

1.1 T100X Features

The Toshiba T100X is one of the lightest and most advanced pen computers available. Utilizing advanced technology and high-speed components, the T100X offers excellent display legibility and battery operation.

The T100X system unit includes the following features:

Microprocessor

The Am386SXLV-25 microprocessor operates at 25 MHz, 3.3 Volts. The microprocessor speed can be changed between 25 MHz and 12.5 MHz in the Setup Program. It also runs at 6.25 MHz in sleep mode.

Disk storage

Internal 1.8-inch 40 Megabyte (MB) Hard Disk Drive (HDD) with an average access time of 18 milliseconds.

Memory

The T100X comes standard with 4 MB of CMOS Random Access Memory (RAM) 3.3 Volts.

Display system

Consists of a Liquid Crystal Display (LCD) and tablet.

The high-resolution, 9.5-inch Super Twist Nematic (STN) monochrome LCD displays 640 x 480 pixels with a 16-level gray scale. The electromagnetic derivative tablet is the internal digitizer, which acts as the interface between the stylus and the computer.

The T100X internal display controller supports Video Graphics Adapter (VGA) functions on the internal display device.

Batteries

Three different batteries: a main battery, a backup battery, and a Real Time Clock (RTC) battery.

PC card slots

Two PC card slots, which support Personal Computer Memory Card International Association (PCMCIA) standard cards. These slots enable you to install an MiNC Toshiba modem card or other industry-standard card.

PRT port

A Centronics-compatible parallel interface port that can be used to connect a Centronics-compatible printer through a parallel printer cable.

COMMS port

A 9-pin serial interface port.

KB port

A 6-pin keyboard (KB) port that can be connected to an IBM PS/2 keyboard.

Memory card slot

A Toshiba optional memory card slot, which enables you to install a Toshiba optional memory card.

Stylus

A cordless stylus (pen) 2.6 V, which is used to enter information into the computer. The stylus holds four batteries.

FDD port

An FDD port for an optional external 3.5-inch Floppy Disk Drive (FDD), which supports 2HD floppy disks (1.44 Mbytes) and 2DD floppy disks (720 Kbytes).

The T100X Pen Computer is shown in Figure 1-1, and its system configuration in Figure 1-2.

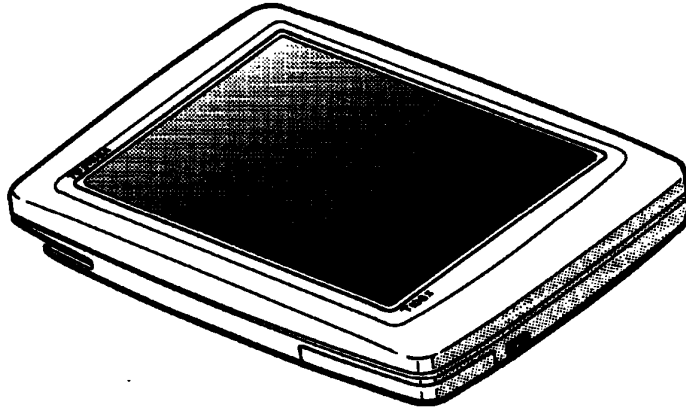


Figure 1-1 T100X Pen Computer

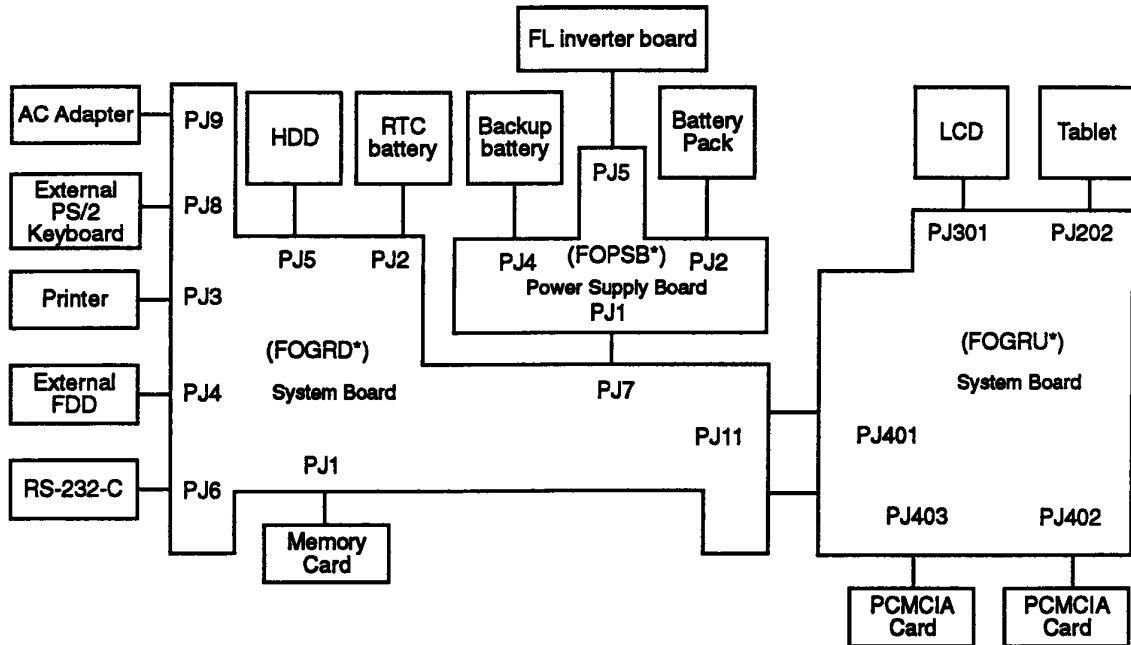


Figure 1-2 T100X System Unit Configuration

1.2 System Unit Block Diagram

Figure 1-3 is a block diagram of the T100X system unit.

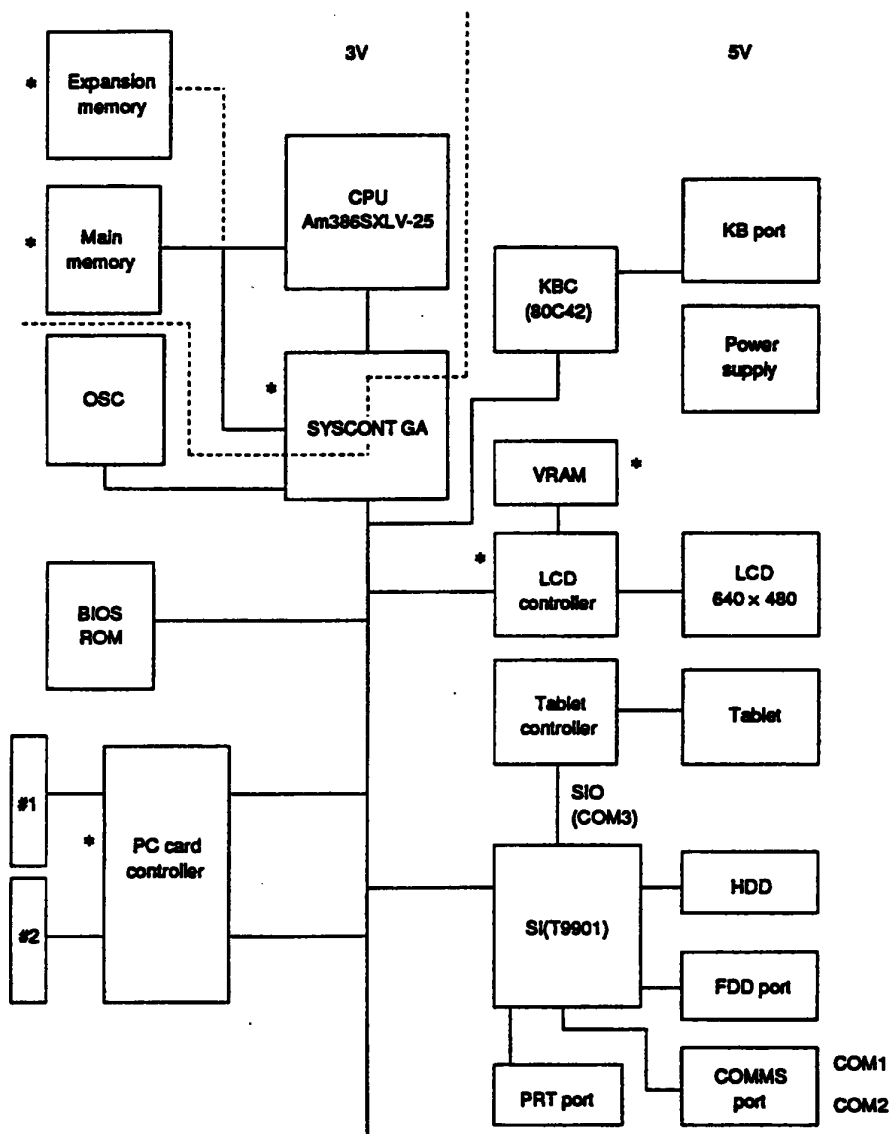


Figure 1-3 Block Diagram

* When the system is turned off, power is supplied to these components in Resume mode.

The T100X system board is composed of two PCB boards (FOGRD* and FOGRU*) connected by a flexible cable. The boards contain the following major components:

FOGRD*

CPU Am386SXLV-25 (32-bit microprocessor, 3.3 volt operation)

- High speed: 25 MHz
- Low speed: 12.5 MHz
- Sleep mode: 6.25 MHz

Standard memory 4 MB

- Eight 256K X 16 bit chips
- Self refresh function
- 3.3 volt operation
- 16-bit data width
- Wait state 0
- Access speed is 80 ns.

BIOS ROM 128 KB (96 KB are used.)

- One 128 K X 8 bit chip
- Flash EEPROM
- 8-bit data width
- Access speed is 80 ns.
- Can be copied to RAM.
 - System BIOS: 64 KB
 - Video BIOS: 32 KB

- Initial reliability test program includes system BIOS.

Video RAM 256 KB

- Two 64 K X 16 bit chips
- 16-bit data width
- Access speed is 80 ns.

Backup RAM 32 KB

Backup RAM is not installed on the system board, instead it occupies an area in standard memory assigned to BIOS RAM. A total of 128 KB is assigned to BIOS RAM, but it uses only 96 KB. The remaining 32 KB are used by Backup RAM.

System controller gate array SYSCNT-GA

Super integration (SI) T9901 chip contains the following components:

- Two Direct Memory Access Controllers (DMAC): 82C37
- Two Programmable Interrupt Controllers (PIC): 82C59
- One Programmable Interval Timer (PIT): 82C54
- One Floppy Disk Controller (FDC): TC8565
- Two Serial Input/Output Controllers (SIO): TC8570
- One Variable Frequency Oscillator (VFO): TC8568

- ❑ Video controller: WD90C23
Controls the internal LCD and supports VGA functions.
- ❑ A Keyboard Controller (KBC): 80C42
Controls the KB port. It uses serial data transfer to the external keyboard.
- ❑ A Real Time Clock (RTC): MC156818B
Stores the calendar, clock and setup values.
- ❑ Oscillator
 - X9 25.175 MHz for Clock Generator 2
 - X11 32.768 KHz for RTC
 - X12 14.31818 MHz for Clock Generator 1
- ❑ Clock Generators 1 and 2
 - Clock Generator 1 receives 14.31818 MHz from oscillator (X12), and generates the following frequencies:
 - 24.0 MHz for VFO, FDC
 - 14.745 MHz for SIO
 - 50.0 MHz for SYSCNT-GA (CPU I/O bus)
 - 14.31818 MHz for KBC
 - Clock Generator 2 receives 25.175 MHz from oscillator (X9) and generates the following frequencies:
 - 28.322 MHz for video controller
 - 44.9 MHz for video controller
- ❑ Jumper
W1 and W2 control the FDD media mode. They should be set as follows:
 - W1: Closed
 - W2: Open
- ❑ Fuses
F1, F2, F3 and F4 control 5 volt and 3.3/5 volt operation.

	F2, F4	F1, F3
5 volt operation	Closed	Open
3.3/5 volt operation	Open	Closed

FOGRU*

- ❑ PC card controller gate array PCCNT-GA
 - Controls PC card slots 1 and 2.
- ❑ Tablet controller 87C51
Controls the tablet through serial interface (COM3).
- ❑ Oscillator
 - X201 for the tablet controller
- ❑ Fuses
 - F201 for tablet
 - F202 for LCD

1.3 1.8-inch Hard Disk Drive

The T100X's 40-MB (formatted) Hard Disk Drive (HDD) is a random access, non-volatile storage device. It has a non-removable 1.8-inch magnetic disk and mini-winchester type magnetic heads.

The T100X HDD is shown in Figure 1-4, and its specifications are described in Table 1-1.

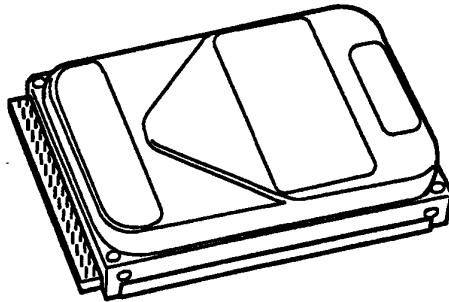


Figure 1-4 1.8-inch HDD

Table 1-1 1.8-inch HDD Specifications

Item	40 MB (1842)
Storage capacity (MB) Formatted	42.5
Number of disks	2
Data heads	3
Data surfaces	2
Tracks per surface	977
Sectors per track	17
Bytes per sector	512
Access time (ms) Track to track Average Maximum	8 18 35
Rotation speed (rpm)	3,571
Data transfer rate (bps) To/from media	4.0M
Interleave	1:1
Recording method	1-7 RLL

1.4 Display Module

The display module is composed of a liquid crystal display panel, tablet unit, a Fluorescent Lamp (FL), and an FL inverter board.

1.4.1 LCD Panel

The T100X sidelit LCD panel supports 640x480 pixels with a High Resolution Graphics Subsystem (HRGS) and 16 levels of gray. The HRGS includes the functions of the Video Graphics Array (VGA).

The LCD panel receives vertical and horizontal synchronizing signals, 8-bit data signals (4-bit upper data signal and 4-bit lower data signal), and shift clock for data transmission. All signals are CMOS-level compatible.

The LCD panel is shown in Figure 1-5, and its specifications are described in Table 1-2.

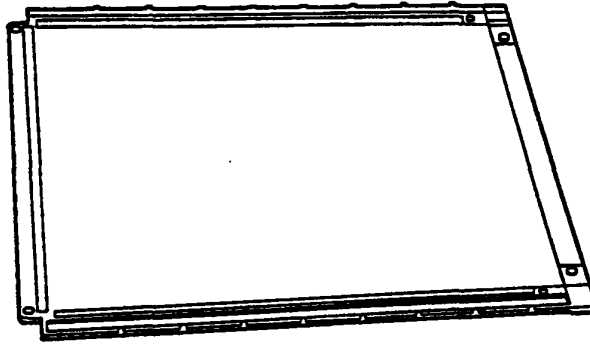


Figure 1-5 LCD Panel

Table 1-2 LCD Panel Specifications

Item	Specifications
Number of Dots (dots)	640 x 480
Dot pitch (mm)	0.30 (W) x 0.30 (H)
Display area (mm)	196 (W) x 148 (H)
Contrast	N/A
FL current (mA)	5.5
FL frequency (KHz)	39

1.4.2 Fluorescent Lamp (FL) Inverter Board

The FL inverter board supplies the high frequency current needed to illuminate the FL. The FL inverter board is shown in Figure 1-6, and its specifications are described in Table 1-3.

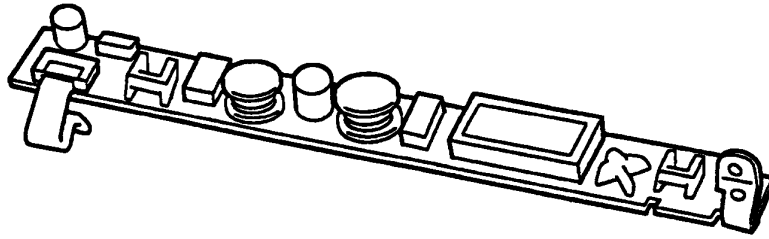


Figure 1-6 FL Inverter Board

Table 1-3 FL Inverter Board Specifications (T100X)

Item			Specifications
Input	Voltage	(VDC)	7.2
	Power	(W)	2.86
Output	Voltage	(VAC)	1,000
	Current	(mA)	5.5
	Frequency	(KHz)	39
	Current limits	(mA)	2.5 - 5.5

1.4.3 Tablet

The tablet is the internal digitizer, which also acts as the interface between the stylus and the computer.

The tablet is shown in Figure 1-7 and its specifications are described in Table 1-4.

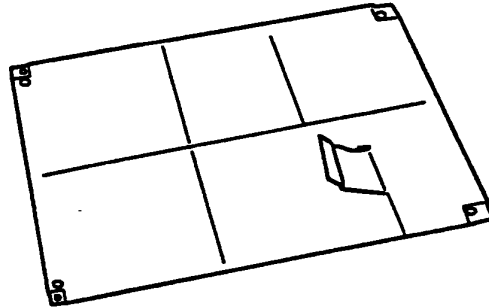


Figure 1-7 Tablet

Table 1-4 Tablet Specifications

Item		Specifications
Material		Electromagnetic derivetic
Voltage	(VDC)	5V
Current	(mA)	30 (In use) 23 (In suspend mode) 5.2 (In sleep mode)
Resolution	(mm)	0.01
Precision	(mm)	± 0.254
Data transfer	(point/sec)	200 (max)

1.5 Power Supply Board

The T100X power supply board supplies six kinds of voltages to the system board, has one microprocessor, and operates at 500 KHz.

The power supply board performs the following functions:

1. Determines if the AC adapter or battery is connected to the computer.
2. Detects DC output and circuit malfunctions.
3. Controls the battery LED.
4. Turns the battery charging system on and off and detects a fully charged battery.
5. Determines if the power can be turned on and off.
6. Provides more accurate detection of a low battery.
7. Calculates the remaining battery capacity.
8. Allows adjustment of the LCD brightness and contrast control.

The power supply board is shown in Figure 1-8 and its output rating is specified in Table 1-5.

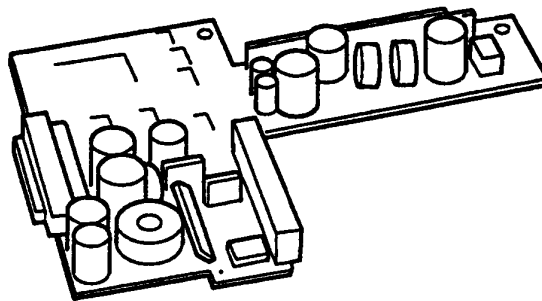


Figure 1-8 Power Supply Board

Table 1-5 Power Supply Board Output Rating

Used for	Name	DC Voltage (V)	Regulation Tolerance (%)	Maximum Current (mA)	Ripple (mV)
System logic, HDD, Tablet	VCC 5	+5	±5	2,900	100
Backup RAM	VRAM	+4.7	±5	725	100
System logic	VCC3	+3.4	±5	125	100
Backup RAM	VRAM3	+3.3	±5	800	100
RS-232-C/modem, flash	VDD	+12	±5	50	150
RS-232-C/modem	VEE	-9	±10	60	150
FL sidelight by inverter	VFL	+6 ~ +12		350	100

1.6 Batteries

The T100X has three types of batteries:

- Main battery pack
- Backup battery
- Real Time Clock (RTC) battery

Specifications for these batteries are listed in Table 1-6.

Table 1-6 Battery Specifications

Battery Name	Material	Output Voltage	Capacity
Main battery	Nickel Metal Hydride	7.2 V	1,500 mAH
Backup battery	Nickel Cadmium	4.8 V	110 mAH
RTC battery	Lithium	3.6 V	2000 mAH

1.6.1 Main Battery

The removable main battery pack is the computer's main power source when the AC adapter is not attached. The main battery recharges the backup battery whether the system's power is on or off. The backup and main battery maintain the state of the computer when you enable AutoResume, and they maintain the information in Hard RAM. When the main battery is fully charged, the Resume and H-RAM data will be retained for three days.

The main battery is shown in Figure 1-9.

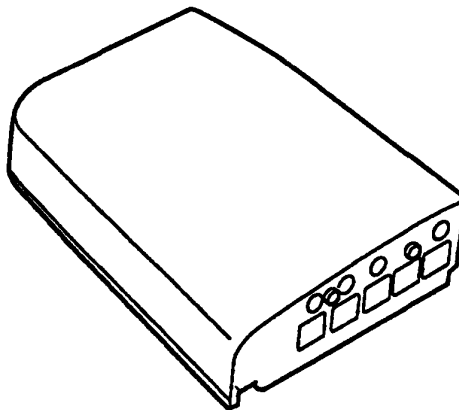


Figure 1-9 Main Battery

❑ Battery Indicator

The Battery Indicator, located near the reset button, shows the status of the removable battery pack, power supply and AC adapter.

The status of each can be determined by color and on/off status.

Table 1-7 Battery LED Indicators

LED		Meaning	Supply Status	Power AC Adapter	Power On/Off	Battery
Color	On/Off Status					
Green	On	Full charge	Normal	Connected	--	Yes
Yellow *1	On	Quick charge			Off	
	Flash 2 Hz	Battery malfunction			--	
Orange	On	Trickle charge			Not connected		Off	Yes (LB1)
	On for 0.2 sec.	Low battery off *2	Off			
	Flash 1 Hz	Low battery	On	Yes (LB0)		
	Flash 2 Hz	Power supply malfunction	Malfunction	--		

*1 Yellow can be displayed at the same time as green or orange.

*2 In Low Battery Off status the LED will glow orange for about 250 ms, but the power cannot be turned on.

LB: Low battery LED (low active)

LB0: Battery LED informs the low battery.

LB1: Automatic return works for storing data.

❑ Main Battery Overload Protective Circuit

The main battery circuit is shown below:

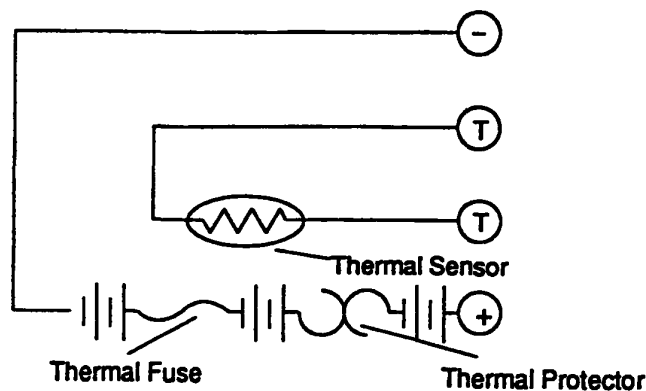


Figure 1-10 T100X Main Battery Circuit

The T100X's main battery has three devices to prevent circuit overload. Table 1-8 lists the overload specifications.

Table 1-8 Circuit Overload Protection

Protection Method	Rating/Function
(1) Thermal protector Electrical rating Maximum circuit breaker current Allowable operating temperature	12 VDC, 3 A 12 VDC/150 A 70° C
(2) Thermal fuse Current rating Voltage rating Temperature rating	10 A 250 V 91° C
(3) Thermal sensor Load resistance Operating temperature limits	(Monitors the battery's temperature) 10 K Ω \pm 1% (at 25° C) -50° ~ 110° C

(1) Thermal protector

When the temperature falls outside the operating range of 70° C, the thermal protector reduces the current by increasing the internal resistance.

(2) Thermal Fuses

If the temperature exceeds 91° C, the thermal fuses may blow to protect the battery and the system.

WARNING: Never try to use a battery unless its fuses are intact. Do not try to replace a battery fuse or try to bypass a fuse. Using a defective battery can permanently damage the system and can cause injury.

(3) Thermal sensor

The thermal sensor monitors the temperature of the battery.

(4) T line

The thermal sensor monitors the temperature of the battery and changes the voltage in the T line accordingly. The power supply microprocessor monitors the voltage changes in the T line.

1.6.2 Battery Charging Control

Battery charging is controlled by a microprocessor that is mounted on the power supply board. The microprocessor controls whether the charge is on or off and detects a full charge when the AC adapter and battery are attached to the computer. The system charges the battery using quick charge or trickle charge.

❑ Quick Battery Charge

The battery quick charges only when the AC adapter is attached and the system is powered off.

Table 1-9 Battery Charging Time

	Charging Time
Quick Charge	About 3 hours

NOTE: Using quick charge, the system CPU automatically stops the charge after two hours, regardless of the condition of the battery.

If one of the following occurs, the battery quick-charge process halts.

1. The battery becomes fully charged
2. The AC adapter or battery is removed
3. The battery or output voltage is abnormal

❑ Trickle Battery Charge

When the AC adapter is attached, trickle charge occurs under two conditions:

1. When the system is powered on. Trickle charge maintains the current battery-charge level.
2. When the system is powered off and the battery is fully charged.

❑ Detection of Full Charge

A full charge is detected only when the battery is charging at quick charge under any of the following conditions:

1. A fall in the battery's voltage is detected ($-\Delta V$, 60 mV).
2. The charging time exceeds the fixed limit (3 hours).
3. The thermal rise ($+\Delta T$, 1°C/m) exceeds the fixed limit (abnormal condition).
4. The battery's temperature is over 55°C (abnormal condition).

1.6.3 Backup Battery

The backup battery maintains data for AutoResume and Hard RAM. The power source used to back up the AutoResume or Hard-RAM data is determined according to the following priority:

AC adapter > Main battery > Backup battery

The backup battery is charged by the main battery or AC adapter when the system is powered on. Table 1-10 lists the charging time and data preservation period of the backup battery.

Table 1-10 Backup Battery Charging/Data Preservation Time

		Time
Charging Time	Power On	8 hours
	Power Off	12 hours
Data Preservation Period (full charge)		8 hours

1.6.4 RTC Battery

The RTC battery provides power to keep the current date, time and other setup information in memory while the computer is turned off.

NOTE: The RTC battery is not rechargeable, however, it has a life of about five years.

1.7 Stylus

The stylus is used to enter information into the computer by writing directly onto the screen. You can write letters or numerals to enter data, draw gestures to enter commands, or tap to select from menus. The stylus holds four batteries, however, it can operate with only two batteries in a serial connection. In the case of two batteries, operating life will be reduced by half.

The stylus is shown in Figure 1-11 and its specifications are described in Table 1-11.

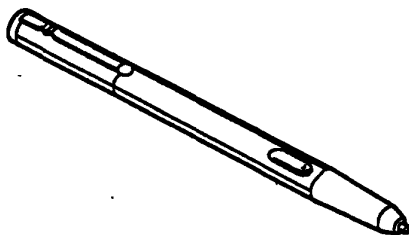


Figure 1-11 T100X Stylus

Table 1-11 Stylus Specifications

Item	Specifications
Voltage	2.6 V
Current	1.5 mA (in use)
	10 μA (standby)
Battery	140-hour life (with four batteries)

1.8 Optional External 3.5-inch Floppy Disk Drive

The T100X's optional external 3.5-inch Floppy Disk Drive (FDD) is a thin, high-performance, reliable drive that supports 720KB (formatted) 2DD and 1.44MB (formatted) 2HD 3.5-inch floppy disks.

Specifications for the FDD are listed in Table 1-12.

Table 1-12 Optional 3.5-inch FDD Specifications

Item	2 MB mode	1 MB mode
Storage capacity (KB)		
Unformatted	2,000	1,000
Formatted	1,440	720
Number of heads	2	2
Number of cylinders	80	80
Access time (ms)		
Track to track	3	3
Average	94	94
Head settling time	15	15
Recording track density (tpi)	135	96
Data transfer rate (Kbps)	500	300
Rotation speed (rpm)	360	300
Recording method	Modified Frequency Modulation (MFM)	

2.1 T100X Troubleshooting

Chapter 2 describes how to determine if a Field Replaceable Unit (FRU) in the T100X is causing the computer to malfunction. The FRUs covered are:

1. Power Supply Board
2. System Board
3. Floppy Disk Drive
4. Hard Disk Drive
5. Display Module
6. Stylus

Diagnostics Disk operations are described in Chapter 3, and detailed replacement procedures are given in Chapter 4.

The following tools are necessary for performing the troubleshooting procedures:

1. T100X Diagnostics Disk
2. Phillips head screwdriver (2 mm)
3. 2DD or 2HD formatted work disk for floppy disk drive testing
4. Printer port LED
5. RS-232-C wraparound connector
6. Printer wraparound connector
7. Multimeter
8. Parallel cable (standard equipment)
9. External PS/2-type keyboard
10. External 3.5-inch floppy disk drive

2.2 Troubleshooting Flowchart

Use the flowchart in Figure 2-1 as a guide for determining which troubleshooting procedures to execute. Before going through the flowchart steps, verify the following:

- Ask the user if a password is registered, and if it is, ask him or her to enter the password. If the user has forgotten the password, connect the printer port wraparound board (F31PRT), then turn the POWER switch on. The computer will skip the password function.

- Make sure all optional equipment is disconnected from the computer.

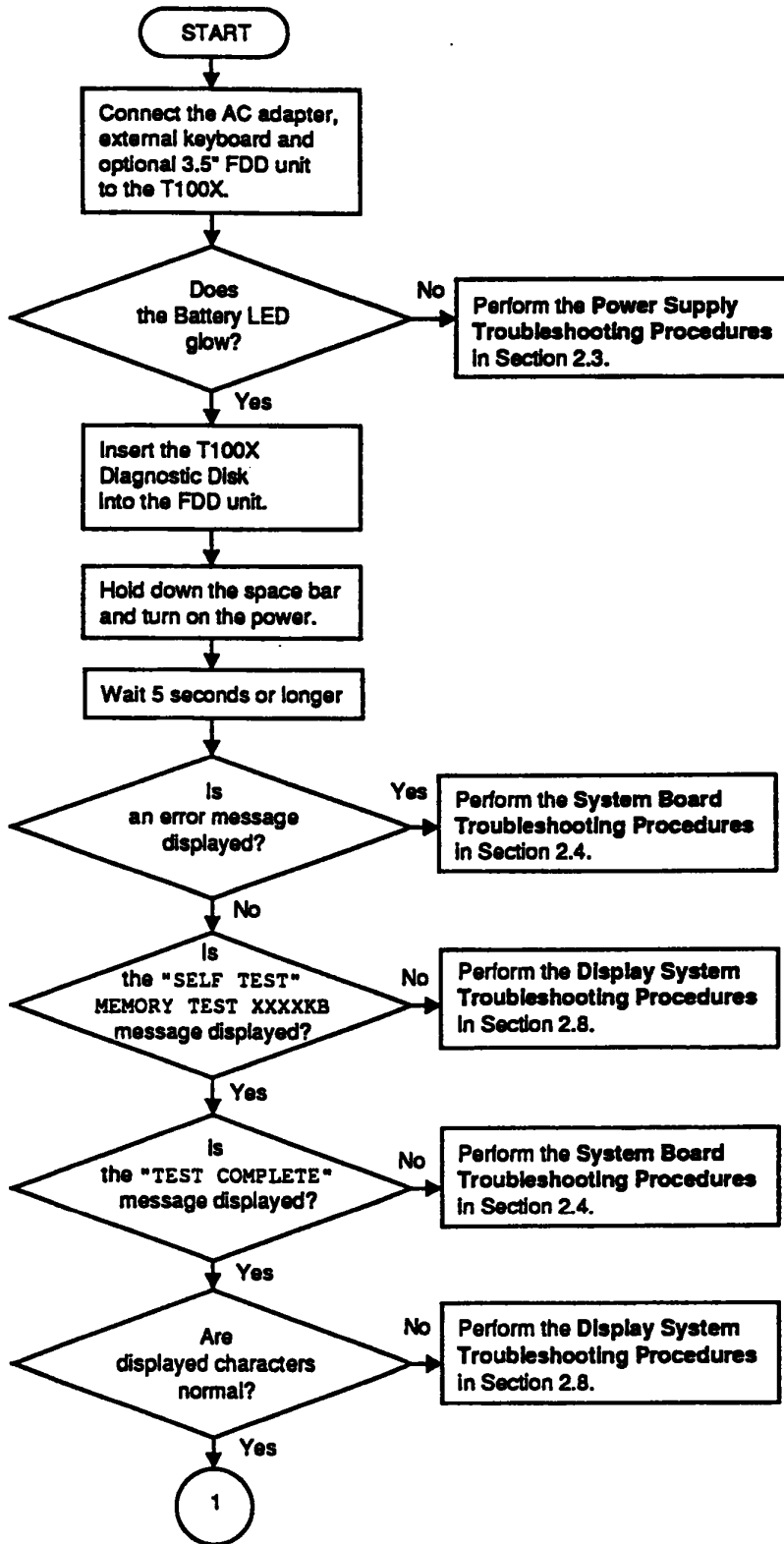


Figure 2-1 Troubleshooting Flowchart (1/2)

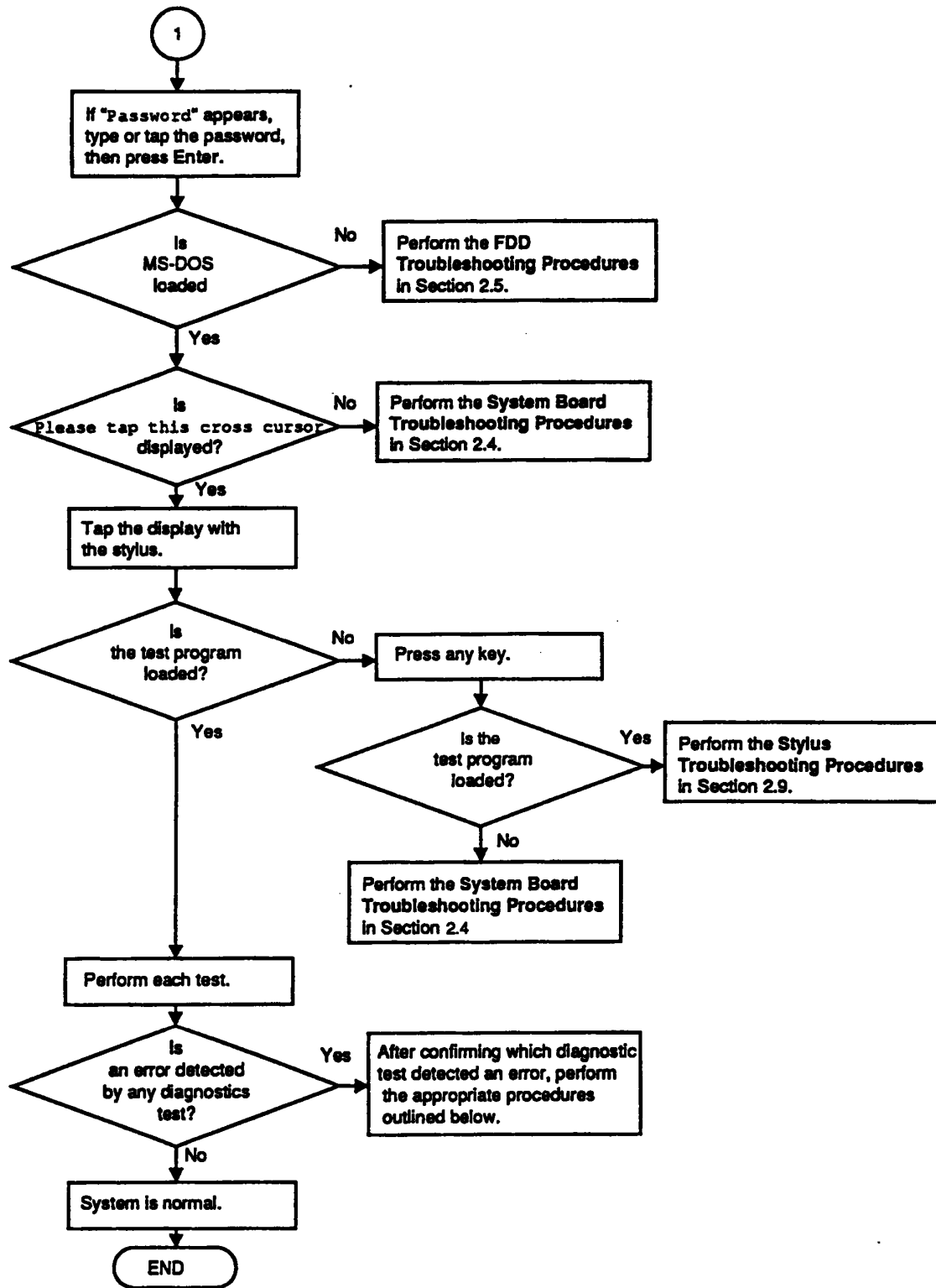


Figure 2-1 Troubleshooting Flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may be intermittent. The Running Test program should be executed several times to isolate the problem.

Check the Log Utilities function to confirm which diagnostic test detected an error(s), then perform the appropriate troubleshooting procedures as follows:

1. If an error is detected on the system test, memory test, display test, ASYNC test, printer test, or real timer test, perform the System Board Troubleshooting Procedures in Section 2.4.
2. If an error is detected on the keyboard test, perform the Keyboard Troubleshooting Procedures in Section 2.7.
3. If an error is detected on the floppy disk test, perform the Floppy Disk Drive Troubleshooting Procedures in Section 2.5.
4. If an error is detected on the hard disk test, perform the Hard Disk Drive Troubleshooting Procedures in Section 2.6.
5. If an error is detected on the tablet test, perform the Stylus Troubleshooting Procedures in Section 2.9.

2.3 Power Supply Troubleshooting

The power supply controls many functions and components in the T100X. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other procedures as instructed. Procedures described in this section are:

Procedure 1: Battery Indicator Check

Procedure 2: AC Adapter Check

Procedure 3: Battery Pack Check

Procedure 4: Power Supply Board Connection Check

Procedure 1 Battery Indicator Check

The Battery indicator shows the battery charging status and power supply condition when the AC adapter is attached and the power is off. Check the following items:

- If the Battery indicator does not glow, go to Procedure 2.
- If the Battery indicator flashes yellow, go to Procedure 3.
- If the Battery indicator flashes orange at 2Hz, go to Procedure 4.

Procedure 2 AC Adapter Check

Check 1 Make sure the AC adapter's cable and AC cord are firmly plugged into the DC IN socket and wall outlet. If these cables are connected correctly, go to Check 2.

Check 2 Connect a new AC adapter. If the Battery LED indicator still does not glow, go to Procedure 3.

Procedure 3 Battery Pack Check

Check 1 Make sure the battery pack is installed in the computer correctly. If the battery pack is installed correctly, go to Check 2.

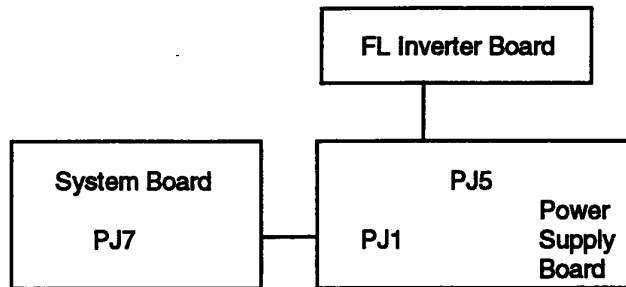
Check 2 Confirm that the battery terminals are clean. In they are not, clean them with a soft cloth. If they are clean, go to Check 3.

Check 3 Install a new battery pack. If the Battery indicator still flashes orange, go to Procedure 4.

Procedure 4 Power Supply Board Connection Check

The power supply board is connected to other components by various cables. The cable connectors can become disconnected from the power supply board, thus causing the T100X to malfunction. To check these connections, it is necessary to disassemble the computer. Refer to Chapter 4, *Replacement Procedures*, for more information on how to disassemble the T100X, then perform Check 1.

- Check 1 Check the following connection. If the power supply board is not firmly connected to the system board and FL inverter board, connect it and restart the system. If the power supply board is firmly connected, go to Check 2.



- Check 2 Replace the power supply board with a new one and restart the system. If the problem still exists, go to Check 3.
- Check 3 Replace the system board with a new one and restart the system. If the problem still exists, other FRUs may be damaged.

2.4 System Board Troubleshooting

This section describes how to determine if the system board is defective or not functioning properly. Start with Procedure 1 and continue with the other procedures as instructed. The procedures described in this section are:

Procedure 1: Message Check

Procedure 2: Printer Port LED Check

Procedure 3: Diagnostic Test Program Execution Check

Procedure 1 Message Check

Hold down the space bar on the external keyboard when applying power to the computer. The system performs the Initial Reliability Test (IRT) installed in the BIOS ROM. The IRT tests each IC on the system board and initializes it.

- If an error message is shown on the display, perform Check 1.
- If there is no error message, go to Procedure 2.
- If the test program is properly loaded, go to Procedure 3.

Check 1 If one of the following error messages is displayed on the screen, tap the display or press the **F1** key as the message instructs. These errors occur when the system configuration preserved in the RTC memory (CMOS-type memory) is not the same as the actual configuration or when the data is lost.

If you tap the display or press the **F1** key as the message instructs, the SETUP menu will appear. If error message (b) appears when the power is turned on, replace the RTC battery. If any other error message is displayed, perform Check 2.

- (a) ***** Error in CMOS. Bad HDD type *****
Check system. Then tap any point on the screen with the stylus or press the [F1] key.
- (b) ***** Error in CMOS. Bad battery *****
Check system. Then tap any point on the screen with the stylus or press the [F1] key.
- (c) ***** Error in CMOS. Bad check sum *****
Check system. Then tap any point on the screen with the stylus or press the [F1] key.
- (d) ***** Error in CMOS. Bad memory configuration *****
Check system. Then tap any point on the screen with the stylus or press the [F1] key.

- (e) *** Error in CMOS. Bad time function ***
Check system. Then tap any point on the screen with the stylus or press the [F1] key.

Check 2 If either of the following error messages [(a) or (b)] is displayed on the screen, press any key as the message instructs.

Error message (a) appears when data stored in RAM under the resume function is lost because the battery has become discharged.

Error message (b) appears when the error is detected during a read test of the Hard RAM or the data in the Hard RAM is lost because the battery has become discharged.

If any other message appears, perform Check 3.

- (a) WARNING: RESUME FAILURE.
TAP ANY POINT ON THE SCREEN WITH THE STYLUS PEN OR PRESS ANY KEY TO CONTINUE.
- (b) WARNING: DATA IN HARD-RAM WAS LOST.
YOU MUST FORMAT HARD-RAM BEFORE USE.
TAP ANY POINT ON THE SCREEN WITH THE STYLUS PEN OR PRESS ANY KEY TO CONTINUE.

Check 3 The IRT checks the system board. When the IRT detects an error, the system stops or an error message appears.

If one of the following error messages (1) through (17), (19), (20), (25) or (26) is displayed, replace the system board.

If Error Message (18) is displayed, go to the Keyboard Troubleshooting Procedures in Section 2.7.

If Error Message (21) or (22) is displayed, go to the HDD Troubleshooting Procedures in Section 2.6.

If Error Message (23) or (24) is displayed, go to the FDD Troubleshooting Procedures in Section 2.5.

- (1) CPU ERROR
- (2) SYSTEM ROM CHECK SUM ERROR
- (3) PIT ERROR
- (4) MEMORY REFRESH ERROR
- (5) TIMER OUT ERROR
- (6) FIRST 64KB MEMORY ERROR
- (7) FIRST 64KB MEMORY PARITY ERROR
- (8) VRAM ERROR
- (9) KBC ERROR
- (10) SYSTEM MEMORY ERROR
- (11) SYSTEM MEMORY PARITY ERROR

- (12) EXTENDED MEMORY ERROR
- (13) EXTENDED MEMORY PARITY ERROR
- (14) DMA PAGE REGISTER ERROR
- (15) DMAC #1 ERROR
- (16) DMAC #2 ERROR
- (17) PIC #1 ERROR
- (18) PIC #2 ERROR
- (19) KEYBOARD ERROR
- (20) HDC ERROR
- (21) HDD #0 ERROR
- (22) HDD #1 ERROR
- (23) NO FDD ERROR
- (24) FDC ERROR
- (25) TIMER INTERRUPT ERROR
- (26) RTC UPDATE ERROR

Procedure 2 Printer Port LED Check

The printer port LED displays the IRT status and test status by turning lights on and off as an eight-digit binary value. Figure 2-2 shows the printer port LED.

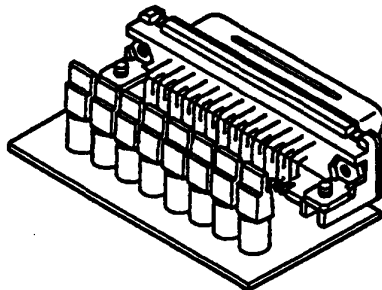


Figure 2-2 Printer port LED

To use the printer port LED follow these steps:

1. Turn off the T100X's power.
2. Connect the parallel cable (standard equipment) to the PRT port.
3. Plug the printer port LED into the parallel cable.
4. Connect the external keyboard to the KB port.
5. Hold down the space bar and turn on the T100X's power.
6. Read the LED status from left to right with the back of the computer turned towards you.
7. Convert the status from binary to hexadecimal notation.
8. If the final LED status is FFh (normal status), go to Procedure 3.
9. If the final LED status matches any of the test status values in Table 2-1, perform Check 1.

Table 2-1 Printer Port LED Error Status (1/2)

Error Status	Message	Test Item	Test Contents
FF	--	CPU self test	Checks result of CPU self test
01	CPU ERROR	CPU register	CPU registers write/read, flag test
02	SYSTEM ROM CHECK SUM ERROR	ROM checksum	Tests ROM checksum
A7	--	Hardware initialization	Tests SMRAM write/read and CMOS, initializes MPDS, memory contents, ROM/RAM copy
05	PIT ERROR	PIT test	Checks counter values in PIT Channels 0, 1, 2
06	--	PIT initialization	Initializes PIT Channels 0, 1, 2
07	MEMORY REFRESH ERROR	PIT functions	Checks refresh status of Port 61h
07	TIMER OUT ERROR		Checks output status of Port 61h
0A	FIRST 64KB MEMORY ERROR	First 64 KB of memory	Checks write/read of first 64 KB of memory
	FIRST 64KB MEMORY PARITY ERROR		Checks for parity error
0D	--	Vector table initialization	Initializes vector table
15	--	RTC test	Checks execution of RTC test
16	--	RTC initialization	Checks for bad battery and bad checksum, initializes controller Registers A, B
18	--	PIC initialization	Initializes PIC 1, 2
1F	VRAM ERROR	Display initialization	Checks MDA, CGA; initializes extended display I/O (C0003h call) MDA, CGA; tests extended display VRAM
22	KBC ERROR	KBC test	Initializes KBC (AAh) command, D1h command (Parameter 03), 60h command (Parameter 54)
25	SYSTEM MEMORY ERROR	System memory	Tests system memory write/read
	SYSTEM MEMORY PARITY ERROR		Checks for parity error
30	EXTENDED MEMORY ERROR	Extended memory test	Checks write/read for extended memory
	EXTENDED MEMORY PARITY ERROR		Checks for extended memory parity

Table 2-1 Printer Port LED Error Status (2/2)

Error Status	Message	Test Item	Test Contents
40	DMA PAGE REGISTER ERROR	DMA page register	Tests write/read DMA register Channels 2, 3, 1, 0, 6, 7, 5
41	DMAC #X ERROR	DMAC test	Tests write/read of DMAC 1, 2
42	--	DMAC initialization	Initializes DMA page registers and DMAC 1, 2
4A	PIC #X ERROR	PIC test	Tests write/read of PIC master Registers 1, 2
54	KEYBOARD ERROR	SCC initialization	Initializes SCC (FFh) command, ADh command
55	KBC ERROR	KBC initialization	D1h command (Parameter 01), 66h command (Parameter 55), F2h command, AEh command
60	HDC ERROR HDD #X ERROR	HDD initialization	Determines if an HDD is connected and initializes the HDC
65	FDC ERROR	FDD initialization	Determines if an external FDD is connected and initializes the FDC
	NO FDC ERROR		
70	--	Printer initialization	Checks printer output
80	--	SIO initialization	Checks SIO
90	RTC UPDATE ERROR	Timer initialization	Checks year, month and date in RTC, sets counter for INT 08h
	TIMER INTERRUPT ERROR		Checks operation of timer interrupts
A0	--	NDP initialization	Checks NDP
A6	--	Extended ROM initialization	Checks and initializes extended ROM
FF	*** ERROR IN CMOS, XXXXXX *** Check system, Then press [F1] key.	Setup startup	Checks setup startup
FF	--	Boot/load	Checks DOS boot/load

NOTE:

- *The tests are executed in the order shown in Table 2-1, and the printer port LED outputs the results of each test after it is completed. If output is interrupted because of an error, then the error is in the next test item. For example, if an interrupt indicates error status 40, then the error was detected in the DMAC test.*
- *The error status for all tests except 01, 02 and A7 are output regardless of whether an error is detected. 01, 02 and 07 are skipped if no error is found.*
- *If an error is detected at error statuses marked by shading, the CPU halts.*

- Check 1 If the following error codes are displayed, replace the system board with a new one.
- FFh (initial), 01h, 02h, 05h, 06h, 07h, 0Ah, 0Dh, 15h, 16h, 18h, 1Fh, 22h, 25h, 30h, 40h, 41h, 42h, 54h, 65h, 70h, 80h, 90h, A0h, A6h, A7h
- Check 2 If Error Code 4Ah is displayed, go to the Keyboard Troubleshooting procedures in Section 2.7.
- Check 3 If Error Code 55h is displayed, go to the HDD Troubleshooting procedures in Section 2.6.
- Check 4 If Error Code 60h is displayed, go to the FDD Troubleshooting procedures in Section 2.5.

Procedure 3 Diagnostic Test Execution Check

Execute the following tests from the *Diagnostic Test* Menu. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform these tests.

1. System Test
2. Memory Test
3. Printer Test
4. ASYNC Test

If an error is detected during these tests, replace the system board with a new one.

2.5 Floppy Disk Drive Troubleshooting

This section describes how to determine if the T100X's optional external 3.5-inch floppy disk drive is functioning properly. If the test program can be loaded, go to Procedure 3. Otherwise, begin with Procedure 1 and continue with the other procedures as required.

Procedure 1: Functioning External FDD Check

Procedure 2: FDD Connection Check

Procedure 3: Diagnostic Test Program Execution Check

Procedure 1 Functioning External FDD Check

Connect a functioning external 3.5 inch FDD to the T100X's FDD port, and check the drive's operation. If the FDD operates properly, the user's FDD is malfunctioning. If the FDD does not operate properly, go to Procedure 2.

Procedure 2 FDD Connection Check

Make sure the external 3.5 inch FDD cable is firmly connected to the FDD port. If this cable is disconnected, reconnect it. If the FDD is still not functioning properly, replace the system board with a new one, and restart the system. If the problem still exists, other FRUs may be damaged.

Procedure 3 Diagnostic Test Program Execution Check

The Floppy Disk Drive Diagnostic Test program is stored on the T100X Diagnostics Disk. Run the diagnostic program. Refer to Chapter 3, *Tests and Diagnostics*, for more information about diagnostics test procedures.

Floppy disk drive test error codes and their status names are listed in Table 2-2. Make sure the floppy disk in the FDD is formatted correctly and that the write-protect tab is disabled. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

Table 2-2 Floppy Disk Drive Error Code and Status

Code	Status
01h	Bad command
02h	Address mark not found
03h	Write protected
04h	Record not found
06h	Media removed on dual attach card
08h	DMA overrun error
09h	DMA boundary error
10h	CRC error
20h	FDC error
40h	Seek error
60h	FDD not drive
80h	Time out error (Not ready)
EEh	Write buffer error
FFh	Data compare error

Check 1 If the following message is displayed, disable the write protect tab on the floppy disk. If any other message appears, perform Check 2.

Write protected

Check 2 Replace the system board with a new one and restart the system. If the problem still exists, other FRUs may be damaged.

2.6 Hard Disk Drive Troubleshooting

To determine if the hard disk drive is functioning properly, perform the procedures listed below starting with Procedure 1. Continue with the other procedures as instructed.

Procedure 1: Message Check

Procedure 2: Diagnostic Test Program Execution Check

CAUTION: *The contents of the hard disk will be erased when the HDD troubleshooting procedures are executed.*

Procedure 1 Message Check

When the T100X's HDD does not function properly, some of the following error messages may appear on the display. Start with Check 1 below and perform the other checks as instructed.

Check 1 If any of the following messages appear, perform Check 3. If the following messages do not appear, perform Check 2:

HDC ERROR
(After 5 seconds this message will disappear.)

or

HDD #0 ERROR
(After 5 seconds this message will disappear.)

or

HDD #1 ERROR
(After 5 seconds this message will disappear.)

Check 2 If either of the following messages appears, perform Procedure 2. If the following messages do not appear, perform Check 3.

Insert system disk in drive
Press any key when ready

or

Non-System disk or disk error
Replace and press any key

Check 3 The HDD is connected to the system board through an HDD flexible cable. This cable can become disconnected or damaged. Disassemble the T100X as described in Chapter 4, *Replacement Procedures*. If the HDD is not connected, connect it to the system board and return to Procedure 1. If the HDD is firmly connected to the system board, perform Procedure 2.



Procedure 2 Diagnostic Test Program Execution Check

The HDD test program is stored in the T100X Diagnostics Disk. Perform all of the HDD tests in the Hard Disk Drive Test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the HDD test program.

If an error is detected during the HDD test, an error code and status will be displayed; perform Check 1. The error codes and statuses are described in Table 2-3. If an error code is not generated, the HDD is operating properly.

Table 2-3 Hard Disk Drive Error Code and Status

Code	Status
01h	Bad command
02h	Bad address mark
04h	Record not found
05h	HDC not reset
07h	Drive not initialized
09h	DMA boundary error
0Ah	Bad sector error
0Bh	Bad track error
10h	ECC error
11h	ECC recover enabled
20h	HDC error
40h	Seek error
80h	Time-out error
AAh	Drive not ready
BBh	Undefined error
CCh	Write fault
DDh	Total time-out error
E0h	Status error
FFh	Data compare error

- Check 1** Replace the HDD unit with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the HDD is still not functioning properly, perform Check 2.
- Check 2** Replace the system board with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.7 Keyboard Troubleshooting

To determine if the external keyboard is functioning properly, perform the following procedures. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Functioning Keyboard Check

Procedure 2: External Keyboard Connection Check

Procedure 3: Diagnostic Test Program Execution Check

Procedure 1 Functioning Keyboard Check

Connect a functioning keyboard to the T100X's KB port, and check the keyboard's functions. If the keyboard is functioning properly, the user's keyboard is malfunctioning. If the keyboard is functioning properly, go to Procedure 2.

Procedure 2 External Keyboard Connection Check

Make sure the external keyboard cable is firmly connected to the KB port. If this cable is disconnected or loose, reconnect it. If the external keyboard still does not function properly, go to Procedure 3.

Procedure 3 Diagnostic Test Program Execution Check

Execute the Keyboard Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

If an error occurs, replace the system board with a new one and restart the system. If the problem still exists, other FRUs may be damaged.

2.8 Display System Troubleshooting

This section describes how to determine if the T100X's display system is functioning properly. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Brightness and Contrast Control Check

Procedure 2: Connector Check

Procedure 3: Diagnostic Test Program Execution Check

Procedure 4: Replacement Check

Use the checklist below to determine which procedure to begin with:

- Procedure 1: Display is dark.
- Procedure 2: Backlight does not light.
Characters are not displayed.
Abnormal lines are displayed.
Some pixels do not light.
The backlight lights but no characters are displayed.
- Procedure 3: Any other problem.

Procedure 1 Brightness and Contrast Control Check

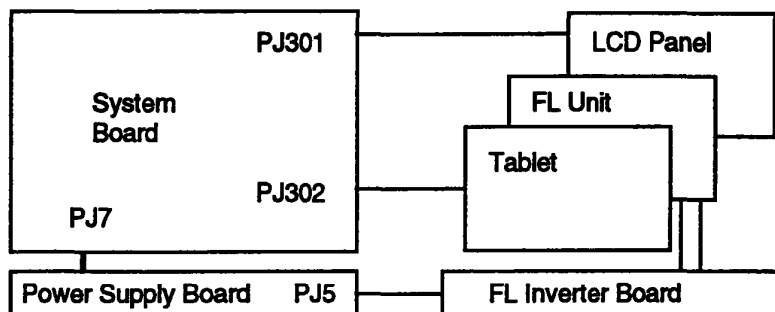
Change the brightness and contrast by tapping the adjust point of the display with the stylus. If the brightness and contrast do not change, go to Procedure 2.

Procedure 2 Connector Check

The display system has an LCD panel, FL unit, tablet and FL inverter board. These components are connected to the system board and power supply board.

Disassemble the display unit and check the cable connections below. Refer to Chapter 4, *Replacement Procedures*, for more information about how to disassemble the computer.

If any of these cables are not connected, firmly reconnect them and repeat Procedures 1 and 2. If the problem still exists, perform Procedure 4.



Procedure 3 Diagnostic Test Program Execution Check

The Display Test program is stored on the T100X Diagnostic Disk. This program checks the display controller and video RAM on the system board. Run the Diagnostics Program. Refer to Chapter 3, *Tests and Diagnostics*, for details.

If the test program indicates an error or abnormal character display, the system board is damaged. Replace the system board with a new one and restart the system. If it still does not function properly, the interface cable is damaged. Replace the display module with a new one.

Procedure 4 Replacement Check

The display system is controlled by the FL inverter board, system board and power supply board. Follow the checklist below to determine which check to perform:

- Check 1: Some pixels do not light.
Abnormal lines are displayed.
- Check 2: Backlight does not light.
- Check 3: Abnormal characters are displayed.
Only the backlight lights.

- Check 1 Replace the display module with a new one and restart the system. If it is still not functioning properly, the system board is damaged. Replace the system board.
- Check 2 Replace the FL inverter board with a new one and restart the system. If it is still not functioning properly, the power supply board is damaged. Replace the power supply board with a new one and restart the system. If it still is not functioning properly, the display module or system board is damaged. Replace each unit.
- Check 3 Replace the system board with a new one and restart the system. If it is still not functioning properly, the display module is damaged. Replace the display module.

2.9 Stylus Troubleshooting

To determine if the T100X stylus is functioning properly, perform the following procedures. Before diagnosing the stylus, however, try using it. If the writing does not feel right, replace the nib. If it still has trouble, start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Keyboard Check

Procedure 2: Battery Check

Procedure 3: Diagnostic Test Program Execution Check

Procedure 1 Keyboard Check

The T100X can be operated with an external keyboard. Connect the external keyboard to the KB port and perform Check 1.

Check 1 Check the keyboard operation. If it is functioning properly, go to Procedure 2. If the keyboard is not functioning properly, replace the system board with a new one.

Procedure 2 Battery Check

The stylus contains up to four batteries, but it can operate on two. Battery life is about 140 hours of stylus operation. Refer to Chapter 4, *Replacement Procedures*, for more information on how to replace the batteries. Install two new batteries and use the stylus. If it still does not function properly, replace it with a new one. If the system still does not work properly, go to Procedure 3.

Procedure 3 Diagnostic Test Program Execution Check

Execute the Tablet Test in the Keyboard Test of the Diagnostic Program. Refer to Chapter 3, *Test and Diagnostics*, for more information on how to perform the test program.

If an error occurs, replace the display module and restart the system. If it still does not function properly, replace the system board.

3.1 The Diagnostic Test

This chapter explains how to use the T100X's Diagnostic Test program to test the functions of the T100X's hardware modules. The Diagnostics Program is stored on the T100X Diagnostics Disk, and consists of 17 programs that are grouped into the Service Program Module (DIAGNOSTIC MENU) and the Test Program Module (DIAGNOSTIC TEST).

The DIAGNOSTIC MENU consists of the following eight functions. These are all located within the Diagnostic test function of the DIAGNOSTIC MENU.

- DIAGNOSTIC TEST
- HARD DISK FORMAT
- HEAD CLEANING
- LOG UTILITIES
- RUNNING TEST
- FDD UTILITIES
- SYSTEM CONFIGURATION
- SETUP

The DIAGNOSTIC TEST menu contains the following nine functional tests:

- SYSTEM TEST
- MEMORY TEST
- KEYBOARD TEST
- DISPLAY TEST
- FLOPPY DISK TEST
- PRINTER TEST
- ASYNC TEST
- HARD DISK TEST
- REAL TIMER TEST

You will need the following equipment to perform some of the T100X Diagnostic test programs.

- The T100X Diagnostics Disk (all tests)
- Optional external 3.5 inch floppy disk drive
- A formatted working disk for the Floppy Disk Drive test
- A cleaning kit to clean the floppy disk drive heads (Head Cleaning)
- A printer wraparound connector for the printer wraparound test (Printer test)
- An RS-232-C wraparound connector for the RS-232-C port wraparound test (Async test)
- Parallel cable for the printer wraparound test (Printer test)
- External PS/2-type keyboard (Keyboard test)
- Stylus

Sections 3.4 through 3.13 detail the tests within the Diagnostic Test function of the DIAGNOSTIC MENU. Refer to Sections 3.15 through 3.21 for detailed information on the remaining Service Program Module functions.

3.2 Executing the Diagnostic Test

To start the DIAGNOSTIC PROGRAM follow the steps below. The Diagnostic Test can be executed with either the stylus or an optional keyboard.

1. Connect an optional 3.5 inch floppy disk drive.
2. Connect an external keyboard, RS-232-C wraparound connector, parallel cable, and printer wraparound connector to each port.
3. Insert the Diagnostic disk and turn on the computer.
4. A cross-hair cursor will appear. Tap the cursor or press **Enter**.

The following menu will appear:

TOSHIBA personal computer T100X DIAGNOSTICS
version X.XX (c) copyright TOSHIBA Corp. 19XX

DIAGNOSTICS MENU :

1 - DIAGNOSTIC TEST
2 - HARD DISK FORMAT
3 -
4 - HEAD CLEANING
5 - LOG UTILITIES
6 - RUNNING TEST
7 - FDD UTILITIES
8 - SYSTEM CONFIGURATION
9 - EXIT TO MS-DOS
0 - SETUP

Break Break

0 1

8 2

9 3

A 4

B 5

C 6

D 7

E Y

F N

R BS

Enter Enter

PRESS [0] - [9] KEY

NOTE: · To use the stylus, tap the appropriate number or command in the menu at right. 'Y' is yes, 'N' is no and 'BS' is back space.
· To use a keyboard, press the number corresponding to the desired test as indicated in the menu at left.

5. To select the DIAGNOSTIC TEST MENU from the DIAGNOSTIC MENU, tap or press the number 1, then tap or press Enter. The following menu appears:

```
TOSHIBA personal computer T100X DIAGNOSTICS
Version X.XX (c) Copyright TOSHIBA Corp. 19XX
DIAGNOSTIC TEST MENU :                               Break Break
1 - SYSTEM TEST                                     0      1
2 - MEMORY TEST                                     8      2
3 - KEYBOARD TEST                                   9      3
4 - DISPLAY TEST                                    A      4
5 - FLOPPY DISK TEST                                B      5
6 - PRINTER TEST                                    C      6
7 - ASYNC TEST                                      D      7
8 - HARD DISK TEST                                  E      Y
9 - REAL TIMER TEST                                 F      N
88 - FDD & HDD ERROR RETRY COUNT SET              R      BS
99 - EXIT TO DIAGNOSTICS MENU                      Enter Enter
```

PRESS [1] - [99] KEY

Refer to sections 3.4 through 3.12 for detailed descriptions of each Diagnostic Test 1 through 9. Function 88 sets the floppy disk drive and hard disk drive error retry count; and Function 99 exits the submenus of the Diagnostic Tests and returns to the Diagnostic Menu.

6. Tap or press the number of the option you want to execute and tap or press Enter. When you select SYSTEM TEST, the following message will appear:

```
SYSTEM TEST   XXXXXXXX                               Break Break
T100X DIAGNOSTIC TEST VX.XX                          0      1
[Ctrl]+[Break]; test end                             8      2
[Ctrl]+[C] ; key stop                                 9      3
SUB-TEST : XX                                         A      4
PASS COUNT: XXXXX   ERROR COUNT: XXXXX                B      5
WRITE DATA: XX     READ DATA : XX                   C      6
ADDRESS : XXXXXX   STATUS : XXX                       D      7
SUB-TEST MENU :                                       E      Y
                                                         F      N
                                                         R      BS
                                                         Enter Enter
01 - ROM checksum
02 - HW status
99 - Exit to DIAGNOSTIC TEST MENU
```

SELECT SUB-TEST NUMBER ?

7. Tap or press the desired number from the subtest menu and tap or press **Enter**. The following message appears:

TEST LOOP : (1: YES/2: NO) ?

Selecting 1 (YES) sets the test to run continuously until it is halted by the user.

Selecting 2 (NO) returns the screen to the main menu after the test is complete.

8. After making the Test Loop selection, the following message appears:

ERROR STOP : (1: YES/2: NO) ?

Selecting 1 stops the test program when an error is found and displays the operation guide on the right side of the display screen, as shown below:

```
ERROR STATUS NAME          [[ HALT OPERATION ]]  
  
1: Test end  
2: Continue  
3: Retry
```

These three selections have the following functions:

- 1: Terminates the test program and exits to the subtest menu.
- 2: Continues the test.
- 3: Restarts the test from the beginning.

Selecting 2 keeps the test running even if an error is found.

9. Tap or press the desired subtest number from the subtest menu and tap or press **Enter**.

Table 3-1 in Section 3.3 describes the function of each test on the subtest menu. Table 3-3 in Section 3.13 describes the error codes and error status for each error.

3.3 Subtest Names

Table 3-1 lists the subtest names for each test program in the DIAGNOSTIC TEST MENU.

Table 3-1 Subtest Names (1/2)

No.	Test Name	Subtest No.	Subtest Item
1	SYSTEM	01	ROM checksum
		02	HW status
2	MEMORY	01	RAM constant data
		02	RAM address pattern data
		03	RAM refresh
		04	Protected mode
		05	Memory module
		06	Backup memory
		07	Hard-RAM
		08	PCMCIA memory
3	KEYBOARD	01	--
		02	Pressed key code display
		03	Tablet interface test
4	DISPLAY	01	VRAM read/write
		02	Character attributes
		03	Character set
		04	80 x 25/30 Character display
		05	320 x 200 Graphics display
		06	640 x 200 Graphics display
		07	640 x 350/400/480 Graphics display
		08	Display page
		09	"H" pattern display
		10	DAC pallet

Table 3-1 Subtest Names (2/2)

No.	Test Name	Subtest No.	Subtest Item
5	FDD	01	Sequential read
		02	Sequential read/write
		03	Random address/data
		04	Write specified address
		05	Read specified address
6	PRINTER	01	Ripple pattern
		02	Function
		03	Wraparound
7	ASYNC	01	Wraparound (board)
		02	--
		03	Point to point (send)
		04	Point to point (receive)
		05	Card modem loopback (2400BPS)
		06	Interrupt test
8	HDD	01	Sequential read
		02	Address uniqueness
		03	Random address/data
		04	Cross talk & peak shift
		05	Write/read/compare (CE)
		06	Write specified address
		07	Read specified address
		08	ECC circuit
		09	Sequential write
		10	W-R-C specified address
9	REAL TIMER	01	Real time
		02	Backup memory
		03	Real time carry

3.4 System Test

To execute the System Test, select **1** from the DIAGNOSTIC TEST MENU and tap or press **Enter**. The System Test contains two subtests. Select the subtest you want to execute and tap or press **Enter**.

Subtest 01 ROM checksum

The ROM checksum tests the T100X's system board from address F0000h to FFFFFh (64KB).

Subtest 02 H/W status

This test reads and displays the T100X's hardware status as shown below:

```

              76543210
H/W status = 10001000

Bit7 ...           =
Bit6 ... CPU clock = 25MHz
Bit5 ... Notch signal = 2HD
Bit4 ... FDD type   = 2MB
Bit3 ...           =
Bit2 ... Drive A/B = Ext. = B
Bit1 ... External FDD = OFF
Bit0 ... Internal FDD = 2HD

Break Break
 0      1
 8      2
 9      3
 A      4
 B      5
 C      6
 D      7
 E      Y
 F      N
 R      BS
Enter Enter

```

Table 3-2 lists the hardware bit status for each bit tested. Pressing or tapping **Enter** returns you to the sub-test menu.

Table 3-2 Hardware Bit Status

Bit	H/W Status	1	0
7	Reserved	--	--
6	CPU clock speed	12.5 MHz	25 MHz
5	Media type	2DD	2HD
4	FDD type	1.6 MB	2 MB
3	Reserved	--	--
2	Drive A/B	Ext. = A	Ext. = B
1	External FDD	ON	OFF
0	Internal FDD	2DD	2HD

3.5 Memory Test

To execute the Memory Test, select **2** from the DIAGNOSTIC TEST MENU and tap or press **Enter**. Then select the number of the desired subtest and tap or press **Enter**.

Subtest 01 RAM constant data (real mode)

This subtest writes constant data to conventional memory (0 to 640 KB), then reads the new data and compares the results with the original data.

The constant data is FFFFh, AAAAh, 5555h, 0101h, and 0000h.

Subtest 02 RAM address pattern data (real mode)

This subtest writes address pattern data created by the exclusive-ORing (XORing) to the address segment and address offset in conventional memory (0 program end to 640 KB), then reads the new data and compares the results with the original data.

Subtest 03 RAM refresh (real mode)

This subtest writes a 256-byte unit of constant data to conventional memory (0 to 640 KB), then reads the new data and compares the results with the original data.

The constant data is AAAAh and 5555h.

NOTE: There is a short delay between write and read operations, depending on the size of the data.

Subtest 04 Protected mode

This subtest writes constant data and address data to extended memory (from 100000h to the maximum address), then reads new data and compares the results with the original data.

Subtest 05 Memory module

NOTE: *To execute this subtest, an optional memory card must be installed in the computer.*

This subtest functions the same as Subtest 04, except it is used for testing an optional memory card. Memory module capacity is 2, 4, 8, or 16 MB.

After selecting Subtest 05, the following message appears:

Extended memory size (1:2 MB, 2:4 MB, 3:8 MB, 4:16 MB).

Select the number that corresponds to the memory card installed in the T100X.

Subtest 06 Backup memory

This subtest writes constant data to memory from address C8000h to CFFFFh, then reads new data and compares the results with the original data.

The constant data is 5555h and AAAAh.

Subtest 07 Hard-RAM

This subtest writes a word unit of constant data to memory (address E0000h to E7FFFh), then reads the new data and compares the results with the original data.

The constant data is 5555h and AAAAh.

Also, this subtest executes a paging test for page data.

Subtest 08 PCMCIA memory

NOTE: *To execute this subtest, a PCMCIA memory card must be installed in the computer.*

This subtest writes a word unit of constant data to memory (address D000h to DFFFFh), then reads the new data and compares the results with the original.

The constant data is 5555h and AAAAh.

This subtest also executes a paging test for test data.

3.6 Keyboard Test

To execute the Keyboard Test, select 3 from the DIAGNOSTIC TEST MENU, tap or press **Enter**, and follow the directions displayed on the screen. The Keyboard test contains two subtests that test the T100X's keyboard actions. Select the subtest you want to execute and tap or press **Enter**.

Subtest 01 Not used.

Subtest 02 Pressed key code display

When a key is pressed, the scan code, character code, and keytop name are displayed on the screen in the format shown below. The **Ins**, **Caps Lock**, **Num Lock**, **Scroll Lock**, **Alt**, **Ctrl**, **Left Shift**, and **Right Shift** keys are displayed in reverse screen mode when pressed.

```
KEYBOARD TEST      IN PROGRESS      302000

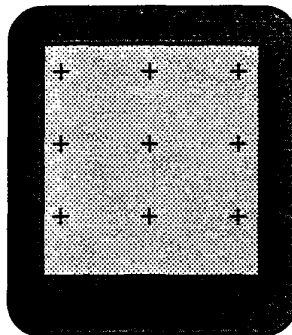
                Scan code      =
                Character code  =
                Keytop          =

Ins Lock   Caps Lock   Num Lock   Scroll Lock
Alt        Ctrl        Left Shift Right Shift

PRESS [Enter] KEY
```

Subtest 03 Tablet interface test

This test displays nine cross-hairs and the coordinates of the pen.



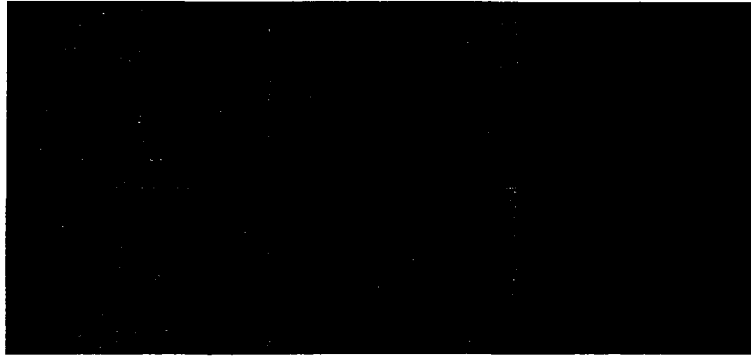
To exit this subtest and return to the Keyboard test menu, press **Ctrl + Break**.

Subtest 06 640 x 200 Graphics Display (mode 6, E)

This subtest displays even dots, odd dots, and all dots in the 640 x 200 dot graphics modes 6 and E as shown below.

640*200 GRAPHICS DISPLAY : [X]

EVEN DOTS DRIVEN	ODD DOTS DRIVEN	ALL DOTS DRIVEN
---------------------	--------------------	--------------------



TAP [ENTER] KEY

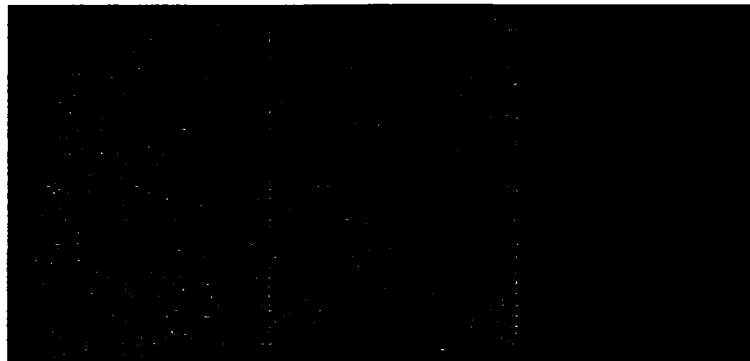
To exit this subtest and return to the DISPLAY TEST menu, press **Ctrl + Break**.

Subtest 07 640 x 350/400/480 Graphics Display (mode 10, 12)

This subtest displays even dots, odd dots, and all dots in the 640 x 350, 640 x 400 and 640 x 480 dot graphics mode 10, 12 as shown below.

640*XXX GRAPHICS DISPLAY : [XX]

EVEN DOTS DRIVEN	ODD DOTS DRIVEN	ALL DOTS DRIVEN
---------------------	--------------------	--------------------



PRESS [ENTER] KEY

Pressing **Enter** changes the size of the displayed image. To exit this subtest and return to the DISPLAY TEST menu, press **Ctrl + Break**.

Subtest 10 LED/DAC Pallet

This subtest checks the Caps Lock, Num Lock and scroll key operations by writing 2Ah/15h data to 6 bits of 256^o3 (RGB). This data is then read and compared to the original data.

Press **Enter** twice to display the following two messages:

[DAC pallet W-R-CMP test] = (about 5 seconds)

Processor latch test (1:256 times, 2:endless) ?

[Processor latch test]	=	Break	Break
		0	1
		8	2
		9	3
		A	4
		B	5
		C	6
		D	7
		E	Y
		F	N
		R	BS
		Enter	Enter

To exit, press **Ctrl + Break**, then press **Enter**.

3.8 Floppy Disk Test

CAUTION: Before running the floppy disk test, prepare a formatted work disk. Remove the Diagnostics Disk and insert the work disk into the FDD. The contents of the floppy disk will be erased.

To execute the Floppy Disk Test, select **5** from the DIAGNOSTIC TEST MENU, press **Enter**, and follow the directions displayed on the screen. The Floppy Disk test contains five subtests that test the T100X's internal floppy disk drive.

The following messages appear after selecting the Floppy Disk Test. Answer each question with an appropriate response to execute the test.

1. Select the test drive number of the floppy disk drive to be tested, and tap or press **Enter**.

Test drive number select (1:FDD#1,2:FDD#2,0:FDD1&2) ?

2. Select the media type of the floppy disk in the test drive to be tested, and tap or press **Enter**.

Media in drive #X mode (0:2DD,1:2D,2:2D-2HD/2DD,3:2HD) ?

3. Select the track you want the test to start on and tap or press **Enter**. Simply pressing **Enter** sets the starting track to zero.

Test start track (Enter:0/dd:00-79) ?

4. The floppy disk test menu appears after you select the start track number. Select the number of the subtest you want to execute, and tap or press **Enter**. The following message appears during the floppy disk test:

FLOPPY DISK	XXXXXXX	T100X DIAGNOSTIC TEST VX.XX [Ctrl]+[Break] ; test end [Ctrl]+[C] ; key stop	Break	Break
			0	1
			8	2
			9	3
			A	4
			B	5
			C	6
			D	7
			E	Y
			F	N
			R	BS
			Enter	Enter

SUB-TEST : XX
PASS COUNT : XXXXX ERROR COUNT : XXXXX
WRITE DATA : XX READ DATA : XX
ADDRESS : XXXXXX STATUS : XXX

The first three digits in the ADDRESS number indicate which cylinder is being tested, the fourth digit indicates the head, and the last two digits indicate the sector being tested.

The first digit in the STATUS number indicates the drive being tested, and the last two digits indicate the error status code as explained in Table 3-3 in Section 3.13.

Subtest 01 Sequential Read

This subtest performs a Cyclic Redundancy Check (CRC) that continuously reads all the tracks on a floppy disk. The following tracks are read according to the media type in the floppy disk drive:

- Double-sided, double-density (2D): Tracks 0 to 39.
- Double-sided, double-density, double-track (2DD) and double-sided, high-density, double-track (2HD): Tracks 0 to 79.

The start track is specified when the FDD test is started from the Diagnostic Test Menu. Refer to Step 3 at the beginning of this section to set the start track.

Subtest 02 Sequential Read/Write

This subtest continuously writes data pattern B5ADADh to all the specified tracks selected in Subtest 01. The data is then read and compared to the original data.

Subtest 03 Random Address/Data

This subtest writes random data to random addresses on all tracks defined in Subtest 01. The data is then read and compared to the original data.

Subtest 04 Write Specified Address

This subtest writes specified data to a specified track, head, and address. When this subtest is selected, the following prompts appear on the screen in succession:

```
TEST DATA ??  
TRACK NO ??  
HEAD NO ?
```

Subtest 05 Read Specified Address

This subtest reads data from a specified track, head, and address. When this subtest is selected, the following prompts appear on the screen in succession:

```
TRACK NO ??  
HEAD NO ?
```

3.9 Printer Test

To execute the Printer Test, select **6** from the DIAGNOSTIC TEST MENU and tap or press **Enter**. The Printer Test contains three subtests that test the output of the printer connected to the T100X.

NOTE: An IBM compatible printer with a parallel cable must be connected to the system to execute this test.

The following message appears when the printer test is selected.

```
Channel#1 = XXXXh
Channel#2 = XXXXh
Channel#3 = XXXXh
Select the channel number (1-3) ?
```

The printer I/O port address is specified by the XXXXh number. The T100X supports three printer channels. Select the printer channel number, and tap or press **Enter** to execute the selected subtest.

Subtest 01 Ripple Pattern

This subtest prints characters for codes 20h through 7Eh line-by-line while shifting one character to the left at the beginning of each new line.

```
! '$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTUvwxyz[\]^_`abcdefghijklmnop
! '$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTUvwxyz[\]^_`abcdefghijklmnop
' '$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTUvwxyz[\]^_`abcdefghijklmnop
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTUvwxyz[\]^_`abcdefghijklmnopqr
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTUvwxyz[\]^_`abcdefghijklmnopqrs
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTUvwxyz[\]^_`abcdefghijklmnopqrst
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTUvwxyz[\]^_`abcdefghijklmnopqrstu
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTUvwxyz[\]^_`abcdefghijklmnopqrstuv
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTUvwxyz[\]^_`abcdefghijklmnopqrstuvw
) *+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTUvwxyz[\]^_`abcdefghijklmnopqrstuvwx
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNQRSTUvwxyz[\]^_`abcdefghijklmnopqrstuvwxy
```

Subtest 02 Function

This subtest is for IBM-compatible printers, and tests the following functions:

- Normal print
- Double-width print
- Compressed print
- Emphasized print
- Double-strike print
- All characters print

The subtest prints the type faces shown below:

```
PRINTER TEST
1.  THIS LINE SHOWS NORMAL PRINT.
2.  THIS LINE SHOWS DOUBLE-WIDTH PRINT.
3.  THIS LINE SHOWS COMPRESSED PRINT.
4.  THIS LINE SHOWS EMPHASIZED PRINT.
5.  THIS LINE SHOWS DOUBLE-STRIKE PRINT.
6.  ALL CHARACTERS PRINT

!''*$$&'()*+,.0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu
vwxyz{|}~
```

Subtest 03 Wraparound

NOTE: To execute this subtest, a printer wraparound connector with a parallel cable must be connected to the computer's printer port. The printer wraparound connector (34M741986G01) wiring diagram is described in Appendix D.

This subtest checks the output and bidirectional modes of the data control and status lines through the printer wraparound connector.

3.10 Async Test

To execute the Async Test, select 7 from the Diagnostic Test Menu and tap or press **Enter**. The Async test contains six subtests that test the T100X's asynchronous communication functions. Select the subtest you want to execute and tap or press **Enter**.

Subtests 01 through 04 require the following data format:

Method:	Asynchronous
Speed:	9600BPS
Data:	8 bits and one parity bit (EVEN)
Data pattern:	20h to 7Eh

The following message appears at the bottom of the screen when Subtests 01, 03, 04, and 05 are selected:

```
Channel#1 = XXXXh
Channel#2 = XXXXh
Channel#3 = XXXXh
Select the Channel number (1/2/3) ?
```

The serial I/O port address is specified by the XXXXh number. Select the serial port channel number, and press **Enter** to start the subtest.

Subtest 01 Wraparound (board)

NOTE: To execute this subtest, an RS-232-C wraparound connector (34M741621G01) must be connected to the RS-232-C port by a parallel cable. The RS-232-C wraparound connector wiring diagram is described in Appendix D.

This subtest checks the data send/receive function through the wraparound connector.

Subtest 02 Not used.

Subtest 03 Point to point (Send)

NOTE: *To execute this subtest, two machines must be connected by a parallel cable to the RS-232-C ports. One machine should be set as "send" (Subtest 03) and the other set as "receive" (Subtest 04). The wiring diagram for the RS-232-C direct cable is described in Appendix D.*

This subtest sends 20h through 7Eh data to the receive side, then receives the sent data and compares it to the original data.

Subtest 04 Point to point (Receive)

This subtest, used with Subtest 03 (described above), receives the data from the send side, then sends the received data.

Subtest 05 Card Modem Loopback (2400BPS)

NOTES: (1) *To execute this subtest, a 2400 bps card modem must be installed.*
(2) *You do not have to turn on PC card slot 2 power to the modem at the Setup option. When you select this subtest, the modem is powered on automatically.*
(3) *To execute this subtest, you must set the PC card slot 2 to Others in the Setup program.*

This subtest sends data from the RS-232-C port to the card modem. The same data is then sent from the modem to the RS-232-C port and compared to the original data.

When you select the channel number of the serial port and tap or press **Enter**, the following message appears:

Baud rate select (1: 300BPS, 2: 1200BPS, 3: 2400BPS)?

Select the baud rate for the serial port and press **Enter** to execute this subtest.

Subtest 06 Interrupt Test

This subtest checks the Interrupt Request Level of IRQs 4, 3 and 5 from the send side.

3.11 Hard Disk Test

To execute the Hard Disk Test, select **8** from the DIAGNOSTIC TEST MENU, and tap or press **Enter**. The hard disk test contains 10 subtests that test the T100X hard disk drive functions.

CAUTION: *The contents of the hard disk will be erased when Subtest 02, 03, 04, 05, 06, 08, 09, or 10 is executed. Before running the test, transfer the contents of the hard disk to a floppy disk(s).*

After the hard disk test is completed, set the partition. Refer to the customer's operating system documentation for details on partitioning the disk.

The following messages will appear after selecting the hard disk test from the DIAGNOSTIC TEST MENU. Answer each of the questions with an appropriate response to execute the test.

1. When you select the hard disk test from the DIAGNOSTIC TEST MENU, the following message will appear:

Test drive number select (1:HDD#1,2:HDD#2,0:HDD1&2) ?

2. Select the hard disk drive number to be tested and press **Enter**. The following message will appear:

HDC F/W error retry (1:yes,2:no) ?

3. This message is used to select the retry operation when the hard disk controller detects an error. Select **1** or **2** and tap or press **Enter**. The following message will appear:

Data compare error dump (1:no,2:yes) ?

4. This message is used to select the error dump operation when a data compare error is detected. Select **1** or **2** and tap or press **Enter**. The following message will appear:

Detail status display (1:no,2:yes) ?

5. This message is used to select whether the HDD status is displayed on the screen. The HDD status is described in Section 3.15. Select **1** or **2** and tap or press **Enter**.

6. The Hard Disk Test message will appear after you respond to the Detail Status prompt. Select the number of the subtest you want to execute and tap or press **Enter**. The following message will appear during each subtest.

```
HARD DISK TEST                XXXXXXXX

SUB-TEST   : XX
PASS COUNT: XXXXX             ERROR COUNT: XXXXX
WRITE DATA: XX               READ DATA  : XX
ADDRESS    : XXXXXX          STATUS      : XXX
```

The first three digits of the ADDRESS indicate which cylinder is being tested, the fourth digit indicates the head, and the last two digits indicate the sector.

The first digit of the STATUS number indicates the drive being tested, and the last two digits indicate the error status code as explained in Table 3-3 in Section 3.13.

Subtest 01 Sequential Read

This subtest is a sequential reading of all the tracks on the HDD starting at Track 0. When all the tracks on the HDD have been read, the test starts at the maximum track and reads the tracks on the HDD sequentially back to Track 0.

Subtest 02 Address Uniqueness

This subtest writes unique address data to each sector of the HDD track-by-track. The data written to each sector is then read and compared with the original data. There are three ways the HDD can be read:

- Forward sequential
- Reverse sequential
- Random

Subtest 03 Random Address/Data

This subtest writes random data to random addresses on the HDD cylinder, head and sector. The data is then read and compared to the original data.

Subtest 04 Cross Talk & Peak Shift

This subtest writes eight types of worst pattern data (shown below) to a cylinder, then reads the data while moving from cylinder to cylinder.

Worst pattern data: B5ADADh, 4A5252h, EB6DB6h, 149249h, 63B63Bh, 9C49C4h, 2DB6DBh, D24924h.

Subtest 05 Write /read/compare (CE)

This subtest writes B5ADADh worst pattern data to the CE cylinder on the HDD, then reads the data from the CE cylinder and compares it with the original data.

Subtest 06 Write specified address

This subtest writes specified data to a specified cylinder and head on the HDD.

Subtest 07 Read specified address

This subtest reads data which has been written to a specified cylinder and head on the HDD.

Subtest 08 ECC circuit

This subtest checks the Error Check and Correction (ECC) circuit functions of the specified cylinder and head on the HDD.

Subtest 09 Sequential write

This subtest writes specified 2-byte data to all of the cylinders on the HDD.

Subtest 10 W-R-C specified address

This subtest writes data to a specified cylinder and head on the HDD, then reads the data and compares it to the original data.

3.12 Real Timer Test

To execute the Real Timer Test, select **9** from the DIAGNOSTIC TEST MENU and tap or press **Enter**. The Real Timer Test contains three subtests that test the T100X's real timer functions. Select the subtest you want to execute and press **Enter**.

Subtest 01 Real Time

A new date and time can be input during this subtest. To execute the Real Time subtest, follow these steps:

1. Select Subtest 01 and the following message will appear:

Current date : XX-XX-XXXX

Current time : XX:XX:XX

Enter new date:

TAP [ENTER] KEY TO EXIT TEST

2. If the current date is not correct, input the correct date at the "Enter new date" prompt and press **Enter**. The following prompt will appear:

Enter new time :

3. If the current time is not correct, input the correct time in 24-hour format.

Pressing **Enter** toggles between the time and the date. To exit, press **Ctrl + Break**.

Subtest 02 Backup Memory

This subtest performs the following backup memory check:

Writes 1-bit of "on" data to address 01h through 80h

Writes 1-bit of "off" data to address FEh through 7Fh

Writes the data pattern AAh through 55h to the RTC 50-byte memory (address 0Eh to 3Fh)

The subtest then reads and compares this data with the original data.

To exit, press **Ctrl + Break**.

Subtest 03 Real Time Carry

CAUTION: *When this subtest is executed, the current date and time are erased.*

This subtest checks the real time clock increments, making sure the date and time are displayed in the following format:

Current date : 01-01-1991
Current time : 00:00:37

Pressing **Enter** displays the following:

Current date :12-31-1990
Current time :23:59:58

TAP [Enter] key to exit test

Press **Ctrl + Break** to exit.

3.13 Error Code and Error Status Names

Table 3-3 lists the error codes and error status names for the Diagnostic Tests.

Table 3-3 Error Codes and Error Status Names (1/2)

Device Name	Error Code	Error Status Name
(COMMON)	FF	Data Compare Error
SYSTEM	01	ROM Checksum Error
MEMORY	01	Parity Error
	02	Protected Mode Not Changed
KEYBOARD	03	Tablet Interface Error
FDD	01	Bad Command
	02	Address Mark Not Found
	03	Write Protected
	04	Record Not Found
	06	Media Removed
	08	DMA Overrun Error
	09	DMA Boundary Error
	10	CRC Error
	20	FDC Error
	40	Seek Error
	60	FDD Not Drive Error
PRINTER	80	Time-out Error
	EE	Write Buffer Error
	01	Time-out
PRINTER	08	Fault
	10	Select Line
	20	Out Of Paper
	40	Power Off
	80	Busy Line

Table 3-3 Error Codes and Error Status Names (2/2)

Device Name	Error Code	Error Status Name
ASYNC	01	DSR Off Time-out
	02	CTS Off Time-out
	04	RX-Enable Time-out
	08	TX-BUFFER Full Time-out
	10	Parity Error
	20	Framing Error
	33	No Carrier (Card Modem)
	34	Error (Card Modem)
	36	No Dial Tone (Card Modem)
	40	Overrun Error
	80	Line Status Error
88	Modem Status Error	
HDD	01	Bad Command Error
	02	Bad Address Mark Error
	04	Record Not Found
	05	HDC Not Reset Error
	07	Drive Not Initialized
	09	DMA Boundary Error
	0A	Bad Sector
	0B	Bad Track Error
	10	ECC Error
	11	ECC Recover Enable
	20	HDC Error
	40	Seek Error
	80	Time-out Error
	AA	Drive Not Ready
	BB	Undefined Error
	CC	Write Fault
	E0	Status Error
F0	Not Sense Error (FF)	

3.14 Hard Disk Test Detail Status

When an error occurs in the hard disk test, the following message is displayed:

```
HDC status = XXXXXXXX
```

Detailed information about the hard disk test error is displayed on the screen by an 8-digit number. The first four digits represent the hard disk controller (HDC) error status number and the last four digits are not used.

The hard disk controller error status is composed of two bytes; the first byte displays the contents of the HDC status register in hexadecimal form, and the second byte displays the HDC error register.

The contents of the HDC status register and error register are described in Tables 3-4 and 3-5.

Table 3-4 Hard Disk Controller Status Register Contents

Bit	Name	Description
7	BSY (Busy)	"0" --- HDC is busy. "1" --- HDC is ready.
6	DRDY (Drive ready)	"0" --- Hard disk drive is not ready to accept any command. "1" --- Hard disk drive is ready.
5	DWF (Drive write fault)	"0" --- DWF error is not detected. "1" --- Write fault condition occurred.
4	DSC (Drive seek complete)	"0" --- The hard disk drive heads are not settled over a track. "1" --- The hard disk drive heads are settled over a track.
3	DRQ (Data request)	"0" --- Drive is not ready for data transfer. "1" --- Drive is ready for data transfer.
2	CORR (Corrected data)	"0" --- Other "1" --- Correctable data error is corrected.
1	IDX (Index)	"0" --- Other "1" --- Index is sensed.
0	ERR (Error)	"0" --- Other "1" --- The previous command was terminated with an error.

Table 3-5 Error Register Contents

Bit	Name	Description
7	BBK1 (Bad block mark)	"0" --- Other "1" --- A bad block mark is detected.
6	UNC (Uncorrectable)	"0" --- There is no uncorrectable data error. "1" --- Uncorrectable data error has been detected.
5	---	Not used
4	IDNF (Identification)	"0" --- Other "1" --- There is no ID field in the requested sector.
3	---	Not used
2	ABRT (Abort)	"0" --- Other "1" --- Illegal command error or a drive status error occurred.
1	TK00 (Track 0)	"0" --- The hard disk has found Track 0 during a recalibrate command. "1" --- The hard disk could not find Track 0 during a recalibrate command.
0	---	Not used.

3.15 Hard Disk Format

The Hard Disk Format function performs a low-level (physical) format of the hard disk and executes the following hard disk formats and check:

1. All track FORMAT
2. Good track FORMAT
3. Bad track FORMAT
4. Bad track CHECK

CAUTION: *The contents of the hard disk will be erased when this program is executed. Before executing the function, transfer the contents of the hard disk onto a floppy disk(s).*

3.15.1 Function Description

1. All track FORMAT

This option performs a low-level format of all the tracks on the hard disk as shown in Table 3-6 below.

NOTE: *Before executing the All track FORMAT option, check for bad tracks using the Bad Track CHECK option or display a list of bad tracks on the HDD.*

Table 3-6 Hard Disk Formatting Sequence

Items	40 MB (1842)
Sector sequences	1:1
Cylinders	0 to 976
Heads	0 to 4
Sectors	1 to 18
Sector length (bps)	512

2. Good track FORMAT

This option formats a specified cylinder and track as a good track. If a good track is formatted as a bad track, use this option to change the track to a good track.

3. Bad track FORMAT

This option formats a specified cylinder and track as a bad track. If a bad track is detected, use this option to label it as a bad track.

4. Bad track CHECK

This option searches the hard disk for bad tracks by reading data to all the tracks on the hard disk. A list of bad tracks is displayed when the program is complete. If an error other than a bad track is detected, the program is automatically terminated.

3.15.2 Operations

***CAUTION:** The contents of the hard disk will be erased when this program is executed. Before executing the function, transfer the contents of the hard disk onto a floppy disk(s).*

Select **TEST 2** and tap or press **Enter** in the **DIAGNOSTIC MENU** to display the following messages:

DIAGNOSTICS - HARD DISK FORMAT : VX.XX	Break	Break
	0	1
1 - All track FORMAT	8	2
2 - Good track FORMAT	9	3
3 - Bad track FORMAT	A	4
4 - Bad track CHECK	B	5
9 - Exit to DIAGNOSTICS MENU	C	6
	D	7
Tap [NUMBER] key	E	Y
	F	N
	R	BS
Tap select area -->	Enter	Enter

1. All Track FORMAT

Pressing or tapping **1** selects All Track FORMAT. After making your selection, the following questions appear at the bottom of the screen in succession:

Drive number select (1:#1,2:#2) ?

- (1) Select a drive number and tap or press **Enter**. The following message appears:

Interleave number (3/1 - 3) ?

- (2) Select an interleave number, 1 ~ 3, and tap or press **Enter**. Pressing only **Enter** selects 1. After pressing **Enter** the following screen displays:

```
[HDD TYPE] : CYLINDER = XXX
[HDD TYPE] : HEAD = X
[HDD TYPE] : SECTOR = XX
```

[WARNING: Current DISK data will be completely destroyed]

Tap [Bad track number (CCCH)] key?

- (3) **Bad Track Register**

The Bad Track Register prompt will appear. Enter the cylinder and head numbers of bad tracks and tap or press **Enter**. Note that if there are no bad tracks, pressing **Enter** alone is the same as executing All Track Format described in Item (4) below.

Enter the cylinder and head number in the format above in decimal notation. Repeat for each bad track you want to format.

After entering the bad tracks, tap or press **Enter** to execute the format.

- (4) **All Track Format**

All tracks are formatted as good tracks except those registered as bad tracks in Item (3) above or those identified as bad tracks in track verification described in Item (5) below.

- (5) **Track Verification**

A check is made of all tracks, and if an ECC error, ECC-correctable-data error, or record-not-found error is detected at a track, that track is formatted as a bad track automatically.

2. Good track FORMAT

If a good track has been erroneously formatted as a bad track, you can use this subtest to reformat the track as a good track. To format a track as a good track, enter the numbers for the drive, interleave, cylinder and head as indicated in the screen prompts shown below.

```
Drive number select (1:#1, 2:#2) ?
Interleave number (3/1 - 3) ?
[HDD TYPE] : CYLINDER = XXX
[HDD TYPE] : HEAD = X
[HDD TYPE] : SECTOR = XX

Tap [Track number (CCCH)] ?
```

After formatting the track as a good track, a "Format complete" message will appear. Tap or press **Enter** to return to the Hard Disk Format menu.

3. Bad track FORMAT

To format a track as a bad track, enter the numbers for the drive, interleave, cylinder and head as indicated in the screen prompts shown below.

```
Drive number select (1:#1, 2:#2) ?
Interleave number (3/1 - 3) ?
Tap [Track number (dddd)] ?
```

Tap or press **Enter** to return to the Hard Disk Format menu.

4. Bad track CHECK

This subtest reads the entire disk and displays a list of bad tracks. The test is terminated when a bad track check error occurs. To initiate the subtest, enter the drive number and interleave number at the prompts shown below.

```
Drive number select (1:#1, 2:#2) ?
Interleave number (3/1 - 3) ?
```

Bad tracks will be displayed in the format shown below.

```
[HDD TYPE] : CYLINDER = XXX
[HDD TYPE] : HEAD = X
[HDD TYPE] : SECTOR = XX
```

```
[[cylinder, head = XXXX XX]]
```

After checking the bad track, a "Format complete" message will appear. Tap or press **Enter** to return to the Hard Disk Format menu.

CAUTION: After the hard disk test is formatted, set the partition. Refer to the customer's operating system documentation for details on partitioning the disk.

3.16 Head Cleaning

3.16.1 Function Description

This function cleans the heads in the FDD by executing a series of head load/seek and read operations. A cleaning kit is necessary to perform this function.

3.16.2 Operations

1. Select **Test 4** from the **DIAGNOSTIC MENU** and tap or press **Enter** to display the following messages:

```
DIAGNOSTICS - FLOPPY DISK HEAD CLEANING : VX.XX
```

```
Mount cleaning disk(s) on drive(s).
```

```
Tap Enter when ready.
```

2. Remove the **Diagnostics Disk** from the FDD, then insert the cleaning disk and tap or press **Enter**.
3. When the **cleaning start message** appears, the FDD head cleaning has begun.
4. The display automatically returns to the **DIAGNOSTIC MENU** when the program is completed.

2. Error information displayed on the screen can be manipulated by the following number keys:

The **1** key scrolls the display to the next page.

The **2** key scrolls the display to the previous page.

The **3** key returns to the Diagnostic Menu.

The **4** key erases all error log information in RAM.

The **5** key outputs the error log information to a printer.

The **6** key reads the log information from a floppy disk.

The **7** key writes the log information to a floppy disk.

3. In the case of "error retry OK," a capital "R" is placed at the beginning of the error status. However, it is not added to the error count.

3.18 Running Test

3.18.1 Function Description

This function automatically executes the following tests in sequence:

1. System Test (Subtest Number 01)
2. Memory Test (Subtest Number 01, 02, 03, 04, 06, 07)
3. Display Test (Subtest Number 01 to 08)
4. FDD Test (Subtest Number 02)
5. HDD Test (Subtest Number 01, 05)
6. Real Timer Test (Subtest Number 02)
7. Printer Test (Subtest Number 03)
8. Async Test (Subtest Number 01)

The system automatically detects the number of floppy disk drives connected to the T100X for the FDD Test.

3.18.2 Operations

CAUTION: Do not forget to load a work disk in the FDD. If a work disk is not loaded, an error will be generated during the FDD testing.

1. Remove the diagnostics disk from the floppy disk drive and insert the work disk.
2. Select **6** from the DIAGNOSTIC MENU and press **Enter**. The following message displays:

Printer wrap around test (Y/N) ?

Selecting **Y (yes)** and pressing **Enter** executes the printer wraparound test. A printer wraparound connector must be connected to the **PRT** port on the back of the T100X to properly execute this test.

3. After selecting **Y** or **N** and pressing **Enter**, the following message appears:

Serial #A wrap around test (Y/N) ?

Selecting **Y (yes)** and pressing **Enter** executes the Async wraparound test. An RS-232-C wraparound connector must be connected to the serial port on the back of the T100X to properly execute this test.

4. After selecting **Y** and pressing **Enter**, the following message appears:

Mount the work disk(s) on the drive(s),
then press [Enter] key.

[Warning] : The contents of the disk(s)
will be destroyed]

5. This program executes continuously. To terminate the program, tap **Break** or press **Ctrl + Break**.

3.19 Floppy Disk Drive Utilities

3.19.1 Function Description

This function formats the FDD, copies the floppy disk, and displays the dump list for both the FDD and HDD.

1. FORMAT

NOTE: This program is only for testing a floppy disk drive. The option is different from the operating system's FORMAT command.

This program can format a 3.5-inch floppy disk in the following formats:

- (1) 2D: Double-sided, double-density, 48/67.5 TPI, MFM mode, 512 bytes, 9 sectors/track.
- (2) 2DD: Double-sided, double-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 9 sectors/track.
- (3) 2HD: Double-sided, high-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 18 sectors/track.

2. COPY

This program copies data from a source floppy disk to a target floppy disk.

3. DUMP

This program displays the contents of the floppy disk and the designated sectors of the hard disk on the display.

3.19.2 Operations

1. Selecting 7 from the DIAGNOSTIC MENU and tapping or pressing Enter displays the following message:

```
[ FDD UTILITIES ]  
  
1 - FORMAT  
2 - COPY  
3 - DUMP  
9 - EXIT TO DIAGNOSTICS MENU  
PRESS [1] - [9] KEY
```

2. FORMAT program

- (1) Selecting **FORMAT** displays the following message:

```
DIAGNOSTICS - FLOPPY DISK FORMAT : VX.XX  
Drive number select (1=A:, 2=B:)?
```

- (2) Select a drive number to display the following message:

```
Type select (0:2DD,1:2D,2:2HD) ?  
2HD media mode (1:1.20MB,2:1.44MB) ?
```

- (3) Select a media/drive type number and press **Enter**. A message similar to the one below will be displayed:

```
Warning : Disk data will be destroyed.  
  
Insert work disk into drive A:  
Tap Enter key when ready.
```

- (4) Remove the Diagnostics Disk from the FDD, insert the work disk, and tap **Enter** or press any key.

The following message displays when the FDD format is executed:

```
[ FDD TYPE ] : TRACK = XXX  
[ FDD TYPE ] : HEAD = X  
[ FDD TYPE ] : SECTOR = XX
```

```
Format start
```

```
[[track, head = XXX X]]
```

After the floppy disk is formatted, the following message appears:

```
Format complete  
Another format (1:Yes/2:No) ?
```

- (5) Typing **1** displays the message from Step (3) above. Typing **2** returns the test to the **DIAGNOSTIC MENU**.

3. COPY program

- (1) When **COPY** is selected, the following message appears:

```
FLOPPY DISK FORMAT & COPY : VX.XX  
Type select (0:2DD,1:2D,2:2HD) ?
```

- (2) Selecting a media/drive type number will display a message similar to the one below:

```
Insert source disk into drive A:  
Tap Enter key when ready.
```

- (3) Remove the Diagnostics Disk from the FDD, insert the source disk, and tap **Enter** or press any key. The following message will appear, indicating the program has started.

```
[ FDD TYPE ] : TRACK  = XXX  
[ FDD TYPE ] : HEAD   = X  
[ FDD TYPE ] : SECTOR = XX
```

```
Copy start
```

```
[[ track, head = XXX X ]]  
Insert target disk into drive A:  
Tap Enter key when ready.
```

- (4) Remove the source disk from the FDD, insert a formatted work disk, and tap **Enter** or press any key. The `[[track, head = XXX X]]` message will appear and start copying to the target disk. When the amount of data is too large to be copied in one operation, the message from Step 2 is displayed again. After the floppy disk has been copied, the following message appears:

```
Copy complete  
Another copy (1:Yes/2:No) ?
```

- (5) To copy another disk, type **1** and the message from Step (1) will be displayed again. Entering **2** returns the test program to the DIAGNOSTIC MENU.

4. DUMP program

- (1) When **DUMP** is selected, the following message appears:

```
DIAGNOSTICS-HARD DISK & FLOPPY DISK DUMP : VX.XX  
Format type select (0:2DD, 1:2D, 2:2HD, 3:HDD) ?
```

- (2) Select a format type number. If **3** is selected, the display goes to Step (5).

```
Select FDD number (1:A, 2:B) ?
```

- (3) Select a media type number and the following message will appear:

Insert source disk into drive A:
Tap Enter key when ready.

- (4) Insert a source disk and press any key. The following prompts will appear in succession:

Track number ??
Head number ?
Sector number ??

- (5) Set the track number you want to dump. The selected track, head and sector will be displayed, and the system will access the disk and dump a list.

Tap or press 1 to dump the next higher sector or 2 to dump the next lower sector. Press 3 to end the test.

3.20 System Configuration

3.20.1 Function Description

The System Configuration program contains the following configuration information for the T100X:

1. BIOS ROM version
2. Base memory size
3. Display type
4. The number of floppy disk drives
5. The number of ASYNC ports
6. The number of hard disk drives
7. The number of printer ports
8. Extended memory size

3.20.2 Operations

Selecting **8** from the DIAGNOSTIC MENU and tapping or pressing **Enter** displays the following system configuration:

```
SYSTEM CONFIGURATION :  
  
* - BIOS ROM VERSION = VX.XX  
* - 640KB MEMORY  
* - COLOR/GRAPH (80 column)  
* - 1 FLOPPY DISK DRIVE(S)  
* - 1 ASYNC ADAPTER  
* - 1 HARD DISK DRIVE(S)  
* - 1 PRINTER ADAPTER  
* - XXXXXXKB EXTENDED MEMORY  
  
PRESS [ENTER] KEY
```

Tap or press **Enter** to return to the DIAGNOSTIC MENU.

3.21 SETUP

3.21.1 Function Description

This program displays the current system setup information as listed below:

1. Memory
 - (1) Total
 - (2) Base
 - (3) Shadow Boot ROM
 - (4) Hard RAM
 - (5) Extended memory
2. Display
 - LCD reverse mode
3. Hard disk
4. Power-on password
5. Battery
 - (1) Battery save mode
 - (2) Battery alarm
 - (3) Battery capacity
6. COM/PRT
 - (1) Serial port
 - (2) PC card slot
 - (3) Printer port
7. Others
 - (1) Resume mode
 - (2) Speaker

3.21.2 Accessing the SETUP Program

Selecting **0** from the DIAGNOSTICS MENU and pressing **Enter** displays the following:

[T100X SETUP]		Version = X.XX
MEMORY	BATTERY	
Total = 4096KB	Battery Save Mode = Normal Life	
Base = 640KB	Battery Alarm = On	
Shadow Boot ROM = 128KB	Battery Capacity = E ??? F	
Hard RAM = 0KB		
Extended = 3328KB		
	COM/PCMCIA/PRT	
DISPLAY	Serial Port = COM1 (IRQ4/3F8E)	
LCD Reverse Mode = Reverse	PC Card Slot = PCMCIA	
	Printer Port = Output	
HARD DISK	OTHERS	
Capacity = 40MB	Resume Mode = Boot	
POWER ON PASSWORD = Not registered	Speaker = On	

↑↓ : Select Items	[Hard RAM]
←→ : Select Values	o 0 o 512 o 1024 o 1536 o 2048
Home: Set Defaults	o 2560 o 3072 o 3584 o 4096 o 4808
End: Exit	o 5120 o 5832 o 6144 o 6658 o 7188
	o 7680 o 8192 o 8704 o 9216 o 9728

PLEASE TAP BELOW			
↑	↓		HOME
←	→		END

The menus above show examples of setup options as they may be currently stored in memory. Since the options shown reflect the previously set options, the display you see may be different from the one above.

If you press or tap **END** the following will be displayed:

↑↓ : Select Items	[Hard RAM]
←→ : Select Values	o 0 o 512 o 1024 o 1536 o 2048
Home: Set Defaults	o 2560 o 3072 o 3584 o 4096 o 4808
End: Exit	o 5120 o 5832 o 6144 o 6658 o 7188
	o 7680 o 8192 o 8704 o 9216 o 9728

PLEASE TAP BELOW			
↑	↓		HOME
←	→		END

3.21.3 Changing SETUP Values

To change values, use the input window shown below and on the previous page. To scroll through the SETUP menu, tap the up arrow or down arrow. To select a value, tap the left arrow or right arrow. You can also use the cursor keys on a keyboard in the same way.

↑↓ : Select Items

←→ : Select Values

Home: Set Defaults

End: Exit

[Hard RAM]				
○ 0	○ 512	○ 1024	○ 1536	○ 2048
○ 2560	○ 3072	○ 3584	○ 4096	○ 4808
○ 5120	○ 5832	○ 6144	○ 6658	○ 7188
○ 7680	○ 8192	○ 8704	○ 9216	○ 9728

PLEASE TAP BELOW			
↑	↓		HOME
←	→		END

3.21.4 SETUP Option Descriptions

The SETUP screen is divided into functionally-related groups. This section describes each group and the options within it.

1. Memory

This group of options lets you configure the computer's memory.

(1) Total

This field displays the total amount of memory installed and is automatically calculated by the computer.

(2) Base

This field displays the amount of memory installed and is automatically calculated by the computer. You cannot change this value. If you set Hard RAM, this value changes automatically.

(3) Shadow BIOS ROM

The SETUP program displays 128 KB of RAM, which is reserved for the Shadow BIOS ROM. This field displays the amount of the extended memory used for the shadow BIOS ROM. You cannot change this value.

(4) Extended Memory

This field displays the amount of extended memory the T100X has available. You cannot change this value.

(5) Hard RAM

This field displays the amount of extended memory assigned to Hard RAM. When you select the size of memory using the arrow keys or stylus, the size of memory allocated for Hard RAM increases or decreases in 512 KB increments from 512 KB to 9728 KB. The default is 0 KB.

If you have installed an 8 MB or 16 MB memory card, the setup program will display a second page of options enabling you to set up to 14848 MB of Hard RAM.

2. Display

This option lets you switch between normal and reverse video.

LCD Reverse Mode o Normal o Reverse

Normal Displays dark text on a light background with 16 shades of gray.

Reverse Displays light text on a dark background with 16 shades of gray.

3. Hard Disk

This option enables or disables the hard disk drive.

40MB A 40 MB HDD is used in the T100X. The disk's capacity is automatically displayed but cannot be changed, except to No drive.

No drive Prohibits access to the hard disk.

4. Power-on Password

This option is used to set or reset the Power-on Password. When Power on Password is selected, the following menu appears:

↑↓ : Select Items
←→ : Select Values
HOME: Set Defaults
END: Exit

[Power on Password]			
o Press [←] or [→] to set the password.			

PLEASE TAP BELOW			
↑	↓		HOME
←	→		END

If no password has been set, Not Registered appears in the menu.

If a password has been set, Registered appears in the menu.

(1) Setting the Password

(a) When the right or left arrow key is pressed, New Password = appears as shown below.

↑↓ : Select Items
←→ : Select Values
DEL: Cancel Input
ENT: Set Password

[Power on Password]	
o Press [←] or [→] to set the password.	
New	
Password =	

PLEASE TAP BELOW			
7	8	9	HOME
4	5	6	DEL
1	2	3	ENT

- (b) Up to four numerical characters (ASCII codes: 30h - 39H) can be selected.

↑↓ : Select Items
 ←→ : Select Values
 Home: Set Defaults
 End: Exit

[Power on Password] ◦ Press [←] or [→] to set the password.		New Password = ****
-----------------------------------------------------------------------	--	----------------------------

PLEASE TAP BELOW			
7	8	9	HOME
4	5	6	DEL
1	2	3	ENT

If DEL is pressed, the characters already pressed are canceled.

- (c) After the Enter key is pressed, Verify Password = appears.

↑↓ : Select Items
 ←→ : Select Values
 Home: Set Defaults
 End: Exit

[Power on Password] ◦ Press [←] or [→] to set the password.		Verify Password =
-----------------------------------------------------------------------	--	--------------------------

PLEASE TAP BELOW			
↑	↓		HOME
←	→		END

- (d) Re-enter the password. If the two character strings match, the following menu appears:

↑↓ : Select Items
 ←→ : Select Values
 Home: Set Defaults
 End: Exit

[Power on Password] ◦ Press [←] or [→] to cancel the password.		
--------------------------------------------------------------------------	--	--

PLEASE TAP BELOW			
↑	↓		HOME
←	→		END

If there is no match, there is a beep and the program returns to the menu shown in (b) above.

(2) Resetting the Password

- (a) When the right or left arrow key is pressed, "Old Password =" appears as shown below.

↑↓ : Select Items
 ←→ : Select Values
 Home: Set Defaults
 End: Exit

<p>[Power on Password]</p> <p>o Press [←] or [→] to set the password.</p>	<p>old</p> <p>Password =</p>	<table border="1" style="border-collapse: collapse; width: 100%;"> <tr> <th colspan="4">PLEASE TAP BELOW</th> </tr> <tr> <td style="text-align: center;">↑</td> <td style="text-align: center;">↓</td> <td></td> <td style="text-align: center;">HOME</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">←</td> <td style="text-align: center;">→</td> <td></td> <td style="text-align: center;">END</td> </tr> </table>	PLEASE TAP BELOW				↑	↓		HOME					←	→		END
PLEASE TAP BELOW																		
↑	↓		HOME															
←	→		END															

- (b) Up to four numerical characters (ASCII codes: 30h - 39H) can be selected. The characters are displayed as a string of asterisks.

↑↓ : Select Items
 ←→ : Select Values
 Home: Set Defaults
 End: Exit

<p>[Power on Password]</p> <p>o Press [←] or [→] to set the password.</p>	<p>old</p> <p>Password = ****</p>	<table border="1" style="border-collapse: collapse; width: 100%;"> <tr> <th colspan="4">PLEASE TAP BELOW</th> </tr> <tr> <td style="text-align: center;">↑</td> <td style="text-align: center;">↓</td> <td></td> <td style="text-align: center;">HOME</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">←</td> <td style="text-align: center;">→</td> <td></td> <td style="text-align: center;">END</td> </tr> </table>	PLEASE TAP BELOW				↑	↓		HOME					←	→		END
PLEASE TAP BELOW																		
↑	↓		HOME															
←	→		END															

If the DEL key is pressed, the characters already pressed are canceled.

- (c) If the characters match the registered password, the password is cleared, and the default menu appears as shown below.

		T100X SETUP	Version = *.*
MEMORY		BATTERY	
Total	= 4096KB	Battery Save Mode	= Normal Life
Base	= 640KB	Battery Alarm	= On
Shadow Boot ROM	= 128KB	Battery Capacity	= E ??? F
Hard RAM	= 0KB		
Extended	= 3328KB		
		COM/PCMCIA/PRT	
DISPLAY		Serial Port	= COM1 (IRQ4/3F8H)
LCD Reverse Mode	= Reverse	PC Card Slot	= PCMCIA
		Printer Port	= Output
HARD DISK		OTHERS	
Capacity	= 40MB	Resume Mode	= Boot
POWER ON PASSWORD	= Not registered	Speaker	= On

↑↓ : Select Items
 ←→ : Select Values
 Home: Set Defaults
 End: Exit

[POWER ON PASSWORD]
 ○ Press [←] or [→] to set
 the password.

PLEASE TAP BELOW

↑	↓		HOME
←	→		END

If there is no match, a beep sounds and Registered reappears.

(3) The Password Service Disk

To make a password disk, press the END key after the password is newly registered or changed. The following window appears:

↑↓ : Select Value
 End: Confirm Choice

○ Exit and save changes
 ○ Exit and discard changes
 ○ Cancel

PLEASE TAP BELOW

↑	↓		
			END

Insert a floppy disk in the FDD, and select Exit and Save Changes .

5. Battery

(1) Battery Save Mode

This option is used to select Long Life , Normal Life , or User Setting of the BATTERY SAVE OPTIONS . You can also set this option using the Hot Keys.

When the AC adapter is connected to the T100X, this option uses the normal life setting, even if you have set it to Long life or User's setting in the SETUP window. The default is Long life when the T100X uses battery power.

Normal Life/ Long Life/ User Setting Selects a preset set of battery save parameters suitable for either Long Life , Normal Life , or the User Setting operation. Selecting this option displays a sub-window of the BATTERY SAVE OPTIONS, like the one shown below. The options in the sub-window cannot be changed and are for information purposes only.

Normal Life

BATTERY SAVE OPTIONS	
Processing Speed	High
CPU Sleep Mode	Disabled
HDD Auto Off	Disabled
Display Auto Off	Disabled
Tablet Auto Off	Disabled
System Auto Off	Disabled
LCD Brightness	Semi-Bright

Long Life

BATTERY SAVE OPTIONS	
Processing Speed	Low
CPU Sleep Mode	Enabled
HDD Auto Off	03 Min
Display Auto Off	03 Min
Tablet Auto Off	03 Min
System Auto Off	Disabled
LCD Brightness	Semi-Bright

User settings This option allows you to set the battery save parameters in the two BATTERY SAVE OPTIONS sub-windows . When you select this option, the automatic setting feature (Long Life or Normal Life) is disabled and the user-preferred parameters become effective. Default settings in the sub-windows depend on the BATTERY SAVE MODE: Long Life and Normal Life. User settings lets you select the following options:

(a) Processing Speed

This option sets the CPU operating speed to High or Low.

Processing Speed	CPU Speed
High	25 MHz
Low	12.5 MHz (Equivalent)

(b) CPU Sleep Function

This option enables or disables the CPU sleep function.

Enable Enables sleep function.

Disable Disables sleep function.

(c) HDD Auto Off

This option disables or sets the duration of the HDD automatic power-off function.

Disable Disables HDD automatic power off.

xx Min. Automatically turns off power to the hard disk drive if it is not used for the duration set. The duration xx can be set to 3, 5, 10, 15 or 20 minutes.

(d) Display Auto Off

This option disables or sets the duration of the display automatic power-off function. The function turns off the computer sidelight if you make no entry for the set period of time.

Disable Disables display automatic power-off.

xx Min. Automatically turns off power to the sidelit LCD panel if it is not used for the duration set. The duration xx can be set to 1, 3, 5, 10, 15, 20 or 30 minutes.

Always OFF Turns off power to the display's fluorescent lamp. This value is not displayed if the AC adapter is connected.

(e) **Tablet Auto Off**

This option enables or disables the tablet automatic power-off function. This function is automatically disabled when the AC adapter is attached to the computer, however the settings are left unchanged.

Disable Disables the tablet auto-off function.

xx Min Enables the tablet auto-off function. The duration xx can be set to 1, 3, 5, 10, 15 or 20 minutes.

(f) **System Auto Off**

This option enables or disables the system automatic power-off function. This function is enabled only when the Resume Mode option is set to Resume. When the Resume Mode option is set to Boot, this function is always disabled and System Auto Off = Disable is displayed in any mode (Normal/Long/User Setting).

Disable Disables the system auto-off function.

xx Min Enables the system auto-off function and prompts for a duration of 30 or 60 minutes. (In long life this option is set to 30 minutes.)

(g) **LCD Brightness**

This option selects either Semi-bright or Bright for the LCD brightness level.

Semi-bright A slightly lower brightness level is used.

Bright The maximum brightness level is used.

(2) **Remaining Battery Capacity**

This feature indicates approximately how much power is left in the battery pack. A horizontal bar graph between "E" and "F" represents the amount of charge.

E Empty

F Full

??? Remaining charge is unknown because the battery has been removed and replaced. Use the left and right arrow keys to set the charge level.

N/A Battery pack is not installed.

6. COM/PRT

This option controls settings for serial and parallel ports.

(1) Serial Port

This option allows you to set the COM level (COM1 or COM2) for the serial and parallel ports.

The serial port interrupt level (IRQ) and I/O port base address for each COM level is shown below:

COM level	Interrupt level	I/O address	
COM1	4	3F8h	(Serial Port default)
COM2	3	2F8h	(Card Modem default)
Not Used			(Disables Port)

NOTE: *The card modem setting is not displayed, but is automatically set to the remaining COM level when the serial port is set.*

(2) PC Card Slot 2

This option allows you to use a PC card or other optional card for Slot 2. (Slot 1 is always assigned to a PCMCIA card.) If you select Others, you can set the next options, COM Port and Power.

PCMCIA You can use a PCMCIA card. (This is the default)

Others This option allows you to set the COM port of the card modem and power on/off for the following options:

(a) COM Port

Two COM levels for the card modem can be selected: COM1 (IRQ4/3F8H) or COM2 (IRQ3/2F8H). If you set this level to the same as that of the serial port, the serial port setting automatically changes to Not Used.

(b) Power

This option allows you to turn the card modem On or Off. However, this option does not appear if you do not install the card modem or set the PCMCIA Slot option to PCMCIA.

(3) Printer Port

This option sets the communication mode for the PRT port to either output-only or bi-directional.

Output Activates uni-directional operation.
 (This is the default.)

Bi-Directional Activates bi-directional operation.

7. Others

Whether or not you need to configure the T100X with these options depends primarily on the kind of software or peripherals you use.

(1) Resume mode

This option enables or disables the AutoResume feature. Disabling AutoResume enables boot mode.

Boot Turns off AutoResume. (This is the default.)

Resume Turns on the AutoResume feature.

(2) Speaker

This option enables or disables the system speaker.

On Enables the system speaker.

Off Disables the system speaker.

4.1 General

This section explains how to disassemble the T100X and replace Field Replaceable Units (FRUs). It may not be necessary to remove all the FRUs in order to replace one. The list below shows the order in which FRUs should be removed. Always start by removing the battery pack, then proceed to the FRU you think is causing the T100X to operate improperly.

- Battery Pack
- Optional PCMCIA Card
- Optional Memory Card
- Backup Battery & RTC Battery
- Back Cover
- FL Inverter Board
- Hard Disk Drive
- Power Supply Board
- System Board
- Display Module

Before You Begin

Look over the procedures in this section before you begin disassembling the T100X. Familiarize yourself with the disassembly and reassembly steps. Begin each procedure by removing the AC adapter and the battery pack as instructed in Section 4.2, *The Battery Pack*.

1. Use only the correct and approved tools when disassembling the T100X.
2. Make sure the working environment is free from the following elements, whether you are using or storing the T100X:
 - Dust and contaminants
 - Static electricity
 - Extreme heat, cold and humidity
3. Make sure the FRU you are replacing is most likely causing the abnormal operation by performing the necessary diagnostic tests described in this manual.
4. Do not perform any operations that are not necessary, and use only the described procedures for disassembling and installing FRUs in the T100X.
5. After removing parts from the computer, place them in a safe place away from the computer so they will not be damaged and do not interfere with your work.
6. You will remove many screws when you disassemble the T100X. When you remove screws, make sure they are placed in a safe place and identified with the correct parts.
7. When reassembling the T100X, make sure you use the correct screws to secure the various pieces in place. Screw sizes are listed in the corresponding figures.

8. The T100X contains many sharp edges and corners, so be careful not to injure yourself.
9. After you have replaced an FRU, make sure the T100X is functioning properly by performing the appropriate test on the FRU you have fixed or replaced.

Disassembly Procedures

The T100X has two basic types of cable connectors:

- Pressure Plate Connectors
- Normal Pin Connectors

To disconnect a pressure plate connector, lift up the tabs on both sides of the connector's plastic pressure plate and slide the cable out of the connector. To connect the cable to a pressure plate connector, make sure the pressure plate is fully lifted and slide the cable into the connector. Secure the cable in place by pushing the sides of the pressure plate down so the plate is flush with the sides of the connector. Gently pull on the cable to make sure the cable is secure. If you pull out the connector, connect it again making sure the connector's pressure plate is fully lifted when you insert the cable.

Standard pin connectors are used with all other cables. These connectors can be connected and disconnected by simply pulling them apart or pushing them together.

Assembly Procedures

After you have disassembled the T100X and fixed or repaired the problem that was causing the computer to operate abnormally, you will need to reassemble it. While assembling the computer, remember the following general points:

- Take your time, making sure you follow the instructions closely. Most problems arise when you get in a hurry.
- Make sure all cables and connectors are securely fastened.
- Before securing the FRU or other parts, make sure that no cables will be pinched by screws, FRUs or other parts.
- Check that all latches are closed securely.
- Make sure all the correct screws are used to secure all FRUs. Using the wrong screw can either damage the threads on the screw or the head of the screw, and may prevent proper seating of an FRU.

After installing an FRU, confirm that the FRU and the T100X are functioning properly.

Tools and Equipment

The use of ElectroStatic Discharge (ESD) equipment is very important for your safety and the safety of those around you. Proper use of these devices will increase the success rate of your repairs and lower the cost for damaged or destroyed parts. The following equipment is necessary to disassemble and reassemble the T100X:

- One M2 Phillips-head screwdriver to remove and replace M1 and M2 screws.
- One jeweler's screwdriver to remove screw masks.
- Tweezers, to lift out screws that you cannot grasp with your fingers.
- One LCD Support Block (30mm x 200mm x 300mm / 1¼" x 8" x 12") This block must be composed of anti-static foam. (This is the same block used with the T2200SX/T3300SL.)
- ESD mats for the floor and the table you are working on.
- An ESD wrist strap or heel grounder.
- Anti-static carpeting or flooring.
- Air ionizers in highly static-sensitive areas.

4.2 Battery Pack

Removing the Battery Pack

To remove the T100X battery pack, follow the steps below and refer to Figures 4-1 and 4-2.

1. Turn off the power to the T100X, and, if attached, disconnect the AC adapter, power cord and all external cables connected to the computer.
2. Turn the T100X over, placing it on the LCD support block to provide anti-static protection and to prevent damage to the glass cover. (For information on the LCD support block, refer to *Tools and Equipment* in Section 4.1.)
3. Push the **battery lock latch** into the unlock position (Figure 4-1).
4. Slide the **battery release latch** until the battery pops free (Figure 4-1).

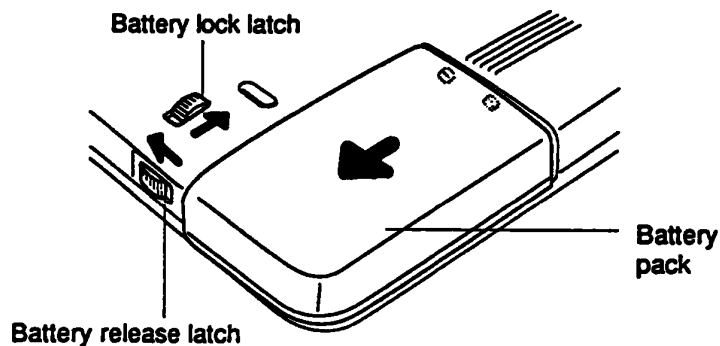


Figure 4-1 Releasing the Battery Pack Latches

5. Grasp the **battery pack**, slide it free of the latches, and lift it out (Figure 4-2).

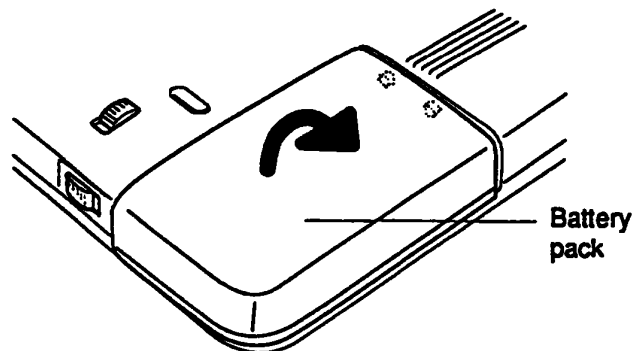


Figure 4-2 Removing the Battery Pack

Installing the Battery Pack

To install the T100X battery pack, follow the steps below and refer to Figures 4-3 and 4-4.

1. Set the **battery pack** in the T100X so that the front edge is on the **red line** and push the battery pack in until it is fully seated (Figure 4-3).

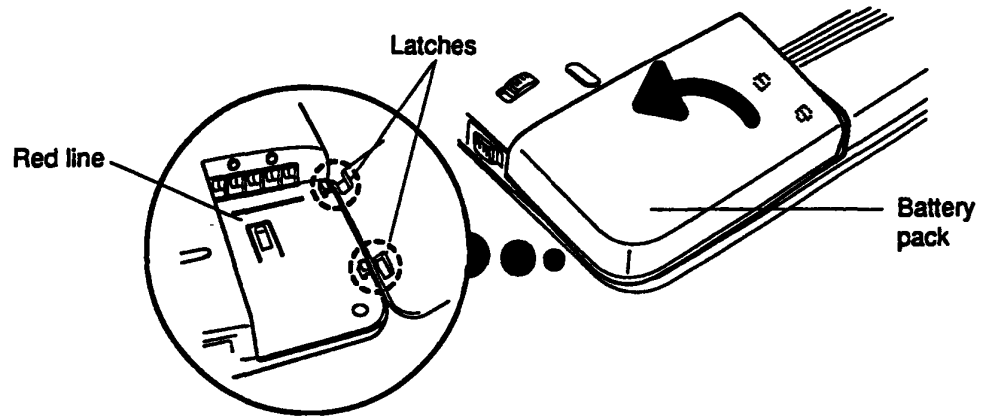


Figure 4-3 Installing the Battery Pack

2. Slide the **battery release latch** back into place (Figure 4-4).
3. Push the **battery lock latch** to the lock position (Figure 4-4).

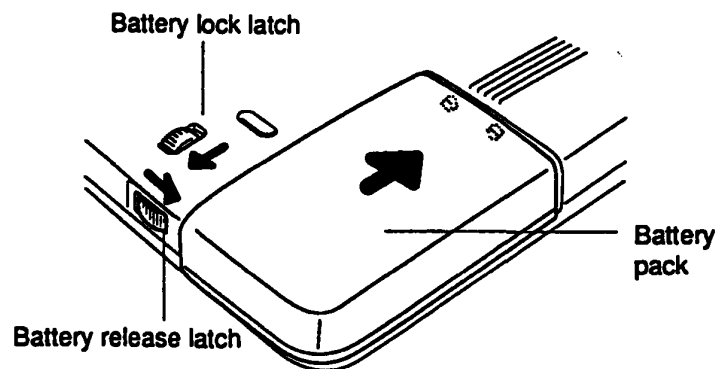


Figure 4-4 Setting the Battery Pack Latches

4.3 Optional PCMCIA Card

Removing the Optional PCMCIA Card

To remove an optional PCMCIA card from the T100X, follow the steps below and refer to Figure 4-5.

NOTE: Before removing the PCMCIA card, be sure the computer is in boot mode.

1. Turn off the power to the T100X.
2. Open the **expansion slot cover**.
3. Press the **eject button** and the optional PCMCIA card will pop partially out.
4. Grasp the **card** and pull it out of the computer.

CAUTION: DO NOT touch the connecting edge of the PCMCIA card. Debris or oil in or on the connector may cause access problems.

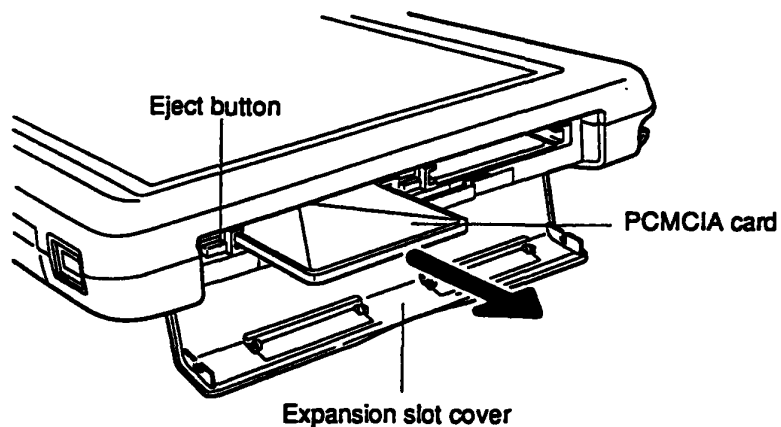


Figure 4-5 Removing the Optional PCMCIA Card

Installing the Optional PCMCIA Card

To install an optional PCMCIA card in the T100X, follow the steps below and refer to Figure 4-6.

1. Insert the PCMCIA card into the card slot and push it in until the eject button pops out.

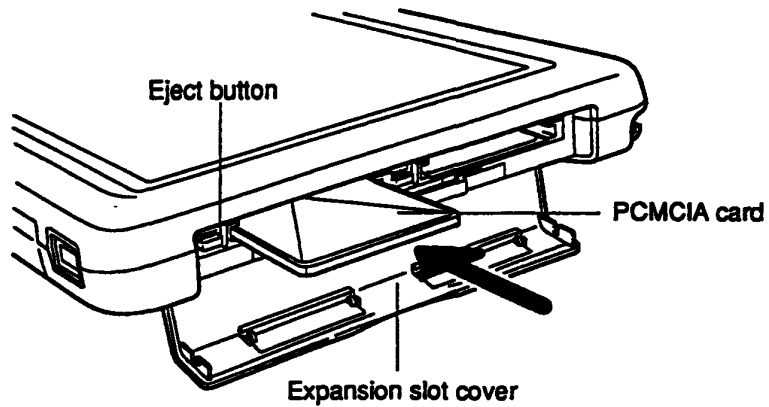


Figure 4-6 Installing an Optional PCMCIA Card

2. Close the **expansion card cover**.
3. Install the battery pack as described in Section 4.2.

4.4 Optional Memory Card

Removing the Optional Memory Card

To remove an optional memory card from the T100X, follow the steps below and refer to Figure 4-7.

1. Turn off the power to the T100X.
2. Open the **expansion slot cover**.
3. Open the **expansion memory slot cover**.
4. Grasp the **card** and pull it out of the computer.

CAUTION: *DO NOT touch the connecting edge of the memory card. Debris or oil in or on the connector may cause memory access problems.*

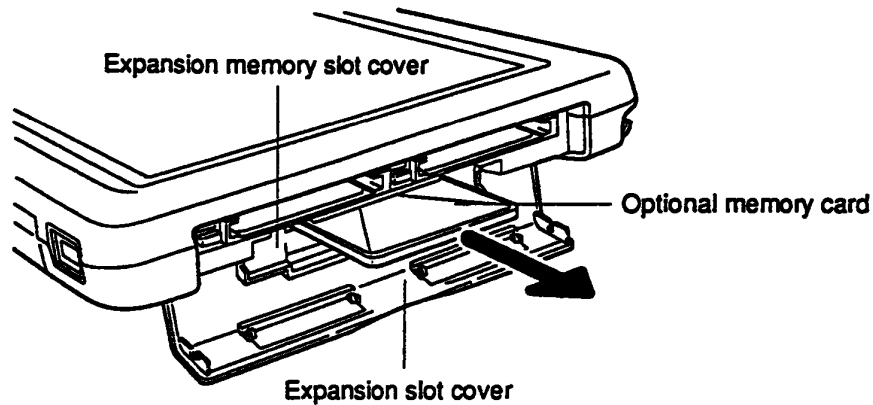


Figure 4-7 Removing the Optional Memory Card

Installing the Optional Memory Card

To install an optional memory card in the T100X, follow the steps below and refer to Figure 4-8.

1. The top of the **optional memory card** is marked with the word “insert” and an arrow pointing toward the connecting edge. Turn the memory card so that it is facing up and carefully insert the connecting edge (arrow first) into the slot. Push gently to ensure a firm connection.

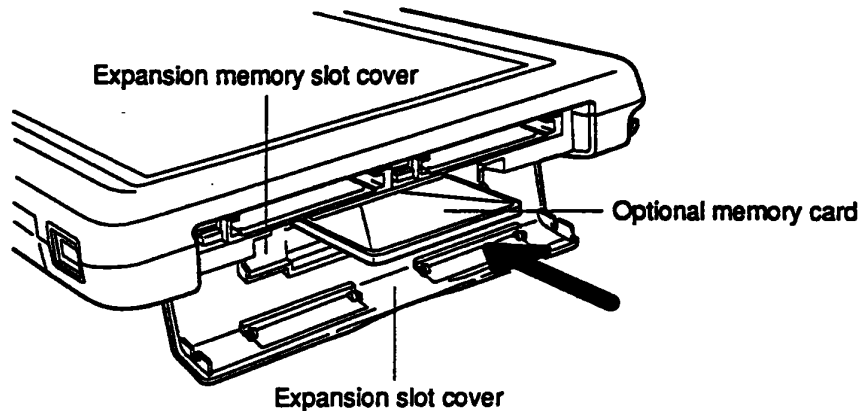


Figure 4-8 Installing the Optional Memory Card

2. Close the **expansion memory slot cover** (Figure 4-8).
3. Close the **expansion slot cover**.
4. The T100X automatically configures all additional memory.

4.5 Backup Battery · RTC Battery

Removing the Backup Battery · RTC Battery

CAUTION: *The resume data and RTC memory data will be erased when the backup battery and RTC battery connectors are disconnected. Before removing the backup battery and RTC battery, save the information.*

To remove the T100X's backup battery and RTC battery, follow the steps below and refer to Figures 4-9 and 4-10.

1. Turn off the power to the T100X, and, if attached, disconnect the AC adapter, power cord and all external cables connected to the computer.
2. Remove the battery pack as described in Section 4.2.
3. Remove the **screw mask** and **M2.5x6 black screw** from the **battery cover**, then tilt the computer upwards to allow the battery cover to fall away from the computer (Figure 4-9).

NOTE: *The battery cover is held in place by one screw and two latches. Be careful to tilt the computer as indicated in Figure 4-9 when removing the cover. When you seat it, engage the latches first, then rotate the battery cover into place.*

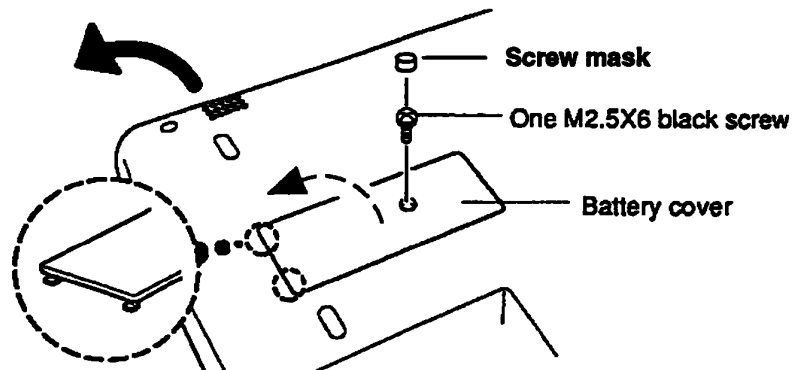


Figure 4-9 Removing the Backup Battery and RTC Battery Cover

4. Lift out the insulator (note how the cables are routed), disconnect the **backup battery** (the longer battery) from **PJ4**, and lift out the battery (Figure 4-10).
5. Disconnect the **RTC battery** from **PJ2** and lift out the battery (Figure 4-10).

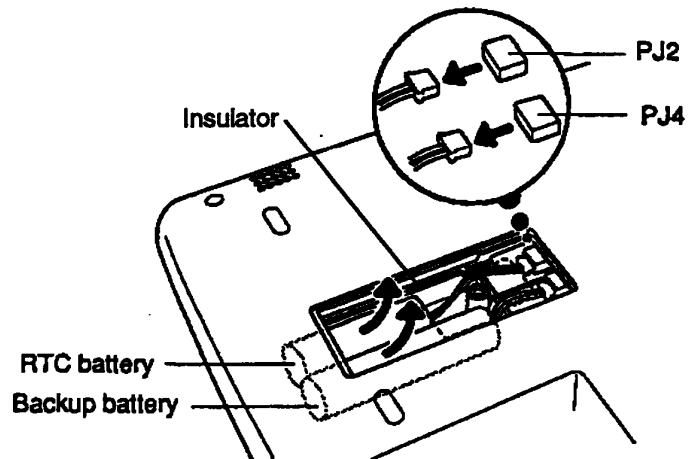


Figure 4-10 Disconnecting and Removing the Backup Battery and RTC Battery

Installing the Backup Battery · RTC Battery

To install the T100X's backup battery and RTC battery, follow the steps below and refer to Figures 4-9 and 4-10.

1. Connect the **RTC battery** (the shorter battery) to **PJ2** and seat the battery (Figure 4-10).
2. Connect the **backup battery** to **PJ4** and seat the battery (Figure 4-10).
3. Set the insulator in place so that one end covers the connectors and the cables are routed through the notches.
4. Replace the cover and secure it with an **M2.5x6 black screw** (Figure 4-9).
5. Replace the **screw mask** (Figure 4-9).
6. Replace the battery pack as described in Section 4.2.

4.6 Back Cover

Removing the Back Cover

To remove the T100X back cover, follow the steps below and refer to Figures 4-11 through 4-13.

1. Turn off the power to the T100X, and, if attached, disconnect the AC adapter, power cord and all external cables connected to the computer.
2. Remove the battery pack, optional memory card, optional PCMCIA card(s), and backup and RTC batteries, as described in Sections 4.2 through 4.5.
3. Remove the three screw masks and five M2.5x6 black screws (Figure 4-11).

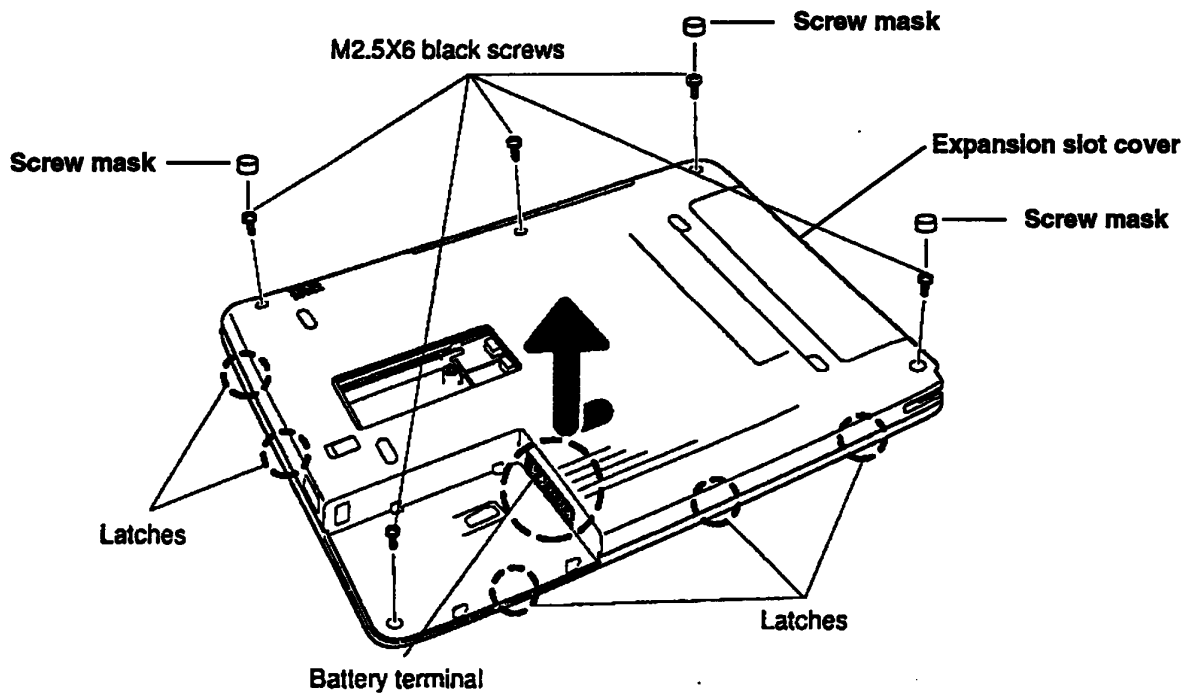


Figure 4-11 Removing the Back Cover

4. Open the expansion slot cover (Figure 4-11).

NOTE: *The latches that fasten the back cover to the display module provide a secure fit, therefore, the first time a computer is disassembled, you may have some difficulty removing the back cover.*

CAUTION: *Do not use a tool to pry off the cover.*

5. Stand the unit on the I/O port side (back cover to the left, screen to the right, Figure 4-12).

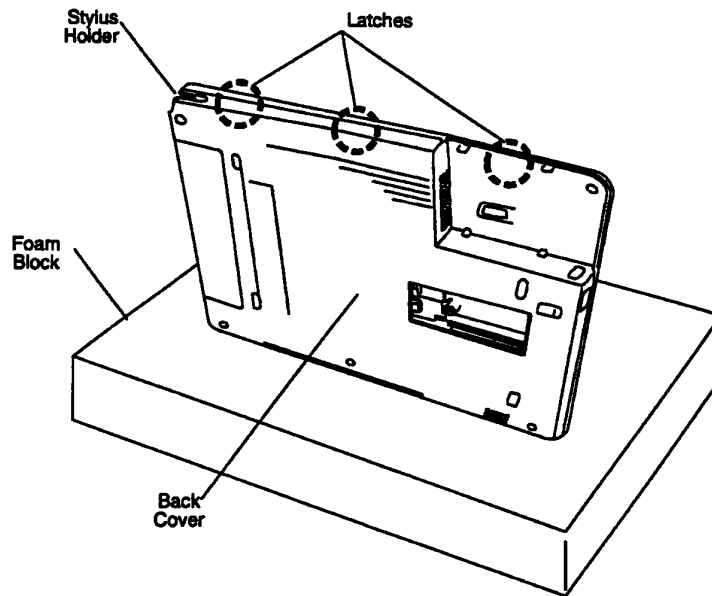


Figure 4-12 Position for Separating Side Latches

6. Insert your left index finger into the **stylus holder**.
7. With your left thumb, press down on the **three latches**, one at a time from the top down, separating the back cover from the display module.
8. Rotate the unit so that it is standing with the expansion slot side down (Figure 4-13). Press the back cover by the **two remaining latches** and separate the covers.

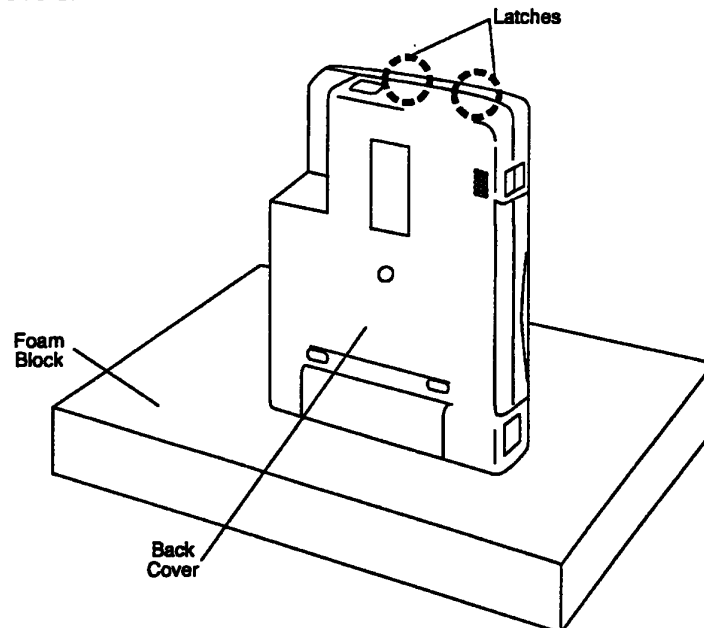


Figure 4-13 Position for Separating Bottom Latches

9. Set the unit face down with the expansion slot facing away from you.

NOTE: The terminals for the battery extend outside the back cover, so be careful not to damage them when removing the cover.

10. With both hands, slightly lift the back cover and slide it towards you so that it does not catch on the **battery terminal**, then lift the cover straight up (Figure 4-11).

NOTE: DO NOT TOUCH the conductive paint on the inside of the back cover.

Installing the Back Cover

To install the T100X back cover, follow the steps below and refer to Figure 4-14.

NOTES:

1. **DO NOT TOUCH** the conductive paint on the inside of the back cover.
2. The terminals for the battery extend outside the back cover, so be careful not to damage them when replacing the cover.

1. Open the **expansion slot** and I/O port covers, then set the back cover in place and press to secure the **five latches**. Close the expansion slot and I/O port covers.
2. Secure the **five M2.5x6 black screws** and **three screw masks**.

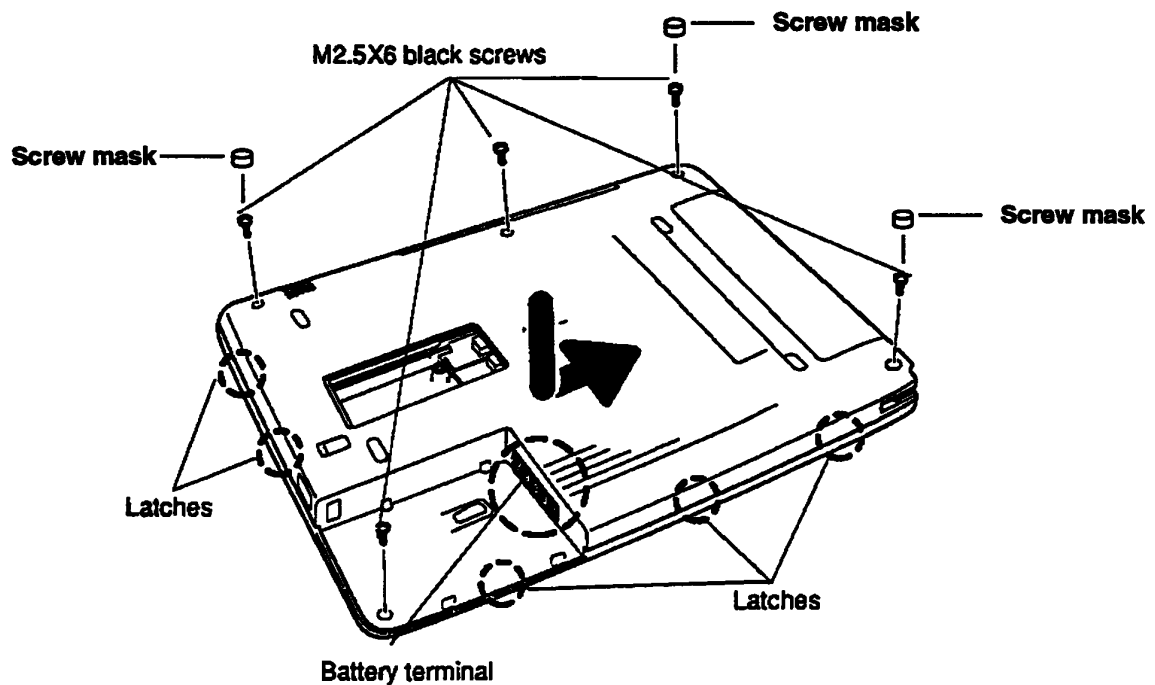


Figure 4-14 Installing the Back Cover

3. Install the backup and RTC batteries, optional PCMCIA card, optional memory card, and battery pack as described in Sections 4.5, 4.3, 4.4, and 4.2.

4.7 FL Inverter Board

Removing the FL Inverter Board

To remove the T100X FL inverter board, follow the steps below and refer to Figure 4-15.

1. Turn off power to the computer, and, if attached, disconnect the AC adapter, power cord, and all external cables connected to the computer.
2. Remove the battery pack, optional memory card, optional PCMCIA card(s), backup and RTC batteries, and back cover, as described in Sections 4.2 through 4.6.
3. Remove the one M2x4 brass screw securing the FL inverter board and the ground wire.
4. Remove the tape securing the FL inverter cable.
5. Disconnect the FL inverter cable from PJ5 on the power supply board.
6. Lift out the FL inverter board with its cover, then remove the two FL cables from CN2 and CN3 on the FL inverter board.

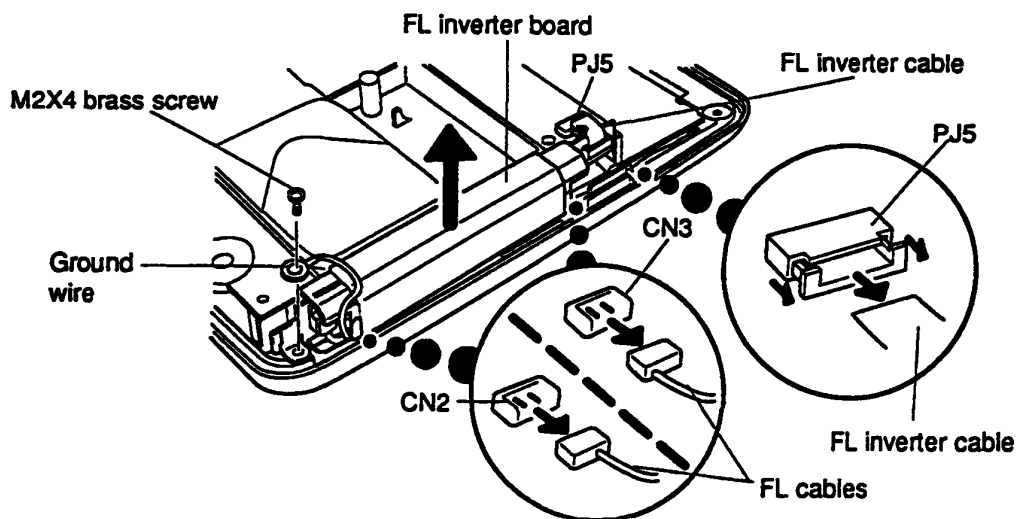


Figure 4-15 Disconnecting and Removing the FL Inverter Board

Installing the FL Inverter Board

To install the T100X FL inverter board, follow the steps below and refer to Figure 4-16.

1. Connect the FL cables to CN2 and CN3 on the FL inverter board.
2. Seat the FL inverter board making sure the ends fit into the notches on the mid-frame assembly of the Display Module.
3. Secure the FL inverter board and the ground wire with an M2x4 brass screw.
4. Connect the FL inverter cable to PJ5 on the power supply board.

NOTE: The FL inverter cable must be folded as indicated in Figure 4-16.

5. Secure the FL inverter cable with tape (50 mm).

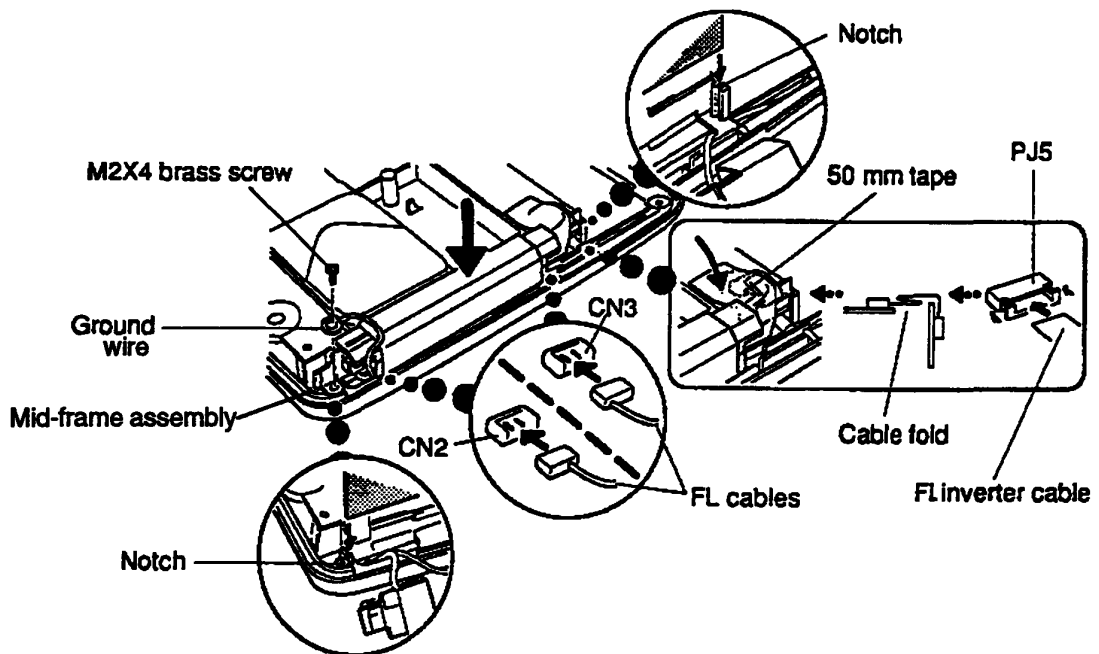


Figure 4-16 Installing the FL Inverter Board

6. Install the back cover, backup and RTC batteries, optional PCMCIA card, optional memory card, and battery pack as described in Sections 4.6, 4.5, 4.3, 4.4, and 4.2.

4.8 Hard Disk Drive

Removing the Hard Disk Drive

CAUTION: Do not drop or bump the HDD. The HDD is sensitive to impact, so be very careful when handling the drive.

To remove the T100X's hard disk drive, follow the steps below and refer to Figures 4-17 and 4-18.

1. Turn off the power to the T100X, and, if attached, disconnect the AC adapter, power cord and all external cables connected to the computer.
2. Remove the battery pack, optional memory card, optional PCMCIA card(s), backup and RTC batteries, and back cover as described in Sections 4.2 through 4.6.
3. Remove the one M2x4 brass screw securing the HDD, and lift out the hard disk drive (Figure 4-17).
4. Grasp the ends of the HDD cable connector and pull to disconnect the HDD cable from the HDD (Figure 4-17).

CAUTION: When disconnecting the cable from the HDD, be careful not to exert tension on the cable's connection at the T100X end.

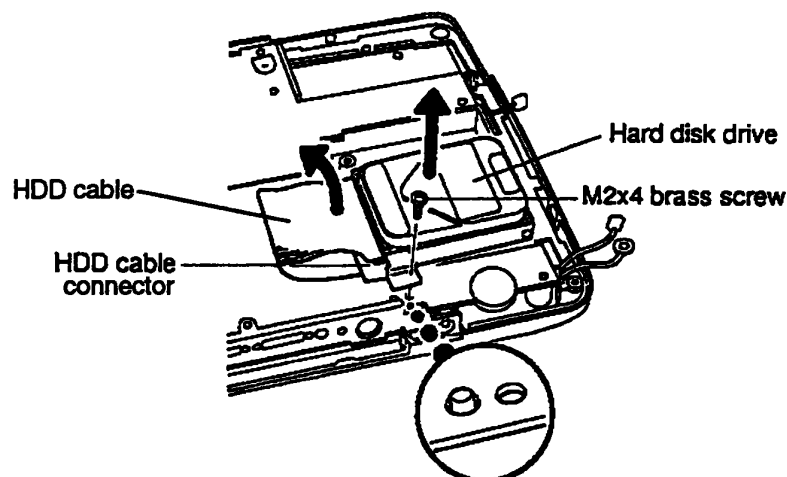


Figure 4-17 Disconnecting and Removing the Hard Disk Drive

5. Remove the two M1.6 black screws securing the hard disk bracket and remove the bracket (Figure 4-18).

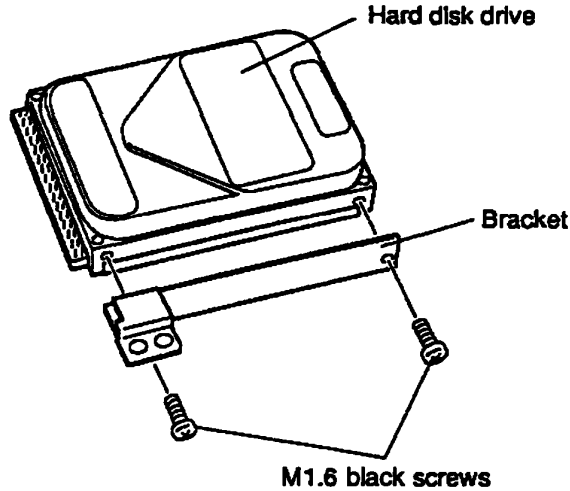


Figure 4-18 Removing the Hard Disk Bracket

Installing the Hard Disk Drive

To install the T100X's hard disk drive, follow the steps below and refer to Figures 4-17 through 4-19.

1. Secure the bracket with the two M1.6 black screws (Figure 4-18).
2. Connect the HDD cable to the HDD (Figures 4-17 and 4-19).

CAUTION: When connecting the cable to the HDD, apply pressure only between the HDD connector PCB and the cable connector. Do not apply pressure on the metal back plate on the HDD or the tab on the cable connector. The back plate and tab each have a thin piece of mylar insulator on them. A short can occur if the pins on the HDD connector or cable connector penetrate these insulators.

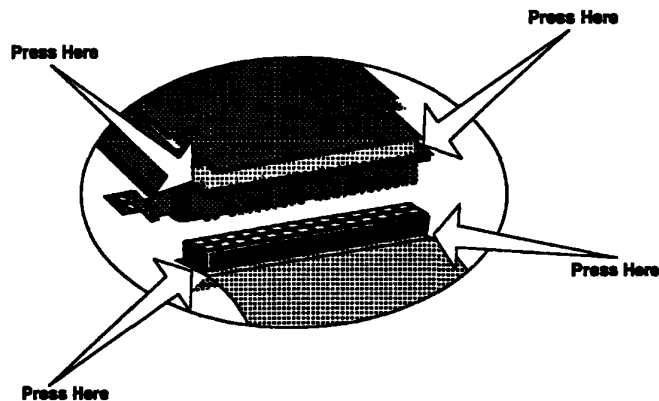


Figure 4-19 HDD Cable and Connector

3. Seat the **HDD** in the T100X and secure it with the one **M2x4 brass screw** (Figure 4-17).
4. Install the back cover, backup and RTC batteries, optional PCMCIA card, optional memory card, and battery pack as described in Sections 4.6, 4.5, 4.3, 4.4 and 4.2.

4.9 Power Supply Board

Removing the Power Supply Board

To remove the T100X's power supply board, follow the steps below and refer to Figure 4-20.

1. Turn off the power to the T100X, and, if attached, disconnect the AC adapter, power cord, and all external cables connected to the computer.
2. Remove the battery pack, optional memory card, optional PCMCIA card(s), backup and RTC batteries, and back cover, as described in Sections 4.2 through 4.6.
3. Remove the **two M2x4 brass screws** and **two M2x6 brass screws** securing the power supply board.
4. If you have removed the FL inverter board, skip this step. Otherwise, pull the **tape back** exposing the FL inverter board connector PJ5, and disconnect the **FL inverter board cable**.
5. Disconnect **PJ1** on the power supply board from **PJ7** on the system board.

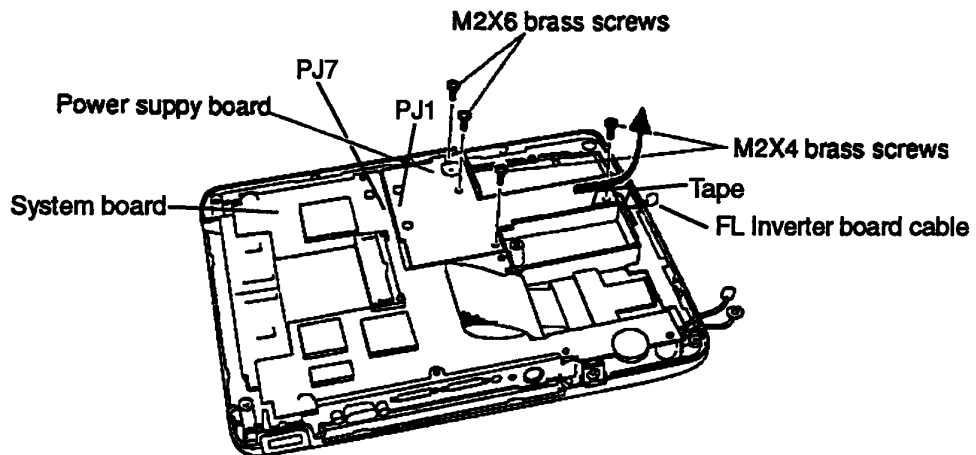


Figure 4-20 Removing the Power Supply Board

Installing the Power Supply Board

To install the T100X's power supply board, follow the steps below and refer to Figure 4-20.

1. Connect **PJ1** on the **power supply board** to **PJ7** on the **system board**.

***NOTE:** Make sure you have a good connection and that the power supply board is properly seated.*

2. Connect the FL inverter cable on the FL inverter board to **PJ5** on the **power supply board**.
3. Secure the FL inverter cable with **tape (50 mm)**.
4. Secure the power supply board with the **two M2x4 brass screws** and **two M2x6 brass screws**.
5. Install the back cover, backup and RTC batteries, optional PCMCIA card(s), optional memory card, and battery pack as described in Sections 4.6, 4.5, 4.3, 4.4 and 4.2.

4.10 System Board

Removing the System Board

To remove the T100X's system board, follow the steps below and refer to Figures 4-21 and 4-22.

1. Turn off the power to the T100X, and, if attached, disconnect the AC adapter, power cord, and all external cables connected to the T100X.
2. Remove the battery pack, optional memory card, optional PCMCIA card(s), backup and RTC batteries, back cover, FL inverter board, HDD and power supply board as described in Sections 4.2 through 4.9.
3. *Carefully* remove the **tape** securing the **ground wire**; otherwise, damage may occur to the wire (Figure 4-21).
4. Remove the **four M2x4 brass screws** securing the **upper system board** (FOGRD*) to the **lower system board** (FOGRU*) (Figure 4-21).
5. Fold out the **upper system board** from left to right (Figure 4-21).

CAUTION: *The upper and lower system boards are connected by a flexible cable. When you fold out the upper system board, use a flat object to support it to avoid applying stress to the flexible cable.*

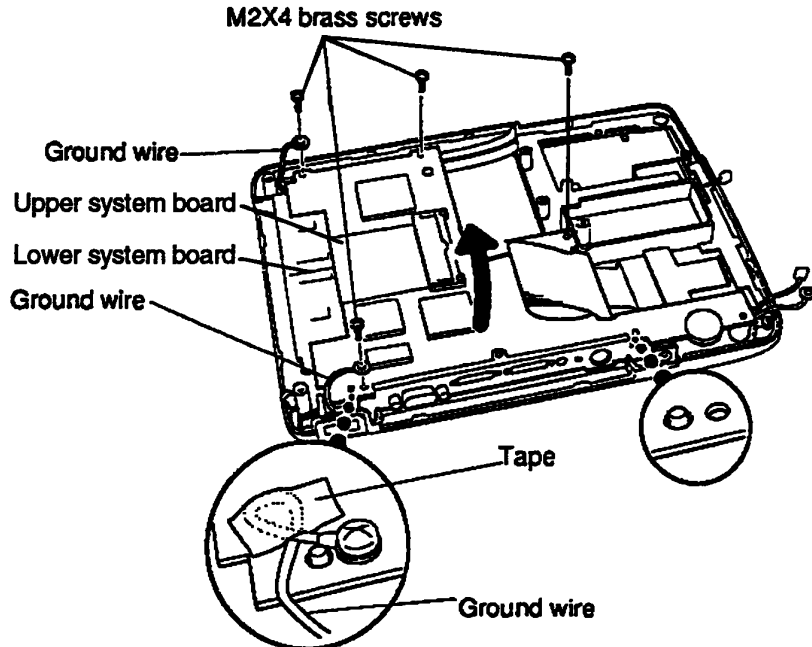


Figure 4-21 Folding Out the Upper System Board

6. Remove five M2x4 brass screws (Figure 4-22). Note that one of the screws holds earth plate A in place, and two of the screws hold earth plate B in place.
7. Set the earth plates aside.
8. Disconnect the LCD cable from PJ301 and the tablet cable from PJ202 on the system board (Figure 4-22).
9. Lift the system board out of the LCD assembly (Figure 4-22).

CAUTION: Place the open system board on a static-free surface. Be careful not to damage the interface cable that connects the upper and lower system boards.

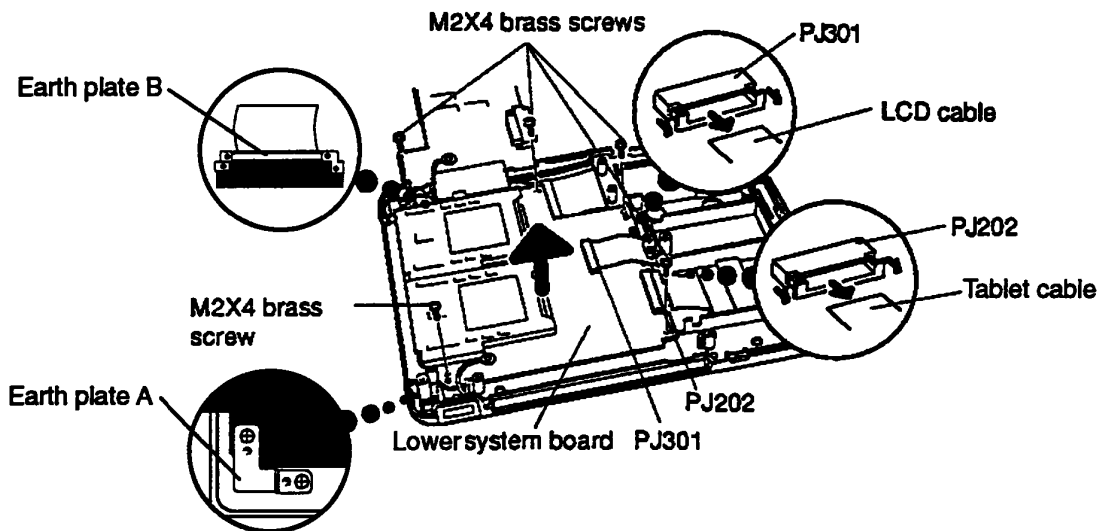


Figure 4-22 Removing the System Board

Installing the System Board

To install the system board, follow the steps below and refer to Figures 4-21 and 4-22.

1. Seat the **lower system board** in the Display Module. Be sure to support the upper system board so as not to damage the interface cable.

***NOTE:** Align the center support pin and two corner pins on the system board frame of the Display Module with the slot in the center of the lower system board and two holes at the corners. Also route the display cable, tablet cable, and ground wires on top of the system board.*

2. Connect the **LCD cable** to **PJ301** and the **tablet cable** to **PJ202** (Figure 4-22).
3. Position the two earth plates and secure them and the **lower system board** with **five M2x4 brass screws** (Figure 4-22). Be sure to align **earth plate B** making the screw holes visible beneath the plate.
4. Carefully fold the **upper system board** back over the **lower system board**.
5. Secure the **upper system board** and ground wires with **four M2x4 brass screws** (Figure 4-21).
6. Secure the **ground wire** next to the I/O panel with **tape** (Figure 4-21).
7. Install the power supply board, HDD, FL inverter board, back cover, backup and RTC batteries, optional PCMCIA card, optional memory card and battery pack as described in Sections 4.9 through 4.2.

4.11 Display Module (LCD, Tablet Assembly)

Removing the Display Module

To remove the T100X's display module, follow the steps below.

1. Turn off the power to the T100X, then, if attached, disconnect the AC adapter and all external cables connected to the T100X.
2. Remove the battery pack, optional memory card, optional PCMCIA card, backup and RTC batteries, back cover, FL inverter board, HDD, power supply board and system board as described in Sections 4.2 through 4.10.
3. If there is a problem with the display module, replace it.

NOTE: Currently, the display module comes fully assembled. Individual parts may not be ordered to repair this FRU. Refer to the most recent parts catalog for the T100X to verify availability of replaceable parts.

Installing the Display Module

To install the T100X's display module, follow the steps below.

1. Install the system board in the display module, then install the power supply board, HDD, FL inverter board, back cover, backup and RTC batteries, optional PCMCIA card(s), optional memory card and battery pack as described in Sections 4.10 through 4.2.

4.12 Stylus Batteries

Removing the Stylus Batteries

If it becomes difficult to input data with the stylus, it may be necessary to change the batteries. To remove the stylus's batteries, follow the steps below and refer to Figures 4-23 through 4-25.

NOTE: *The stylus itself is not repairable, only replaceable.*

1. Unscrew the cap that secures the stylus's clip (Figure 4-23).

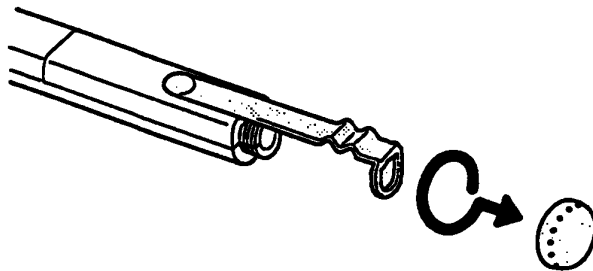


Figure 4-23 Removing the Cap

2. Lift up the threaded end of the battery cover and disengage the other end from latches on the stylus (Figure 4-24).

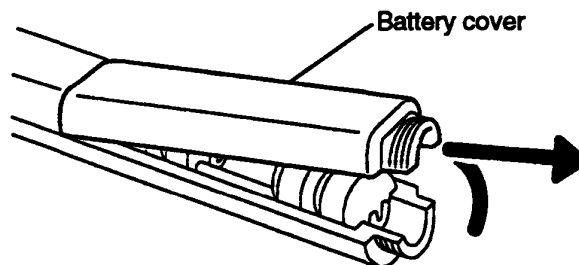


Figure 4-24 Removing the Battery Cover

- Lift out the batteries (Figure 4-25).

NOTE: The stylus will operate with only two batteries, so there may be either two or four batteries in the stylus.

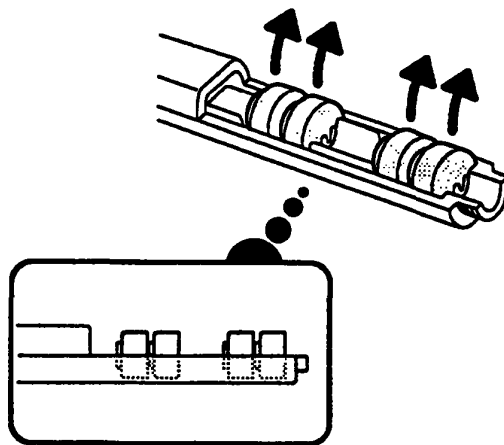


Figure 4-25 Removing the Batteries

Installing the Batteries

- Insert the new batteries*. Be sure the positive ends face towards the cap (Figure 4-25).
- Replace the battery cover.
- Attach the clip and screw on the cap (Figure 4-23).

* *Battery Type:* The stylus uses four (or two) hearing-aid batteries, available at many large drug and discount stores. Some compatible batteries are listed below:

Manufacturer	Part Number
Berec	BSR48H
Duracell	MS13H, D393
Eveready	S13E, 393
Matsushita	SR48, SR48W
Ray O Vac	RS13G, 393
Varta	V393

Warning: Use only one of the battery types listed above. Using a Zinc Air battery may damage the stylus.

4.13 Stylus Nib

Removing the Stylus Nib

If the stylus's nib becomes worn or damaged or if data input is still difficult after the batteries have been replaced, it may be necessary to change the plastic nib. To remove the nib, follow the steps below and refer to Figure 4-26.

1. Remove the cap that secures the nib. Use tweezers or your fingernail to pry the cap off the pen.
2. Grip the nib and pull it out.

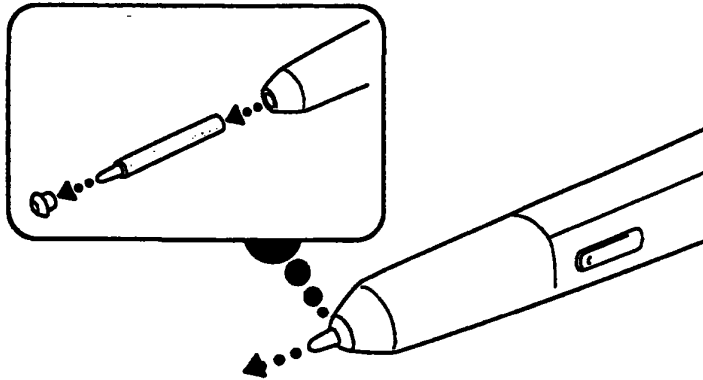


Figure 4-26 Removing the Nib

Installing the Nib

To install the stylus's nib, follow the steps below and refer to Figure 4-26.

1. Insert the new nib and push gently to fully seat it.
2. Slip the cap over the nib and press it onto the stylus until the cap clicks into place.

Appendix A System Board Layout

A.1 System Board (Front)

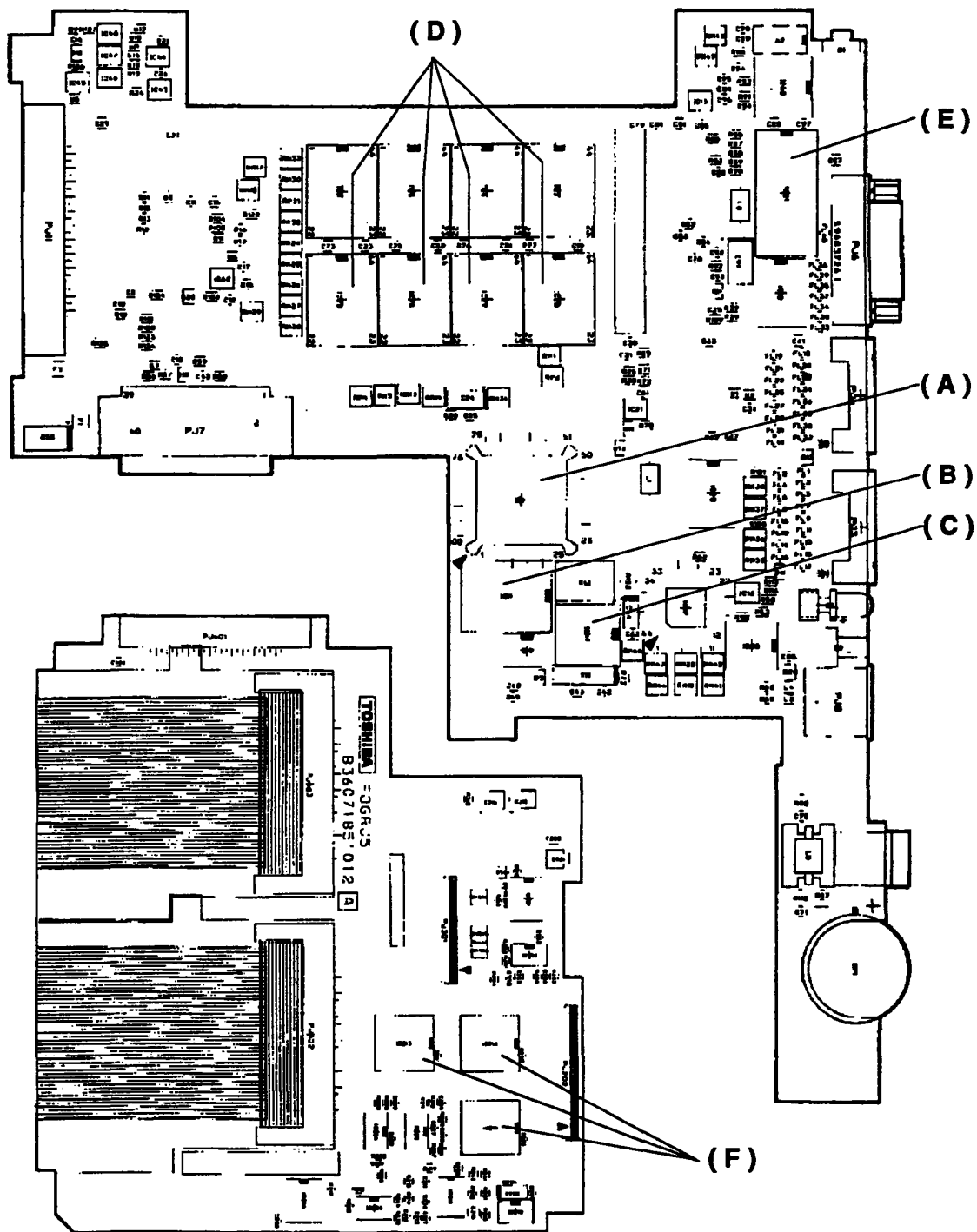


Figure A-1 System Board (front)

A.2 System Board (Back)

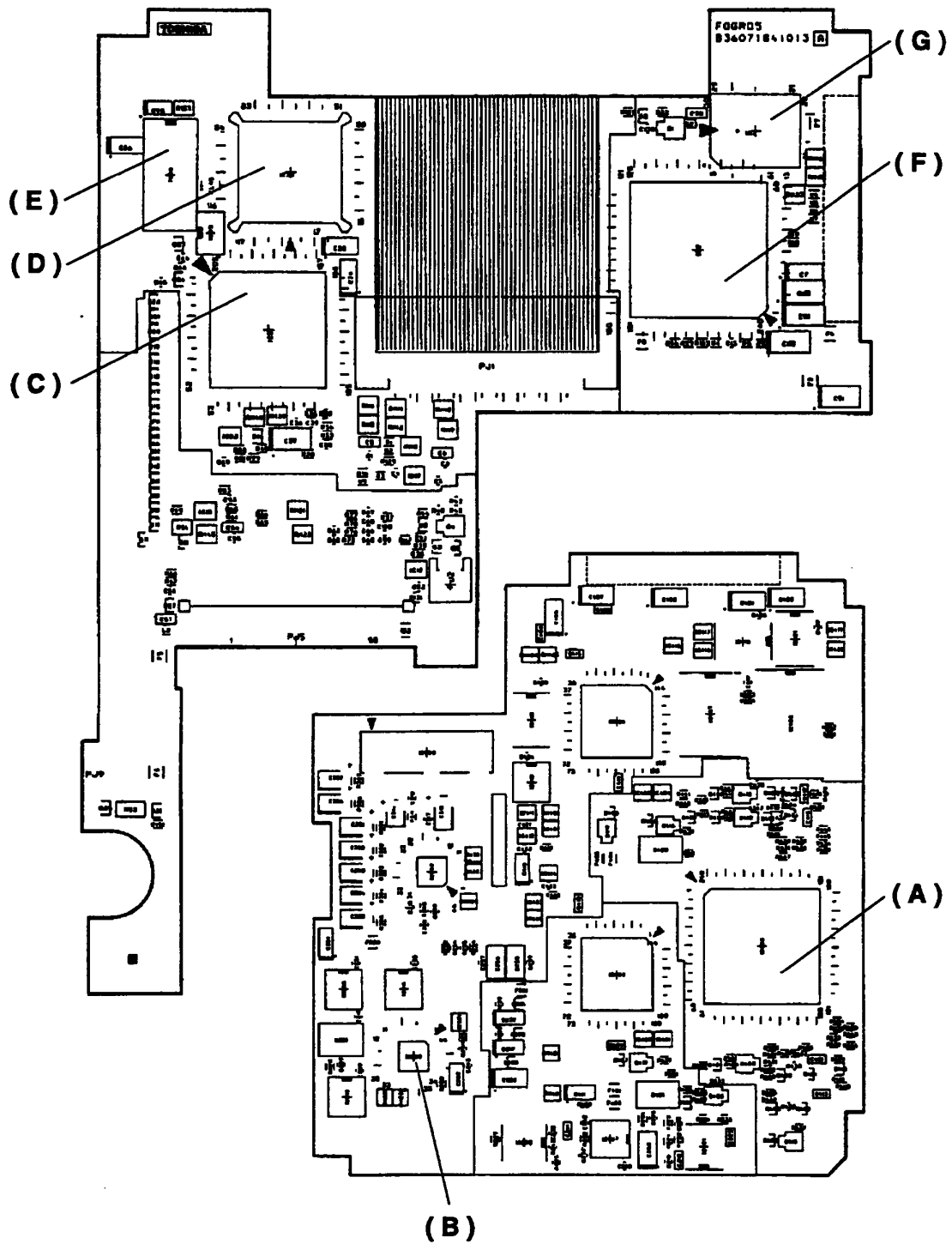


Figure A-2 System Board (back)

Table A-1 ICs and Connectors on the System Board (front)

Mark	Number	Name
(A)	IC 1	Central Processing Unit (CPU)
(B)	IC11	Real Time Clock (RTC)
(C)	IC 41	Clock Generator
(D)	IC 3 - 6, 25 - 28	System RAM
(E)	IC 31	Video RAM (1/2)
(F)	IC 212 - 214	Tablet Interface

Table A-2 ICs and Connectors on the System Board (back)

Mark	Number	Name
(A)	IC 409	PC Card Controller Gate Array
(B)	IC 209	Tablet Controller Gate Array
(C)	IC 8	Super Integration T9901
(D)	IC 30	Video Controller PVGA1F
(E)	IC 32	Video RAM (2/2)
(F)	IC 2	System Controller Gate Array
(G)	IC 7	BIOS ROM

Appendix B Pin Assignments

B.1 PJ1 Memory Slot Connector (88-Pin)

Table B-1 Memory Slot Connector Pin Assignments (88-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	--	45	GND	--
02	D00;100	I/O	46	D16;100	I/O
03	D01;100	I/O	47	D17;100	I/O
04	D02;100	I/O	48	D18;100	I/O
05	D03;100	I/O	49	D19;100	I/O
06	D04;100	I/O	50	D20;100	I/O
07	D05;100	I/O	51	D21;100	I/O
08	D06;100	I/O	52	D22;100	I/O
09	B3V	--	53	D23;100	I/O
10	D07;100	I/O	54	GND	--
11	VCC	--	55	RAS2;001	O
12	GND	--	56	GND	--
13	MA00;111	O	57	MA01;111	O
14	MA02;111	O	58	MA03;111	O
15	B3V	--	59	MA05;111	O
16	MA04;111	O	60	MA07;111	O
17	VCC	--	61	MA09;111	O
18	MA06;111	O	62	GND	--
19	MA08;111	O	63	GND	--
20	MA10;111	O	64	GND	--
21	GND	--	65	RAS1;001	O
22	RAS0;001	O	66	CAS2;011	O
23	CAS0;011	O	67	GND	--
24	CAS1;011	O	68	CAS3;011	O
25	VCC	--	69	RAS3;001	O
26	GND	--	70	MEMWE;011	O
27	B3V	--	71	DRAMST1;100	I/O
28	DRAMST2;100	I/O	72	DRAMST3;100	I/O
29	DRAMST4;100	I/O	73	GND	--
30	DRAMST6;100	I/O	74	DRAMST5;100	I/O
31	CAS0;011	O	75	DRAMST7;100	I/O
32	CAS1;011	O	76	DRAMST8;100	I/O
33	GND	--	77	CAS2;011	O
34	D08;100	I/O	78	CAS3;011	O
35	VCC	--	79	GND	--
36	D09;100	I/O	80	D24;100	I/O
37	B3V	--	81	D25;100	I/O
38	D10;100	I/O	82	D26;100	I/O
39	D11;100	I/O	83	D27;100	I/O
40	D12;100	I/O	84	D28;100	I/O
41	D13;100	I/O	85	D29;100	I/O
42	D14;100	I/O	86	D30;100	I/O
43	D15;100	I/O	87	D31;100	I/O
44	GND	--	88	GND	--

B.2 PJ2 RTC Connector (3-Pin)

Table B-2 RTC Connector Pin Assignments (3-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	3V	--	03	GND	--
02	N/C	--			

B.3 PJ3 PRT Connector (25-Pin)

Table B-3 PRT Connector Pin Assignments (25-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	STROB	O	14	AUTFD	O
02	PDB00	I/O	15	ERROR	I
03	PDB01	I/O	16	PINT	O
04	PDB02	I/O	17	SLIN	O
05	PDB03	I/O	18	GND	--
06	PDB04	I/O	19	GND	--
07	PDB05	I/O	20	GND	--
08	PDB06	I/O	21	GND	--
09	PDB07	I/O	22	GND	--
10	ACK	I	23	GND	--
11	BUSY	I	24	GND	--
12	PE	I	25	GND	--
13	SELCT	O			

B.4 PJ4 FDD (Ext) Connector (26-Pin)

Table B-4 FDD (Ext) Connector Pin Assignments (26-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	ISSEL;000	I	14	GND	--
02	GND	--	15	IDIRC;000	O
03	IRDAT;000	I	16	ILOWD;000	O
04	GND	--	17	IMON;000	O
05	IWPR;000	I	18	IHMED;000	I
06	GND	--	19	IRDY;000	I
07	ITRO;000	I	20	VCC	--
08	GND	--	21	DSKCHG;000	I
09	IWEN;000	O	22	VCC	--
10	GND	--	23	IDSL;000	O
11	IWDAT;000	O	24	VCC	--
12	GND	--	25	IINDEX;000	I
13	ISTEP;000	O	26	VCC	--

B.5 PJ4 FDD Connector (26-Pin)

Table B-5 FDD Connector Pin Assignments (26-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	VCC	--	14	-ISTEP	O
02	VCC	I	15	GND	--
03	VCC	--	16	-IWDAT	O
04	-IOSL	O	17	GND	--
05	VCC	--	18	-IWEN	O
06	-DSKCHG	I	19	GND	--
07	VCC	--	20	-ITRQ	I
08	-IRDY	I	21	GND	--
09	-IHMED	I	22	-IWPR	I
10	-IMON	O	23	GND	--
11	-LOWD	O	24	-IRDAT	I
12	-DIAC	O	25	GND	--
13	ILOWD2	O	26	-ISSEL	O

B.6 PJ5 HDD I/F Connector (50-Pin)

Table B-6 HDD I/F Connector Pin Assignments (50-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	SD15;102	I/O	26	SD01;102	I/O
02	SD07;102	I/O	27	GND	-
03	RESET;000	O	28	SD13;102	I/O
04	MOUSCK;100	I/O	29	GND	-
05	MOUSDT;100	I/O	30	SD00;102	I/O
06	SD06;102	I/O	31	GND	-
07	GND	-	32	SD14;102	I/O
08	SD08;102	I/O	33	GND	-
09	GND	-	34	SA01;100	O
10	SD5;102	I/O	35	GND	-
11	GND	-	36	IORD;000	O
12	SD9;102	I/O	37	HDDCS2;000	O
13	GND	-	38	IIRDY;102	I
14	SD04;102	I/O	39	SA02;100	O
15	GND	-	40	IIO16;000	O
16	SD10;102	I/O	41	IRQ14;100	I
17	GND	-	42	SA00;100	O
18	SD03;102	I/O	43	IOWR;000	O
19	GND	-	44	HDDCS1;000	O
20	SD11;102	I/O	45	VCC	-
21	GND	-	46	DRVSL;000	O
22	SD02;102	I/O	47	BATR;100	-
23	GND	-	48	BATG;100	-
24	SD12;102	I/O	49	SPOUT1;100	-
25	VCC	-	50	SPOUT0;100	-

B.7 PJ6 (FSHBP1) Serial I/F Connector (9-Pin)

Table B-7 Serial I/F Connector Pin Assignments (9-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	DCD1;100	I	06	DSR1;100	I
02	RD1;000	I	07	RTS1;111	O
03	SD1;011	O	08	CTS1;100	I
04	DTR1;111	O	09	RI1;100	I
05	GND	-			

B.8 PJ7 PS I/F Connector (40-Pin)

Table B-8 PS I/F Connector Pin Assignments (40-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	ACPWR;100	O	21	RAMV	I
02	ACPWR;100	O	22	3VCC	I
03	ACPWR;100	O	23	3RAMV	I
04	ACPWR;100	O	24	3RAMV	I
05	ACPWR;100	O	25	12V	I
06	GND	—	26	-9V	I
07	GND	—	27	GND	—
08	GND	—	28	GND	—
09	VCC	I	29	PCLR;001	I
10	VCC	I	30	BEEP;000	I
11	VCC	I	31	CNTSG;100	I
12	VCC	I	32	PSRD;100	O
13	VCC	I	33	PSSD;100	I
14	VCC	I	34	LB;100	I
15	VCC	I	35	CHG;100	I
16	VCC	I	36	GND	—
17	GND	—	37	PWRSW;000	O
18	GND	—	38	RSTSW;000	O
19	GND	—	39	PSMI;000	I
20	RAMV	I	40	PSBUSY;000	I

B.9 PJ8 External Keyboard I/F Connector (6-Pin)

Table B-9 External Keyboard I/F Connector Pin Assignments (6-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	EKBDAT	I/O	04	VCC	-
02	N/C	--	05	EKBCLK	I/O
03	GND	--	06	N/C	-

B.10 PJ301 LCD Connector (23-Pin)

Table B-10 LCD Connector Pin Assignments (23-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	S		14	UD3	O
02	LP	O	15	UD0	O
03	GND	-	16	LD1	O
04	SCP	O	17	LD2	O
05	GND	-	18	LD3	O
06	DOFF	O	19	V1	-
07	VDD	-	20	V2	-
08	GND	-	21	V3	-
09	VEE	-	22	V4	-
10	V0	-	23	V5	-
11	UD0	O			
12	UD1	O			
13	UD2	O			

B.11 PJ402 PC Card Slot A Connector (68-Pin)

Table B-11 PC Card Slot A Connector Pin Assignments (68-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	–	35	GND	–
02	CDA03;100	I/O	36	CD1A;000	I
03	CDA04;100	I/O	37	CDA11;100	I/O
04	CDA05;100	I/O	38	CDA12;100	I/O
05	CDA06;100	I/O	39	CDA13;100	I/O
06	CDA07;100	I/O	40	CDA14;100	I/O
07	CE1A;000	O	41	CDA15;100	I/O
08	CADA10;100	O	42	CE2A;000	O
09	OEA;000	O	43	N/C	–
10	CADA11;100	O	44	IORA;000	O
11	CADA09;100	O	45	IOWA;000	O
12	CADA08;100	O	46	CADA17;100	O
13	CADA13;100	O	47	CADA18;100	O
14	CADA14;100	O	48	CADA19;100	O
15	WEA;000	O	49	CADA20;100	O
16	BSYA;000	I	50	CADA21;100	O
17	MCVCCA	–	51	MCVCCA	–
18	MCVP1A	–	52	MCVP2A	–
19	CADA16;100	O	53	CADA22;100	O
20	CADA15;100	O	54	CADA23;100	O
21	CADA12;100	O	55	CADA24;100	O
22	CADA07;100	O	56	CADA25;100	O
23	CADA06;100	O	57	N/C	–
24	CADA05;100	O	58	CRSTA;100	O
25	CADA04;100	O	59	WAITA;000	I
26	CADA03;100	O	60	INPAKA;000	I
27	CADA02;100	O	61	REGA;000	O
28	CADA01;100	O	62	BVDA2;100	I
29	CADA00;100	O	63	BVDA1;100	I
30	CDA00;100	I/O	64	CDA08;100	I/O
31	CDA01;100	I/O	65	CDA09;100	I/O
32	CDA02;100	I/O	66	CDA10;100	I/O
33	WPA;000	I	67	CD2A;000	I
34	GND	–	68	GND	–

B.12 PJ403 PC Card Slot B Connector (68-Pin)

Table B-12 PC Card Slot B Connector Pin Assignments (68-pin)

Pin	Signal	I/O	Pin	Signal	I/O
01	GND	–	35	GND	–
02	CDB03;100	I/O	36	CD1B;000	I
03	CDB04;100	I/O	37	CDB11;100	I/O
04	CDB05;100	I/O	38	CDB12;100	I/O
05	CDB06;100	I/O	39	CDB13;100	I/O
06	CDB07;100	I/O	40	CDB14;100	I/O
07	CE1B;000	O	41	CDB15;100	I/O
08	CADB10;100	O	42	CE2B;000	O
09	OEB;000	O	43	N/C	–
10	CADB11;100	O	44	IORB;000	O
11	CADB09;100	O	45	IOWB;000	O
12	CADB08;100	O	46	CADB17;100	O
13	CADB13;100	O	47	CADB18;100	O
14	CADB14;100	O	48	CADB19;100	O
15	WEB;000	O	49	CADB20;100	O
16	BSYB;000	I	50	CADB21;100	O
17	MCVCCB	–	51	MCVCCB	–
18	MCVP1B	–	52	MCVP2B	–
19	CADB16;100	O	53	CADB22;100	O
20	CADB15;100	O	54	CADB23;100	O
21	CADB12;100	O	55	CADB24;100	O
22	CADB07;100	O	56	CADB25;100	O
23	CADB06;100	O	57	N/C	–
24	CADB05;100	O	58	CRSTB;100	O
25	CADB04;100	O	59	WAITB;000	I
26	CADB03;100	O	60	INPAKB;000	I
27	CADB02;100	O	61	REGA;000	O
28	CADB01;100	O	62	BVDB2;100	I
29	CADB00;100	O	63	BVDB1;100	I
30	CDB00;100	I/O	64	CDB08;100	I/O
31	CDB01;100	I/O	65	CDB09;100	I/O
32	CDB02;100	I/O	66	CDB10;100	I/O
33	WPB;000	I	67	CD2B;000	I
34	GND	–	68	GND	–

Appendix C USA Display Codes

Table C-1 USA Display Codes

HEXA DECIMAL VALUE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	BLANK (NULL)	▶	BLANK (SPACE)	0	@	P	'	p	Ç	É	á				α	≡
1	☺	◀	!	1	A	Q	a	q	ü	æ	í				β	±
2	☹	↑	"	2	B	R	b	r	é	Æ	ó				Γ	∞
3	♥	!!	#	3	C	S	c	s	â	ô	ú				π	∞
4	♠	¶	\$	4	D	T	d	t	ä	ö	ñ				Σ	∫
5	♣	§	%	5	E	U	e	u	à	ò	Ñ				σ	∫
6	♠	=	&	6	F	V	f	v	ð	û	ä				μ	÷
7	•	↓	'	7	G	W	g	w	ç	ù	ö				τ	≈
8	•	↑	(	8	H	X	h	x	ê	ÿ	ï				ϕ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	Γ				θ	•
A	●	→	*	:	J	Z	j	z	è	Ü	Γ				Ω	•
B	♂	←	+	:	K	[	k	{	ï	ç	½				δ	√
C	♀	└	,	<	L	\	l	!	↑	£	¼				∞	π
D	♪	↔	-	=	M	]	m	}	î	¥	ï				φ	2
E	♪	▲	.	>	N	^	n	~	Ä	Pt	∅				€	■
F	☼	▼	/	?	O	_	o	Δ	Å	f	»				∩	BLANK FF

Appendix D Wiring Diagrams

D.1 Printer Wraparound Connector

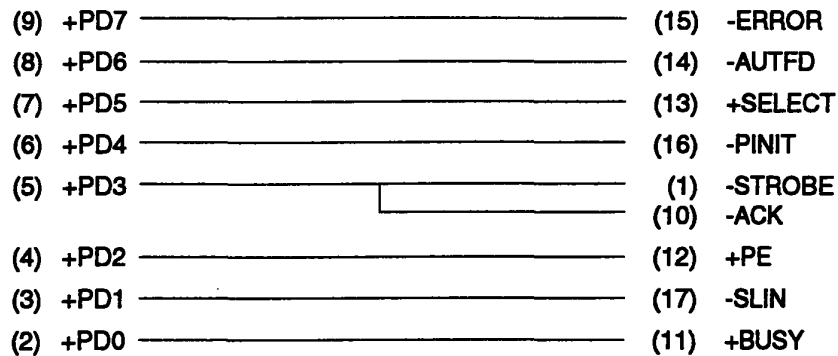


Figure D-1 Printer Wraparound Connector

D.2 RS-232-C Wraparound Connector

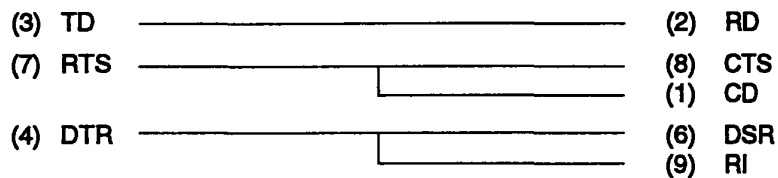


Figure D-2 RS-232-C Wraparound Connector

D.3 RS-232-C Direct Cable (9-Pin to 9-Pin)

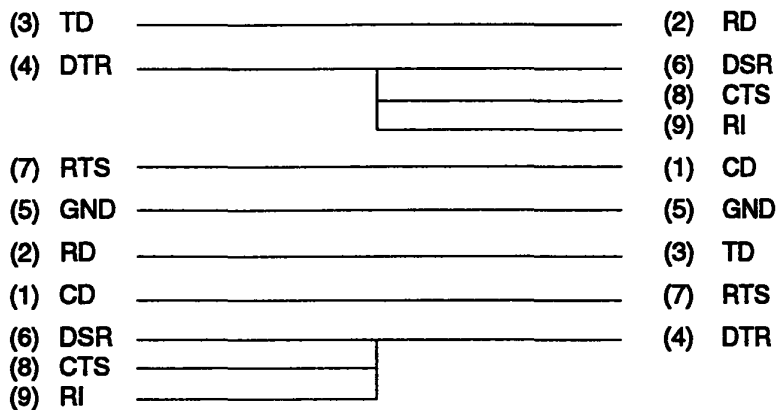


Figure D-3 RS-232-C Direct Cable (9-pin to 9-pin)

D.4 RS-232-C Direct Cable (9-Pin to 25-Pin)

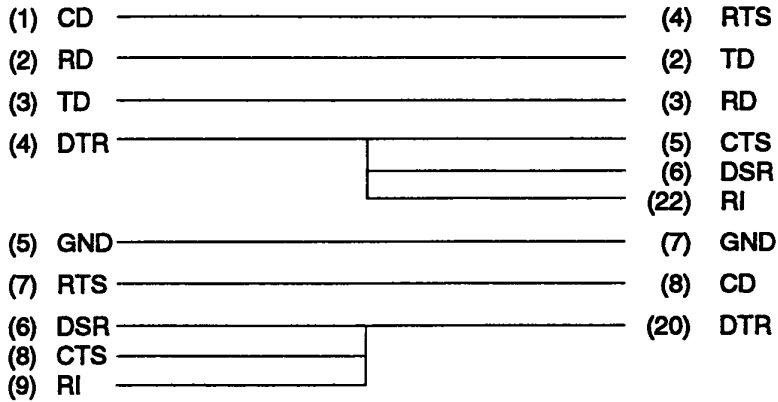


Figure D-4 RS-232-C Direct Cable (9-pin to 25-pin)