed by the value for color on black.
- You must enter a value for the color on color line and the color on black line.
- Separate each value with a comma (c,b).
- W** is optional. If you want the values written into memory to be used each time the system is started, enter a **W**.

Note the following examples.

To set both Color on Color and Color on Black to reverse display, at the system prompt type:

CHAD 2,2

and press **Enter**.

To set Color on Color to normal and Color on Black to intensified reverse, at the system prompt type:



**CHAD 1,4**

and press **Enter**.

### **Making Changes Permanent**

To make the changes permanent, add a **W** after entering the value parameters. For example:



**CHAD 1,3,W**

sets the display mode for Color on Color to normal, the display mode for Color on Black to intensified normal and writes the changes into the computer's memory. Each time the system is started, these values are used to define CHAD settings.





# Appendix B

## ASCII CHARACTER CODES

DEC CODE	HEX CODE	CHAR	SORT SEQ	CTRL CHAR
000	00		0	NUL
001	01	SOH	1	SOH
002	02	STX	2	STX
003	03	ETX	3	ETX
004	04	EOT	4	EOT
005	05	ENQ	5	ENQ
006	06	ACK	6	ACK
007	07	BEL	7	BEL
008	08	BS	8	BS
009	09	HT	9	HT
010	0A	LF	10	LF
011	0B	VT	11	VT
012	0C	FF	12	FF
013	0D	CR	13	CR
014	0E	SO	14	SO
015	0F	SI	15	SI
016	10	DLE	16	DLE
017	11	DC1	17	DC1
018	12	DC2	18	DC2
019	13	DC3	19	DC3
020	14	DC4	20	DC4
021	15	NAK	21	NAK
022	16	SYN	22	SYN
023	17	ETB	23	ETB
024	18	CAN	24	CAN
025	19	EM	25	EM
026	1A	SUB	26	SUB
027	1B	ESC	27	ESC
028	1C	FS	28	FS
029	1D	GS	29	GS
030	1E	RS	30	RS
031	1F	US	31	US

# ASCII CHARACTER CODES/Appendix B

DEC CODE	HEX CODE	CHAR	SORT SEQ	DEC CODE	HEX CODE	CHAR	SORT SEQ
032 <sup>(1)</sup>	20	SP	32	064	40	@	64
033	21	!	33	065	41	A	65
034	22	"	34	066	42	B	66
035	23	#	35	067	43	C	67
036	24	\$	36	068	44	D	68
037	25	%	37	069	45	E	69
038	26	&	38	070	46	F	70
039 <sup>(2)</sup>	27	'	39	071	47	G	71
040	28	(	40	072	48	H	72
041	29	)	41	073	49	I	73
042	2A	*	42	074	4A	J	74
043	2B	+	43	075	4B	K	75
044 <sup>(3)</sup>	2C	,	44	076	4C	L	76
045	2D	-	45	077	4D	M	77
046	2E	.	46	078	4E	N	78
047	2F	/	47	079	4F	O	79
048	30	0	48	080	50	P	80
049	31	1	49	081	51	Q	81
050	32	2	50	082	52	R	82
051	33	3	51	083	53	S	83
052	34	4	52	084	54	T	84
053	35	5	53	085	55	U	85
054	36	6	54	086	56	V	86
055	37	7	55	087	57	W	87
056	38	8	56	088	58	X	88
057	39	9	57	089	59	Y	89
058	3A	:	58	090	5A	Z	90
059	3B	;	59	091	5B	[	91
060	3C	<	60	092	5C	\	92
061	3D	=	61	093	5D	]	93
062	3E	>	62	094 <sup>(4)</sup>	5E	^	94
063	3F	?	63	095 <sup>(5)</sup>	5F	_	95

# Appendix B/ASCII CHARACTER CODES

DEC CODE	HEX CODE	CHAR	SORT SEQ	DEC CODE	HEX CODE	CHAR	SORT SEQ
096 <sup>(6)</sup>	60	'	96	128	80	ÿ	67
097	61	a	97	129	81	ü	85
098	62	b	98	130	82	û	69
099	63	c	99	131	83	ù	65
100	64	d	100	132	84	ú	65
101	65	e	101	133	85	û	65
102	66	f	102	134	86	ü	65
103	67	g	103	135	87	ù	67
104	68	h	104	136	88	ú	69
105	69	i	105	137	89	ë	69
106	6A	j	106	138	8A	è	69
107	6B	k	107	139	8B	í	73
108	6C	l	108	140	8C	î	73
109	6D	m	109	141	8D	ï	73
110	6E	n	110	142	8E	ä	65
111	6F	o	111	143	8F	å	65
112	70	p	112	144	90	é	69
113	71	q	113	145	91	ê	65
114	72	r	114	146	92	ë	65
115	73	s	115	147	93	ö	79
116	74	t	116	148	94	ó	79
117	75	u	117	149	95	ô	79
118	76	v	118	150	96	õ	85
119	77	w	119	151	97	ö	85
120	78	x	120	152	98	ù	89
121	79	y	121	153	99	ú	79
122	7A	z	122	154	9A	û	85
123	7B	{	123	155	9B	ü	36
124	7C	}	124	156	9C	ý	36
125 <sup>(7)</sup>	7D	~	125	157	9D	ÿ	36
126	7E	¸	126	158	9E	ÿ	36
127 <sup>(8)</sup>	7F	¸	127	159	9F	ÿ	36

DEC CODE	HEX CODE	CHAR	SORT SEQ	DEC CODE	HEX CODE	CHAR	SORT SEQ
160	A0	┌	65	192	C0	┐	
161	A1	┐	73	193	C1	┌	
162	A2	┌	79	194	C2	┐	
163	A3	┐	85	195	C3	┌	
164	A4	┌	78	196	C4	┐	
165	A5	┐	78	197	C5	┌	
166	A6	┐	166	198	C6	┌	
167	A7	┐	167	199	C7	┌	
168	A8	┐	63	200	C8	┌	
169	A9	┐	169	201	C9	┌	
170	AA	┐	170	202	CA	┌	
171	AB	┐	171	203	CB	┌	
172	AC	┐	172	204	CC	┌	
173	AD	┐	33	205	CD	┌	
174	AE	┐	34	206	CE	┌	
175	AF	┐	34	207	CF	┌	
176	B0	┐		208	D0	┌	
177	B1	┐		209	D1	┌	
178	B2	┐		210	D2	┌	
179	B3	┐		211	D3	┌	
180	B4	┐		212	D4	┌	
181	B5	┐		213	D5	┌	
182	B6	┐		214	D6	┌	
183	B7	┐		215	D7	┌	
184	B8	┐		216	D8	┌	
185	B9	┐		217	D9	┌	
186	BA	┐		218	DA	┌	
187	BB	┐		219	DB	┌	
188	BC	┐		220	DC	┌	
189	BD	┐		221	DD	┌	
190	BE	┐		222	DE	┌	
191	BF	┐		223	DF	┌	

DEC CODE	HEX CODE	CHAR	SORT SEQ
224	E0	Ⓐ	
225	E1	Ⓑ	83
226	E2	Ⓒ	
227	E3	Ⓓ	
228	E4	Ⓔ	
229	E5	Ⓕ	
230	E6	Ⓖ	
231	E7	Ⓗ	
232	E8	Ⓘ	
233	E9	Ⓚ	
234	EA	Ⓛ	
235	EB	Ⓜ	
236	EC	Ⓝ	
237	ED	Ⓞ	
238	EE	Ⓟ	
239	EF	Ⓠ	
240	F0	≡	
241	F1	Ⓡ	
242	F2	Ⓢ	
243	F3	Ⓣ	
244	F4	↵	
245	F5	↩	
246	F6	Ⓛ	
247	F7	Ⓜ	
248	F8	Ⓝ	
249	F9	Ⓞ	
250	FA	Ⓟ	
251	FB	Ⓠ	
252	FC	Ⓡ	
253	FD	Ⓢ	
254	FE	Ⓣ	
255	FF	Ⓤ	



# GLOSSARY

## A

**AC:** Alternating Current

**allocate:** Assignment of space or function for a specific task.

**alphanumeric:** Consisting of letters, numbers and other symbols, such as punctuation marks or mathematical symbols. Reference is to the keyboard characters and character set available for the various data transfer operations of the computer; for example, as in word processing.

**antistatic:** A material, such as packing material, which is treated to prevent the build-up of static electricity. The static charge is dissipated as it accumulates, which prevents build-up and subsequent discharge.

**ASCII:** Acronym for American Standard Code for Information Interchange. This code consists of binary numbers and decimal numbers which correspond to characters on the keyboard. For example, the letter 'A' has a binary number of 01000001 that has a decimal equivalent number of 65. ASCII codes are used for information interchange between different kinds of computer equipment. When the computer sends the binary code to the printer, it prints the corresponding letter.

**asynchronous:** Lacking regular time relationship. As applied to computer communications, asynchronous refers to the method of transmitting data that does not require a steady stream of bits to be transmitted at regular time intervals.



**B**

**backup:** A duplicate copy of files on a floppy disk kept as a spare in case the original is destroyed.

**baud** (*baud rate*): Rate of character transmission speed over asynchronous communication devices such as printers, terminals and MODEMs. In standard usage, one baud is equivalent to one bit per second. It is named for Emil Baudot, a pioneer in printing telegraphy.

**binary:** The base two number system composed of zeros or ones (on or off), used by most digital computers. The farthest right digit of a binary number has a value of 1, the next a value of 2, then 4, 8, 16, and so on. For example, a binary number 101 has a value of 5 (see ASCII).

**bit:** A contraction of BInary digiT, the basic unit of information used by the computer. It is either zero or one. Eight bits equal one byte (see byte).

**board:** A systematic arrangement of electronic components, such as chips, attached to a board for performing some function or for increasing current capabilities of the system. A board is typically plugged into the computer on the motherboard.

**boot:** Short for 'bootstrap.' A bootstrap program allows a computer to be placed in a desired state by means of its own actions. For example, the computer is readied for use by a bootstrap program that issues a few instructions sufficient to bring the rest of the program into the computer.

**buffer:** The portion of the computer's memory where data is temporarily stored. A buffer is temporary memory, in that the computer 'forgets' everything in the buffer when the power is turned off. See RAM.

**byte:** The representation of a single character. A sequence of eight bits treated as single unit; also the smallest addressable unit within the system.

## C

**capacity:** Amount of data that can be stored on a magnetic storage device such as a floppy disk. It is usually described in terms of K bytes, where one K = 1024 bytes.

**card:** Synonym for board.

**Centronics:** The name of the printer manufacturer whose method of data transmission between a parallel printer and a computer has become an industry standard.

**character:** Synonym for byte.

**chip:** A small semiconductor containing computer logic and circuitry for processing, memory and input/output functions. Chips are soldered on a printed circuit board to form the microcomputer.

**cold start:** Starting a computer that is currently off.

**commands:** Instructions entered by the user at the terminal keyboard to direct the actions of the computer.

**compatibility:** The ability of one computer to accept and process data by another computer without modifying the data or the media upon which it is being transferred.

**component:** Elements of parts (of a system) which serve to constitute the whole (system).

**computer program:** A set of instructions written for a computer that enable it to achieve a desired result.

**computer system:** A combination of hardware, software, firmware and peripheral components, which has been assembled to satisfy a particular goal or set of goals.

**configuration:** The arrangement of a group of devices (such as terminals, printers, disk drives, etc) connected to a computer that is programmed to operate them as a single system.

**control keys:** Key or sequence of keys entered at the keyboard to initiate a particular function within a program.

**CPU (*Central Process Unit*):** The 'brain' of the computer where instructions and data are interpreted and executed.

**CRT (*Cathode Ray Tube*):** A vacuum tube in which beams projected on a fluorescent screen produce luminous spots. An example is the television set.

**CTS (*Clear to Send*):** An RS232C signal used in the exchange of data between the computer and the printer.

**cursor:** Indicates position on the terminal screen. Usually a small, blinking rectangle or line.

## D

**data:** Information which is factual, measurable or statistical and which is ordered or formatted to be computer processed or stored/retrieved.

**DC:** Direct Current.

**DCE (*Data Communication Equipment*):** DCE and DTE indicate whether the specific equipment transmits on pin 3 and receives on pin 2 (DCE) or transmits on pin 2 and receives on pin 3 (DTE).

**default:** The parameter value automatically selected by the processor in the absence of any instructions.

**delete:** Complete removal of data from a disk or other data storage device. Synonymous with erase.

**disk:** See floppy disk.

**disk drive:** The mechanism designed to rotate a magnetic disk at high speed past a read-write head.

**disk storage:** Storing data on magnetic disk. Data is arranged on concentric tracks much like a phonograph record.

**display:** A CRT or LCD used as a computer output device.

**documentation:** In the present context, the set of manuals and/or other instructions written for the users of the computer system. Computer system documentation typically includes procedural and tutorial information as well as system/subsystem/component functional and performance specifications.

**driver:** A software program that controls the link between a computer and a peripheral device.

**DSR (*Data Set Ready*):** An RS232C signal used in the exchange of data between the computer and the printer.

**DTE (*Data Terminal Equipment*):** DTE and DCE indicate whether the specific equipment transmits on pin 2 and receives on pin 3 (DTE) or transmits on pin 3 and receives on pin 2 (DCE).

**DTR (*Data Terminal Ready*):** An RS232C signal used in the exchange of data between the computer and the printer.

**E**

**echo:** A portion of a transmitted signal is returned to the sending device. Also, when a computer receives back a portion of a signal it has just transmitted to a CRT (or other peripheral device) and then retransmits the data to the printer, the printer is said to 'echo' the CRT.

**emulation:** A technique, using software, in which one computer terminal is made to behave exactly like another computer terminal.

**erase:** See delete.

**execute:** The process of entering a command that the computer can successfully perform or carry out.

**F**

**file:** A single, named collection of data, such as a manuscript or a list of addresses, that can be recalled by the computer.

**firmware:** A set of instructions built into the hardware which controls and directs a microprocessor's activities.

**floppy disk:** A small, flexible disk that stores magnetically encoded data used on a microcomputer.

**format:** The process of readying a blank floppy disk for its first use. Formatting establishes the structure of a floppy disk that the operating system expects before it writes files or programs onto the disk.

**function keys:** The keys labeled F1 through F10 on the T1100 that tell the computer to perform certain functions.

**G**

**GA (*Gate Array*):** A single chip containing a large number of circuits (gates) in a matrix (array). This chip can replace a large number of separate circuit chips.

**GND (*Ground*):** An RS232C signal used in the exchange of data between the computer and the printer.

**graphics:** 1) Information presented as drawings, pictures or other images, such as charts or graphs. 2) A term sometimes used to refer to the display itself.

**H**

**handshake:** The series of signals between a computer and another peripheral device (for example a printer) that establishes the parameters required for passing data.

**hardware:** The physical electronic and mechanical components of a computer system: typically, the T1100 itself, external disk drives, etc. Contrast: software, firmware.

**I**

**input:** Data entered into the computer to be processed from the keyboard, or the transfer of data from external storage to internal storage devices.

**interface:** 1) Hardware and/or software components of a system used specifically to connect one system or device to another. 2) To physically connect one system or device to another so that information can be exchanged. 3) The point of contact between operator and machine, for example, the keyboard.

**I/O:** The symbolic notation for Input/Output. Refers to acceptance and transfer of data to and from a computer.

**I/O devices:** Devices used to communicate with the computer and transfer data to and from it.

**instruction:** Statement in a computer program specifying a particular function or task to be performed.

**K**

**K:** Taken from the Greek word kilo, meaning 1000; usually equivalent to 1024, or 2 raised to the 10th power (see byte).

**KB:** Kilobyte, 1024 bytes.

**keyboard:** An input device containing switches which are activated by manually pressing marked keys. Each keystroke activates a switch which transmits a specific code to the computer. For each key, the transmitted code is, in turn, representative of the (ASCII) character marked on the key.

**kilobyte:** See KB.

**L**

**LCD:** See liquid crystal display.

**liquid crystal display:** The screen on which data from the T1100 is shown. It consists of a thin nematic layer of liquid crystal pressed between two glass plates.

**M**

**menu:** A list of options which appears on the screen, along with an invitation to make a selection.

**main board:** See motherboard.

**microprocessor:** A hardware component contained in a single integrated circuit which carries out instructions.

**mode:** A method of operation, for example, the binary mode or the alphanumeric mode. Also, the value of an item occurring most frequently in a series of statistical data.

**modem:** A device that converts (MODulates) digital data for transmission over telephone lines and then converts modulated data (DEmodulates) to digital format when received.

**monitor:** Synonymous with CRT.

**motherboard:** A name sometimes used to refer to the main hardware (printed circuit) board in the processing equipment. It contains integrated circuits for performing various functions as well as additional connectors for adding other PC boards, such as interface boards. These latter provide the capabilities for hooking up peripheral equipment, and for expanding existing capabilities.

**O**

**OCR wand (*Optical Character Reader*):** A device that reads hand written or machine printed symbols into a computer.

**operating system:** The computer system software that facilitates operating and using a computer for the creation of programs and data files and controlling the transmission and receipt (input/output) of data to and from peripheral devices connected to the computer. The T1100 uses the MS-DOS operating system.

**operating system disk:** The disk containing the operating system.

**output:** The results of a computer operation. Commonly used to indicate data on printed paper, on a terminal or stored on some magnetic media.

## P

**parallel:** In computer terminology, usually refers to two or more processes or events which can occur simultaneously, and without interfering with each other. Contrast: serial.

**parallel interface:** Refers to a type of information exchange capability available at the connection point with the system, for example, on the motherboard or back panel. Specifically, the reference is to a capability to exchange more than one bit of information at a time. Contrast: serial interface.

**parity:** The symmetrical relationship between two parameter values (integers) both of which are either on or off; odd or even; 0 or 1.

**pel:** See pixel.

**peripheral device:** An I/O device which is external to the central processor and/or main memory. The device is connected to the processor or memory via an interface device or card (PC board).

**pixel:** A picture element. The smallest dot that can be made on a display or printer.

**Printed Circuit Board:** A hardware component of a processor to which integrated circuits and other components are attached. The board itself is typically flat and rectangular, and constructed of fiberglass, to form the attachment surface.

**printer:** Computer controlled/assisted printing device with information storage capabilities. The information storage allows for printing large amounts of information without human intervention.

**PROM (*Programmable Read Only Memory*):** A memory chip that can be written on only once, usually by a computer equipment manufacturer.

**prompt:** An audible or visible signal to the system user that some process is complete or some user action is required. Also used to signify a need for further input and/or location of needed input.

**protocol:** A collection of rules and conventions used for the orderly transfer of information between devices.

## R

**Radio Frequency Interference Shield (RFI):** A metal shield enclosing the printed circuit boards of the printer to prevent radio and TV interference.

**RAM (Random Access Memory):** High speed memory locations within the computer circuitry itself.

**RD (Receive Data):** An RS232C signal used in the exchange of data between the computer and the printer.

**RFI (Radio Frequency Interference):** All computer equipment generates radio frequency signals. The FCC regulates the amount of RFI a computing device can 'leak' past its shielding. A Class A device is sufficient for office use. Class B is a more stringent classification for home equipment use. The T1100 complies with Class B computing device regulations.

**ROM (Read Only Memory):** A memory chip manufactured to contain certain information.

**RS232C:** The Electronic Industries Association (EIA) interface standard that describes control, data and status signals for cable connectors mating with computers, printers, communications and other peripheral devices.

**RTS (Request to Send):** An RS232C signal used in the exchange of data between the computer and the printer.

## S

**SD (Send Data):** An RS232C signal used in the exchange of data between the computer and the printer.

**serial interface:** An interface between systems or system components in which information is transmitted sequentially, one unit at a time. In computer systems with serial interface the transmission rate is one bit at a time. Contrast: Parallel interface.

**SIO (Serial Input / Output):** The electronic methodology used in serial data transmission.

**software:** The set of programs, procedures and related documentation associated with a computer system. Specifically refers to computer programs, which direct and control the computer system's activities. Contrast: hardware

**stop bit:** One or more bits of a byte that follow the transmitted character group codes in asynchronous serial communications.

**system disk:** See operating system disk.



## T

**terminal:** A typewriter-like keyboard and CRT display screen connected to the computer for input/output of data.

**toggle switch:** A switch in the form of a projecting lever whose movement through a small arc opens or closes an electric circuit. Also, any control that acts like a toggle switch, switching from one mode to another and back.

## V

**virtual RAM disk (*VDISK*):** Part of the T1100's Random Access Memory assigned to simulate a disk.

## W

**warm start:** Restarting or resetting a computer without turning it off.

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