Maintenance Manual

TravelMate® 6000/6100 Series Notebook Computers

9804464-0001, Rev. C

March 1997

TEXAS INSTRUMENTS

Preface

Introduction

This manual provides installation, operation and servicing data for the TravelMate® 6000/6100 Series Notebook Computers.

Intended Audience

This manual is primarily intended for use by qualified service technicians but contains information useful to non-technical users.

Contents

This manual contains six sections and numerous appendices that are common to all TravelMate 6000/6100 Series Notebook Computers. Some appendices contain model-dependent maintenance data as identified in the titles. The sections and appendices that comprise this manual include:

- **Section 1: General Description -** Introduces the main features of the TravelMate 6000/6100 Notebook Computer Series; identifies all options, provides physical and electrical specifications (excellent training overview).
- **Section 2: Installation -** Describes how to unpack, install options and begin using the notebook series. This section also contains signal listings for each of the I/O connectors.
- **Section 3: Operating Instructions -** Describes the notebook computer operating controls and indicators and basic operating procedures required to support maintenance operations. For additional detail, refer to the *TravelMate 6000/6100 Series Notebook Computers Online Manuals.*
- **Section 4: Theory of Operation -** Provides a block diagram level theory of operation for the TravelMate 6000/6100 Series notebooks.
- **Section 5: Troubleshooting Procedures -** Provides troubleshooting procedures for the 6000/6100 Series notebook computers.
- **Section 6: Field Service -** Provides preventive and corrective maintenance procedures for the notebook computer series. This section also contains a Field-Replaceable Unit (FRU) listing with an index to the assembly/disassembly procedures for each FRU.
- **Appendix A: Model 6020 Maintenance Data -** Provides model-specific maintenance data for the TravelMate 6020 Notebook Computer. This appendix lists the TI Part Numbers for each FRU and provides an illustrated parts breakdown of the 6020 Notebook Computer.

- **Appendix B: Model 6030 Maintenance Data -** Provides model-specific maintenance data for the TravelMate 6030 Notebook Computer. This appendix lists the TI Part Numbers for each FRU and provides an illustrated parts breakdown of the 6030 Notebook Computer.
- **Appendix C: Model 6050 Maintenance Data -** Provides model-specific maintenance data for the TravelMate 6050 Notebook Computer. This appendix lists the TI Part Numbers for each FRU and provides an illustrated parts breakdown of the 6020 Notebook Computer.
- **Appendix D: Model 6160 Maintenance Data -** Provides model-specific data for the TravelMate 6160 Series Notebook Computer. This appendix lists the FRU part numbers and provides an illustrated parts breakdown.
- **Appendix E: 6000 Series Top Board Logic Diagram (28 Sheets) -** This logic diagram applies to the Top Board Assembly used in the Model 6020, 6030 and 6050 Notebook Computers. Appendix H contains the logic diagram for the 6160 Top Board Assembly.
- **Appendix F: 6000 Series Bottom Board Logic Diagram (15 Sheets) -** This logic diagram is applicable to the TravelMate 6020, 6030 and 6050 Series Notebook Computers.
- **Appendix G: 6000/6100 Series Pick Button Board Logic Diagram (2 Sheets)**
- **Appendix H: 6100 Series Top Board Logic Diagram (28 Sheets)**
- **Appendix I: 6100 Series Bottom Board Logic Diagram (15 Sheets)**
- **Appendix J: 6100 Series DAA Board Logic Diagram (2 Sheets)**
- **Appendix K: 6000/6100 Display Modes**
- **Appendix L: 6000/6100 Character Sets**
- **Appendix M: 6000/6100 Connector Pinouts**
- **Appendix N: 6000/6100 Keyboard Layouts**
- **Appendix O: 6000/6100 Memory Management**
- **Alphabetical Index**

Other Manuals About the System

The following documents provide additional information related to the TravelMate 6000/6100 Notebook Computer Series:

- *TravelMate 6000/6100 Series Notebook Computers Online Manuals* - electronic manuals (Hyper Text Markup Language or HTML format) containing user reference information for the TravelMate 6000/6100 Series Notebook Computers. The HTML format is in the standard language of the World Wide Web.
- *TravelMate 6000/6100 Series Notebook Computer User's Guides* (TI Part No. 9804462-0001 and 9814483-0001) - printed manuals containing setup, installation and troubleshooting information for the TravelMate 6000/6100 Series Notebook Computers. All information that can be accessed online is

provided in the Online Manual described above.

- *Microsoft® Online Manuals*
- *PC-Doctor Help* and *Technical Reference* (online)

Accessing TravelMate Online Manual

Access the manual from Windows 95® using the following procedure:

1. Click on **Start**.
2. Point to the **TravelMate Notebook Center**.
3. Click on **TravelMate Online Manual**.

Ordering Parts and Supplies

To order a copy of any TI publication or to order option kits, spare parts or supplies for your system, contact your TI reseller:

Telephone Toll-free: **1-800-TI TEXAS**.

TravelMate® 6000/6100 Series Notebook Computers
Maintenance Manual
TI Part No. 9804464-0001, Rev. C

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Changes may be made periodically to the information in this publication. Such changes will be incorporated in new editions of this manual.

The equipment, as well as the programs that TI has created to use with them, are tools that can help people better manage the information used in their business; but tools — including TI products — cannot replace sound judgement nor make the manager's business decisions.

Consequently, TI cannot warrant that its products are suitable for any specific customer application. The manager must rely on judgement of what is best for his or her business.

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Temple, Texas 76503

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1
General Description

1.1 Introduction

This manual contains field and factory level servicing information for the TravelMate® 6000/6100 Series Notebook Computers manufactured by Texas Instruments. The first six sections contain information common to all members of the TravelMate 6000/6100 Family of Notebook Computers; the appendices contain model dependent maintenance information.

This section provides a general overview of the TravelMate 6000/6100 Series, describes the standard and optional features, and identifies the major assemblies and subassemblies. This section also contains detailed functional and environmental specifications for the TravelMate 6000/6100 Series Notebook Computers.

Figure 1-1 TravelMate 6000/6100 Series Notebook Computer

1.2 Product Overview

1.2.1 Overview of 6000 Series Notebooks

The TravelMate 6000 Series Notebook Computers are high performance, multimedia notebooks powered by the Intel® P54CSLM Pentium® Processor Chip (initial versions run at 120 MHz; later versions).

All members of the TravelMate 6000 Series come standard with 8 MB or more of 60-ns page-interleaved, random access memory on the main board (user-expandable using standard so-DIMM Modules); 16 KB of internal cache memory, and 256 KB of L2 cache memory.

All members of the 6000 Series Notebooks are equipped with the high performance PCI expansion bus and supported by a family of DockMate™ Expansion Systems (DockMate, DockMate Plus and DockMate Net Ready) for enhanced desktop connectivity. All notebooks use advanced power management and streamlined BIOS to take full advantage of power savings features embedded in the hardware and software.

All TravelMate 6000 Series Notebooks can accommodate up to two 8-cell high-charge capacity Lithium-Ion batteries for extended portable operation. As a standard feature, the notebooks are also equipped with a 28.8 Kbps speakerphone modem.

1.2.2 TravelMate 6100 Series Overview

The TravelMate 6160 Series Notebooks are similar in design and look to 6000 Series Notebooks but feature a number of performance enhancements such as a 166 MHz Pentium Processor with MMX™ technology, 32 MB of EDO RAM (expandable to 96 MB), and an expanded 512 KB L2 cache.

The video features of the 6100 Series are also enhanced. The LCD is a 12.1 inch Super VGA active matrix display driven by a NeoMagic 128-bit controller for higher performance with multimedia presentations.

Some members of the TravelMate 6100 Series Notebooks also come with an integrated 33.6K baud x2™ modem that delivers download speeds up to 56K (twice the rate of conventional modems).

All members of the 6100 Series Notebooks are also equipped with a higher capacity internal hard drive (2.1 GB).

Other features of the 6100 Series are identical to the 6000 Series (e.g., external ports, Modular Bay Features, PC Card slots, the TI **live**gear Docking Systems, etc.) as described later in this section.

NOTE: Any described features are assumed to apply to both the TravelMate 6000 and the TravelMate 6100 Series unless otherwise specified.

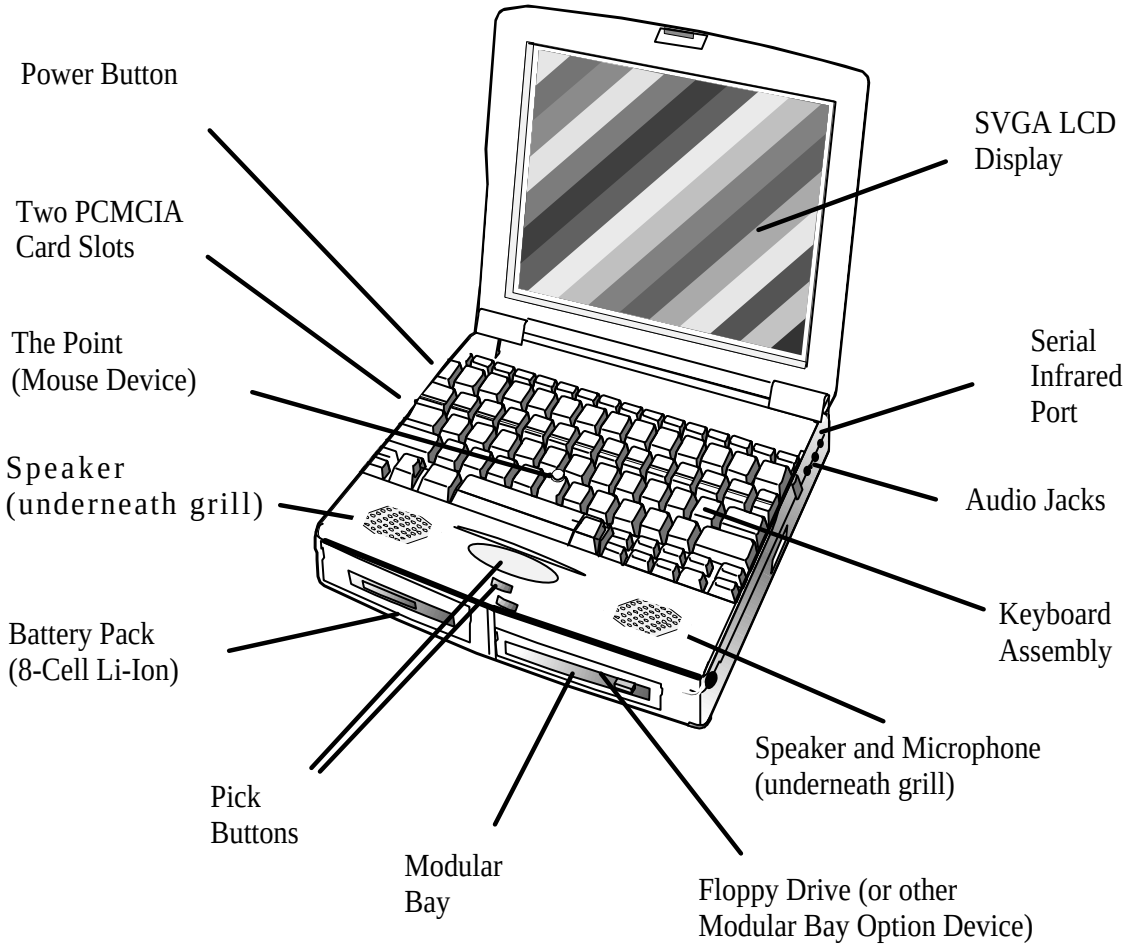

Figure 1-2 TravelMate 6000/6100 Notebook External Features

1.2.3 Modular Bay

For versatility, the TravelMate 6000/6100 Series Notebooks contain a modular (media) bay and support software to permit installing one of a variety of peripherals such as CD-ROM Drive, Floppy Disk Drive, Removable Media Cartridge Drive, second battery pack, etc. A software-controlled, solenoid actuated, locking mechanism prevents removing a device such as a CD-ROM or hard drive while the device is active. A list of supported devices is provided in Table 1-1.

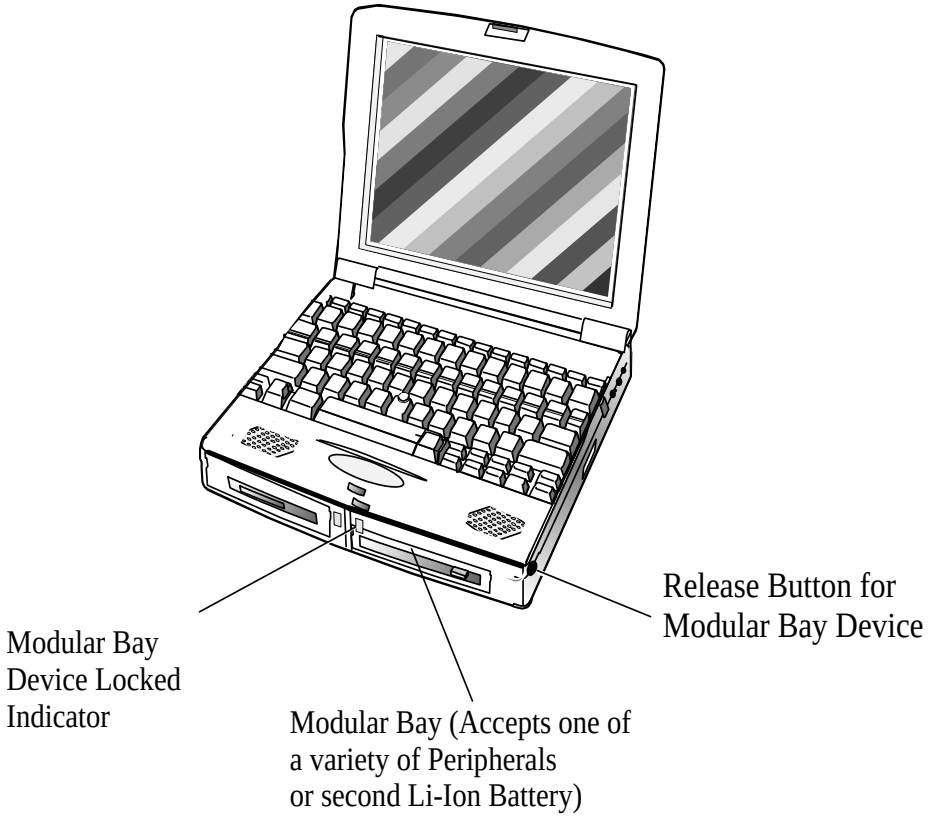

Figure 1-3 Modular Bay Features

Table 1-1 Modular Bay Kit Options for 6000/6100 Series Notebooks

Option Device	TI Part No.
1.44 MB Floppy Disk Drive Kit*	9804447-8001
CD-ROM Reader, 6X speed, Kit	9811477-0001
Avatar® 170 MB Removable Media Cartridge Drive Kit	9811479-0001
2.1 GB IDE Hard Disk Drive Kit	9811478-0001
Second 8-cell Li-Ion Battery Pack Kit	9811457-0001
Weight-Reduction Module	9811464-0001

Note: The notebook is shipped with a 1.44 MB Floppy Disk Drive. However, a Floppy Disk Drive is also available as a kit option.

1.2.4 User-Selectable Operating Environment

As a standard feature, the TravelMate 6000/6100 notebook family is factory loaded with installable software to allow the user to configure the notebook for one of the operating system environments described in Table 1-2.

Table 1-2 User-Selectable Operating System Environments

Operating System	Description
Windows® 95	Supports both desktop and mobile operation with Plug N Play capabilities and Advanced Power Management; customized to include TI startup screen, CSL Support information, Internet browser, multimedia options, and choice of wallpaper to customize different computer resources, TI utilities such as BatteryPro™, wBattery, wSetpower, TISetup, variety of device drivers including Cirrus® CL-GD7548, ESS 1888 Sound Device Drivers, WinModem Device Drivers, PC-Card Bus Socket Services and Card Services Device Drivers, and Windows 95 MPEG-1 Software Audio/Video Compression Device Drivers.
Windows/DOS 6.22	This environment has some limitations in the Plug N Play area; includes TI utilities and various device drivers including Cirrus CL-GD7548, ESS 1888 Sound Device Drivers, WinModem Device Drivers, PC-Card Bus Socket Services and Card Services Device Drivers, and TranXit™ Serial Infrared (IRDA™) Device Drivers, etc.

1.2.5 Memory Expansion Features

1.2.5.1 6000 Series RAM Expansion

The TravelMate 6000 Series Notebook is shipped standard with 8 MB of memory, user expandable to a maximum of 72 MB (practical limit of 64 MB) using up to three conventional Small Outline Dual Inline Memory Modules (SO-DIMMs). An 8-MB module can be installed in any of the three sockets. A 32-MB module must be inserted in either slot 1 or slot 2 (slot 3 is the outermost slot).

Note: The maximum recommended memory for a TM6000 Series Notebook is 64 MB.

1.2.5.2 BIOS Upgrade Required for 32-MB Expansion Modules

A BIOS upgrade (to BIOS version 1.01.17 or higher) is required in all 6000 Series Notebooks when installing 32-MB RAM expansion modules (refer to *Installation Instructions, TravelMate 6000 Memory Modules*, T.I. Part No. 9813434-0002).

1.2.5.3 6100 Series RAM Expansion

The TravelMate 6100 Series Notebook is shipped standard with 32 MB of memory, user expandable to a maximum of 96 MB using two 32-MB Small Outline Dual Inline Memory Modules or one 64 MB Small Outline Dual Inline Memory Module (SO-DIMM).

No ROM upgrade is required for 6100 Series RAM expansion.

1.2.6 6000/6100 Series External Ports

All Series 6000/6100 Notebooks contain the same external ports (connectors) for the desktop environment as shown in Figure 1-4 and summarized in Table 1-4.

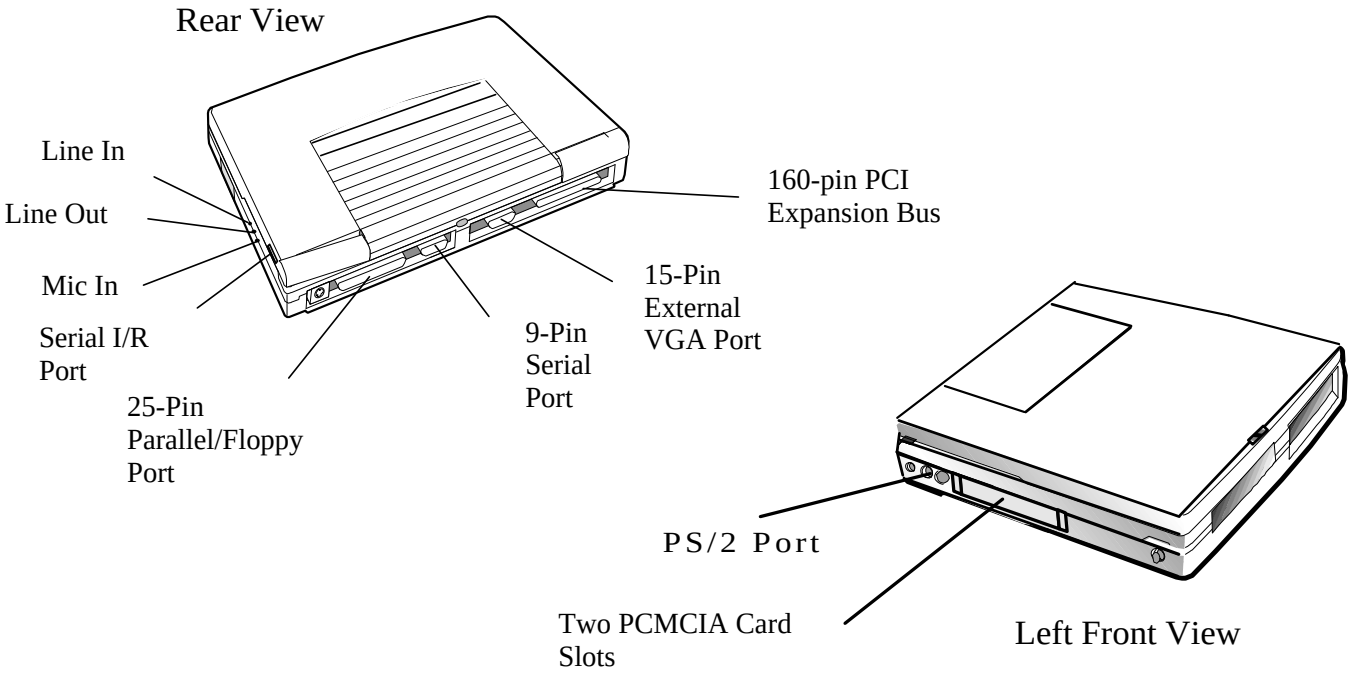

Figure 1-4 TravelMate 6000/6100 Series External Ports

Table 1-4 TM6000/6100 Notebook External Ports

Port Assignment	Description
External VGA Port	15-Pin Female connector used to attach an external SVGA monitor to the notebook.
Serial Port	9-Pin Male connector used to attach an RS-232 serial device to the Notebook.
Parallel/Floppy Port	25-Pin Female connector used to attach a bidirectional printer or an external floppy drive (requires special cable for use with floppy drive).
PS/2® Port	6-Pin Circular connectors used to attach external keyboard/mouse devices to the notebook.
DC-IN Connector	Power in connector used to attach the output of the AC adapter to the notebook.
Serial Infrared Port	High speed Serial Infrared Port (115 kbaud) used for wireless communications between the notebook and an SIR-equipped device such as keyboard, another notebook, printer, etc.
PCI Expansion Bus Connector	160-pin connector used to drive a DockMate Expansion System when attached to the notebook.

1.2.7 Sound Capabilities

The TravelMate 6000/6100 Series Notebooks have built-in audio features including an internal Sound Blaster™ Pro 16 compatible stereo amplifier with keyboard volume control, ESS Sound Software, 4 Watt stereo speakers, and built-in microphone, external mini-bayonet (3.5 mm) stereo sound jacks are provided for Audio In, Speaker Output, and Microphone In connections.

The Audio In line has an input impedance of 10K Ohms and maximum input up to 3.5 VRMS. The Speaker Output delivers approximately 400 milliwatts into an 8 ohm load (e.g. headphones or external speakers). Optionally, an external microphone with input levels between 10 and 100 milliwatts can be connected to the notebook (all audio connectors are located on the right side of the notebook).

1.2.8 Video Capabilities

1.2.8.1 6000 Series Video

The notebooks also offer powerful new video features on the PCI Expansion Bus including the MotionVideo™ Architecture (MVATM). MVATM supports storage and playback of video clips (320 x 240 clips can be played back at 30 fps with 24 bpp color quality).

The notebook's video controller has a feature interface that is VESA VAFC compatible enabling a system to provide live video overlay capability.

1.2.8.2 6100 Series Video

All members of the 6160 Series contain the NeoMagic 128-bit Graphics Controller that offers faster performance and reduced power consumption levels. Some of the features of the 6100 series include:

- 32-bit BitBLT Graphic Accelerator
- MPEG1 decode available through Zoomed Video Port (bottom PC card Slot)
- PCI multimedia video controller and PCI local bus with burst mode support

1.2.9 Integrated Modem Features (6100 Series Only)

Some models of the 6100 Series also incude a built-in 33.6 Kbps Modem with digital simultaneous voice/data and telephony capabilities (DSVD). The integrated modem includes advanced telephony features such as:

- Caller I.D.
- Distinctive ring
- Answering machine
- Full-duplex speakerphone that allows users to talk with and listen to the person on the other end without interrupting the normal flow of conversation.
- X2 technology that allows data reception at rates up to 56 Kbps from many Internet and corporate servers using a compatible modem.

1.2.10 Intelligent Li-Ion Battery Packs

All 6000/6100 Series Notebooks come standard with a long life, 8-cell, intelligent Lithium-Ion battery pack (with built-in charge remaining indicators). Optionally, a second Li-Ion battery pack can be installed in the Media Bay for extra long portable operation. The battery packs are interchangeable.

1.2.11 Standard Peripheral Devices

As standard features, the TravelMate 6000/6100 notebooks include a removable 3.5-inch Floppy Disk Drive in the Modular Bay, internal high-density IDE Hard Disk Drive, and built-in point device. The hard drive uses the Fast IDE interface (with a 120 KB buffer) and has an average access time of 12 milliseconds or less.

1.2.12 Standard Software

All system software is shipped preloaded on the hard disk drive and not supplied in floppy disk form. The TravelMate 6000/6100 Series Notebooks are shipped with only one disk: the *System Recovery Disk* that allows you to rebuild your system software using your backup disks.

1.3 Preloaded Online Documentation

TravelMate 6000/6100 Series Notebooks are factory-loaded with online manuals listed in Table 1-5.

Table 1-5 Online Manuals for the TravelMate 6000/6100 Series

Item No.	Manual Title and Description
1	*TravelMate 6000 Series Notebook Computers User's Guide* - provides operating instructions for the notebook (also available in hardcopy form, TI Part No. 9804462-0001).
2	*TravelMate 6000 Series Notebook Computers Reference Guide* - provides more comprehensive application loading and configuration instructions for the TravelMate 6000 Series Notebook Computers.
3	*PCMCIA PhoenixCARD Manager User's Guide* (TI Part No. 9791792-0001) - provides user instructions for running the PCMCIA install program when adding/removing PCMCIA option cards to/from the TravelMate 6000 Series Notebook Computers.
4	*PC-Doctor Technical Reference Manua*l - provides user instructions for the PC-Doctor Diagnostics supplied with the TravelMate 6000 product line (**not available with the 6100 Series)**.

1.4 Expansion Capabilities

The TravelMate 6000/6100 Series Notebooks are designed with a variety of expansion features that permit substantial functionality and performance upgrades over the life of the product. The expansion capabilities built into the notebook are summarized in Table 1-6 and described in greater detail in the following paragraphs.

Table 1-6 TravelMate 6000/6100 Expansion Features Summary

Expansion Feature	Description
CD-ROM Drive, Modular Bay	Reads from Audio CD, Photo CD or CD ROM
Second Hard Disk Drive, Modular Bay Option	Almost triples the hard disk capacity of the Notebook
High-Density Disk Drive Module, Modular Bay Option	Provides 200 MB of extended storage on a removable disk
Weight-Reduction Module, Modular Bay Option	Reduces the weight of the notebook by 1/2 pound when a Modular Bay option device is not required
Second Li-Ion Battery Pack, Modular Bay option	Doubles the time you can operate on battery power without an AC adapter installed
PCI Expansion Bus (connector on rear of notebook)	Allows one of a variety of DockMate Expansion Systems to be attached to the notebook. Provides enhanced desktop connectivity plus quick system disconnect capability when the notebook is needed for portable operation.
Memory Expansion Features (three connectors underneath the keyboard assembly)	Main memory on the TravelMate 6000 Series notebook can be expanded from 8 MB to a maximum of 72 MB using so-DIMM modules (8 MB, 16 MB and 32 MB configurations).
Flash ROM (hardware feature)	Permits new versions of BIOS to be downloaded into Flash ROM without physically having to replace the ROMs
PCMCIA Slots	Allows installation of any optional PCMCIA device such as speakerphone modems, Ethernet® cards, and full motion video cards.
Serial Infrared Interface	Permits wireless communications with other SIR-equipped devices such as other notebooks, printers, keyboards, etc.
Desktop Connectivity Ports	Permits attaching a variety of external devices to the notebook including external CRTs, keyboards, mouse devices, modems, external floppy disk drive, etc.

1.4.1 PCMCIA Card Options

The 6000/6100 Series Notebooks contain an onboard PCMCIA Controller and two 64-pin sockets that can accept up to two credit-card size (14.5 mm) Type I or Type II PCMCIA option cards or one Type III card. The PCMCIA Card options install on the left side of the notebook (Figure 1-5) and are removed using the PCMCIA Release Buttons. Some of the PCMCIA card options available from TI are listed in Table 1-7.

Table 1-7 PCMCIA Card Option Kits Available from TI

Item No.	TravelMate 6000 Option Description	TI Part No.
1	28.8 Kb/s Data/Send/Receive Fax Modem PCMCIA Option Kit	9798074-0003
2	Token Ring® PCMCIA Card Option Kit	9791774-0001
3	Ethernet 10BaseT Twisted Pair PCMCIA Card Option Kit	9791773-0001
4	MPEG Video Playback Card Option Kit	9812675-0001

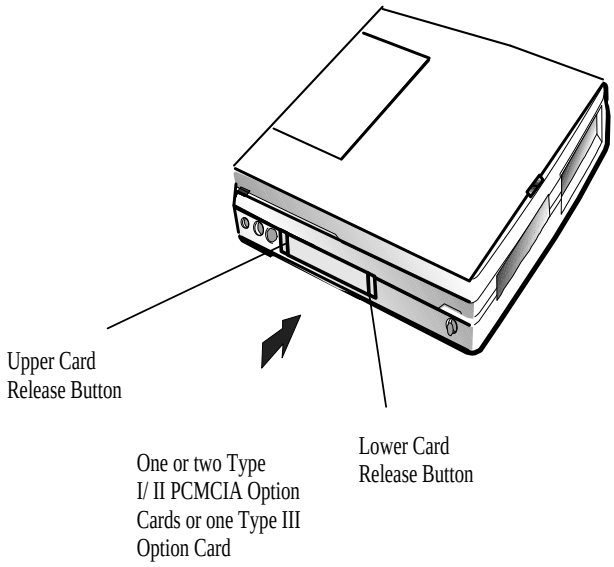

Figure 1-5 Installing PCMCIA Card Options

1.4.2 DockMate Series Expansion Systems

The TravelMate 6000/6100 Series Notebook Computers can be used in conjunction with the DockMate Series Expansion Systems listed in Table 1-8. The DockMate Plus system features are summarized in Figure 1-6.

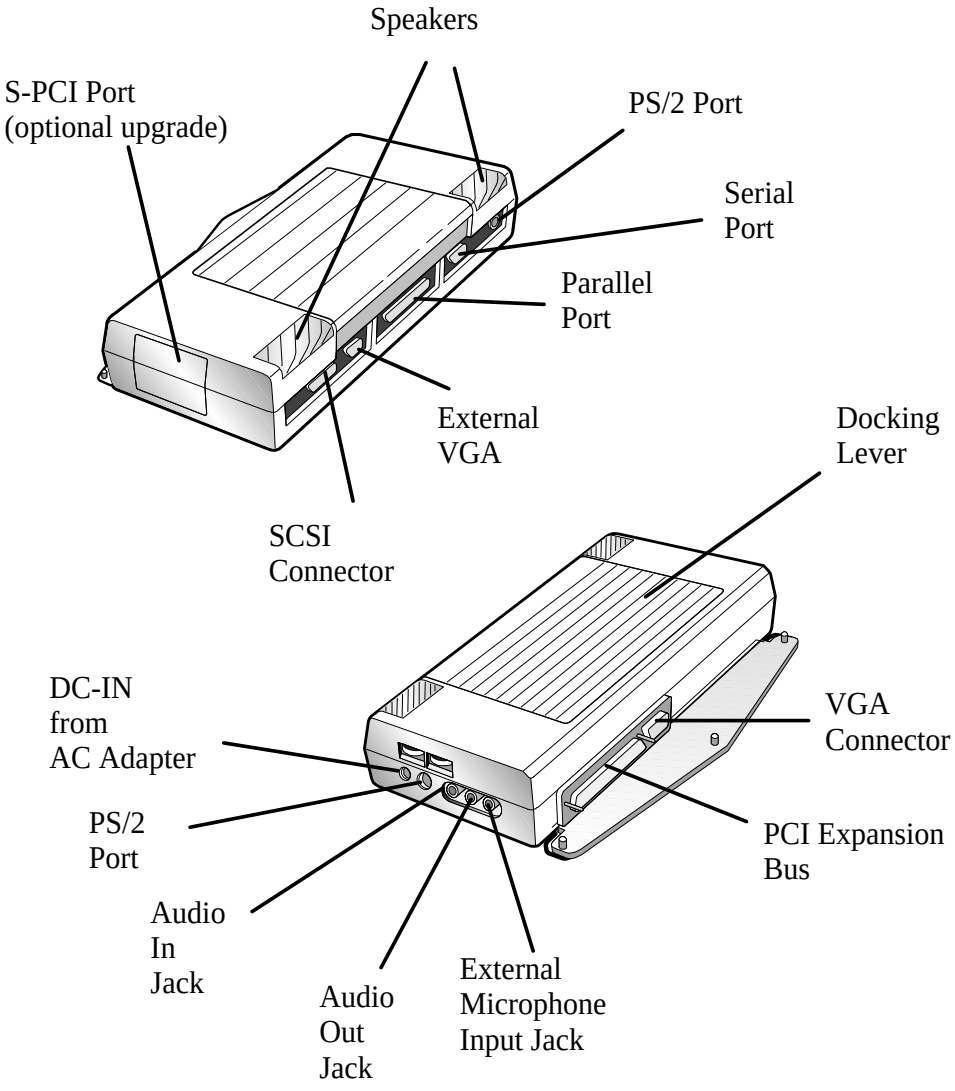

Figure 1-6 DockMate Plus Expansion System

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Table 1-8 DockMate Series Expansion Systems

Item No.	Description	TI Part No.
1	DockMate Expansion System - basic port replicator; expands PCI Bus and sidebands to provide common desktop connectivity requirements and quick disconnect.	9794518-0010
2	DockMate Net Ready Expansion System - includes the port replicator features of the DockMate but includes an RJ-45 connector for connection to an Ethernet network.	9794572-0001
3	DockMate Plus Expansion System, Domestic - includes the port replicator features of the DockMate plus additional features such as built-in stereo amplifier, stereo speakers, SCSI® drive capability, and PCMCIA Option card provision.	9794518-0021
4	DockMate Plus Expansion System, International (refer to item 3 above for features).	9794518-0022
5	DockMate Plus Expansion System, Australia (refer to item 3 above for features).	9794518-0023

1.4.3 Other TravelMate 6000/6100 Accessories

A full-line of **live**gear accessories are available for the TravelMate 6000/6100 Series Notebook including expansion RAM, extra battery packs, AC adapters, carrying cases, etc. A partial listing of **live**gear accessories is provided in Table 1-9..

Table 1-9 TravelMate 6000/6100 Series Accessories

Item No.	Description	TI Part No.
1	8 MB EDO Memory Module	9811456-0001
2	16 MB EDO Memory Module	9811456-0002
3	Lithium-Ion Battery Pack	9811457-0001
4	AC Adapter	9811459-0001
5	Battery Charger/Auto Adapter	9811460-0001
6	Carrying Case, Multimedia, Black	2249164-0001
7	Sport Case, Green	2249165-0001
8	Sport Case, Navy	2249165-0002

Table 1-9 TravelMate 6000/6100 Series Accessories

Item No.	Description	TI Part No.
9	Zipaway Backpack, Maroon	2249166-0001
10	Zipaway Backpack, Navy	2249166-0002
11	Zipaway Backpack, Green	2249166-0003
12	Book Bag, Black	2249167-0001
13	Leather Classic, Black	2249168-0001
14	Leather Executive, Black	2249168-0001
15	Modular Accessory Case	2249169-0001
16	Travel Connection Pack, America	2249171-0001
17	Travel Connection Pack, Europe	2249171-0002
18	Retractable Telephone Cord	2249172-0001

1.5 Standard Test Features

The TravelMate 6000/6100 Series Notebook Computers use modular design and built-in test features to reduce the mean time to repair. A power on self test program automatically verifies the operational state of the primary circuits and a powerful suite of diagnostic tests (known as PC-Doctor) are available to further test selected parts of the system.

1.5.1 Power On Self Test

The notebook computer contains a BIOS-resident, Power On Self Test (POST) that automatically performs a test of memory and all major circuits each time the computer is powered up. In the event of a failure, the computer displays a descriptive error message and issues a series of coded beeps (in case the display subsystem is not functioning). If self test completes normally, the computer displays the amount of memory tested, loads the Operating System and Windows environment.

1.5.2 PC-Doctor Diagnostics Program (6000 Series Only)

The TravelMate 6000 Series Notebooks are shipped with PC-Doctor for Windows, a powerful diagnostics tool that can help you scan a system for viruses, determine the hardware configuration of a local or remote system, benchmark its performance, analyze the performance of all subsystems, and perform a suite of interactive and non-interactive tests on attached devices (such as printers, joystick devices, VGA monitors, SCSI devices, CD-ROM drives). The test results are stored in a log which can be printed

out (by pressing **F2**) or saved in a disk file (by pressing **F3**).

Features of the diagnostic program are accessed through a series of pull-down menus and basic keyboard keys (cursor keys to move highlighted pointer, Enter key to select a highlighted feature, **Esc** key to cancel a function and move back one level.

PC-Doctor is typically user-friendly but if you don't understand a feature, context-sensitive help information is available at any time by pressing the **F1** function key; pressing the **F1** function key twice accesses the online Technical Reference Manual for PC-Doctor.

A powerful set of utilities within PC-Doctor (that can be run locally or remotely) simplify the task of determining system configuration data, allocating and using system memory, IRQ and DMA use, what device drivers are installed, what COM and LPT ports are assigned and what ports are available, identifying partitioning data for fixed disk drive(s), determining the VGA setup information, reading the software interrupts/interrupt vectors, etc.

Note: Refer to the Troubleshooting Section for additional information regarding the Diagnostics Program.

1.6 International Product Models

The TravelMate 6000/6100 Series Notebooks are available in 17 or more international configurations as listed in Table 1-10.

Table 1-10 TravelMate International Models

Configuration	Dash No.
United States	-0001
UK Configuration	-0002
German Configuration	-0003
French Configuration	-0004
Spanish Configuration	-0005
Swiss/German Configuration	-0006
Italian Configuration	-0007
Portuguese Configuration	-0008
Western European Configuration	-0009
Swedish Configuration	-0010

Table 1-10 TravelMate International Models

Configuration	Dash No.
Swiss/French Configuration	-0011
Danish Configuration	-0012
Norwegian Configuration	-0013
Finnish Configuration	-0014
Belgian Configuration	-0015
Austrian Configuration	-0016
Latin American Configuration	-0018

1.7 Notebook Physical Description

The TravelMate 6000/6100 Series Notebooks are modular in design and can be disassembled for maintenance purposes using a set of small Phillips®-head, flat blade and TORX® screwdrivers, hex drivers and a small plastic stick. The notebook consists of two major assemblies including the Display Assembly and the Base Assembly (Figure 1-7).

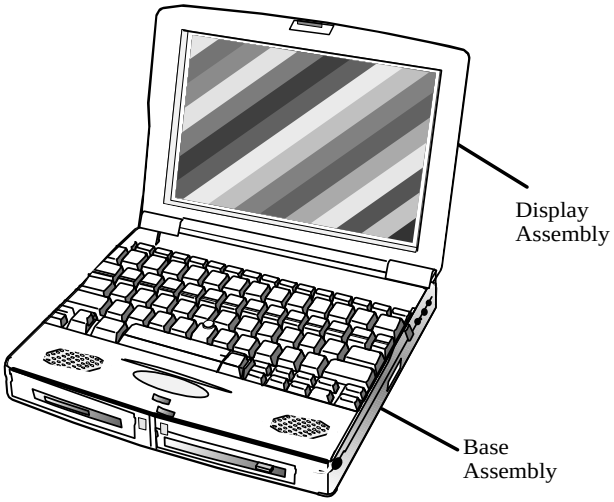

Figure 1-7 6000/6100 Notebook Assemblies

1.7.1 Display Assembly

The Display Assembly (Figure 1-8) contains the LCD Panel, Inverter Board, Bezel, Display Cover and Display Cable.

1.7.2 Base Assembly

The Base Assembly, shown in Figure 1-8, houses a variety of field-replaceable subassemblies and components including:

- Top Board Assembly
- Bottom Board Assembly
- Keyboard Assembly
- Pick Button Assembly
- Hard Drive Assembly
- Left and Right Speakers
- Internal Microphone Assembly
- Battery Pack
- Flex Cable, Bus/VGA
- Modular Bay Device (Drive, Battery Pack or Weight-Reduction Module)

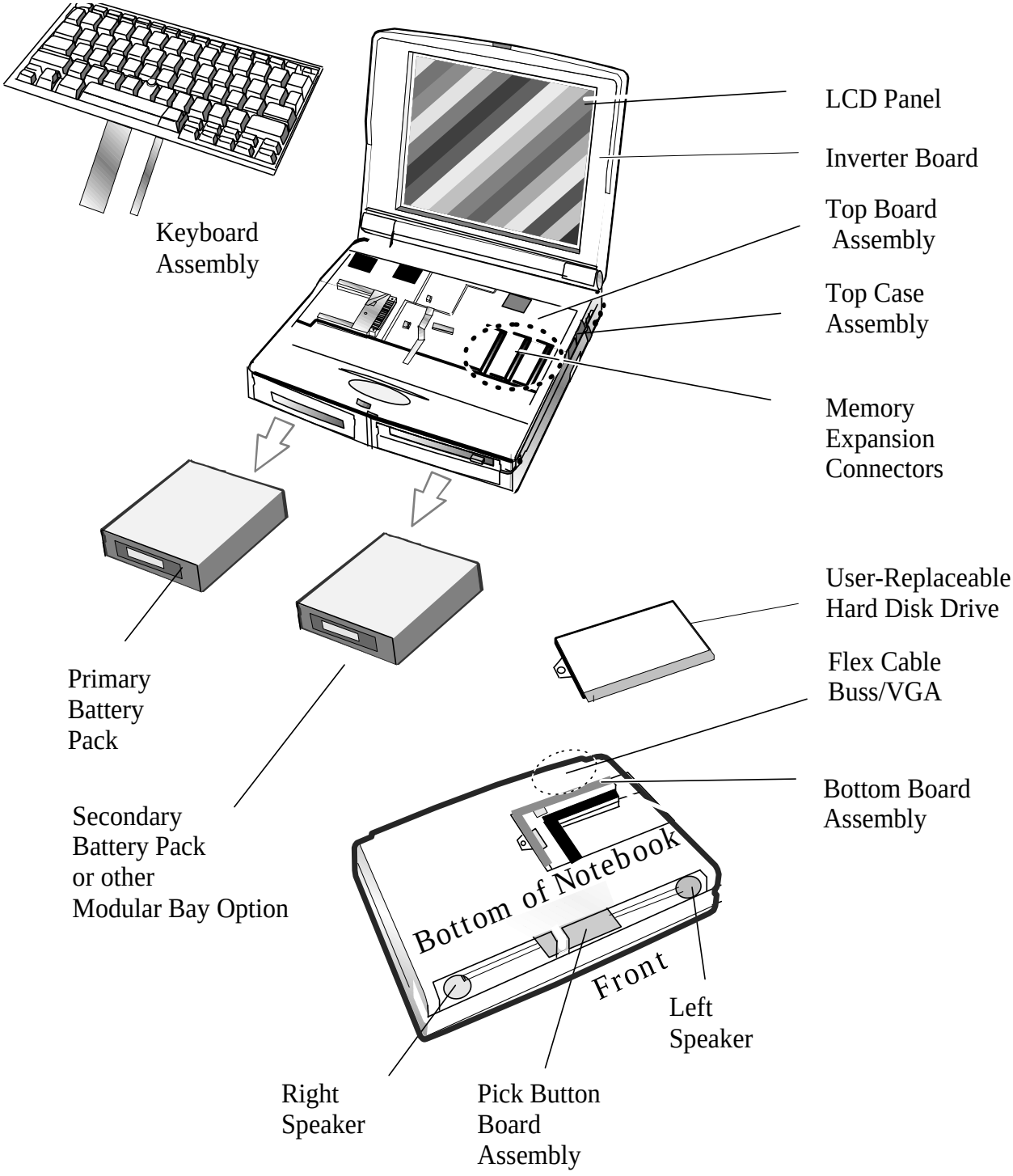

Figure 1-8 Base Assembly Components

1.7.2.1 LED Displays

As shown in Figure 1-9, the TravelMate 6000/6100 Series Notebook Computers contain a set of six LED displays just above the keyboard and two LEDs along the front edge. The status indicators located above the keyboard include:

- **Disk Activity** indicator - lights when the hard drive is reading/writing
- **Standby Mode** indicator - lights when the notebook enters the Standby mode
- **Caps Lock** indicator - lights when the keyboard is locked in the uppercase mode. To switch to the lowercase mode, press the **Caps Lock** key.
- **Pad Lock (Num Lock)** indicator - lights when you press the **Fn-F7 (**NumLk) keys to toggle on the numeric keypad lock function. When the LED is On, the embedded numeric keyboard keys generate AT®-keypad characters and functions when pressed in conjunction with the **Fn** key. When the indicator is Off, pressing the **Fn** key with the appropriate keys provides cursor movement, paging and other functions in the normal mode. When the indicator is blinking, the embedded numeric keypad becomes a temporary numeric keypad that does not require you to press any other key.
- **Scroll Lock** indicator - lights to indicate that the keyboard is locked in the Scroll mode.
- **Turbo Speed** indicator- lights when turbo speed is selected.

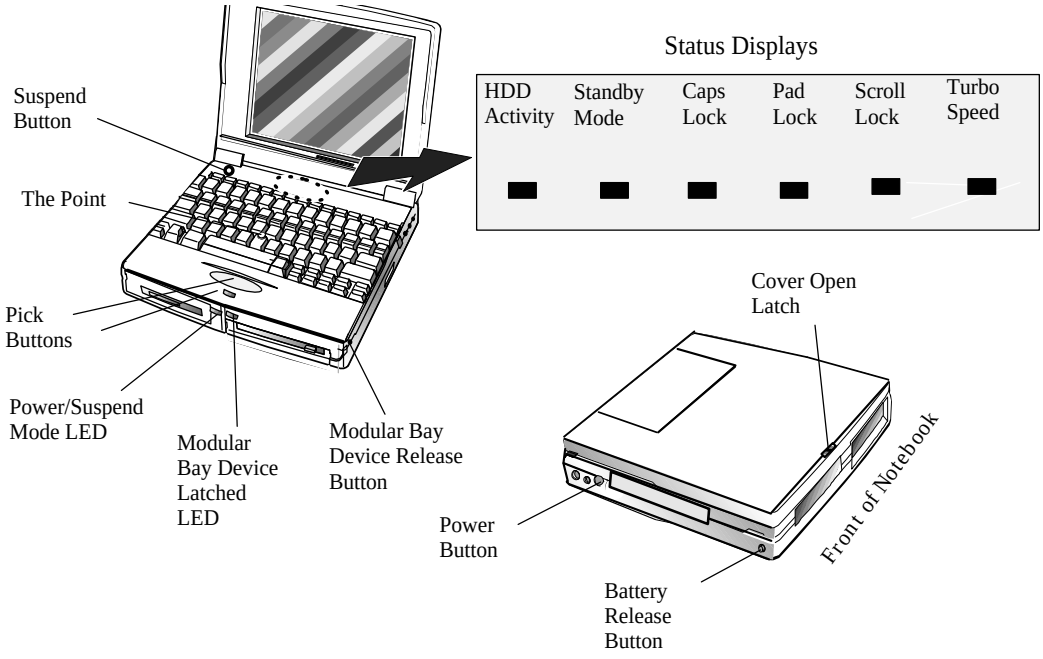

Figure 1-9 Notebook Status Indicators

The two LEDs located on the front edge of the notebook include:

- Power/Suspend Indicator
- Modular Bay Device Latched Indicator

1.8 TravelMate 6000 Series Specifications

General specifications for the TravelMate 6000 Series Notebooks are provided in Table 1-11. Model dependent specifications are provided in the appendices.

Table 1-11 TravelMate 6000 Series Notebook Specifications

Hardware/ Software Function	Specifications
Processor	Intel Pentium P54CSLM, 120 MHz (initially); 2.9 Volt **Bus Type**: VL Local Bus; bridge to 33 MHz PCI Bus
Memory	8 MB DRAM, 60-ns, page-interleaved, expandable to 40 MB 2 MB FLASH ROM
Internal Cache	16 KB
L2 Cache	256 KB
LCD Type	11.3-inch (Diagonal) TFT, Color SVGA (model dependent)
Primary Hard Disk Drive	**Disk Storage Capacity**: 1.08 GB (Model Dependent) **Disk size**: 12.5 mm) **Average access time**: 12 ms or less **Throughput:** 11+ Million I/O's per second
CD-ROM Drive	6X, Mode 2
Floppy Disk Drive	1.44 MB, 3.5 inch floppy disk; installed in Modular Bay or connected externally to the Parallel Port
Internal Keyboard	3-mm Key movement Integrated numeric keypad Inverted T Cursor Control Key Layout
Pointing Device	The Point™ (embedded in keyboard; select buttons on keyboard palm rest)

Table 1-11 TravelMate 6000 Series Notebook Specifications

Hardware/ Software Function	Specifications
Video Subsystem	**Controller:** Cirrus GD7548 Controller **LCD Aspect Ratio**: 1-1 **Graphic Accelerator:** 64-bit BLT **Emulations:** VGA **Video Memory (EDO)**: 2 MB **Video Bus**: 32 bits **Simultaneous LCD and external VGA display** **LCD Resolution:** 640 x 480 pixels bit-mapped at 16.77 million colors; 600 x 800 at 65K colors. **LCD Characters/Line**: 80 **LCD Lines/Screen:** 25
External CRT Monitor Interface	**Connector Type**: 15-Pin, female, D-type connector **Monitors Supported**: 640 x 480 with 16.7 million colors on CRT 800 x 600 with 65 K colors on CRT 1024 x 768 with up to 256 colors on CRT 1280 x 1024 with 256 colors on CRT (interlaced)
Parallel Port	EPP/ECP Bidirectional; Parallel Printer Port: 25-Pin, DB-25 Connector Also supports external Floppy Disk Drive with appropriate cable (refer to Figure 2-7 in Section 2 of this manual)
Serial Port	**RS-232-D Serial Port**: 9-Pin, male, sub-D-type connector **Method**: EIA RS-232-D **Type**: synchronous transmission **Bits per second:** 110, 200, 300, 600, 1200, 2400, 4800, 9600, 19200 **Parity: Transmit**: odd, even, mark, space **Receive:** data check: odd, even **Line control**: READY/BUSY, DC1/DC3 **Data word**: 7- or 8-bit
Serial I/R Port	115K baud
PS/2 Port	Supports either external mouse or keyboard (or both with Y-type cable)

Table 1-11 TravelMate 6000 Series Notebook Specifications

Hardware/ Software Function	Specifications
Audio Jacks	**Line in:** 3.5 mm bayonet connector; input Z of 10K ohms; 3.5 V_{RMS} maximum input. **Speaker Out**: 3.5 mm bayonet connection to drive external amplified or headphones; 400 mW output into 8 ohm speaker/headphones. **Mic In:** 3.5 mm bayonet connector to connect an external condenser-type mic to the notebook; 10 to 100 mW input level.
Audio Features	ESS Chip set; Sound Blaster Pro 16 compatible Built-in power amplifier with volume control 3-D Expansion (Spatializer)
Battery Pack **Recharge Time**	40 Watt-Hour, 8-cell, Li-Ion intelligent battery with built-in charge indicator circuitry and display 4 Hours with unit off; 4.5 to 10 hours with unit on
Power	**Input Voltage:** 100 to 250 VAC **Input Current:** 0.7 to 0.4 Amps **Input Frequency**: 50 to 60 Hz **Wattage:** 35 Watts
AC Adapter	**Output Voltage**: +9.0 VDC to +18VDC
Card Bus Interface	Two Type I/II PCMCIA Cards or one Type III Card
Physical Characteristics	**Size:** 12 inches x 9 inches x 2 inches **Weight**: 5.92 pounds (including battery pack and Floppy Disk Drive) (model dependent)*
Environmental Operating	**Temperature**: 50 degrees F to 95 degrees F (10 degrees C to 35 degrees C) **Relative humidity**: 20 to 80 percent, noncondensing **Shock:** 6G applied in 6-orientations (pos. and neg. X, Y and Z axes) **Vibration**: Sinusoidal; 5 to 20 Hz limited to 0.0244-inch (0.6 mm) peak-to-peak maximum displacement; 0.5g, 20 to 400 Hz **Altitude:** 8200 ft (2500 m) maximum

Table 1-11 TravelMate 6000 Series Notebook Specifications

Hardware/ Software Function	Specifications
Environmental Storage	**Temperature**: -4 degrees F to 140 degrees F (-20 degrees C to +60 degrees C) **Relative humidity**: 10 to 90 percent, noncondensing 2500 ft (2.2 C per 305 m over 762 m) **Shock:** 60G pulse applied in 6-orientations (pos. and neg. X, Y and Z axes) **Vibration**: Sinusoidal; 5 to 20 Hz limited to 0.244-inch (0.6 mm) peak-to-peak maximum displacement; 5.0g, 20 to 400 Hz

1.9 TravelMate 6100 Series Specifications

Refer to Appendix D for specifications for the TravelMate 6100 Series Notebooks.

1.10 Regulatory Agency Approvals

All TravelMate 6000/6100 Series products meet the following regulatory agency standards:

- Underwriter's Lab (UL) Standard 1950 (safety)
- Canadian Standards Association (CSA) Standard 950 (safety)
- FCC CFR 47, Part 15, Subpart B, FCC Level B (Emissions)
- Canadian Department of Communications (DOC) ICES, Class B (Emissions)
- VDE- EN60950 (Safety)
- EN 50082-1 (Immunity: ESD, RFI, EFT, and Surge)
- EN 50081-1 (Emissions: RFI, EMI, Harmonics, and Flicker)
- Approval Marks: UL, CUL, VDE, FCC, ICES, and CE

2
Installation

2.1 Introduction

This section contains unpacking and preparation for use instructions for the TravelMate 6000/6100 Series Notebook Computers (procedures are common to both series unless otherwise stated). Installation procedures include:

- Removing the computer and all manuals, options and accessories from the shipping container(s)
- Installing Internal Notebook Options
- Installing External Notebook Options
- Installing Battery Packs
- Installing Desktop Devices
- Installing the AC Adapter
- Checking Out the System
- Configuring the System
- Making Backups of System Software
- Loading Application Software

2.2 Unpacking Instructions

Unpack the computer using the following instructions:

1. Carefully cut the tape that seals the top flap of the shipping carton.
2. Remove the computer and the accessories Carton from the main shipping carton.
3. Remove all protective coverings from the computer.
4. Remove the holding tape and open the accessory box; remove the contents.

Note: Save the two shipping containers and packaging for later reuse.

2.3 Installing Internal Notebook Options

If you have no internal options to install at this time, skip to Paragraph 2.4. Otherwise, continue with Paragraph 2.3.1.

2.3.1 Installing Main Memory Expansion (Optional)

2.3.1.1 6000 Series Notebooks

The basic 6000 Series Notebook is shipped with 8 MB of main memory. You can increase memory size up to a maximum of 72 MB (64MB is the maximum recommended size) using Small Outline Dual Inline Memory Modules (so-DIMMs). These modules come in 8 MB, 16 MB and 32 MB sizes and install in three slots underneath the keyboard assembly.

CAUTION: On the 6000/6100 Series Notebooks, do not use any combination of 16-MB and 32-MB so-DIMM Expansion Modules. The 32-MB modules are compatible only with 8-MB Modules. Also, use only memory supplied by Texas Instruments. Memory obtained from other sources may result in performance degradation or other undesirable affects.

Note: In order to use 32-MB so-DIMM modules in a TravelMate 6000 Series Notebook, you must have BIOS version 1.01.17 or higher installed in your notebook. Check and/or install a BIOS upgrade if your notebook is "down Rev". This BIOS upgrade kit is included in the TI **live**gear 32-MB Memory Module Kit available from Texas Instruments.

2.3.1.2 6100 Series Notebooks

The basic 6100 Series Notebook is shipped with 32-MB of RAM (expandable to a maximum of 96 MB). 32-MB Modules cannot be used with 16-MB modules (use one 64-MB module or two 32-MB modules to reach 96-MB or use any combination of 8-MB and 16-MB or 32-MB and 8-MB so-DIMMs for RAM expansion.

Note: On the 6100 Series Notebook, a BIOS upgrade is not required to install 32-MB expansion memory.

2.3.1.3 Expansion RAM Installation Procedure (6000/6100 Series)

The installation process consists of the following steps:

Caution: The so-DIMM module option contains components that are sensitive to static electricity. When handling the module and the internal parts of the computer, protect against static electricity by using wrist or ankle grounding straps and grounded working mats. When moving or storing items, use the anti-static bags supplied with the items.

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1. If installing 32-MB so-DIMMs, check the BIOS revision level in the notebook and install BIOS Upgrade if revision level is not 1.01.17 or higher.
2. Ensure that the notebook is powered off and the AC adapter disconnected from the AC outlet. Also, ensure that all batteries are out of the unit.
3. Remove the so-DIMM module(s) from its shipping container.
4. Disengage the keyboard assembly (refer to the procedure in Paragraph 6.6.5) and tilt assembly back against the LCD (Figure 2-1). Also, remove the keyboard stiffener from underneath the keyboard.

Note: An 8-MB module can be used in any of the three slots; however, only slots 1 and 2 can be used for so-DIMM modules larger than 8 MB (e.g., 16 MB or 32 MB modules). Also, all so-DIMM modules are keyed to insert in only one direction.

---

5. Insert the so-DIMM expansion module (component side up) into one of the available connectors (if larger than 8 MB or if the notebook has L2 Cache installed in slot 3, the module must go into either slot 1 or 2).
6. Align the module with the connector and plug the board in securely until the metal guides on the Top Board snap into place.
7. Repeat steps 4 and 5 for any additional so-DIMM Modules being installed.
8. Replace the Keyboard Assembly and any components previously removed. Replace the AC adapter and power on the notebook.
9. Power up the notebook and reboot. If all of the installed memory is not recognized, try reseating the so-DIMM module(s) and rebooting.

This completes the Memory Module installation procedure.

2.3.1.4 Expansion RAM Installation Procedure (6100 Series)

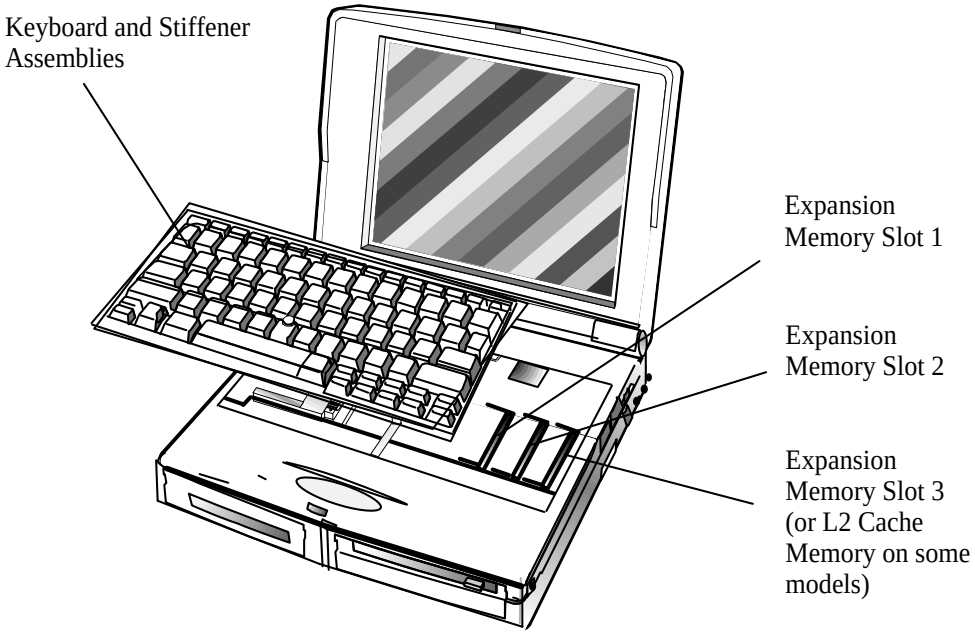


Figure 2-1. Installing Expansion Memory

Note: Expansion Slots 1 and 2 can accommodate 8, 16, or 32 BM Modules; Slot 3 is restricted to 8 MB Modules or L2 Cache memory on some models. 32-MB modules **cannot** be installed in same notebook containing 16-MB so-DIMM module.

2.4 Installing External Options

2.4.1 Installing PCMCIA Options

The Notebook has two connector slots for PCMCIA option cards. These two slots can be used to install one Type III or two Type I/II credit card size PCMCIA option cards. You can install a PCMCIA (PC card) without turning the computer off.

Use the following procedure to install a PCMCIA option:

1. Review the installation instructions supplied with the PCMCIA option card(s).

2 Press the PCMCIA Card Release Button (leftmost button for the top slot) and remove the filler in the slot you plan to use.

3. Hold the card at the end opposite the connector pins with the label side up. Insert the card into an unused slot on the left side of the Notebook.

3. If the option requires external cabling (e.g., Modem option), connect external cabling at this time.

Note: After installation of a PCMCIA option card, Windows 95 displays the *New Hardware Found* dialog box to help you configure the new device. To remove a card, click on the **PCMCIA** icon; then, press the appropriate PC Card Release Button (or press both buttons for a Type III device) and remove the option.

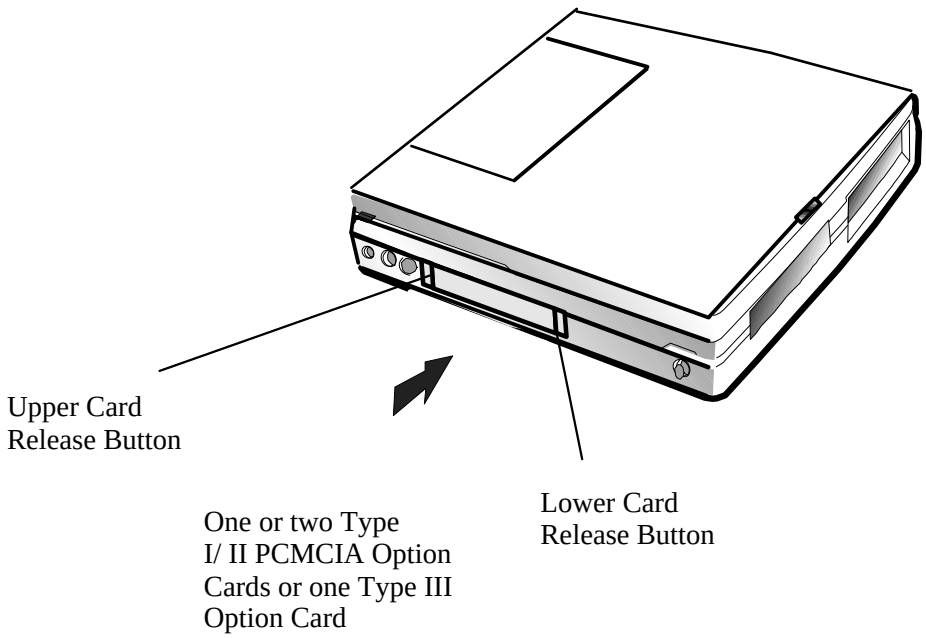


Figure 2-2 Installing PCMCIA Option Cards

2.5 Installing External Notebook Options

2.5.1 Installing the Optional Numeric Keypad

An optional numeric keyboard can be attached to the notebook via the keyboard connector as shown in Figure 2-3.

Note: To install an external option such as the Numeric Keypad Option, power off the notebook. Then power the unit back on after the installation is completed.

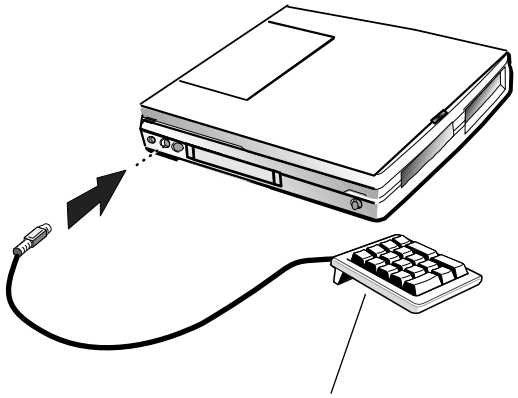


Figure 2-3 Installing the Optional Numeric Keypad Kit

2.5.2 Installing a DockMate Expansion System

When using a DockMate Expansion System, all external devices connect to the docking system as shown in Figure 2-4. Otherwise, all external devices connect to the Notebook via the connectors on the rear and sides of the notebook as shown Figure 2-5. Device installation procedures and connector pinouts are provided in the following paragraphs.

To install a DockMate Expansion System onto your notebook, use the following procedure:

1. Clear an area on your workstation surface to permit the notebook and DockMate Expansion System to rest on the work surface during the docking procedure.
2. Press the rear connector door release button on the rear of the notebook and open the rear connector door.
3. Attach the DockMate to the notebook as described in following steps.

4. Lift the lever on top of the DockMate so that the guide pin plate is extended. Carefully match the holes on the underside of the notebook with guide pins protruding from the DockMate.
5. Press the lever on top of the DockMate so that the notebook fits snugly against the DockMate.
6. Install additional desktop devices/LANs/etc. as required.
7. Install the AC power adapter to the power connector on the DockMate.

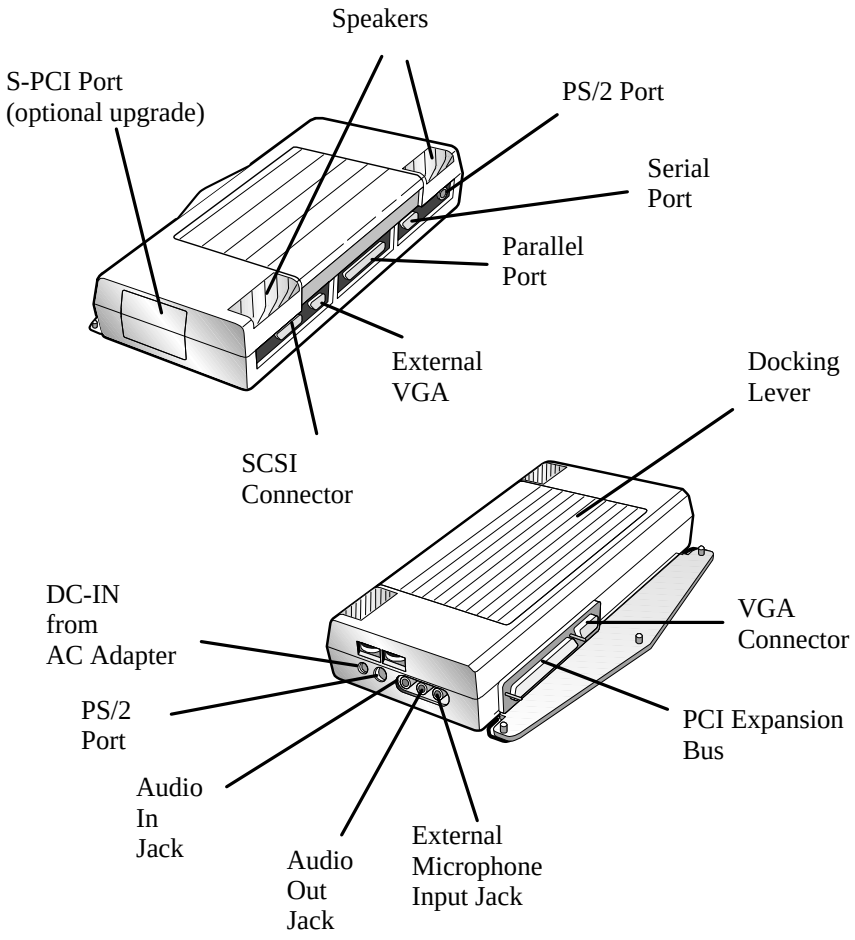


Figure 2-4 DockMate Plus Connectors

2.5.3 Desktop Connections Directly to Notebook

If not using one of the expansion systems, connect your desktop devices directly to the notebook (summarized in Figure 2-5 and described in greater detail in the following paragraphs).

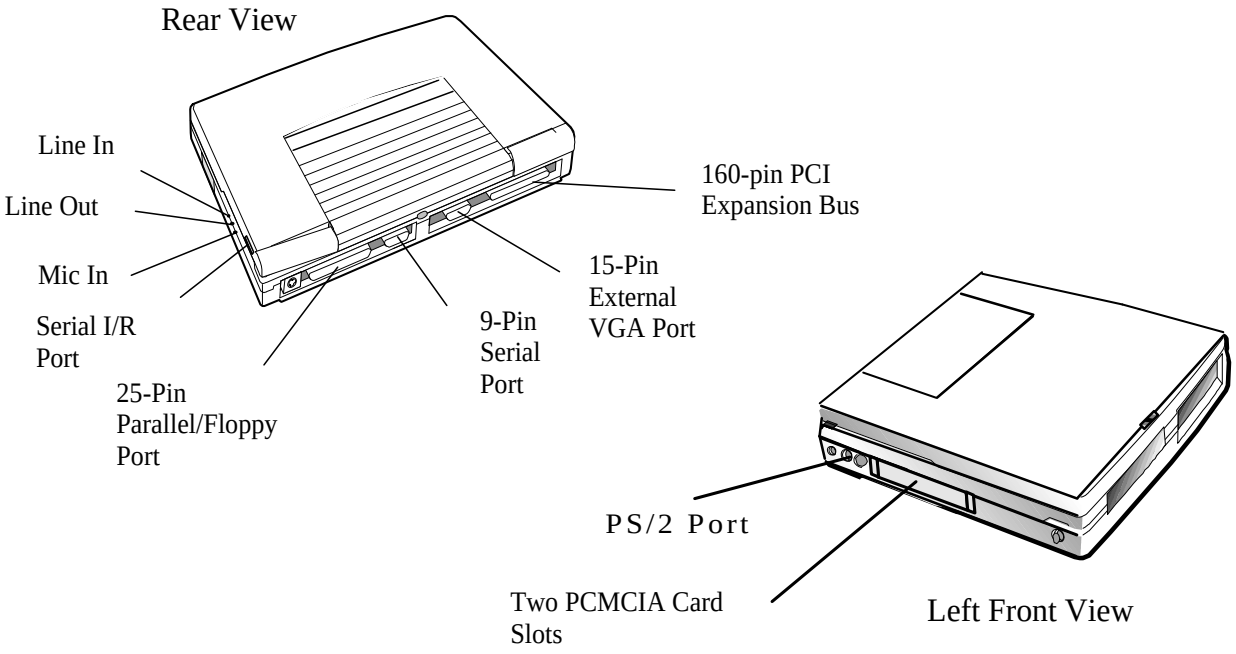


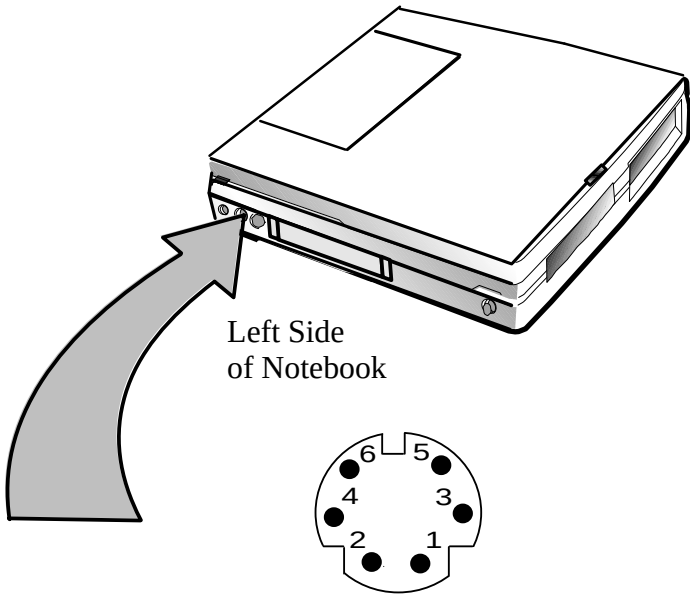
Figure 2-5 Notebook I/O Ports

2.5.4 Battery Pack Installation

1. Press the Battery Release Button and remove battery pack filler, if installed.
2. Insert battery pack with the battery contacts facing up and toward the rear of the notebook.
3. Press inward until battery pack clicks into place.

2.5.5 Installing an External Keyboard/Mouse/Keypad

A PS/2 compatible Keyboard, mouse or an optional PS/2-compatible numeric keypad may be installed on the notebook via the mouse connector on the left rear port as shown in Figure 2-6.

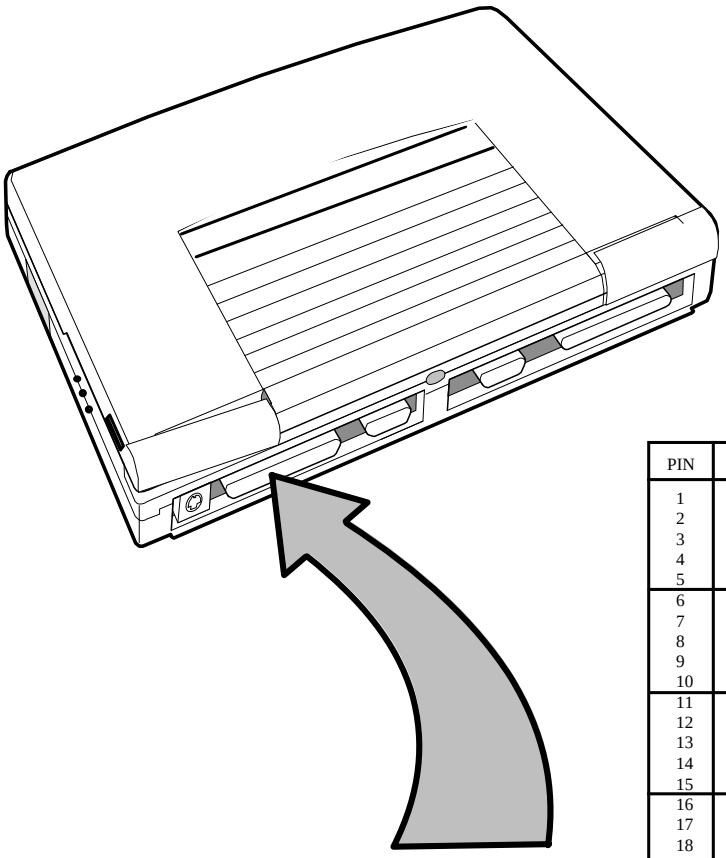


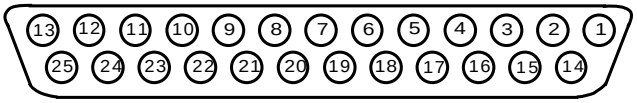
Mouse/Keyboard Connector	
Pin No.	Signal Name
1	MDATA/KDATA
2	
3	MSGND
4	MSVcc
5	MCLK/KCLK
6	

Figure 2-6 PS/2 Port Pinouts

2.5.6 Installing External Parallel Printer or Floppy Disk Drive

The Notebook is equipped with an external, bidirectional, ECC/EPP compatible, 25-pin parallel printer port. The connector pinouts and connector location are shown in Figure 2-7. When used with a special cable, an external floppy disk drive may also be attached to the notebook via the parallel port. When a floppy disk drive is connected to the parallel port, the floppy disk drive in the Modular Bay is disabled, if present.





PARALLEL PORT PINOUTS

PIN	SIGNAL	SPP Mode	FDC Mode
1	STROBE	STB*	DS0*
2	DATA BIT 0	PD0	INDEX*
3	DATA BIT 1	PD1	TRK0*
4	DATA BIT 2	PD2	WP*
5	DATA BIT 3	PD3	RDATA*
6	DATA BIT 4	PD4	DSKCHG*
7	DATA BIT 5	PD5	MEDIA_ID0*
8	DATA BIT 6	PD6	MTR0*
9	DATA BIT 7	PD7	MEDIA_ID1*
10	ACKNOWLEDGE *	ACK*	DS1*
11	BUSY	BUSY	nMTR1*
12	PAPER OUT	PE	WDATA*
13	SELECT	SLCT	WGATE*
14	AUTO LINEFEED *	AFD*	DSEL*
15	ERROR *	ERR*	HDSEL*
16	INITIALIZE PRINTER *	INIT*	DIR*
17	SELECT IN *	SLIN*	STEP*
18	GROUND	Ground	Ground
19	GROUND	Ground	Ground
20	GROUND	Ground	Ground
21	GROUND	Ground	Ground
22	GROUND	Ground	Ground
23	GROUND	Ground	Ground
24	GROUND	Ground	Ground
25	GROUND	Ground	Ground

NOTE: * Denotes Active Low

Figure 2-7 Parallel Port Pinouts

2.5.7 Installing External Serial Port Device

The notebook contains an external RS-232 serial port with a 9-pin, male DB-9 connector as shown in Figure 2-8 (25-pin cables require the use of an adapter for use with the 9-pin port). The serial ports are used to interconnect such devices as:

- External Modem

- Serial Mouse
- Serial Printer
- Any device that uses an RS-232 interface

Caution: Never connect a parallel device to a serial port or a serial device to a parallel port or video port; this may cause damage to the notebook and/or external device. If you are uncertain of what type connector the external device has, refer to the technical manual for the external device.

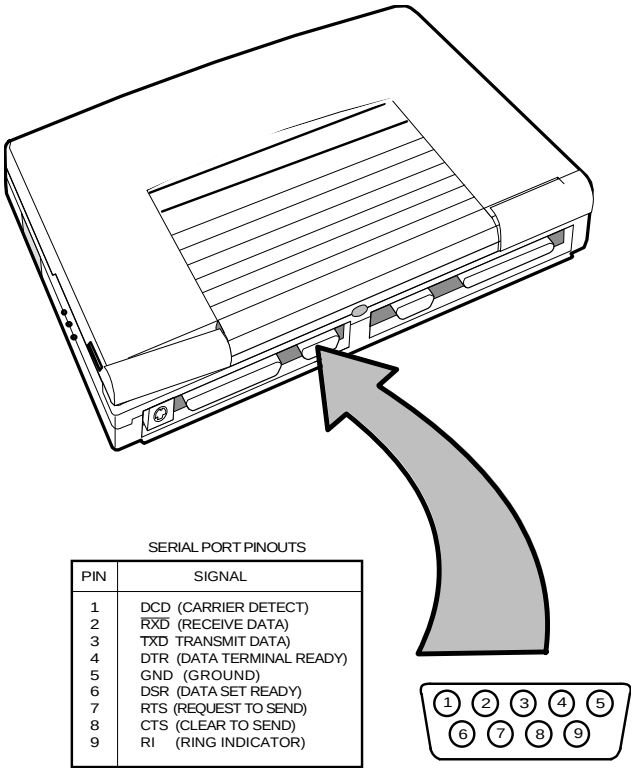


Figure 2-8 Serial Port Pinouts

2.5.8 Installing External VGA Monitor

The notebook contains an external CRT port that can drive one of a variety of monitor resolutions and colors as summarized in Table 2-1. The associated connector location

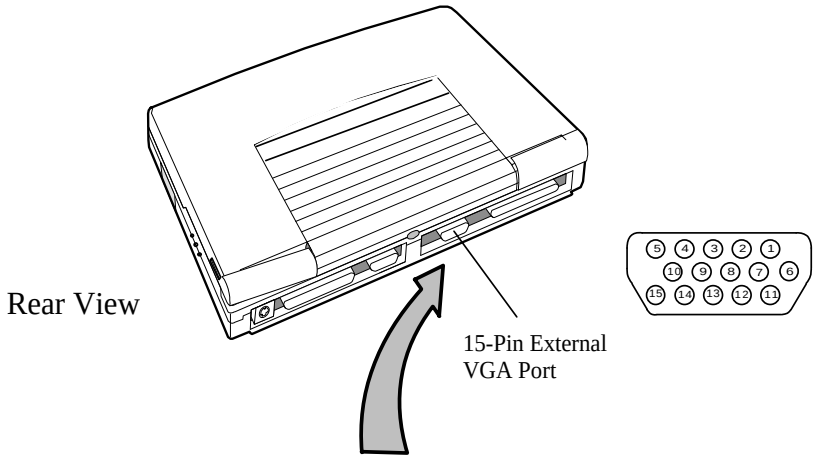
and pinouts are shown in Figure 2-9.

Table 2-1 Supported External Monitors

Resolution	No. of Colors
640 x 480	256, 64K, 16.8M
800 x 600	256, 64K
1024 x 768	256
1280 x 1024	256

Use the following procedure to install an external monitor:

1. Turn off power to both the notebook and monitor.
2. Connect the 15-pin external VGA cable from the monitor to the VGA connector on the notebook computer (refer to Figure 2-9).
3. Power up the notebook computer first; then turn on power to the monitor.
4. Setup the notebook display mode for **LCD only**, **simultaneous LCD and CRT** or **CRT only** (under Windows 95, select the **Change Display Utility**; under Windows for Workgroups, use the *WinMode Utility*.
5. Install the correct driver, if required (refer to the Monitor Installation Instructions supplied by the CRT vendor).



EXTERNAL VGA CONNECTOR PINOUTS		
PIN	SIGNAL NAME	DIRECTION
1	RED VIDEO	OUTPUT
2	GREEN VIDEO	OUTPUT
3	BLUE VIDEO	OUTPUT
4	NOT USED	
5	GROUND	
6	RED RETURN	INPUT
7	GREEN RETURN	INPUT
8	BLUE RETURN	INPUT
9	NOT USED	
10	GROUND	
11, 12	NOT USED	
13	HORIZONTAL SYNC	OUTPUT
14	VERTICAL SYNC	OUTPUT
15	NOT USED	

Figure 2-9 External VGA Pinouts

2.5.9 Installing External Headphone/Microphones

The notebook connectors used for installing a set of external headphones (or speakers) and an external microphone are shown in Figure 2-10. The notebook also has an Audio In connector for attaching a CD-ROM player, Tape Player or Radio to the notebook (Figure 2-10).

Note: When external devices are connected to the Audio Out and Microphone In connectors, the internal speaker and microphone are disabled.

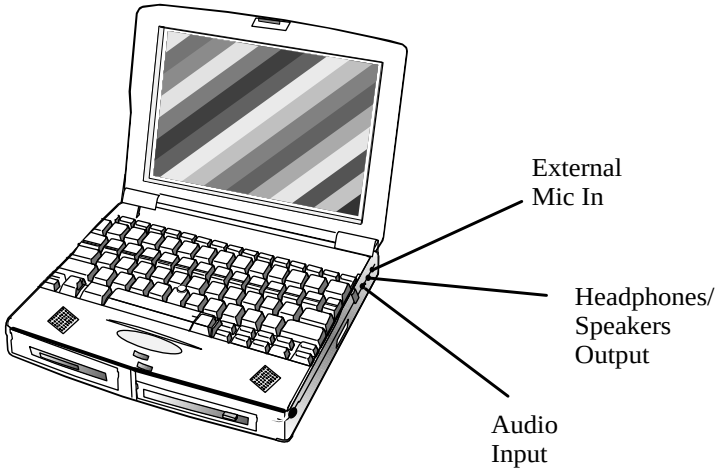


Figure 2-10 Notebook Audio Connectors

2.5.10 Installing Devices with SIR Interface

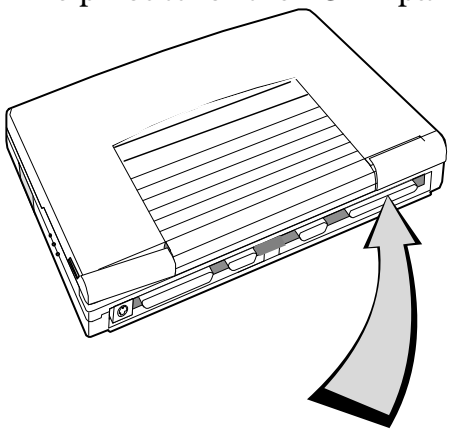
Any device with an Infrared interface conforming to Infra Red Data Association IRDA or Hewlett Packard HPSIR communications protocols may be placed adjacent to the SIR connector on the notebook (two SIR interfaces must face each other). The SIR port specifications are listed in Table 2-2.

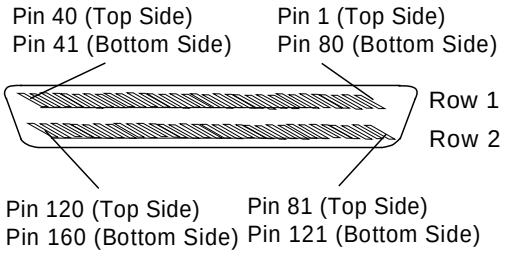
Table 2-2 SIR Port Specifications

Function	Specification
Range:	0.1 to 1.0 meters
Communication Angle:	+/- 15 degrees
Wave Length:	875 nm
Backlight:	Typical Indoor Environment
Communication Parameters:	8 Data Bits; Odd, Even or No Parity Bits; 1 Stop Bit
Data Rates Supported:	1.2 kb/s to 115 kb/s

2.5.11 PCI Bus Pinouts

The pinouts for the PCI Expansion Bus are shown in Figure 2-11.





PCI Expansion Bus Pinouts

PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
1	GND	61	AD12	121	VCC3
2	LMICIN	62	AD15	122	GND
3	MICGND	63	GND	123	FCDCLK
4	RMICIN	64	AD17	124	GND
5	LFLNOUT	65	AD20	125	FCEVIDEO
6	LNOUTGND	66	GND	126	OVRW
7	RTLNOUT	67	AD23	127	FCP0
8	IRQ15	68	AD25	128	FCP2
9	IRQ11	69	GND	129	GND
10	IRQ7	70	AD28	130	FCP4
11	IRQ6	71	AD31	131	FCP6
12	IRQ5	72	GND	132	GND
13	IRQ4	73	PAR	133	FCESYNC-
14	Reserved	74	TRDY-	134	GND
15	GND	75	GND	135	AD1
16	GND	76	DEVSEL-	136	AD2
17	POFFLTCH	77	SERR-	137	GND
18	PWROFF-	78	GND	138	AD6
19	Reserved	79	SDONE	139	CBE0-
20	PWRON-	80	SBO-	140	GND
21	REQ2-	81	EXP_SMI-	141	AD11
22	LOCK-	82	VCC	142	AD13
23	PWRGOOD	83	GND	143	GND
24	GNT2-	84	FCVCLK	144	AD16
25	VDC	85	GND	145	AD18
26	GND	86	FCBLANK-	146	GND
27	VDC	87	GND	147	AD22
28	GND	88	FCP1	148	CBE2-
29	VDC	89	FCP3	149	GND
30	GND	90	GND	150	AD27
31	KBDDAT	91	FCP5	151	AD29
32	GND	92	FCP7	152	GND
33	KBDCLK	93	GND	153	IRDY-
34	GND	94	AD0	154	PERR-
35	DIN_DAT	95	GND	155	GND
36	GND	96	AD3	156	REQ0-
37	DIN_CLK	97	AD4	157	REQ1-
38	GND	98	GND	158	GND
39	RESERVED	99	AD8	159	VDC
40	GND	1 00	AD10	160	VCC
41	LFLNIN	101	GND		
42	LINGND	102	AD14		
43	RTLNIN	103	CBE1-		
44	GND	104	GND		
45	GND	105	AD19		
46	MIDIRXD	106	AD21		
47	MIDITXD	107	GND		
48	IRQ14	108	AD24		
49	IRQ10	109	AD26		
50	GND	110	GND		
51	IRQ9	111	AD30		
52	IRQ3	112	CBE3-		
53	RESERVED	113	GND		
54	GND	114	FRAME-		
55	PCICLKBS	115	STOP-		
56	GND	116	GND		
57	AD5	117	GNT0-		
58	AD7	118	GNT1-		
59	AD9	119	GND		
60	GND	120	DOCK-		

Figure 2-11 PCI Bus Pinouts

2.5.12 Installing the AC Power Adapter

Use the following procedures to connect the AC Adapter to the system:

Caution: Use only the AC adapter supplied with the computer; other adapters can damage the unit.

1. Remove the AC adapter from the packaging. Connect the round coaxial connector supplied with the notebook to the **DC IN** power receptacle on the left rear of the notebook as shown in Figure 2-12.
2. Connect the female side of the AC power cord to the AC adapter and connect the male end to a grounded AC outlet.

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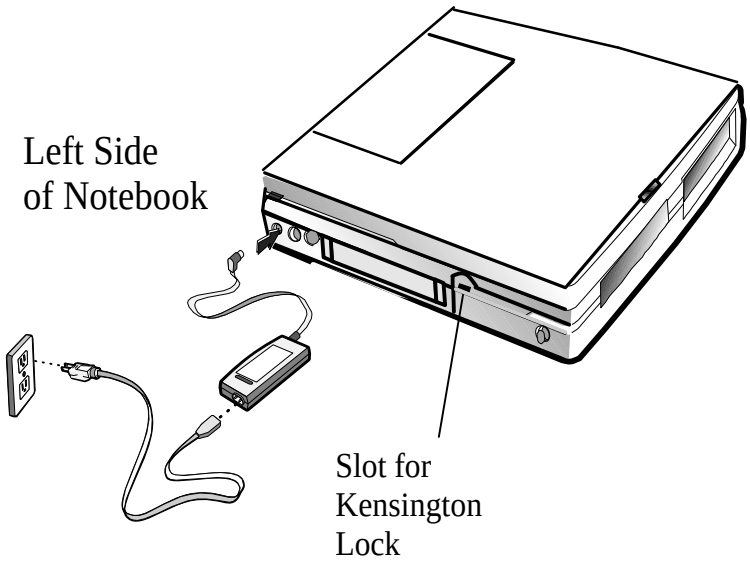


Figure 2-12 Installing the AC Adapter

2.6 Installing the Security Lock Option

Use the following procedure to install the optional Kensington® security lock.

1. Unpack the Kensington Lock Kit.
2. Secure the loop end of the lock to a permanent fixture located such that the notebook can be installed in a desired location.
3. Insert the lock into the slot on the left side of the computer (refer to Figure 2-12).
4. Rotate the key to its locked position and remove the key.

2.7 Initial System Checkout

After you've installed all internal options and external cabling, you're ready for system checkout and software configuration.

To check out the system, press the power button on the left side of the notebook which initiates self test. During self test execution, the computer checks the operation of all key hardware including memory and CPU (and displays copyright and version number data during test execution).

Upon successful conclusion of self test, the computer automatically loads its operating system and windows environment. If self test fails to complete and an error message is displayed, try powering down the computer for a couple of minutes and turning power back on to repeat self test. If the error message persists, refer to Section 5 for troubleshooting information.

2.8 Making Backups of System Software

Immediately after completion of the installation procedures, make backups of all software. In the event of a disk problem, restore the system using the *System Recovery Disk* (supplied with the notebook) and the set of backup disks.

Note: A CD containing backup for all pre-installed software is included with some notebook computers. Refer to the *TravelMate 6000 Online Reference Guide* for additional information.

3
Operating Instructions

3.1 Introduction

The first two subsections describe the TravelMate 6000/6100 Series Notebook Computer operating controls and indicators. The remainder of this section contains a summary of computer operations related to notebook maintenance including how to restore system software.

3.2 Notebook Controls and Indicators

As shown in Figure 3-1, the notebook has the following controls and indicators:

- Group of six status LEDs just above the keyboard (**Hard Disk Active**, **Standby Mode**, **Caps Lock**, **Num Lock**, **Scroll Lock**, and **Turbo Mode** status LEDs)
- Power Button - Left side of Notebook near the back
- Suspend (Zz) Button - above the keyboard on left side of notebook.
- Four "Eject" buttons (two PCMCIA Card eject buttons, primary battery eject button, and modular bay device eject button)
- Cover Release latch located on the front edge of the notebook
- The Point and two select buttons (The Point is embedded in the keyboard at intersection of **G, H, and B** keys) and the two Select buttons are located near the bottom of the keyboard.
- Two status LEDs near the center front edge of the notebook (**Power On/Suspend** LED and **Modular Bay Device Latched** LED)
- Group of four **Battery** charge indicators along the front edge of each removable battery pack
- Rear connector door release button (left side of rear panel)

3.2.1 Switches/Buttons

The Notebook switches (buttons) are shown in Figure 3-1 and described in the following paragraphs.

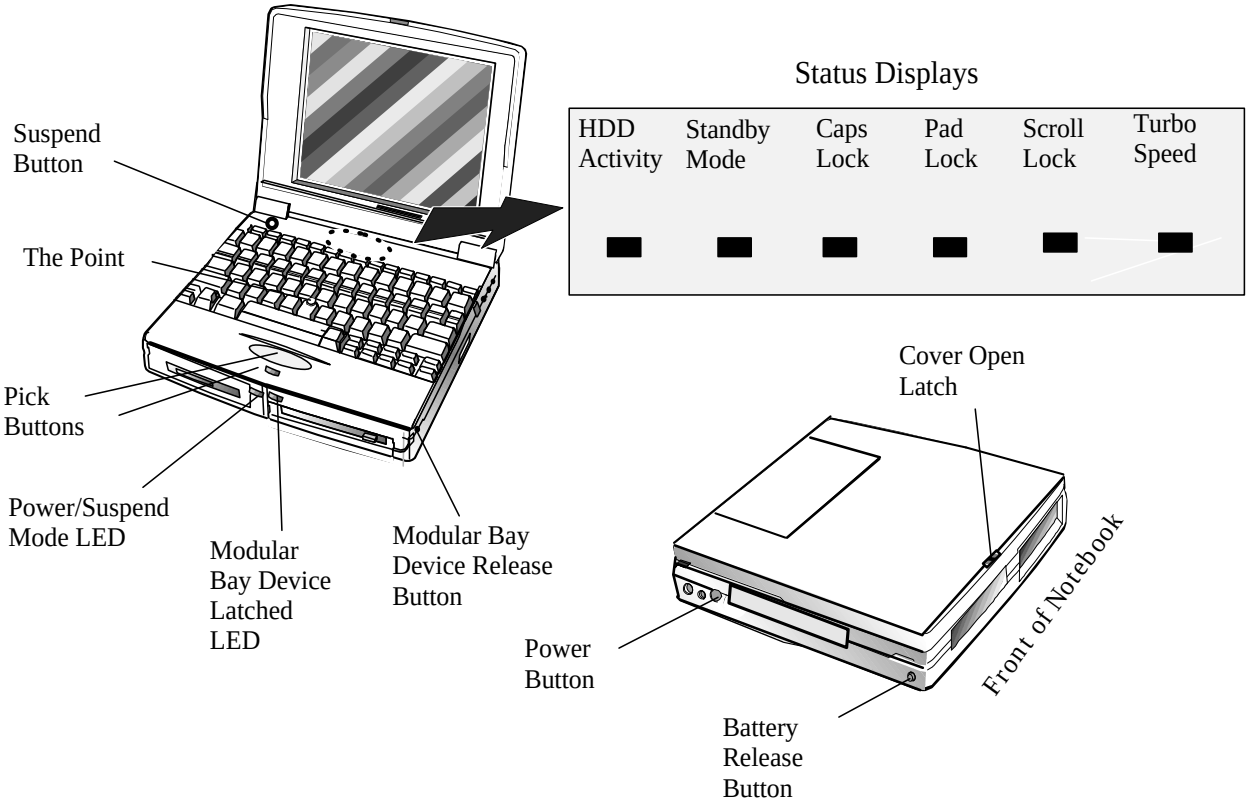


Figure 3-1 Notebook Controls and Indicators

3.2.1.1 Power Button

The notebook contains an alternate action power button on the left side of the notebook near the AC adapter connection. On the first button depression, power is turned on to the notebook. On the second depression, power is turned off.

3.2.1.2 Suspend Button

The notebook contains an alternate action touch switch (button) just to the left of the keyboard that places the notebook in **Suspend** mode (if previously **On**) or **On** if previously in **Suspend** mode.

3.2.1.3 Cover Release Latch

The Notebook contains a Cover Release latch near the center of the top cover. To open the notebook, press inward on the latch and lift upward on the notebook cover.

3.2.1.4 The Point (Mouse) Buttons

The TravelMate 6000 Series Notebook Computers are equipped with a built-in mouse device called The Point physically located at the intersection of the **G, H,** and **B** keys on the keyboard (refer to Figure 3-1).

The cursor is positioned by applying slight pressure to the rubber ball in the direction you want the cursor to go. The harder you press, the faster the cursor moves.

The select or pick functions are performed by the two buttons at the bottom of the keyboard (Figure 3-1). The larger button is the primary select button and the smaller button is the secondary button.

3.2.1.5 Rear Connector Door Release Button

The **Rear Connector Door Release** button (refer to Figure 3-2), located at the left side of the rear panel of the notebook, is used to open the rear panel connector door when attaching external devices or installing the notebook onto a "Docking System" option.

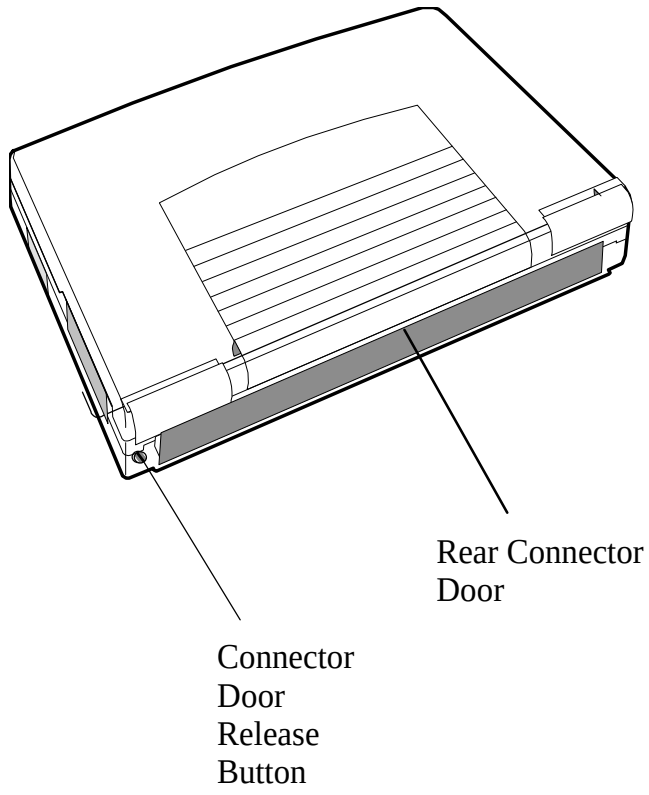


Figure 3-2 Opening the Rear Connector Door

3.2.2 Notebook LED Displays

The notebook is equipped with eight Status LEDs as shown in Figure 3-1 and described in the following paragraphs. These LEDs include:

- **Hard Disk Active** - this LED lights when hard drive activity is detected (disk read/ writes).
- **Standby Mode LED -** this LED lights when the Notebook is placed in the Standby Mode (**Fn-F4**).
- **CAP** (Caps Lock) Indicator - this LED lights when the keyboard is locked in the **Uppercase** mode. To switch to the **Lowercase** mode, press the **Caps Lock** key on the keyboard.
- **Pad Lock** (Num Lock) Indicator - this LED lights when you press the **Fn-F7** (NumLk) keys to toggle the numeric keypad lock function. When the LED is On, the embedded numeric keyboard keys generate AT-keypad characters and functions when pressed in conjunction with the **Fn** key.
  - When the **Pad Lock** indicator is Off, pressing the **Fn** key with the appropriate keys provides cursor movement, paging and other functions in the normal mode.
  - When the indicator is Blinking, the embedded numeric keypad becomes a temporary numeric keypad that does not require you to press any other key.
- **Scrl Lock (Scroll Lock)** indicator - this LED lights to indicate that the keyboard is locked in the **Scroll** mode.
- **TURBO (Turbo Mode)** indicator - lights when the notebook is operating at its fastest clock speed.
- **PWR/Suspend** indicator - dual-color LED that glows green when the Power switch is set to the **On** position and glows amber when the computer is in the **Suspend Mode**. The LED also alternately glows amber and green when the computer enters the Auto Suspend mode.
- **Modular Bay Device Active** - this LED lights when the modular bay device is locked by the software-controlled solenoid.
- **Battery Charge Condition LEDs** - each notebook battery pack has a set of four **Battery Charge Indicator** LEDs along the front bezel and a **Charge Display** Button. The more LEDs on, the greater the remaining charge capacity on the battery pack (all LEDs lit indicate batteries are 90 to 100% charged).

3.3 Internal Speaker/Microphone

The notebook is equipped with a pair of internal speakers (underneath the palm rests on the keyboard) and a condenser-type microphone underneath the right speaker grill. The internal microphone and speakers are disabled when using an external microphone and external headset or speakers.

3.4 Operating Procedures

Some of the common operating features for the Notebook are provided in the following paragraphs. For additional operating instructions, refer to the *TravelMate 6000 Series Notebook Computers Online Reference Guide.*

3.4.1 Adjusting Brightness

To control screen brightness:

- Press **Fn-Up Arrow** to increase screen brightness
- Press **Fn-Dn Arrow** to decrease screen brightness

3.4.2 Adjusting Sound Volume

To control notebook sound, use the following procedures:

- Press the **Fn-Pg Dn** keys in combination to reduce volume
- Press the **Fn-Pg Up** keys in combination to increase volume
- Press the **Fn-End** keys in combination to alternately mute/enable the sound

3.4.3 Placing Notebook In Standby/Suspend Modes

Use the following key combinations to place the computer in **Suspend** or **Standby** modes of operation:

- Press the **Suspend (Zz)** button above the keyboard (upper left side) to enter **Suspend** Mode. This action places the notebook in a deeper sleep conserving battery power. Normal operation is restored by pressing any key. However, the restore period is longer than that experienced for **Standby** Mode.
- Press **Fn-F3** to enter **Suspend** Mode. In this mode, the computer turns off the screen and the hard disk drive to conserve battery power. The notebook returns to normal operation when the **Shift** key is pressed.
- Press **Fn-F4** to enter **Standby** Mode. In this mode, the computer goes into a light sleep to conserve battery power and quickly returns to normal operation by pressing the **Shift** key.

3.4.4 Save to Disk

Press **Fn-F2 t**o quickly save any current work to hard disk and power down the computer.

3.4.5 Video Controls (Internal/External/Both)

Alternately, press **Fn-F12** to cycle between LCD video, external monitor video, or both.

3.4.6 Using Sound Utilities

Several sound utilities are factory installed on the hard drive including:

- AudioRack™32
- Audio Recorder
- Extender Recorder
- Reminder
- Calculator
- Stopwatch
- Timer
- Chime
- Clock
- Audio Clip Library

To access sound applications, click on **Start/Programs/AudioRack32**; double-click on the desired application and select **Help** from the menu bar.

3.4.7 Responding to Low Battery Conditions

The computer generally will notify you when you are reaching a low battery condition by one of the following:

- During peak power uses such as disk accesses, the **Charge** indicator blinks
- In Windows, double-clicking on the "**Battery-Level**" icon in the Notebook Group gives an estimate of the percentage of battery charge remaining.
- The battery packs contain four LEDs that display relative battery charge levels (the more LEDs lit, the greater the remaining charge). If a single LED is lit on the front of the battery pack, the charge level is below 25%.
- When the battery packs reach 10% charge levels, the **Charge** LED blinks and the low-battery alarm begins chirping (if enabled in the **Setup** Program). Typically, only a few minutes remain before complete system shutdown occurs.

3.4.8 Minimizing Power Usage

When operating on battery power and the charge remaining is 20% of maximum, the **Low Battery** indicator blinks and the audible alarm sounds (if enabled). The following actions can minimize power usage and protect your work during the critical minutes before you shut the system down or replace the battery packs with a fully-charged pack:

- Press **Fn-End (Mute)** to shut off the alarm (if its enabled)
- Use the *wSpeed utility* in the **TravelMate Notebook Center** to reduce processor speed (refer to the *TravelMate Online Manual* for details)
- Save all work in progress to prevent losing data
- Press the **Suspend Button** to spin down the Hard Disk Drive
- Reduce screen brightness by pressing **Fn-Down Arrow**
- Press the **Suspend Button** to put the computer in Suspend mode whenever you are not actively using the computer
- Power down the system if you do not need the computer
- Install the AC adapter if AC power is available (can be done without powering down the notebook).

3.4.9 Removing Battery Packs

The TravelMate 6000 Series Notebooks have provisions for installing two intelligent battery packs. To remove a battery pack from the notebook, power down the notebook and press the **Battery Eject** Button.

3.4.10 Recharging the Battery Packs

A standalone battery charger option is available to charge notebook battery pack(s). The battery pack(s) may also be charged in the notebook as follows:

1. Install the battery pack(s) in your computer (if not already installed).
2. Connect the AC adapter as described in Section 2. The LEDs on the battery pack(s) will gradually light starting from the left. When all four LEDs on the battery pack light, this indicates that the battery pack is at least 90% charged. All four LEDs extinguish when the battery is 100% charged.
3. To fully charge the battery pack(s), leave them charging in the Notebook for at least another 90 minutes after all four battery LED's light.

4
Theory of Operation

4.1 Introduction

This section contains a general block diagram theory of operation description of the TravelMate 6000/6100 Series Notebook Computers.

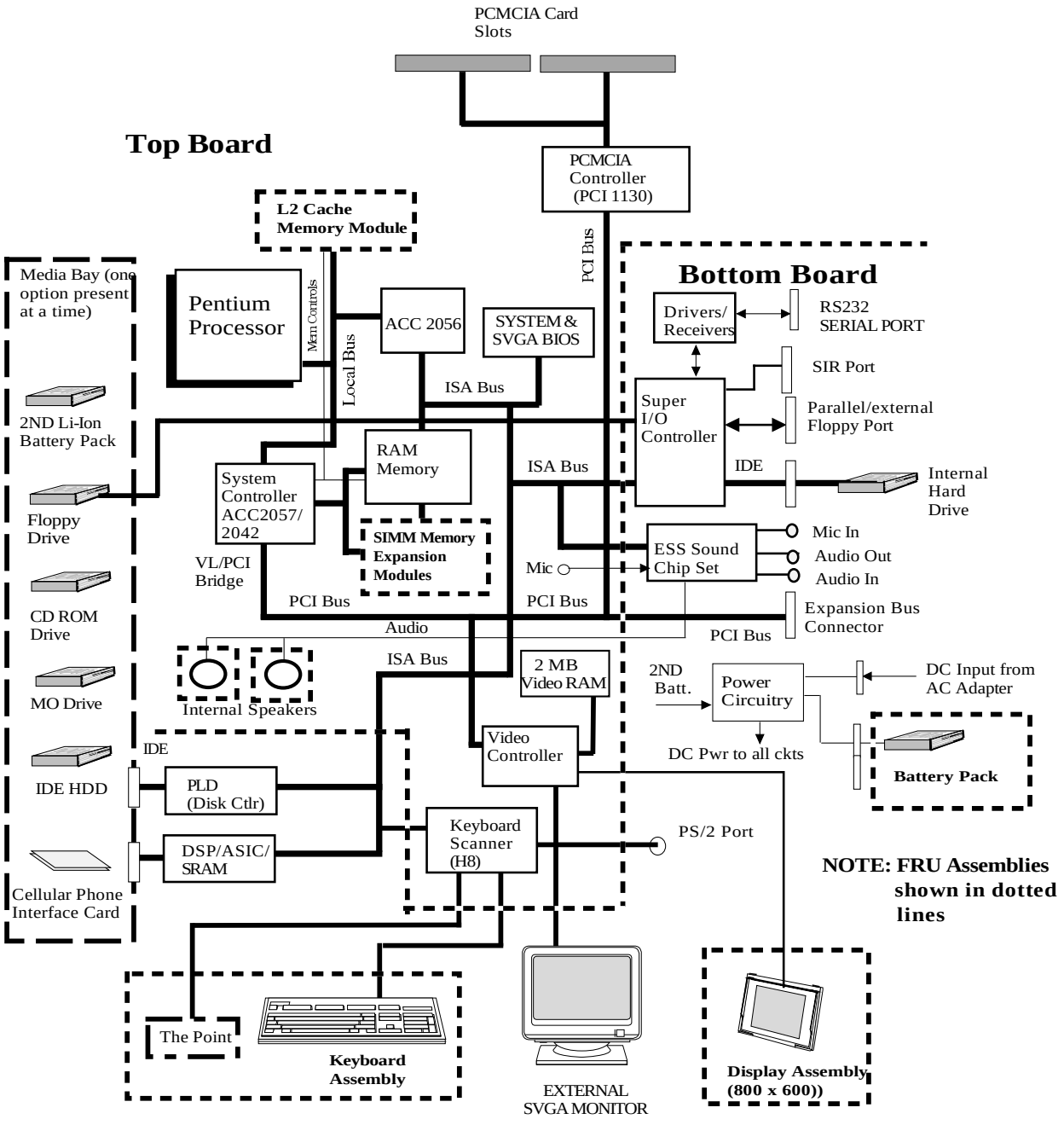
Note: Various internal components may change on future models and busses/ bus speeds are subject to change. For specific information regarding a model type, refer to the associated Appendix.

4.2 Notebook Functional Overview

The TravelMate 6000/6100 Series Notebooks consist of ten major functions or sections including:

- System Processor - implemented on the Bottom Board Assembly
- Memory Subsystem - implemented on the Top Board Assembly
- Processor/Memory/I/O Control
- Keyboard Subsystem - implemented on the Top Board Assembly and the Keyboard Assembly
- Video Subsystem - implemented on the Top Board and on the LCD Display Assembly
- Sound Subsystem - implemented on the Bottom Board Assembly and on the Pick Button Board Assembly
- Pointing Device Subsystem-implemented on the Top Board and the Keyboard Assembly
- Hard Disk Subsystem - implemented on the Bottom Board and the Hard Disk Drive Assembly (and optional Hard Disk Drive in the Modular Bay)
- Floppy Disk Subsystem - implemented on the Bottom Board and Floppy Disk Drive Assembly
- Power Subsystem - implemented on the Top and Bottom Boards, Inverter Board, battery packs, and AC adapter

A simplified block diagram of the computer is shown in Figure 4-1.



Typical TravelMate 6000/6100 Series Notebook Computer

Figure 4-1 TravelMate 6000 Functional Block Diagram

4.2.1 System Processor

The System Processor function for the notebook is implemented on the Main Board in the form of an Intel Pentium (P54-C, 133 MHz for the 6000 Series, P55CLM, 166 MHz for the 6100 Series). The processor operates in conjunction with RAM and ROM Memory and other control logic to process software instructions (BIOS, DOS, Windows, and applications). The processor communicates with the hard disk and the memory components using a 50-MHz, VL-Local Bus and with other high speed peripheral components using a 33-MHz PCI Bus (future models may implement higher bus speeds and chip types).

The PCI Bus Controller Chip (ACC2188) provides the bridge between the 50 MHz system bus (VL-Local Bus) and the 33 MHz Peripheral Components Interface (PCI) Bus. The PCI Bus operates asynchronous to the 50 MHz System Bus for increased system performance.

The Processor also executes the BatteryPro software and interacts with other hardware logic to provide the power savings features for the notebook. These features include controlling CPU clock speeds, reducing clock speeds whenever possible (e.g., when performing floppy disk drive accesses), powering down unused devices, etc.

4.2.2 Memory Subsystem

The memory subsystem comprises the following components:

- Main memory
- L2 Secondary Memory (cache)
- Flash ROM

The TravelMate 6000/6100 uses fast Extended Data Out (EDO) DRAM for main and video memory and high-speed synchronous, pipelined burst SRAM for L2 cache memory. Main BIOS and Video BIOS are stored in Flash ROM.

4.2.2.1 6000 Series Main Memory

The standard 6000 Series notebook comes with 8 MB of Main memory installed either on the Top Board Assembly or on a so-DIMM Module inserted into the Top Board Assembly. You can increase memory size up to a maximum of 72 MB (64 MB is the maximum recommended size) using Small Outline Dual Inline Memory Modules (so-DIMMs). These modules come in 8 MB, 16 MB and 32 MB sizes and install in three slots underneath the keyboard assembly.

CAUTION: On the 6000/6100 Series Notebooks, do not use any combination of 16-MB and 32-MB so-DIMM Expansion Modules. The 32-MB modules are compatible only with 8-MB Modules. Also, use only memory supplied by Texas Instruments. Memory obtained from other sources may result in performance degradation or other undesirable affects.

Note: In order to use 32-MB so-DIMM modules in a TravelMate 6000 Series Notebook, you must have BIOS version 1.01.17 or higher installed in your notebook. Check and/or install a BIOS upgrade if your notebook is " down Rev". This BIOS upgrade kit is included in the TI **live**gear 32-MB Memory Module Kit available from Texas Instruments.

4.2.2.2 6100 Series Main Memory

The basic 6100 Series Notebook is shipped with 32-MB of RAM (expandable to a maximum of 96 MB). 32-MB Modules cannot be used with 16-MB modules (use one 64-MB module or two 32-MB modules to reach 96-MB or use any combination of 8-MB and 16-MB or 32-MB and 8-MB so-DIMMs for RAM expansion.

Note: On the 6100 Series Notebook, a BIOS upgrade is not required to install 32-MB expansion memory.

Primary control for the memory subsystem is provided by the Core Logic Chip that includes a DRAM controller, PCI Bus interface, ISA Bus Interface Power Management and L2 Cache Control functions.

4.2.2.3 L2 Cache Memory

The 6000 Series is equipped with 256 KB of L2 cache memory; the 6100 Series contains 512 KB of L2 cache memory.

On some 6000 Series models, the expansion memory connector 3 on the Top Board Assembly is used for installing Level 2 or secondary cache memory. On these models, the cache connector (rightmost 44-pin so-DIMM black, color-coded connector) accepts a 256 KB SRAM.

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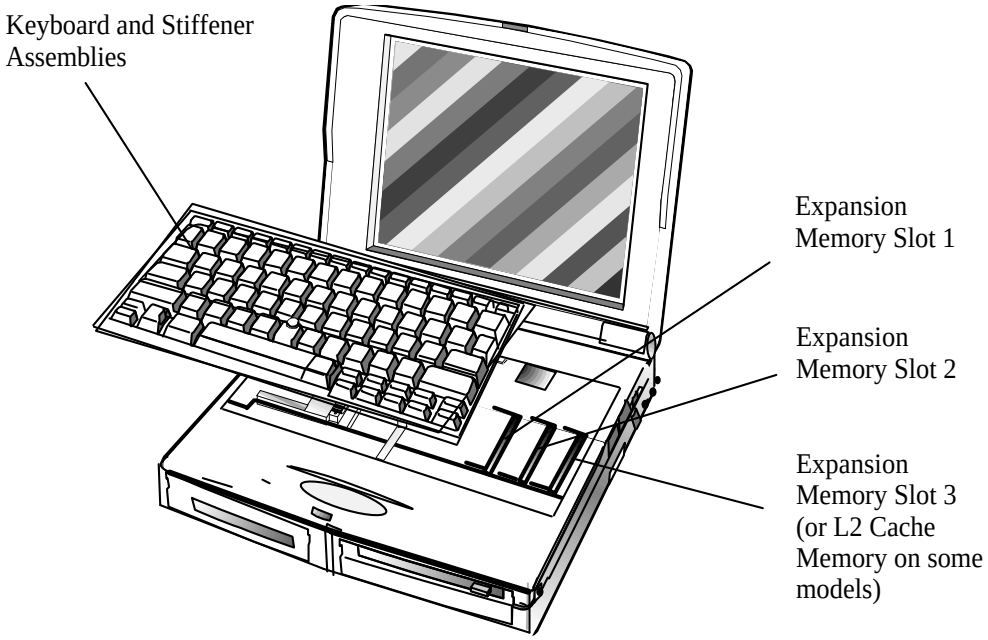


Figure 4-2 Expanding Main Memory Using so-DIMM Modules

Note: Expansion Slots 1 and 2 can accommodate 8, 16, or 32 MB Modules; Slot 3 is restricted to 8 MB Modules or L2 Cache memory on some models.

4.2.2.4 Flash ROM

All versions of the TravelMate 6000/6100 Series notebook families use a "Flash" ROM that contains both the main system BIOS and the VGA BIOS. The Flash ROM contains "Boot Block" logic that allows downloading new versions of BIOS without destroying the Boot Load area.

The Flash ROM execution is 8 bits wide. However, better performance can be attained by enabling the Shadow ROM in the CMOS setup routine or by selecting the Windows Control Panel Applet. When the Shadow ROM is enabled, BIOS is copied into 32-bit high speed system.

Note: When installing 32-MB so-DIMM modules into a 6000 Series Notebook, ensure that the BIOS is Version 1.01.17 or higher.

The memory address map for the TravelMate 6000/6100 Series notebooks is provided in Table 4-2.

Table 4-2 Memory Address Map

Memory Address Range	Assignment
000000h 09FFFF	System DRAM 640 KB
0A0000 0BFFFF	Video DRAM 128 KB
0C0000h 0CBFFF	Video BIOS ROM 48 KB
0CC000h 0E7FFF	Upper Memory
0E8000h 0EFFFF	Power Management
0F0000 0FFFFF	System BIOS 64 KB

4.2.3 Video Subsystem

The video subsystem, implemented on the lower electronics board and Display Assembly, provides for simultaneous LCD and external monitor video outputs.

The notebook contains a built-in 11.3 inch (or larger) Thin Film Transistor (TFT) SVGA LCD. The LCD has an SVGA compatible resolution of 800 x 600 pixels, 65K colors. All members of the TravelMate 6000/6100 family support simultaneous LCD and external VGA display.

4.2.3.1 6000 Series Video System

At the heart of the 6000 Series notebook's video subsystem is a powerful video engine, the Cirrus Logic CL-GD7548 GUI-accelerated Super VGA LCD Controller with MotionVideo. Features of this video engine include:

- ♦ 32-bit Block Transfer Engine with GUI Acceleration
- ♦ True-color capability
- ♦ Motion-Video architecture with live video overlay
- ♦ Support for 2 MB display memory

- ♦ Support for 256 through 16 million display colors on CRT and Panel
- ♦ Support for 640 x 480 (VGA), 800 x 600 (SVGA), and 1024 x 768 (XGA) resolution panels
- ♦ Support for Active Matrix (TFT) panels of all resolutions
- ♦ Support for flexible 3V and 5V operation.
- ♦ Support for Zoom Video operation
- ♦ Support for hardware assisted GUI acceleration including Transparent BLT for game acceleration
- ♦ Support for continuous scaling independent color-depth multimedia window with hardware assisted color space conversion.

The video subsystem includes a 2 MB EDO (Extended Data Out) DRAM memory, 32-bit DRAM bus, and separate display and memory clocks. An additional frame buffer/ accelerator DRAM increases the available memory band width for CPU accesses. The video section also uses additional levels of write FIFOs, a read cache, page mode DRAM and full 32-bit bus access for increased performance.

The CL-GD7548 video controller chip also supports multi-media capabilities using the MotionVideo Architecture (MVATM). This feature permits integrating video clips or live video. In addition to powerful multi-media capabilities, the video controller offers full hardware and BIOS compatibility with the IBM® VGA standard.

The video engine in the notebook is capable of operating at dot clock rates programmable up to 85 MHz at 5.0 V or 65 MHz at 3.3 V and supports standard VGA and VESA high-resolution extended modes at refresh rates up to 75 MHz. The internal palette can be configured as an industry-standard RAMDAC to provide a palette of 256K colors or configured for direct color displays of 32K, 64K, and 16.8 million colors.

4.2.3.2 6100 Series Video System

The 6100 Series Notebooks have a 12.1-inch Super VGA active matrix display driven by a NeoMagic 128-bit controller for higher performance with multimedia presentations.

4.2.3.3 Zoom Video Capabilities

The TravelMate 6000/6100 Series Notebooks support Zoom Video PC Cards via the lower PCMCIA option slot on the left side of the notebook. A direct link is provided between the PC Card and the VGA accelerator/Audio DAC bypassing the PCI Bus for improved video performance. With a Zoom Video Card installed, the computer has powerful multimedia capabilities including:

- ♦ Video Teleconferencing
- ♦ Full motion video with digital audio capabilities for advanced multimedia games and presentations

4.2.3.4 External Monitor Drive Capability

For non-portable operation, all 6000 Series Computers provide a 15-pin, female, D-type connector that can be connected to an external super video graphics adapter (SVGA) type monitor.

- ♦ 640 x 480 with up to 16 million colors
- ♦ 800 x 600 with up to 64K colors
- ♦ 1024 x 768 with up to 256 colors
- ♦ 1280 x 1024 with up to 256 colors
- ♦ High Resolution VESA and Extended Modes

4.2.3.4.1 Supported Modes

The supported modes for CRT and all LCD panel operation are listed in Table 4-3.

Table 4-3 Supported Modes for CRT/LCD Operation

Mode No. (hex)	No. of Colors	Char. Cell	Pixels	Display Mode	CRT Vert. Freq. Hz
00/01	16/256K	8x8	320x20	text	70
00*/01*	16/256K	8x14	320x35	text	70
00+/01+	16/256K	9x16	360x40	text	70
02/03	16/256K	8x8	640x20	text	70
02*/03*	16/256K	8x14	640x35	text	70
02+/03+	16/256K	9x16	720x40	text	70
04/05	4/256K	8x8	320x20	graphics	70
6	2/256K	8x8	640x20	graphics	70
07*	mono	9x14	720x35	text	70
07+	mono	9x16	720x40	text	70
0D	16/256K	8x8	320x20	graphics	70
0E	16/256K	8x8	640x20	graphics	70
0F	mono	8x14	640x35	graphics	70
10	16/256K	8x14	640x35	graphics	70
11	2/256K	8x16	640x48	graphics	60
12	16/256K	8x16	640x48	graphics	60
13	256/256K	8x8	320x20	graphics	70

4.2.3.4.2 Supported CRT Modes

Table 4-4 lists the CRT Modes supported by the TravelMate 6000 Series Notebooks.

Table 4-4 Supported CRT Modes

Mode No. (hex)	VESA No. (hex)	No. of Colors	Char. x Row	Char. Cell	Screen Format	Vert. Freq. Hz
		Text Modes				
14	—	16/256K	132x25	8x16	1056x400	70
54	10A	16/256K	132x43	8x8	1056x350	70
55	109	16/256K	132x25	8x14	1056x350	70
		Graphics Modes				
11	—	2/256K	80x30	8x16	640x480	72
11	—	2/256K	80x30	8x16	640x480	75
12	—	16/256K	80x30	8x16	640x480	72
12	—	16/256K	80x30	8x16	640x480	75
58, 6A	102	16/256K	100x37	8x16	800x600	56
58, 6A	102	16/256K	100x37	8x16	800x600	60
58, 6A	102	16/256K	100x37	8x16	800x600	72
58, 6A	102	16/256K	100x37	8x16	800x600	75
5C	103	256/256K	100x37	8x16	800x600	56
5C	103	256/256K	100x37	8x16	800x600	60
5C	103	256/256K	100x37	8x16	800x600	72
5C	103	256/256K	100x37	8x16	800x600	75
5D†	104	16/256K	128x48	8x16	1024x768	43†
5D	104	16/256K	128x48	8x16	1024x768	60
5D	104	16/256K	128x48	8x16	1024x768	70
5D	104	16/256K	128x48	8x16	1024x768	72
5D	104	16/256K	128x48	8x16	1024x768	75
5E	100	256/256K	80x25	8x16	640x400	70
5F	101	256/256K	80x30	8x16	640x480	60
5F	101	256/256K	80x30	8x16	640x480	72
5F	101	256/256K	80x30	8x16	640x480	75
60†	105	256/256K	128x48	8x16	1024x768	43†
60	105	256/256K	128x48	8x16	1024x768	60
60	105	256/256K	128x48	8x16	1024x768	70

Table 4-4 Supported CRT Modes

60	105	256/256K	128x48	8x16	1024x768	72
60	105	256/256K	128x48	8x16	1024x768	75
64	111	64K	—	—	640x480	60
64	111	64K	—	—	640x480	72
64	111	64K	—	—	640x480	75
65	114	64K	—	—	800x600	56
65	114	64K	—	—	800x600	60
65	114	64K	—	—	800x600	72
65	114	64K	—	—	800x600	75
66	110	32K‡	—	—	640x480	60
66	110	32K‡	—	—	640x480	72
66	110	32K‡	—	—	640x480	75
67	113	32K‡	—	—	800x600	60
6C†	106	16/256K	160x64	8x16	1280x1024	43†
6D†	—	256/256K	160x64	8x16	1280x1024	43†
71	112	16M	80x30	8x16	640x480	60
74†	—	64K	—	—	1024x768	43†

4.2.4 Sound Subsystem

The TravelMate 6000 Series Notebook is equipped with the ESS chip set that is Sound Blaster and Sound Blaster Pro compatible. Internal stereo speakers and a built-in microphone provide the Notebook with direct sound generation and recording capabilities. A set of 3.5-mm bayonet socket connectors allow for external microphone and line inputs and headphone/speaker outputs.

The sound subsystem also includes a variety of sound utilities (located in the Windows 95 *AudioRack32* group) that combine to provide additional multi-media functions:

- ♦ AudioRack32
- ♦ Audio Recorder

4.2.5 Pointing Device Subsystem

The pointing device subsystem (Figure 4-3) consists of the built-in "Point" device on the keyboard and logic on the upper electronics board.

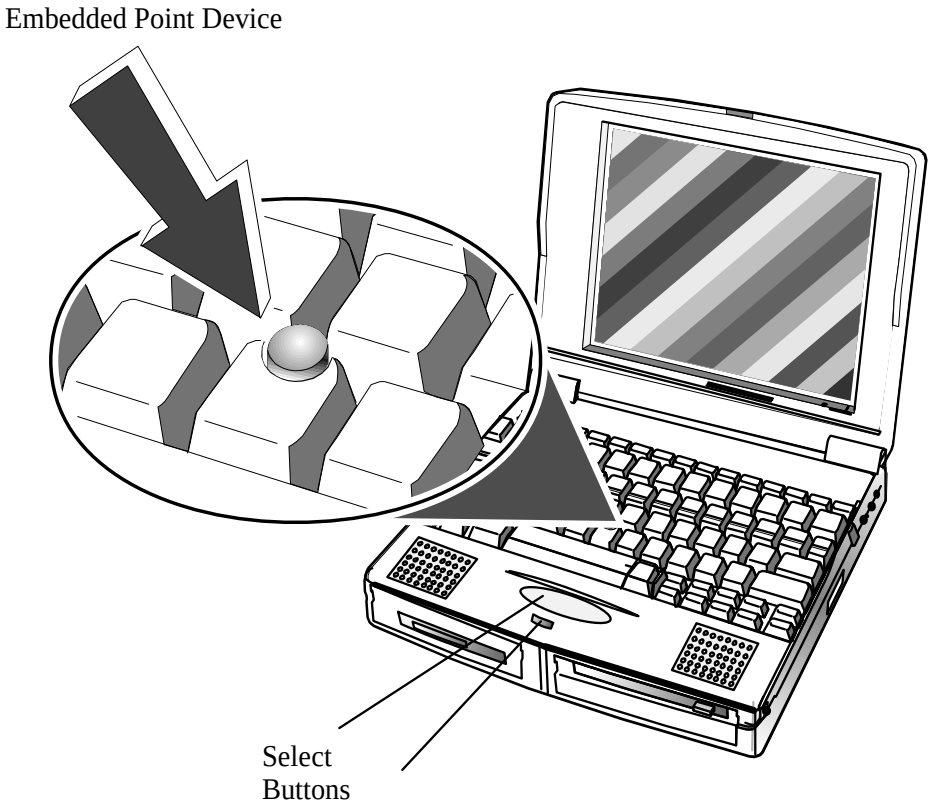


Figure 4-3 The Point

4.2.6 Keyboard Subsystem

The keyboard subsystem, implemented on the Keyboard Assembly and the Top Board, consists of the following major sections:

- Keyboard Assembly
- Keyboard Scanner
- Status LED Interface
- Battery State Logic

4.2.6.1 Keyboard Assembly

The TravelMate 6000 Series Keyboard, shown in Figure 4-4, is a 7.5-mm, Windows 95 Keyboard with 3-mm keystroke travel (enhanced-type keyboard with the standard character and function keys plus 12 programmable function keys (**F1** through **F12, Fn** Key (special Function key) and dedicated keys for use with Windows 95.

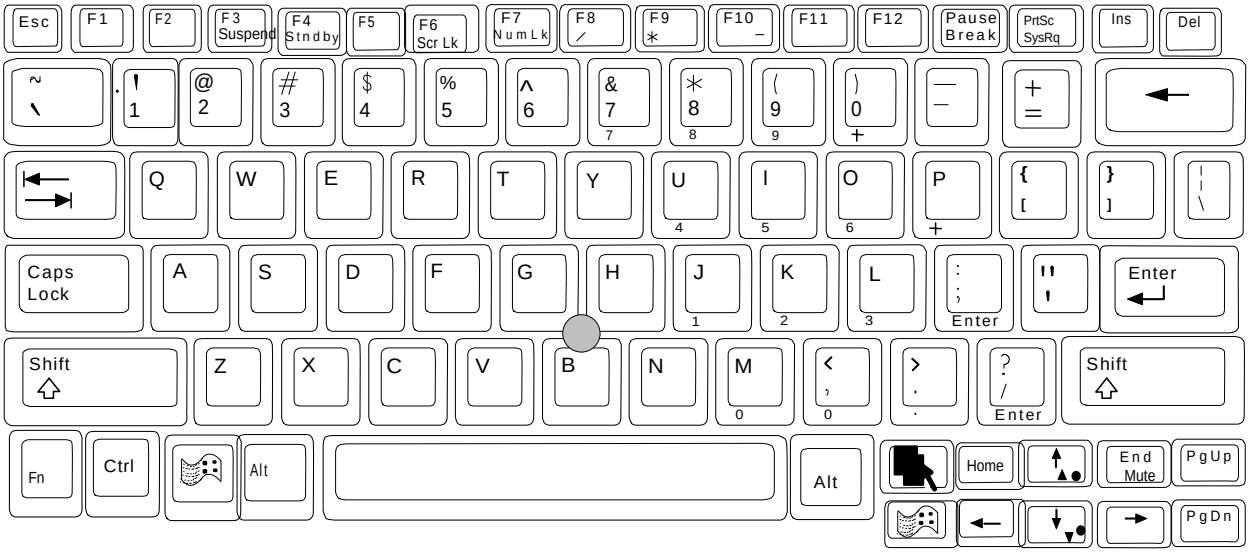


Figure 4-4 TravelMate 6000 Series Keyboard Layout

Using the Special Function (**Fn**) key which assigns multiple functions to keys, the keyboard can emulate the IBM 101/102 keyboards.

The keyboard has a 3-mm stroke and features a special keyboard interface chip that can detect multiple levels of key input (good simulation of N-key rollover for up to 10 keys).

Some of the major keyboard features include:

- Integrated numeric keypad
- Inverted T Cursor Control Key Layout
- Separate keys for **Pg Up**, **Pg Down**, **F11** and **F12** plus inverted "T".

Note: The *TravelMate 6000 Series Notebook Computer User's Reference Guide* provides detailed descriptions of keyboard special function keys.

A six-pin mini-DIN connector on the left side of the Notebook can attach to either an external PS/2 keyboard (or 101 Keyboard via an adapter), PS/2 Mouse, or the optional PS/2 Numeric Keypad.

4.2.6.2 Keyboard Scanner

The keyboard scanner function comprises a keyscan microcontroller and associated keyboard software code that performs the following functions:

- Monitors the internal (or external keyboard if attached) and generates the functionality of an IBM 101/102 keyboard
- Provides support for the Fn key and the three additional keys used with the Windows 95 operating system.
- Enters/exits a low power state on command of the system processor
- Monitors assigned “hot key” combinations and initiates the associated responses (adjusting LCD brightness, adjusting sound volume, saving to disk, entering Suspend/Standby modes on command, etc.
- Monitors battery status and supplies the processor function with battery status on request.
- Generates the scan codes for all keyboard key depressions and submodes of operation

4.2.6.3 Status LED Interface

As shown in Figure 4-5, the TravelMate 6000 Series Notebook Computers contain a set of six LED displays just above the keyboard and two LEDs along the front edge. The function of these LEDs is described in Section 3 of this manual.

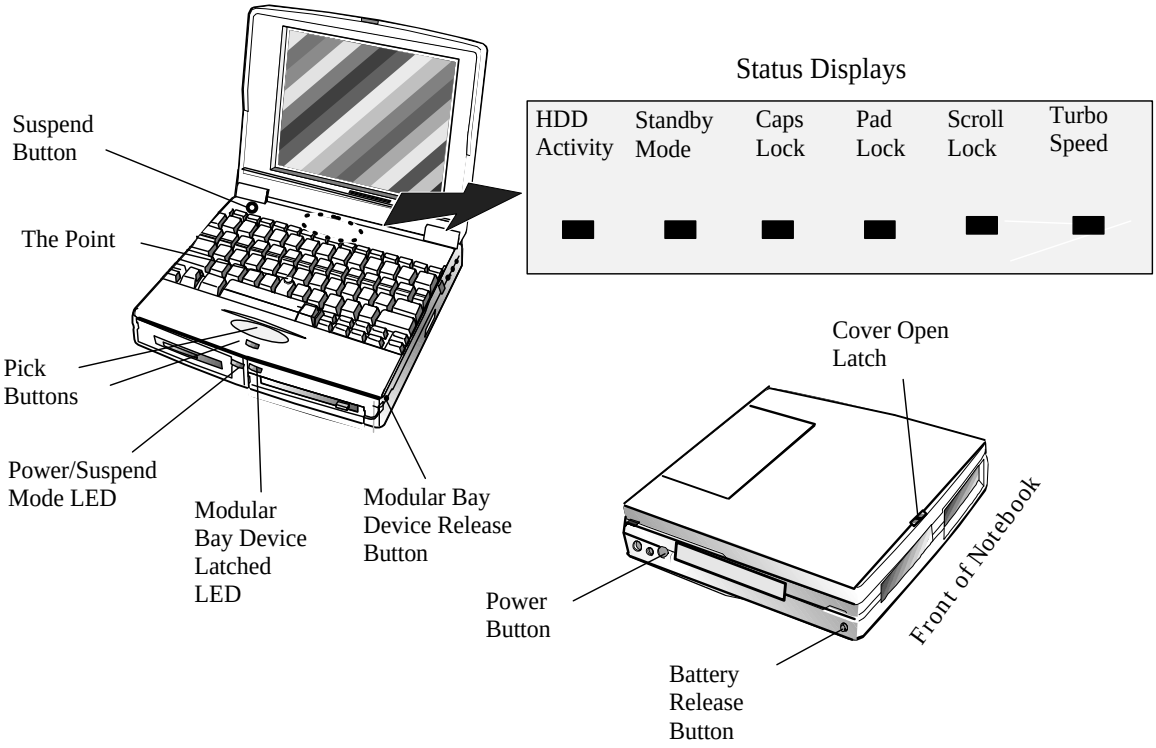


Figure 4-5 Notebook Status Indicators

4.2.7 Hard Disk Subsystem

The Hard Disk Subsystem, implemented on the Main Board and on the associated hard disk drive module(s), provides disk storage for all system software and user files.

The 6000 Series notebook is equipped with a 1.08 or 1.35 GB 2.5-inch IDE hard disk drive (6100 Series comes standard with 2.1 GB internal hard disk drive). Optionally, a second high capacity hard disk drive can be installed in the modular bay on either the 6000/6100 Series Notebook.

During the manufacturing process, Texas Instruments formats the hard disk drive and then loads all supplied software (DOS operating system, Windows, application programs, diagnostics and utilities). The notebook family features a user-removable, 2.5-inch, 1.08 GB (or higher capacity) industry-standard IDE interface Hard Disk Drive. The drive has a 120 KB buffer and can transfer data in or out of the buffer at a 7.5 MB/second rate across the ISA Interface using the 2 of 7 RLL code recording method.

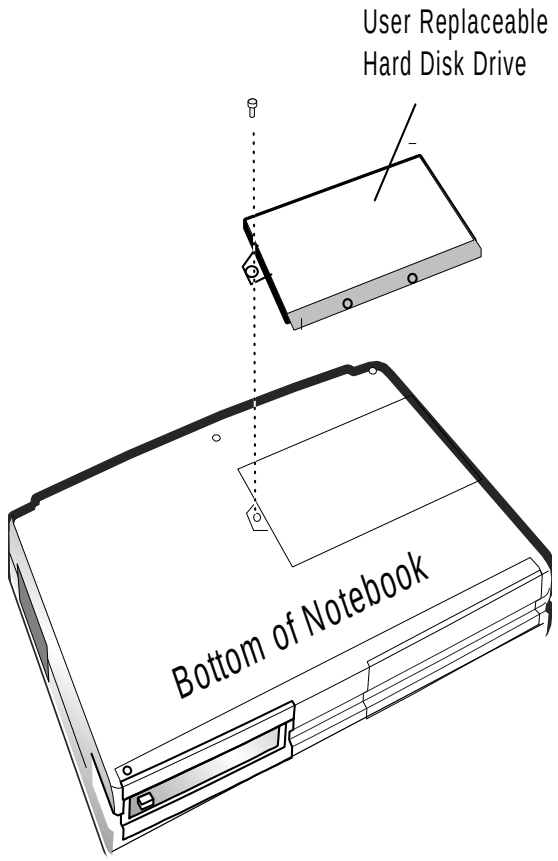


Figure 4-6 Removable Hard Disk Drive

The hard disk drive also features built-in power conservation features configured from the standard CMOS Setup Routine. An Automatic Power Down mode can be selected which powers down the drive motor during periods of inactivity. An additional level of power conservation may also be selected which powers down the motor plus all control circuits.

The hard disk drives are factory formatted as a single drive (Drive C:) and are preloaded with installation versions of Windows 95 and Windows for Workgroups (dual load feature; the user selects the operating system prior to software installation).

A second high capacity hard disk drive, similar in performance to the internal hard drive, can be installed in the Media Bay. This drive is a 2.5-inch IDE type disk drive with average access time of 16 milliseconds or less.

4.2.7.1 Hard Disk Power Management

Both the internal hard disk drive and the hard disk drive installed in the media bay implement power savings features. From the CMOS setup routine, an automatic power down mode can be selected which enables the drive to turn off its motor after a specified period of inactivity. Additional **Sleep** modes can direct additional power savings during inactive periods by powering down the control circuitry.

4.2.8 Floppy Disk Drive Subsystem

The TravelMate 6000/6100 Series notebooks contain provisions for supporting a floppy disk drive installed in the media bay or externally connected to the parallel port. The Floppy Disk Drive Subsystem consists of a Floppy Disk Controller (part of the Combo SMC 37C665 chip on the main board) and the Floppy Disk Drive located either in the media bay or external to the notebook (not both).

The 3.5-inch floppy disk drive can read/write standard 3.5-inch disks (either 1.44 MB or 2 MB capacity). The drive can also read a 720 KB disk (for interchange of data with other computers).

The data transfer rate for the floppy disk drive is 500 Kbits per second for high density disks and 250Kbits per second for double-density disks.

4.2.9 Integrated Modem (6100 Series Only)

Some members of the TravelMate 6100 Series Notebooks also come with an integrated 33.6K baud x2 modem that delivers download speeds up to 56K (twice the rate of conventional modems).

4.2.10 Power Subsystem

The notebook is equipped with a software/hardware monitored/controlled Power Subsystem that minimizes battery usage for prolonged battery operation and automatically recharges the batteries when the notebook is used with an AC adapter.

The TravelMate 6000/6100 Series Notebooks hold up to two intelligent battery packs (Lithium-Ion). Each intelligent battery pack contains circuitry to monitor the charge remaining in the pack and recharge the pack when the AC adapter is present.

Functionally, the Power Subsystem consists of the following major sections:

- ♦ AC Power Adapter
- ♦ Primary Battery Pack (an optional secondary battery pack may be installed in the modular bay).
- ♦ NVRAM Battery (on Top Board)
- ♦ Charger/Power Supply (on Top/Bottom Boards)

4.2.10.1AC Power Adapter

The computer is equipped with a universal AC power adapter that converts AC voltage into approximately 13 VDC at 2.77 Amps (approx. 36 Watts of power) used to operate the notebook and charge the batteries. The specifications for the AC adapter include:

- **Input Voltage:** 100 to 250 VAC
- **Input Current:** 0.7 to 0.4 Amps
- **Input Frequency**: 50 to 60 Hz
- **Output Voltage**: +9.0 Vdc to +18VDC

4.2.10.2 Intelligent Battery Packs

The TravelMate 6000/6100 Series Notebooks hold up to two Lithium-Ion intelligent battery packs. Each intelligent battery pack contains circuitry to monitor the charge remaining in the pack.

The rechargeable battery packs provide DC power for the computer (and for the NVRAM and real time clock battery on the Main Board) when the AC adapter is not being used.

Each battery pack contains four green LEDs to display charge status of the pack (either when the Display Charge Status button is pressed on the front of the battery pack or when the batteries are being charged). The green LEDs indicate the percent of charge on the batteries (25% to 100%).

4.2.10.3 NVRAM Battery

The Top Board Assembly in the notebook is equipped with a smaller Nickel-Metal-Hydride battery which drives the battery powered CMOS memory (non-volatile memory) and real time clock when the main batteries are out of the notebook. The NVRAM battery is recharged from the Vcc supply when the notebook is operating off battery power or from the AC adapter when attached even if the notebook is powered off (requires 8 to 10 hours or a full charge).

4.2.10.3.1Charger/Power Supply

The Charger/Power Supply, implemented on the Top and Bottom Boards, receives DC inputs from the Battery Packs and/or the AC adapter; generates the required DC voltages for all notebook components and provides battery charging current when battery packs and the AC adapter are installed.

The output voltages supplied by the Charger/Power Supply include:

- +5 VDC @ 5 Amps
- +3.3 VDC @ 3 Amps
- 2.9 VDC @ 3 Amps

- +12 VDC @ .3 Amps
- -12 VDC @ .12 Amps
- -5 VDC @ .25 Amps

4.2.10.4 Inverter Board Assembly

The Inverter Board, located in the Display Assembly, converts the +5 VDC input from the battery or AC adapter into a high voltage AC voltage used to drive the LCD screen.

5
Troubleshooting Procedures

5.1 Introduction

This section provides an overview of the fault isolation process, provides guidelines for isolating 6000/6100 Series Notebook Computer malfunctions to replaceable subassemblies and provides instructions for executing diagnostics and interpreting error messages. The actual troubleshooting procedure is identical for both the 6000 and the 6100 Series notebooks.

5.2 Overview of Fault Isolation Process

The fault isolation process (summarized in Figure 5-1) consists of the following steps:

- Notebook power system (including battery packs and AC adapter connections) - refer to Paragraph 5.4.
- Switch settings (ensure **Power** is On)
- Press the **Shift** key to ensure that Notebook is not in **Suspend** mode
- Verify if computer is configured to boot from the A: Drive or C: Drive.
- Check LCD brightness adjustment (press **Fn-Up Arrow** keys to increase brightness)
- Ensure that computer is not set for external monitor (press **Fn-F12** to select internal screen)
- Record and attempt to resolve any displayed error messages or error beeps (refer to Paragraph 5.2.3.1 and Tables 5-1 and 5-2)
- Try rebooting the system **(Ctrl-Alt-Del)**
- If the computer is capable of running the *Setup* program; check the serial and parallel port configurations, Sound System enable/disable, and other features that may affect system operation.
- Run PC-Doctor Diagnostics to further isolate problem area (refer to Paragraph 5.4). For indicated hardware failures, cycle power and repeat self test to verify that a hard failure has occurred.
- Remove and replace suspect hardware (as described in Section 6 of this manual) and retest the system using the diagnostic tests as described in Paragraph 5.4.5.

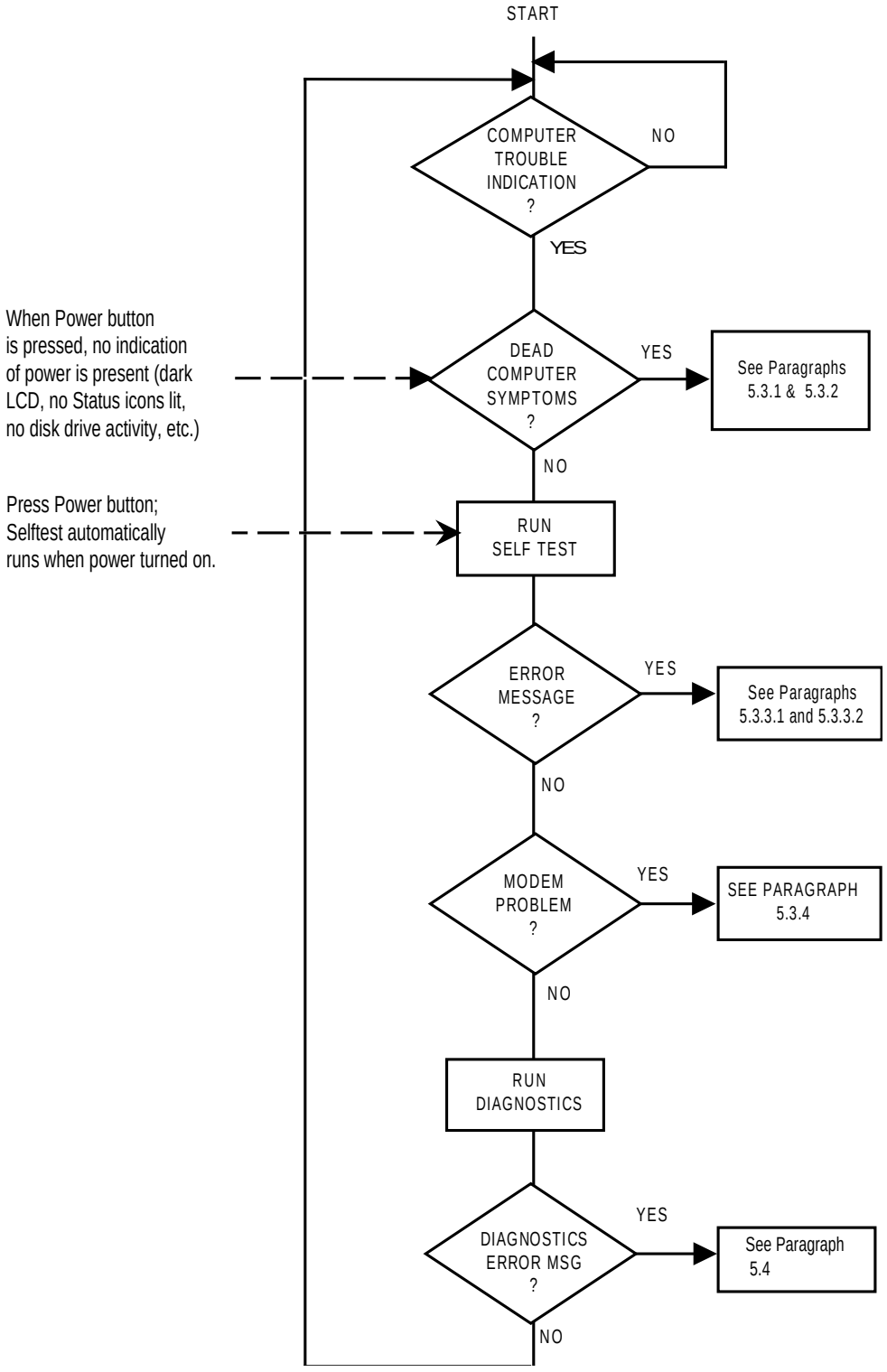
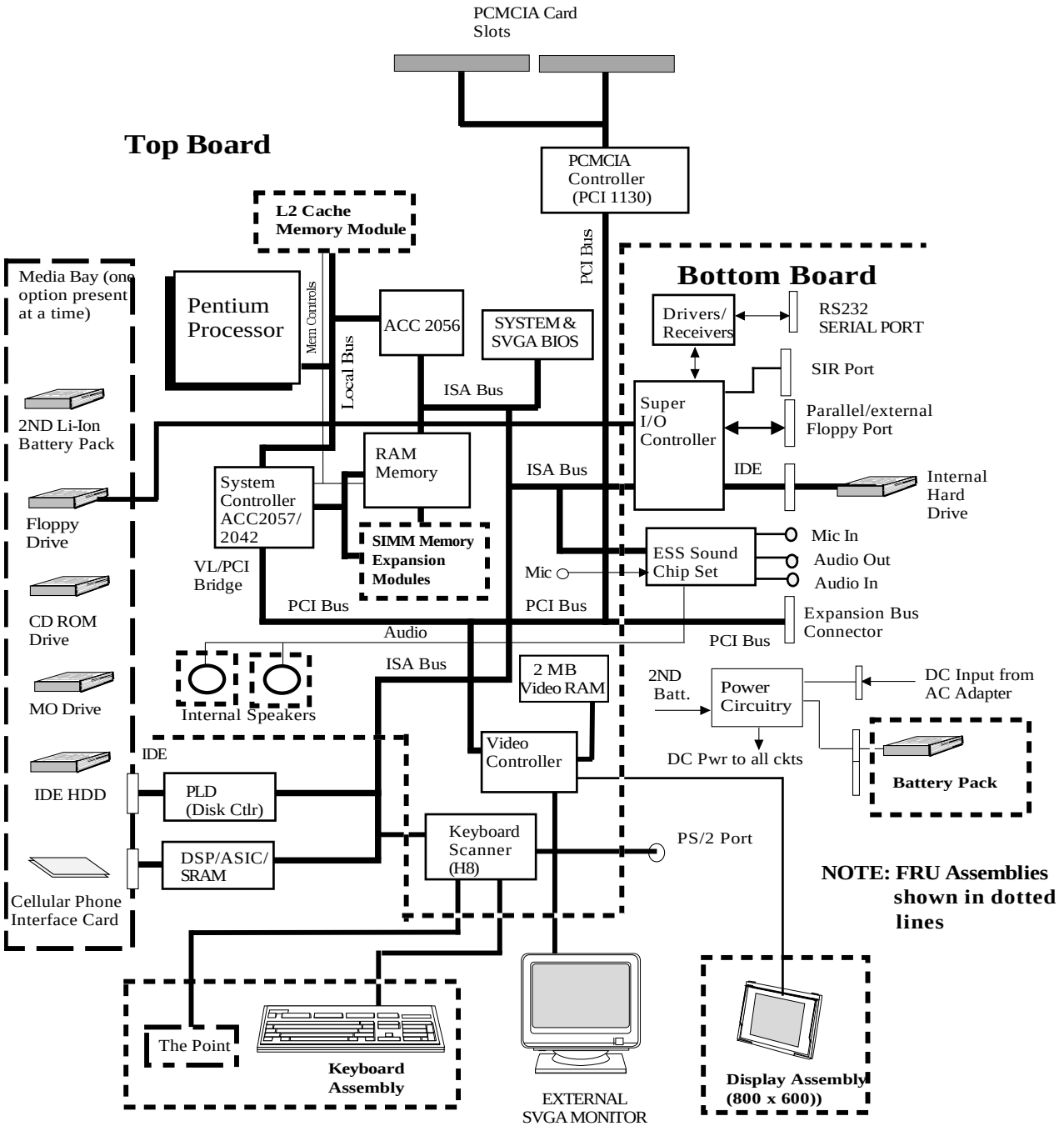


Figure 5-1 Notebook Computer Troubleshooting Flow Chart

The detailed block diagram, shown in Figure 5-2, is also useful in performing fault analysis of various internal subsystems.



Typical TravelMate 6000/6100 Series Notebook Computer

Figure 5-2 Notebook Block Diagram

5.3 Troubleshooting Procedures

The built-in self test program and the disk resident diagnostics program (PC-Doctor) are useful tools in computer troubleshooting. However, if the computer has a power, keyboard or display problem, you must first solve this problem before running diagnostics. If the computer powers up and displays messages on the LCD or emits a series of beeps, skip to Paragraph 5.3.3 for further instructions.

5.3.1 Troubleshooting a Power Supply Problem

If the computer does not power up when the Power Switch is set to the ON position, you most likely have a malfunction in the power subsystem (loss of power at the AC Outlet, faulty AC adapter, discharged Battery Packs, or faulty Power Supply on the Main Board). With a power problem, all LEDs are extinguished, the LCD screen is blank, the system does not respond when the suspend switch is pressed several times consecutively and no drive activity can be heard. The computer is unable to load software and displays no visible signs of activity. To fault isolate a power problem, check the following:

- AC adapter and Battery - Plug in the AC adapter and double-check all connections on the adapter and computer. Ensure that the Notebook **Power** switch is set to the On position and that the system is not in **Suspend** or **Sleep** mode.
- Measure the voltage at the AC outlet or plug in a known good appliance (e.g., a lamp) to verify that voltage is present. If the voltage is okay, try replacing the AC adapter.
- Check to see that the battery packs are installed correctly and that the battery charge indicators on the front of the battery packs indicate the batteries are charged (try using a new battery pack if batteries are discharged).
- If the AC outlet voltage, AC adapter, and battery packs test normal but the computer will not power up, try disconnecting the display cable from the base (refer to Section 6 for disassembly instructions) to see if a short in the display assembly has occurred.
- If the display assembly appears to be normal, replace the Bottom Board as described in Section 6 and retest system.

5.3.2 Troubleshooting a Display Problem

If the LCD remains blank when you turn on the computer, and the status indicators light, check the following controls on the display):

- LCD Suspend mode - press **Shift** to terminate Suspend mode.
- Brightness set too low - press **Fn-Up Arrow** keys to increase screen brightness
- Notebook Set for External Monitor - press **Fn-F12** to switch to the internal screen.

- Faulty LCD - Replace the cover-display assembly as described in Section 6 of this manual.
- Low battery - Use a fully charged battery and/or plug in the AC adapter.

Table 5-1 contains fault isolation information for Display Problems on the notebook. Symptoms are listed along the left side of the chart and the various Display FRUs are listed along the top of the chart. Within the body of the table are the probabilities of each of the FRUs causing that particular problem. For example, a single display line on the screen is most likely caused by the LCD Panel or Display Cable; other components have a low probability of causing the problem.

Table 5-1 Display Troubleshooting Guide

Problem Description	Inverter Board	LCD Panel	Display Cable	Top Board	Bottom Board	BIOS
Single line on LCD display (horizontal or vertical)	Low	High	Medium	Low	Low	Low
Multiple lines on display (horizontal or vertical)	Low	Medium	Medium	Low	Low	Low
Sections of the display are missing characters	Low	Medium	Medium	Low	Low	Low
Scrambled Display	Low	Medium	Low	Medium	Low	Medium
Intermittent characters on display	Low	Medium	Medium	Medium	Low	Low
Bright display, no visible characters	Low	Medium	Medium	Medium	Low	Low
Brightness level fluctuating or display blinking on/off	High	Low	Medium	Low	Low	Low
Display goes dim over time	High	Medium	Low	Low	Low	Low
Dim display but characters very visible	Medium	Medium	Low	Low	Low	Low
Very dark display and characters are slightly visible when a light is directed at surface of the display	High	Low	Low	Low	Low	Low
Very dark display and no characters are visible	Low	High	High	Medium	Low	Low

5.3.3 Fault Isolation Using Self Test

When the computer is first powered up, it automatically performs a self test of its central hardware and memory functions. During self test (which lasts for a few seconds), the display shows copyright and version number information.

Note: Some procedures in this paragraph require you to use keystroke sequences, such as **Ctrl-Alt-Del**. To execute a keystroke sequence such as this, you must press all three keys simultaneously.

5.3.3.1 Self Test Error Messages

Upon successful completion of the self test, the computer automatically loads its operating system and other built-in utilities. If the self test fails to complete successfully, the display shows one of the error messages described in Table 5-2.

Note: In the event of a hardware problem that affects the display, the Notebook also communicates errors via a series of beeps. The interpretation of the beep codes is provided in Table 5-3.

Table 5-2 Self Test Error Messages

Diskette drive 0 failure

This message indicates the internal floppy disk drive (Drive A) has failed (or is not installed on the computer). Press **Ctrl-Alt-Esc** to ensure that drive type is correctly set (3.5 inch, 1.44 MB).

Run the Diagnostics to check Drive A as described in Paragraph 5.4. Also try using a new, correctly formatted disk.

Diskette read failure - strike F1 to try to retry boot

This message indicates the disk is defective or not formatted.

Try another known good formatted disk and press **F1**.

Fixed disk failure

This message indicates the system disk drive failed to complete the self test or that the nonvolatile random-access memory (NVRAM) is configured incorrectly for the installed hard disk drive type.

Ensure that the notebook is configured to boot from the C: Drive.

Press **Ctrl-Alt-Esc** to ensure that the hard disk drive type is correctly identified in Setup (should be default for the internal hard disk drive).

Press the **Ctrl-Alt-Del** keys to attempt to reboot the system. If the error occurs a second time, run the diagnostics as described in Paragraph 5.4.

Fixed disk read failure - strike F1 to retry boot

This message indicates that the hard drive improperly formatted, or that a hardware failure has occurred in the hard disk subsystem.

Press **Ctrl-Alt-Esc** to ensure that the hard disk type is correctly identified in Setup (should be default for the internal hard drive).

If the booting process still fails, run the diagnostics as described in Paragraph 5.4.

Invalid configuration information

This message indicates the computer has been configured incorrectly. Check the settings in the Setup program menu. Also, NVRAM battery failure (resulting in loss of configuration data) can generate this error message. Install the AC adapter and the recharge system. If the problem persists, replace Top Board.

Keyboard clock/data line failure

This message indicates either the keyboard or the external keyboard (if one is installed) is defective. If the computer has an external keyboard connected, check the connection to ensure that it is connected correctly. If the problem still exists, run the diagnostics as described in Paragraph 5.4.

Keyboard stuck key failure

This message indicates the self test has detected a stuck key on the keyboard.

Table 5-2 Self Test Error Messages (continued)

Try the keyboard keys to determine if they appear to be working properly and reboot the computer.

Note: Also, ensure that no key is pressed during power up and that no keys are jammed.

If the self test still fails, execute the diagnostics as described in Paragraph 5.4.

No boot device available - press F1 to retry boot

This message indicates the system disk, the disk drive, or the disk is defective (if loading MS-DOS® from disk) or that the NVRAM is not correctly configured for the installed disk drive type. Replace the disk and reboot the computer. If the self test still fails, run the diagnostics as described in Paragraph 5.4.

No boot sector on system disk - press F1 to retry boot

This message indicates the system disk is not formatted. Try powering down the system and re-running the self test. Press **Ctrl-Alt-Esc** to ensure that the drive type is correctly set in Setup. Also, press **F1** to try loading MS-DOS from the hard disk drive again. If the message persists, the hard disk drive must be reformatted and software reloaded from disks (refer to Section 3).

Non-System Disk or Disk error. Replace and press any key when ready.

This message indicates the disk installed in floppy disk Drive A is not a bootable disk. Format an MS-DOS bootable disk and install the disk in drive A, and reboot the computer. Also try pressing **Ctrl-Alt-Esc** to ensure the disk drive type is correctly set in **Setup**.

Time-of-day clock stopped

This message indicates that the battery sustaining the system configuration has failed. Reset the configuration.

Note: The following messages are informational messages that do not necessarily indicate a self test failure.

NNN Main Memory, NNN Extended

This message lists the amount of standard memory and optional extended memory that has tested successfully during self test execution. This message is only displayed if Quick Boot is off in **System Setup**.

Memory tests terminated by keystroke

This message tells you that you have pressed the Space Bar while the memory tests were running. Pressing the Space Bar during memory testing stops the tests.

Table 5-2 Self Test Error Messages (continued)

Press F1 to continue

This message tells you that an error was found during self test execution. Press **F1** to attempt to reboot the computer.

Save-to-disk file is too small

This message occurs when you add memory. Use the MS-DOS program PHDISK to increase the size of the save-to-disk file.

Save-to-disk file is missing

Use the MS-DOS program PHDISK to create a new save-to-disk file.

Swap File is missing

Use the MS-DOS program PHDISK to create a new swap file.

5.3.3.2 Self Test Beep Error Messages

In the event of a hardware problem that affects the display, the Notebook also communicates errors via a series of beeps. These codes may be heard over the system's speaker as three bursts of beeps. The interpretation of the beep codes is provided in Table 5-3.

To recover from a self test error, try cycling power to the computer. Also, press **Ctrl-Alt-Esc** to ensure that the Setup configuration is correct. In general, most of the failures are associated with the Upper and Lower Electronics Boards and may require board removal/replacement.

Try running PC-Doctor (refer to Paragraph 5.4) if possible to verify the source of problem.

Table 5-3 Self Test Beep Messages

Beep Code	Port 80h	Description
None	01h	CPU Register Test in Progress
1-1-3	02h	CMOS Write/Read Failure
1-1-4	03h	ROM BIOS Checksum Failure
1-2-1	04h	Programmable Interval Timer Failure
1-2-2	05h	DMA Initialization Failure
1-2-3	06h	DMA Page Register Write/Read Failure
1-3-1	08h	DRAM Refresh Verification Failure
None	09h	1ST 64K RAM Test in Progress
1-3-3	0Ah	1ST 64K RAM Chip or Data Line Failure
1-3-4	0Bh	1ST 64K RAM Odd/Even Logic Failure
1-4-1	0Ch	Address Line Failure, 1ST 64K RAM
1-4-2	0Dh	Parity Failure, 1ST 64K RAM
2-1-1	10h	Bit 0, 1ST 64K RAM Failure
2-1-2	11h	Bit 1, 1ST 64K RAM Failure
2-1-3	12h	Bit 2, 1ST 64K RAM Failure
2-1-4	13h	Bit 3, 1ST 64K RAM Failure
2-2-1	14h	Bit 4, 1ST 64K RAM Failure
2-2-2	15h	Bit 5, 1ST 64K RAM Failure
2-2-3	16h	Bit 6, 1ST 64K RAM Failure
2-2-4	17h	Bit 7, 1ST 64K RAM Failure
2-3-1	18h	Bit 8, 1ST 64K RAM Failure
2-3-2	19h	Bit 9, 1ST 64K RAM Failure
2-3-3	1Ah	Bit A, 1ST 64K RAM Failure
2-3-4	1Bh	Bit B, 1ST 64K RAM Failure
2-4-1	1Ch	Bit C, 1ST 64K RAM Failure
2-4-2	1Dh	Bit D, 1ST 64K RAM Failure
2-4-3	1Eh	Bit E, 1ST 64K RAM Failure
2-4-4	1Fh	Bit F, 1ST 64K RAM Failure
3-1-1	20h	Slave DMA Register Failure
3-1-2	21h	Master DMA Register Failure
3-1-3	22h	Master Interrupt Mask Register Failure

Table 5-3 Self Test Beep Codes (continued)

Beep Code	Port 80h	Description
3-1-4	23h	Slave Interrupt Mask Register Failure
None	25h	Interrupt Vector Loading In Progress
3-2-4	27h	Keyboard Controller Test Failure
None	28h	CMOS Power Failure and Checksum in Progress
None	29h	CMOS Configuration Validation in Progress
3-3-4	2Bh	Screen Memory Test Failure
3-4-1	2Ch	Screen Initialization Failure
3-4-2	2Dh	Screen Retrace Test Failure
None	2Eh	Search for Video ROM in progress
1-2	2Eh	Cirrus Video Chip Failure
1-3	2Eh	Cirrus RAM DAC or Video RAM Failure
None	30h	Screen Believed Operable; running with Video ROM
None	31h	Monochrome Monitor Believed Operable
None	32h	Color Monitor (40 Column) Believed Operable
None	33h	Color Monitor (80 Column) Believed Operable
4-2-1	34h	No Time Tick
4-2-2	35h	Shutdown Failure
4-2-3	36h	Gate A20 Failure
4-2-4	37h	Unexpected Interrupt in Protected Mode
4-3-1	38h	Memory High Address Line Failure at 010000h-0A0000h
4-3-3	3Ah	Timer Chip Counter 2 Failed
4-3-4	3Bh	Time of Day Clock Stopped
4-4-1	3Ch	Serial Port Failure
4-4-2	3Dh	Parallel Port Failure
4-4-3	3Eh	Math Coprocessor Failure

5.3.4 PCMCIA Modem Problems

If an optional PCMCIA modem does not work properly, check the following items:

- Dialing problem or wrong number - Try dialing a number that you have previously dialed successfully.
- Faulty phone line - Connect a telephone to the line and listen for a dial tone.
- Software program - Check to ensure that you have installed the software correctly.

5.4 Fault Isolation Using Diagnostics

PC-Doctor supplied with the TravelMate 6000 Series Notebooks is a powerful diagnostics tool that can help you determine the hardware configuration of a local or remote system, benchmark its performance, analyze the performance of all subsystems, and perform a suite of interactive and non-interactive tests on attached devices (such as printers, joystick devices, VGA monitors, SCSI devices, CD-ROM drives). The test results are stored in a log which can be printed out (by pressing **F2**) or saved in a disk file (by pressing **F3**).

Features of the diagnostic program are accessed through a series of pull-down menus and basic keyboard keys (cursor keys to move highlighted pointer, **Enter** key to select a highlighted feature, **Esc** key to cancel a function and move back one level.

PC-Doctor is typically user friendly but if you don't understand a feature, context-sensitive "help" information is available at any time by pressing the **F1** function key; pressing the **F1** function key twice accesses the online *Technical Reference Manual for PC-Doctor* **(6000 Series Only)**.

A powerful set of utilities within PC-Doctor (that can be run locally or remotely) simplify the task of determining system configuration data, allocating and using system memory, IRQ and DMA use, what device drivers are installed, what COM and LPT ports are assigned and what ports are available, identifying partitioning data for fixed disk drive(s), determining the VGA setup information, reading the software interrupts/ interrupt vectors, etc.

Functionally, PC-Doctor includes the following:

- Group of nine non-Interactive diagnostic tests that perform a non-destructive test of the major hardware functions in the notebook (Processor, Memory, System board, video section, serial and parallel ports (when loopback adapters are installed), hard disk drive and floppy disk drive.
- Group of seven Interactive tests (require operator input) for testing the keyboard, video sections, sound subsystem, mouse, joystick, hard disk drive, printer subsystem and the SCSI/CD-ROM Drive subsystems supported by the docking station options.
- Utility that provides detailed system information such as configuration data, allocation and use of system memory, IRQ and DMA use, what device drivers are

installed, what COM and LPT ports are assigned and what ports are available, partitioning data for fixed disk drive(s), VGA setup information, software interrupts and interrupt vectors, and installed SCSI options.

- Group of special purpose utilities to run other tests from PC-Doctor, perform a virus scan of the system, edit configuration files, surface scan hard disk drives, measure system performance, open a DOS prompt, provides terminal access to devices connected to serial ports, supports memory debug operations, enables remote operations, permits deep discharge of notebook batteries and provides an extensive test reporting function.

The PC-Doctor diagnostic program contains a group of nine non-Interactive diagnostics, available from the **Diagnostics** heading in the main menu, that permits testing various hardware sections without operator input. You can select one, several, or all tests from the Diagnostics menu. These tests are non-destructive; the serial and parallel port tests require disconnecting external devices from your notebook and installing loopback plugs. The Non-Interactive test categories include:

- CPU and Coprocessor Tests
- Base RAM Memory Test
- System Board Test
- Video Test
- COM1 and LPT1 Serial Port Tests
- Parallel Port Test
- Fixed Disk Test
- Disk Drive Tests
- Other devices (Sound card, PCMCIA options, etc.)

5.4.1 Interactive Tests

The PC-Doctor diagnostic test includes a suite of seven Interactive tests that require operator input during the course of the test. The **Interactive Tests** category includes:

- **Keyboard** - tests the keyboard keys, LEDs and repeat function
- **Video** - tests the LCD and external VGA character sets, and colors
- **Speaker** - tests the volume response at different frequencies
- **Mouse** - tests the mouse driver, buttons and functionality
- **Joystick***- calibrates the external joystick connected to the system and tests the joystick buttons
- **Disk Drive** - checks Floppy disk drive functionality

- **Maximum System Load** - thoroughly exercises system to the maximum extent possible for performing system "burn-in" and test
- **Printer Test** - tests the operation of a connected printer
- **SCSI Test*** - sends test codes to attached SCSI devices (requires use of a docking system with SCSI)
- **CD-ROM Test*** - checks out any installed CD-ROM drive

***devices available when certain external options are installed.**

5.4.2 Supporting Online Documentation

The PC-Doctor Diagnostic contains the following online information sources:

- ***Online Technical Manual*** - selected at any time by pressing **F1** key twice or by clicking on the Question Mark in the upper left hand corner of any PC-Doctor Menu
- **On-line Help system** - provides context sensitive information from every PC-Doctor screen- accessed by pressing the **F1** key once (pressing **F1** twice gets you into the online manual)

5.4.3 User Interface to PC-Doctor

PC-Doctor is structured as a text-mode, windowed user interface with pull-down menus. Program operation requires the use of the following keys:

- **Cursor Keys** - Moves the highlighted pointer
- **Enter** Key - Selects the highlighted option
- **Esc** Key - Cancels current function and goes back one step
- **F1** Key - Activates the context-sensitive help feature (pressing **F1** twice in a row calls up the online Technical Reference Manual for PC-Doctor)

Scrolling windows, which show the results of various operations, use the following keys:

- **Page Up/Page Down** - Moves the screen one page at a time
- **F2** - Prints the log to PRN
- **F3** - Saves the log to a file

You can also use the mouse or Point to interact with PC-Doctor. The leftmost **Select** key is used to choose objects (menu entries and action codes typically enclosed in brackets). The rightmost **Select** key is equivalent to the **Esc** key which takes you back to your previous step.

5.4.4 Creating a Bootable Floppy Disk

Prior to using PC-Doctor, create a bootable floppy disk using the following procedure:

1. Format a floppy disk.
2. From the **A:** prompt, copy the basic MS-DOS files to the disk using the following command: **Format A: /F:1440 /S** where the value 1440 is the capacity of the disk (1.44 MB in this example).
3. Get into the PC-Doctor directory and copy the PC-Doctor files to the bootable disk using the following command: **XCOPY C:. A:**.

After completion of this command, you should have a bootable disk containing PC-Doctor.

5.4.5 Running PC-Doctor

PC-Doctor is a DOS-resident program that can be run from either hard disk or from the bootable diskette you previously created.

1. From the **C:** prompt, type: **PCDR** and press **Enter**.
2. The Diagnostics Program loads into system memory, and the LCD displays the diagnostics header.

Note: There are a number of command-line switches that can be entered when starting up PC-Doctor to enable loopback testing of serial/parallel ports, work from the remote menu if performing remote operations, etc. To get a listing of the available command-line switches, start up PC-Doctor with the following command: **PCDR /?** and press **Enter**.

5.4.6 Quitting PC-Doctor

To exit PC-Doctor, select the **Quit** pull down menu and then select the **Quit** option.

Note: For additional information, access the *Online Reference Manual* for PC-Doctor.

6
Field Service

6.1 Introduction

This section contains general preventive and corrective maintenance procedures that apply to all members of the TravelMate 6000/6100 Series Notebook Computers. The first part of the section describes the computer cleaning procedures and preferred handling procedures for sensitive components (e.g., disk drives, batteries).

The second part of the section identifies the location of the field-replaceable parts; the remainder of the section contains removal and replacement procedures for the field-replaceable parts.

Note: Field-Replacement Unit (FRU) TI part numbers vary according to specific model number. The required FRU listings for the various 6000/6100 Series models are provided in the Appendices B through E at the back of this manual.

6.2 Preventive Maintenance

Preventive maintenance is limited to cleaning the plastic case, keyboard and the display screen, cleaning the floppy disk drive heads as required and replacing The Point cap as required.

6.2.1 Cleaning the Computer

When it is necessary to clean the plastic case and keyboard use a soft, lint-free cloth, slightly dampened with a mild detergent solution or use the contents of any commercially available computer cleaning kit.

Caution: Never spray any liquids directly on the computer case, keyboard, or screen. If the liquid-crystal display (LCD) screen has become smeared or dusty, clean the screen first with a soft, clean, lint-free cloth and gently wipe the glass. If the glass is still smeared, use distilled water or a 25% solution of alcohol and distilled water.

Caution: Do not use paper towels to clean the display screen. Paper can scratch the display screen matte.

6.2.2 Handling the Computer

The notebook computer requires reasonable care and handling for extended life. Some of the precautions to follow to protect your computer against accidental damage include:

- Never pick up or carry the unit by the cover
- Do not force the cover beyond its fully opened position (about 180 degrees)
- Never subject the computer to harsh environments (dusty areas or areas of rapidly changing temperatures)
- Never place anything on top of the computer, particularly when it is operating or charging (could result in overheating and damage to the computer).
- Never move the computer while the hard disk drive is rotating (press the **Suspend** button to put the computer in a **Sleep** mode before closing cover).
- Never expose the computer hard disk drive(s) or disks to strong magnetic fields such as those generated by transformers, speakers, or telephone handsets.

6.2.3 Replacing the Point Cap

The Point cap will periodically require replacement with the frequency depending on the operational environment and user operating patterns. To replace the cap, use the following procedure: Grasp the cap and pull it straight up. Position a replacement cap on the spindle and press in place.

6.2.4 Handling the Computer Battery Pack

The battery pack furnished with the computer requires reasonable care and handling to ensure efficient operation and maximum life. Periodically inspect the battery terminals and the batteries for evidence of corrosion and oxide build-up; clean if necessary.

To ensure that the battery packs endure normal life cycle, always observe the following precautions when handling the battery packs:

- Do not drop the battery pack or subject it to excessive shock and vibration.
- Do not expose the battery pack to direct sunlight, moisture, or chemical compounds.
- Do not disassemble the battery pack.
- Do not use the battery pack to power other devices.
- Do not short the battery leads or connect the battery with reversed polarity.
- Never attempt to charge the battery pack in any way other than as described in this manual.
- Always charge the battery pack as soon as possible after a low battery indication.

Caution: When operating the TravelMate 6000 Notebook, ensure that either a battery pack or weight-reduction module is installed in the front battery slot.

6.2.5 Password Caution

The notebook computer can be password protected to prevent unauthorized use. However, if the password is lost, the notebook must be returned to the Texas Instruments manufacturing facility in Temple, Texas U.S.A. to restore access. This service is not covered by warranty.

6.2.6 Restoring System Software

The hard disk drive on the TravleMate 6000/6100 Series Notebooks are factory loaded with installation software that loads one of several operating system environments onto the notebook. Supplied with the system is a *System Recovery Disk* that allows the user to copy software from the hard disk drive for use in rebuilding the disk in the event of a disk crash.

6.3 Required Tools and Equipment

All TravelMate 6000/6100 corrective maintenance procedures can be performed using the following tools:

- Tweezers
- Plastic Stick
- Small flat-blade screwdriver
- Small Phillips screwdriver
- No. 6 and No. 9 TORX Drivers
- Hex nut drivers, 3/16 inch and 7/32 inch

Caution: All boards, options and peripherals contain components that are sensitive to static electricity. When handling any of these items, protect against static electricity by using wrist grounding straps and grounded working mats. When moving or storing items, use the anti-static bags supplied with the items.

6.4 Notebook FRUs

As shown in Figure 6-1, all members of the TravelMate 6000/6100 Series Notebook Computers contain two major assemblies:

- System Base Assembly
- Cover-Display Assembly

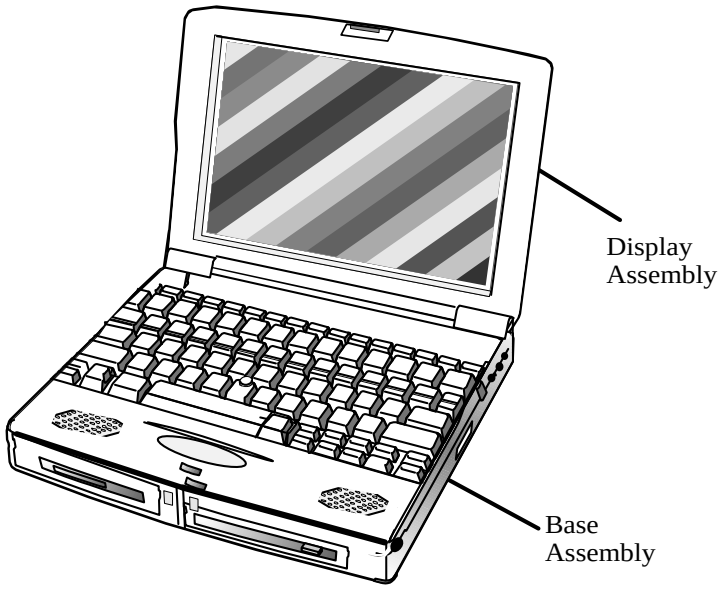


Figure 6-1 TravelMate 6000 Assemblies

6.4.1 Cover-Display Assembly

The Cover-Display Assembly shown in Figure 6-2, contains the LCD screen, Power Inverter Board, bezel LCD cover and various other components as listed in Table 6-1. This table also references the paragraph number for the associated disassembly/ reassembly procedure for each FRU.

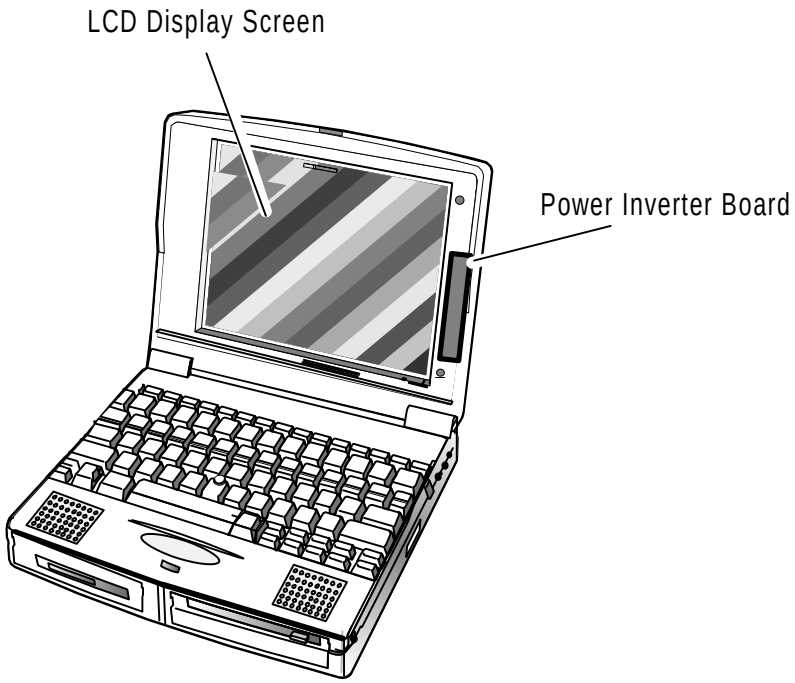


Figure 6-2 Display FRUs

Table 6-1 Top Cover Assembly Field-Replaceable Units (FRUs)

FRU Description	Assembly/ Disassembly Paragraph
Display Assembly, TFT 11.3 inch SVGA	6.6.6
LCD Display, TFT 11.3 inch SVGA	6.6.6
Inverter Board	6.6.12
Display Cable , TFT 11.3 inch SVGA	6.6.6
Bezel, TFT 11.3 inch SVGA	6.6.11
LCD Cover, TFT, SVGA w/insulator	6.6.11
LCD Latch	Ref
Foam for LCD Latch	Ref

6.4.2 System Base Assembly

As shown in Figure 6-3, the System Base Assembly houses a variety of field-replaceable subassemblies and components. The various assemblies and reference paragraph numbers containing removal/replacement procedures are listed in Table 6-2. Table 6-3 contains a listing of Customer-(non-technical user) replaceable units (CRUs).

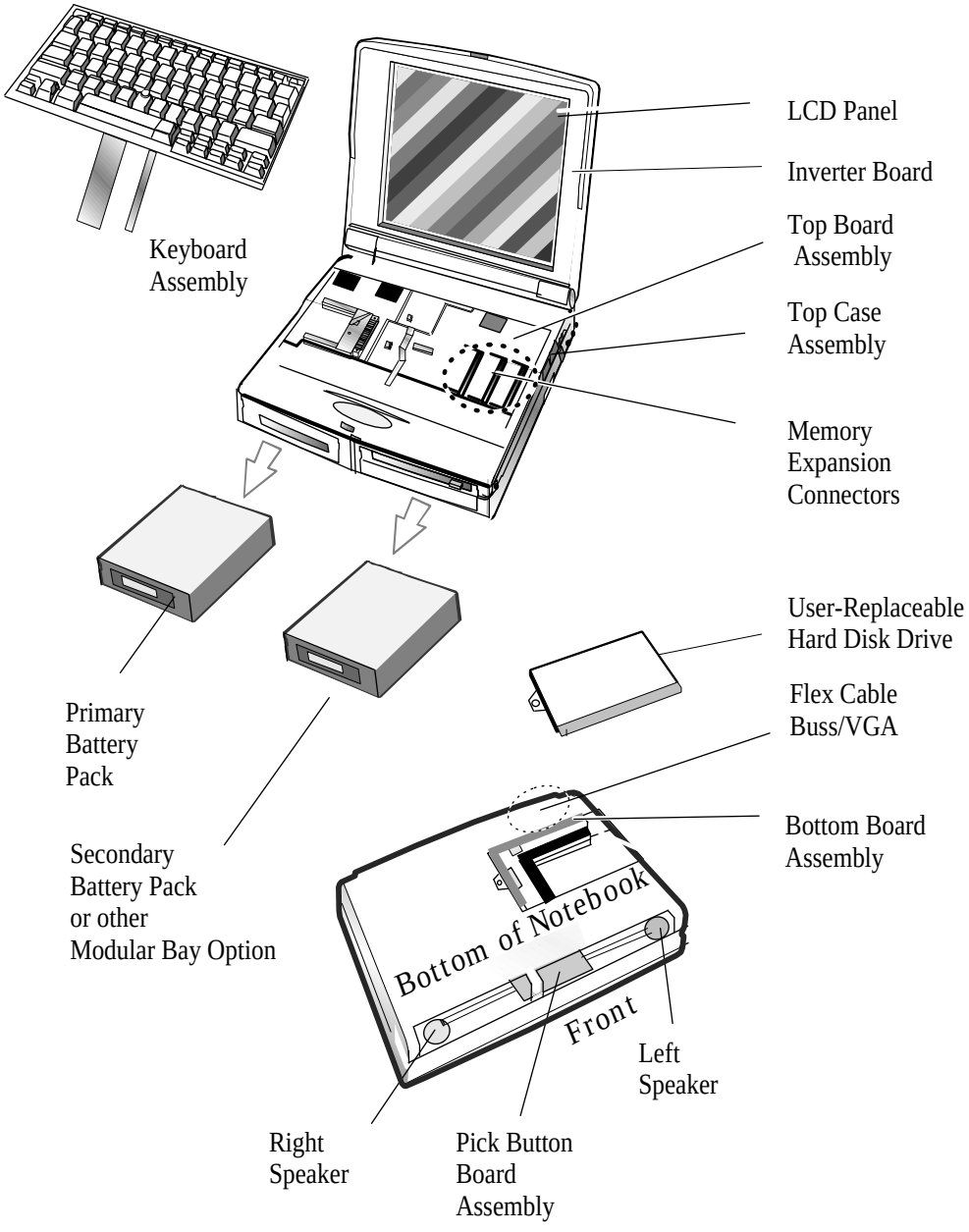


Figure 6-3 Base Assembly FRUs

Table 6-2 Base Assembly Field-Replaceable Units (FRUs)

Base Assembly FRU Description	Assembly/ Disassembly Paragraph
PCB Assemblies	
Top PCB Assembly, 120 E57 w/Heat sink	6.6.9
Bottom PCB Assembly, E57	6.6.9
Flex Cable, Bus/VGA	6.6.10
Pick Button Assembly	6.6.8
Keyboard Assembly	6.6.4
Cables	
HDD Cable, 12.5 mm	6.6.3
HDD Cable, 17 mm	6.6.3
HDD Cable, Avatar	6.6.2
FDD Cable	6.6.2
CD-ROM Cable, 6X KME	6.6.2
Pick Button Cable	6.6.8
Peripherals	
Microfloppy Drive	6.6.2
HDD, 1.08 GB, 12.5 mm	6.6.3
HDD, 2.1 GB	6.6.2
HDD, Avatar	6.6.2
CD-ROM Drive, 6X KME	6.6.2
Covers, Doors, Buttons	
Top Cover Assembly	6.6.7
Base Assembly (not for sale domestically)	Ref
Rear Door	Ref
HDD Door	6.6.3
HDD Door Insulator	6.6.3
IR Lens	Ref

Table 6-2 Base Assembly Field-Replaceable Units (FRUs)

Base Assembly FRU Description	Assembly/ Disassembly Paragraph
Speaker Assembly	Ref
Magnet, Close Cover Detect	Ref
Warranty Label	Ref
Logo Label	Ref
Hinge Cover	Ref
Nameplate Label, TM6020	Ref
Spring Torsion, Rear Door	6.6.13
Keyboard Support Stiffener	6.6.4

Table 6-3 Customer-Replaceable Units (CRUs)

Customer-Replaceable Unit Description
PCM Assemblies
AC Adapter Kit
Spare Li-Ion Battery Kit
2.1 GB HDD with Pack
Avatar HDD Module with Pack
FDD Module with Pack
CD-ROM 6X Module with Pack
28.8 K Modem/Fax with Speakerphone
Display Bumper
PCMCIA Slot Filler Card
Weight-Reduction Module
8 MB RAM Module Kit
16 MB RAM Module Kit

6.5 FRU Removal/Replacement Procedures

The following paragraphs contain field service-level removal/replacement procedures for the 6000/6100 Series Notebooks.

6.6 Removing/Replacing the Notebook Battery Pack

The procedure for removing and replacing the battery pack(s) is as follows:

1. Turn off the computer.
2. Press on the left front release button and remove the battery pack from the front of the unit.
3. Insert the replacement battery until it snaps in place.

6.6.1 Removing/Replacing PCMCIA Options

The procedure for removing and replacing the PCMCIA options is as follows:

1. Turn off the computer.
2. Press the card eject button on the left side of the notebook (button closest to the rear of the notebook ejects the upper card) and remove any filler cards and/or PCMCIA device(s).
3. To replace the PCMCIA device, remove any filler cards present and insert the device. Reinstall any external cabling required for the device.

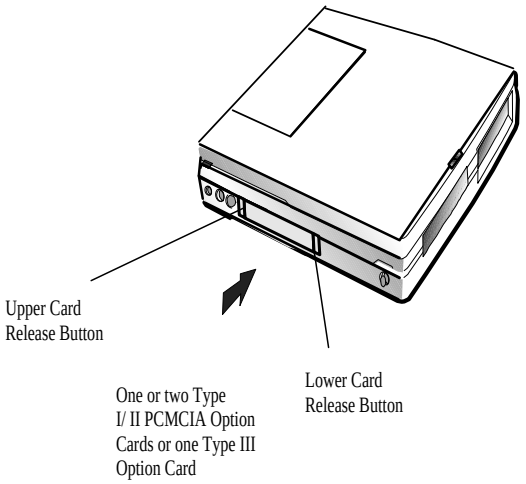


Figure 6-4 Installing/Removing PCMCIA Options

6.6.2 Removing/Replacing Modular Bay Devices

To remove and replace a modular bay accessory (device), use the following procedure:

1. Save any work in progress and shutdown the notebook.
2. Tilt the notebook upward and place your hand on the ribbed surface along the bottom of the device.

3. While pressing the release button on the right front of the notebook, pull the device out of the notebook.
4. Replacement is essentially the reverse of Steps 1 through 3 above.

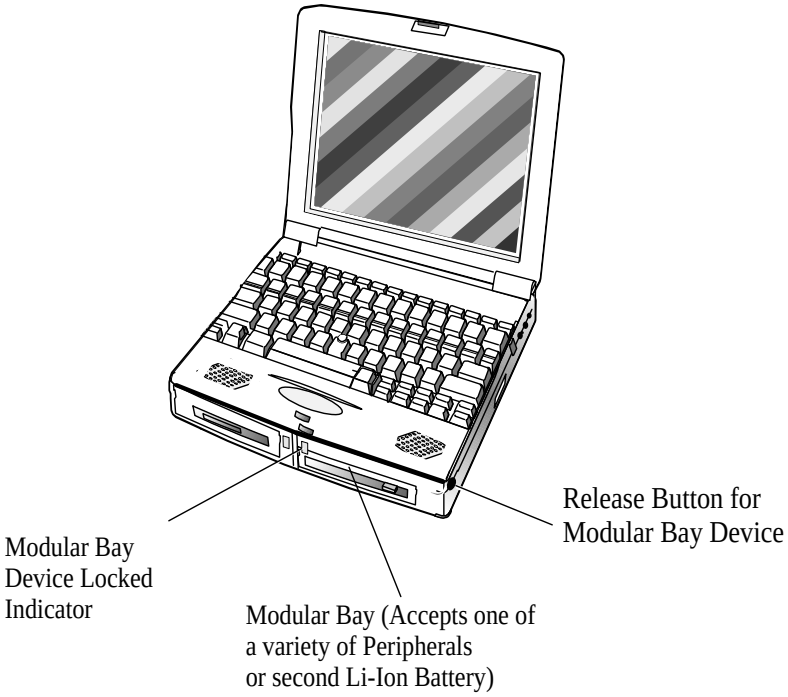


Figure 6-5 Installing/Removing Modular Bay Devices

6.6.2.1 FDD Assembly/Disassembly

Use the following procedure to disassemble the Floppy Disk Drive Module:

1. Remove the FDD assembly as described in Paragraph 6.6.2.
2. Remove the two flat TORX- head screws from the top panel.
3. Slide the top metal plate toward the connector while lifting on the plate until it clears the plastic tabs.
4. Place your palm on top of the floppy disk drive/connector and flip the module over.
5. Disconnect the floppy drive cable from the FDD by gently pulling on the cable (not the connector).
6. During reassembly, insert the connector cable into the floppy disk drive with label side up.
7. Insert the floppy disk drive and connector into tray so that the eject button fits

into the cut slot. Gently press down on the connector so that the connector top is flush with the connector guides.

8. Slide the top metal plate under the plastic tabs and replace the screws.

6.6.3 Removing/Replacing the Hard Disk Drive Assembly

The procedure for removing and replacing the hard drive assembly is as follows:

1. Power down the notebook, disconnect the AC adapter, if installed, and remove any installed battery packs from the front of the notebook.
2. Disconnect any peripheral device interface cables from the external interface connectors and remove any installed PCMCIA options.
3. Turn the computer over and remove the Phillips head screw securing the drive to the plastics as shown in Figure 6-6.

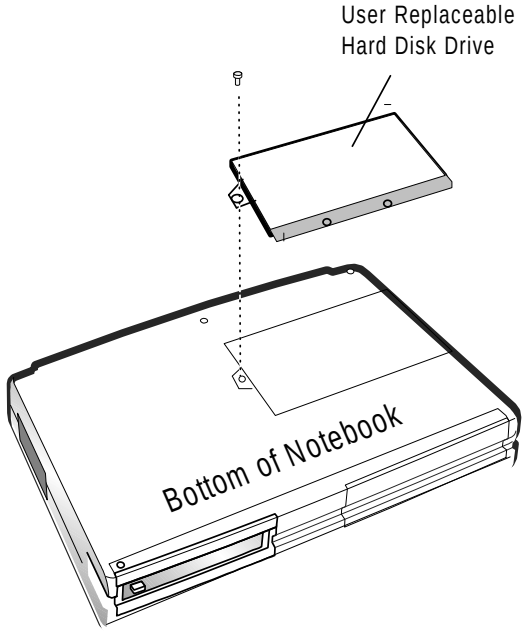


Figure 6-6 Hard Disk Drive Removal/Replacement

4. Slide the HDD out and lift the drive up and out from its bay.
5. Replacement is the reverse of Steps 1 through 4.

6.6.3.1 HDD Assembly/Disassembly

Use the following procedure to disassemble the HDD Module:

1. Remove the HDD assembly as described in Paragraph 6.6.3.
2. Remove the four TORX-head screws from the sides of the HDD casing.

3. Remove the two flat TORX- head screws from the connector bracket.
4. Remove the connector bracket freeing the connector and HDD unit.
5. Disconnect the connector cable from the HDD by gently pulling on the cable (avoid pulling on the connector).
6. Reassembly is the reverse of Steps 1 through 5.

6.6.4 Removing/Replacing the Keyboard Assembly

The procedure for removing and replacing the keyboard assembly is as follows:

1. Turn off the computer; disconnect the AC power adapter (if it is attached), and remove any installed battery packs from the left and right front areas of the notebook.
2. Press the Cover Release Latch and open the notebook.
3. Locate the three keyboard release points along the top edge of the keyboard; gently pry the keyboard loose at these three points.
4. Once the keyboard is released, carefully flip it over on its keys. Also remove the keyboard stiffener.
5. Disconnect the keyboard cable from its Zero Insertion Force (ZIF) connector on the Top Electronics Board (pry each end of the connector upward using a small plastic stick).
6. Disconnect the point cable from its Zero Insertion Force (ZIF) connector.
7. Remove the keyboard assembly from the notebook.
8. When installing the replacement keyboard, essentially reverse of Steps 1 through 7.

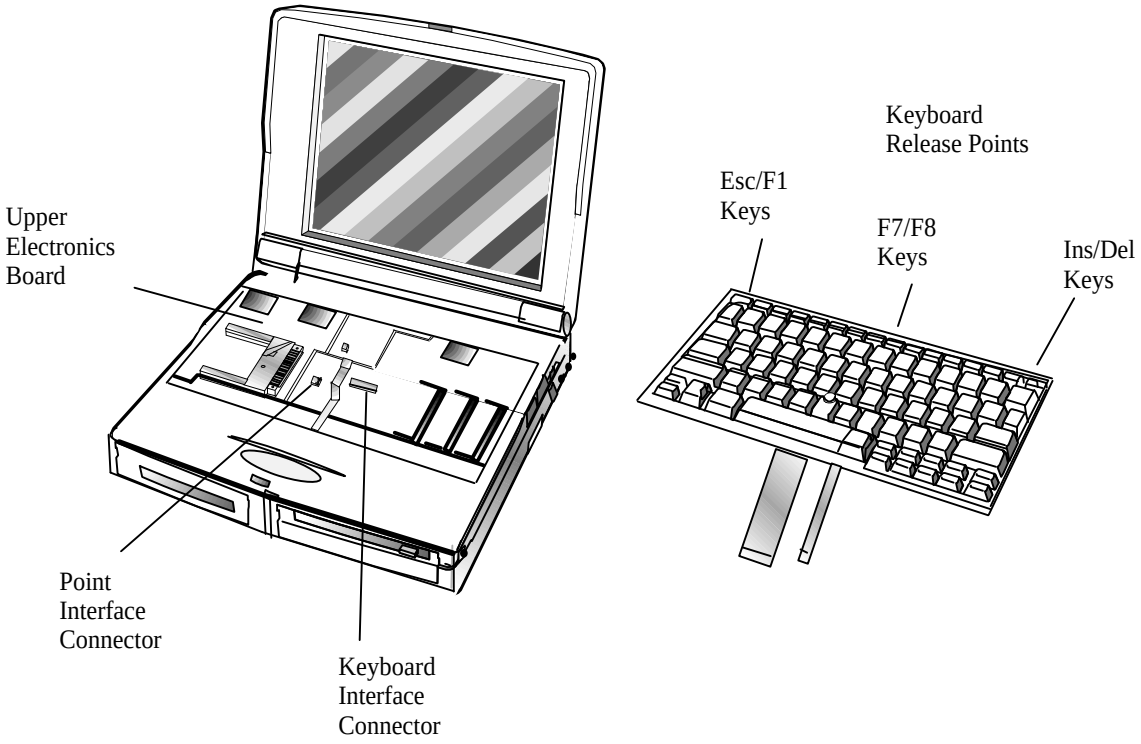


Figure 6-6 Keyboard Removal/Replacement

6.6.5 Removing/Replacing DIMM Modules

To remove and replace expansion RAM (so-DIMM) boards, perform the following procedure:

CAUTION: On the 6000/6100 Series Notebooks, do not use any combination of 16-MB and 32-MB so-DIMM Expansion Modules. The 32-MB modules are compatible only with 8-MB Modules. Also, use only memory supplied by Texas Instruments. Memory obtained from other sources may result in performance degradation or other undesirable affects.

Note: In order to use 32-MB so-DIMM modules in a TravelMate 6000 Series Notebook, you must have BIOS version 1.01.17 or higher installed in your notebook. Check and/or install a BIOS upgrade if your notebook is " down Rev". This BIOS upgrade kit is included in the TI **live**gear 32-MB Memory Module Kit available from Texas Instruments.

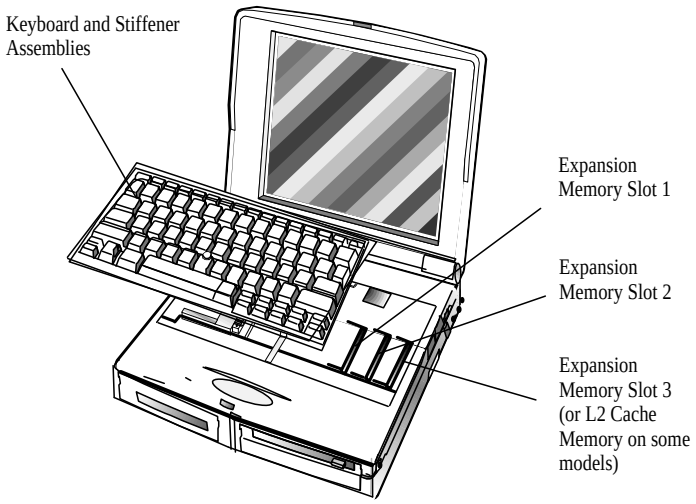
6.6.5.1 6100 Series Notebooks

The basic 6100 Series Notebook is shipped with 32-MB of RAM (expandable to a maximum of 96 MB). 32-MB Modules cannot be used with 16-MB modules (use one 64-MB module or two 32-MB modules to reach 96-MB or use any combination of 8-MB and 16-MB or 32-MB and 8-MB so-DIMMs for RAM expansion.

Note: On the 6100 Series Notebook, a BIOS upgrade is not required to install 32-MB expansion memory.

---

1. Power down the notebook, disconnect the AC adapter, and any installed battery packs.
2. Disconnect any peripheral device interface cables from the external interface connectors and remove any installed PCMCIA options.
3. Disengage the keyboard assembly from the top case as described in Paragraph. 6.6.5 but don't disconnect the keyboard cables.
4. Remove the keyboard stiffener.
5. Remove the desired so-DIMM module from the Top Electronics Board.
6. Replacement is essentially the reverse of Steps 1 through 5 above (orient the board chip side up and slide module in until metal guides on the top board snap in place).



NOTE: Expansion slots 1 and 2 can accomodate 8, 16 or 32 MB Modules; Slot 3 is restricted to 8MB Modules or L2 Cache memory on some models.

Figure 6-5 Memory Expansion Removal/Replacement

6.6.6 Removing/Replacing the Display Assembly

Use the following procedure to remove the Display Assembly from the Base Assembly:

1. Power down the notebook, remove the battery packs, and disconnect the AC adapter, if installed.
2. Disconnect any peripheral device interface cables from the external interface connectors and remove any installed PCMCIA options.
3. Remove the Keyboard Assembly as described in Paragraph 6.6.5.
4. Remove the left and right hinge covers by pressing in the center of each toward the rear of the unit and lifting upward. Set these aside for later installation.
5. Remove the two screws from the bottom rear corners of the notebook that secure the Display Assembly to the Base Assembly.
6. Disconnect the LCD Panel ribbon cable from the ZIF connector on the Top Board (release the ZIF connector and use tweezers to remove the cable). Also remove the screw that holds the ground strap to the heat sink.

7. Remove the hinge screws on each side of the notebook. Let the LCD lay as flat as possible on the work surface when removing the last screw. The ribbon cable is still routed down inside the base assembly at this point.
8. Lift up on the left rear corner of the top case and move the display assembly slightly to the left to permit the large end of the ribbon cable to be pulled out of the access slot (**Note:** The ground tab on the ribbon cable may need to be folded behind the rest of the cable).
9. Replacement is essentially the reverse of Steps 1 through 8.

6.6.7 Opening/Closing the Base Assembly

Use the following procedure to open the Base Assembly for servicing (e.g., removing/replacing boards, speakers, etc.).

1. Remove the Display Assembly as described in Paragraph 6.6.6.
2. Remove the three bottom front screws from the Base Assembly.
3. Remove the screw near the front center of the keyboard cavity.
4. Lift up and slide the top cover forward and disconnect the Pick Button cable.
5. Remove the Top Cover from the Base Assembly.
6. Installation is the reverse of Steps 1 through 5.

6.6.8 Removing/Replacing the Pick Button Board Assembly

To remove and replace the Pick Button Board Assembly, perform the following procedure:

1. Open up the Base Assembly as described in Paragraph 6.6.7.
2. Remove the two screws securing the Pick Button Board Assembly to the underside of the Top Assembly.
3. Loosen the speaker wires from their holders and turn the Pick Button Board Assembly over.
4. Disconnect the speaker wires and remove the Pick Button Board Assembly from the Top Cover.
5. Replacement is the reverse of Steps 1 through 4.

6.6.9 Removing/Replacing Top/Bottom Electronics Boards

To remove and replace the Top/Bottom Boards, perform the following procedure:

1. Open up the Base Assembly as described in Paragraph 6.6.7.
2. Remove the tamper evident label and remove the screw underneath the label.
3. Remove the screw located just above and to the right of the PCMCIA card slots.
4. Remove the screw lactated at bottom center rear of base.

5. Disconnect the cable for the solenoid assembly.

Note: During reinstallation, attach this cable and dress down the wires prior to installing the board assembly using the reverse of Step 7.

---

6. Ensure that the rear connector door is closed. This door must remain closed while removing the upper and lower electronics boards as a unit.

7. Using the large heat sink as a handle, carefully but firmly lift the board up at an angle and out of the Base Assembly (audio jack side goes out last).

8. Remove the hex nuts from the serial and parallel connectors.

9. Remove the two screws that secure the bottom board to the top board.

10. Separate the two boards (held by the main connector).

11. Replacement is essentially the reverse of Steps 1 through 9 above.

Note: When installing the assembly, ensure that you insert the board at an angle and that the audio jack side goes in first.

6.6.10 Removing/Replacing Flex Cable/Bus/VGA Assembly

To remove and replace the Flex Cable, Bus/VGA Assembly, perform the following procedure:

1. Open up the Base Assembly as described in Paragraph 6.6.7.
2. Remove the Top/Bottom Board Assembly as described in Paragraph 6.6.9.
3. Remove the four hex nuts and two screws securing the assembly to the heat sink.
4. Disconnect both of the top flex cable bus connectors and remove the Flex Cable/ Bus/VGA Assembly.
5. Replacement is essentially the reverse of Steps 1 through 4.

6.6.11 Removing/Replacing the LCD Bezel

To remove the LCD Bezel (to gain access to Cover-Display FRU's), perform the following procedure:

1. Turn off the computer, disconnect the AC power adapter (if it is attached) and remove all installed battery packs from the front of the notebook.
2. Disconnect any peripheral device interface cables from the external interface connectors.

Caution: If the notebook is powered up with the LCD bezel removed, you can be exposed to high voltages which could result in shock and equipment damage. Ensure that the batteries and AC adapter are removed from the notebook when working on the LCD/Display assembly.

3. The display bezel is held in place with clips and can be removed by gently prying each snap loose. Begin unfastening the clips along the top and then work around the LCD bezel until all clips are unfastened.
4. To reinstall the Display Bezel, reverse the removal procedure.

6.6.12 Removing/Replacing the Inverter Board

To remove/replace the Inverter Board, use the following the procedure;

1. Remove the Display Bezel as described in Paragraph 6.6.11.

Caution: If the notebook is powered up with the LCD bezel removed, you can be exposed to high voltages which could result in shock and equipment damage. Ensure that the batteries and AC adapter are removed from the notebook when working on the LCD/Display assembly.

2. Remove the two screws securing the Inverter Board to the cover. Carefully disconnect the wiring on top of the board and the ribbon cable from the connector at the bottom of the board.
3. Remove the Inverter Board.
4. Replacement is the reverse of Steps 1 through 3.

6.6.13 Removing/Replacing the Rear Door

Use the following procedure to remove/replace the rear connector door:

1. Press the Rear Door Access Button (Figure 6-6) and open the rear connector door.
2. Flex the connector door in the middle and remove the cover door.
3. Note the position on the door spring at the left side of the door opening (as viewed from the rear).

Note: When installing the spring on the peg at the left side of the connector door opening (when viewed from the rear), ensure that the spring leads face the front of the notebook.

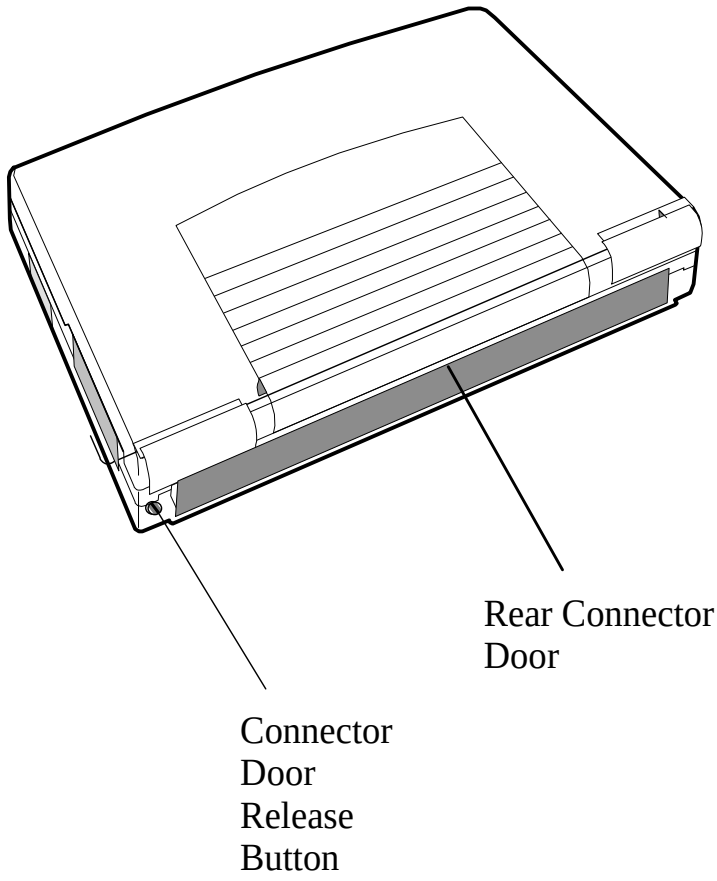


Figure 6-6 Removing\Replacing the Rear Connector Door

A
Model 6020 Maintenance Data

A.1 Introduction

This section contains model-dependent maintenance data for the TravelMate Model 6020 Notebook Computer. For information common to all members of the TravelMate 6000 Series, refer to Sections 1 through 6 of this manual.

A.2 Model 6020 Features Summary

The TravelMate Model 6020 has a 11.3-inch Super VGA Display, comes standard with a 1.08 GB Hard Drive and is powered by a 120 MHz Pentium processor. Refer to Section 1 for a detailed description of TravelMate 6020 features.

A.3 Field-Replaceable Units (FRUs)

As shown in Figure A-1, the Model 6020 Series Notebook Computer contains two major assemblies:

- System Base Assembly
- Cover-Display Assembly

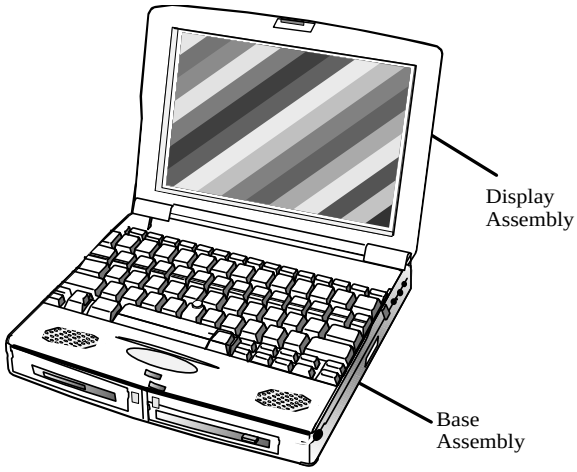


Figure A-1 TravelMate 6020 Major Assemblies

A.3.1 Cover-Display Assembly

The Cover-Display Assembly shown in Figure A-2, contains the LCD screen, Power Inverter Board, bezel LCD cover and various other components as listed in Table A-1.

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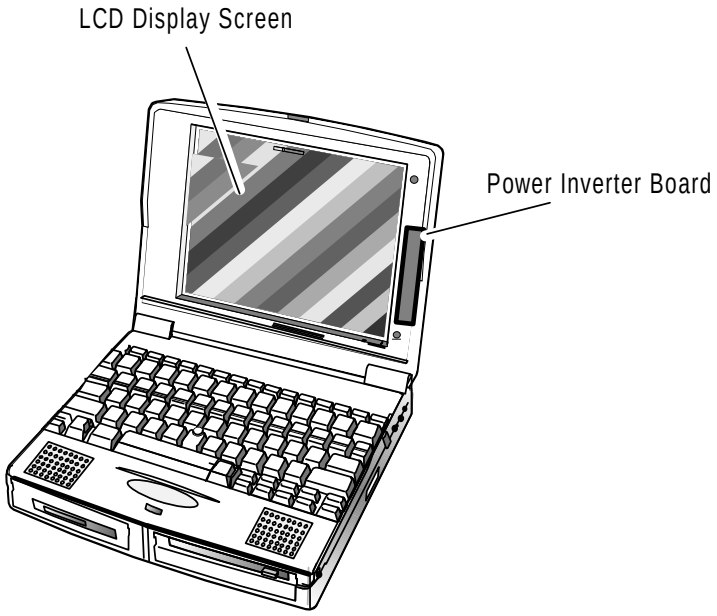


Figure A-2 Model 6020 Display FRUs

Table A-1 Model 6020 Top Cover Assembly FRUs

FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
Display Assembly, TFT 11.3 inch SVGA	6.6.6	9804438-8004
LCD Display, TFT 11.3 inch SVGA	6.6.6	9786440-8001
Inverter Board	6.6.12	9804480-8001
Display Cable , TFT 11.3 inch SVGA	6.6.6	9804475-0001
Ferrite for Display Cable	6.6.6	2248836-0002
Bezel, TFT 11.3 inch SVGA	6.6.11	9804448-8003
LCD Cover, TFT, SVGA w/insulator	6.6.11	9804425-8001
LCD Latch	Ref	9804451-0001
Foam for LCD Latch	Ref	9804459-0001

A.3.2 System Base Assembly

As shown in Figure A-3, the System Base Assembly houses a variety of field-replaceable subassemblies and components. The various assemblies and reference paragraph numbers containing removal/replacement procedures are listed in Table A-2. Table A-3 contains a listing of Customer-(non-technical user) replaceable units (CRUs).

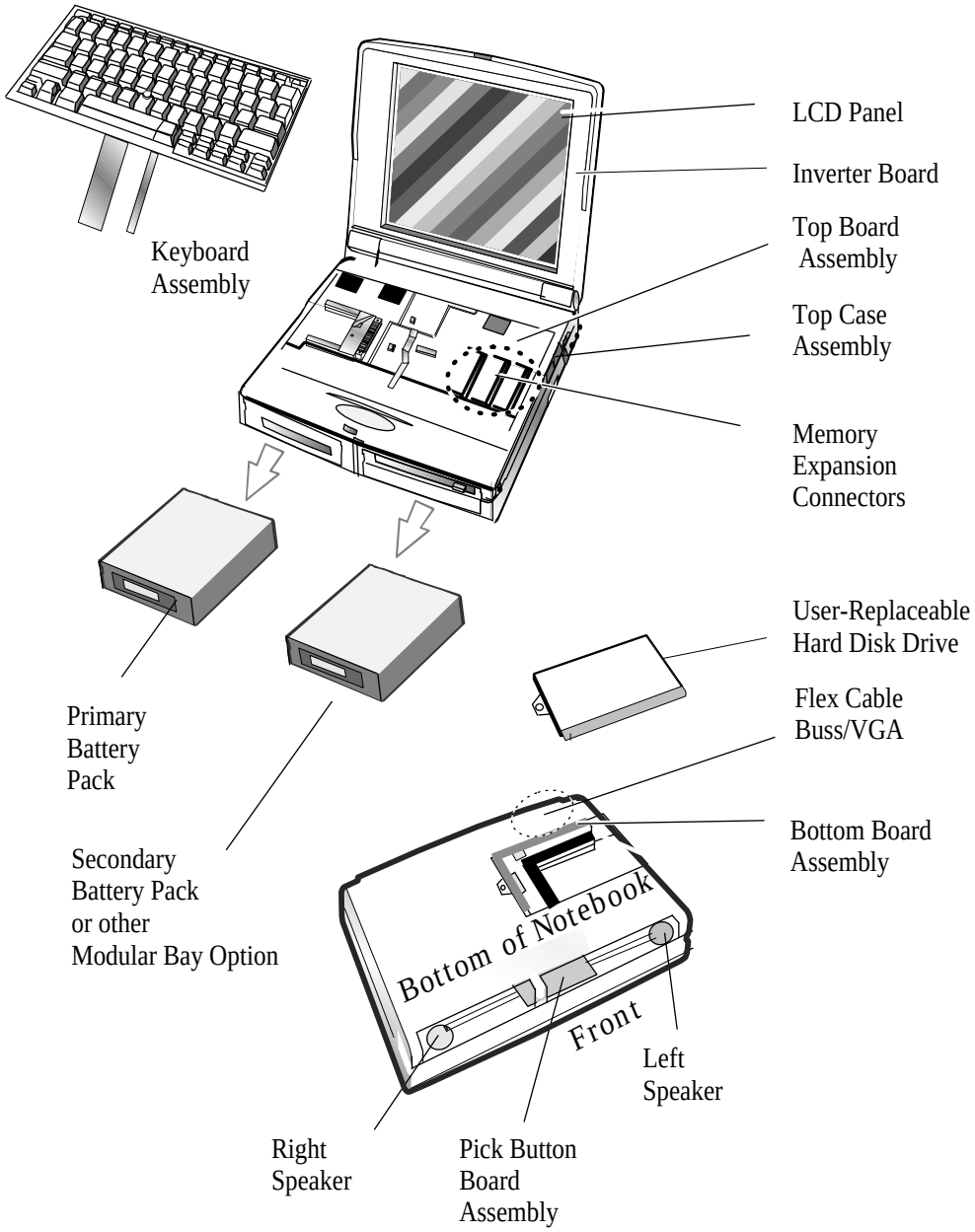


Figure A-3 Base Assembly FRUs

Table A-2 Model 6020 Base Assembly FRUs

Base Assembly FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
PCB Assemblies		
Top PCB Assembly, 120 E57 w/Heat sink	6.6.9	9811425-8001
Bottom PCB Assembly, E57	6.6.9	9804408-8002
Flex Cable, Bus/VGA	6.6.10	9804585-8001
Pick Button Assembly	6.6.8	9804420-8002
Keyboard Assembly	6.6.4	9804437-0001
Cables		
HDD Cable, 12.5 mm	6.6.3	9804544-0001
HDD Cable, 17 mm	6.6.3	9804548-0001
HDD Cable, Avatar	6.6.2	9804586-0001
FDD Cable	6.6.2	9804545-0001
CD-ROM Cable, 6X KME	6.6.2	9804546-0001
Pick Button Cable	6.6.8	9804584-0001
Peripherals		
Microfloppy Drive	6.6.2	9786185-8003
HDD, 1.08 GB, 12.5 mm	6.6.3	9804569-8004
HDD, 2.1 GB	6.6.2	9786285-8003
HDD, Avatar	6.6.2	9804472-8001
CD-ROM Drive, 6X KME	6.6.2	9804470-8002
Covers, Doors, Buttons		
Top Cover Assembly	6.6.7	9804543-8001
Base Assembly (not for sale domestically)	Ref	9804553-8002
Rear Door	Ref	9804430-0001
HDD Door	6.6.3	9804491-0001
HDD Door Insulator	6.6.3	9804522-0003
IR Lens	Ref	9804516-0001

Table A-2 Model 6020 Base Assembly FRUs

Base Assembly FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
Speaker Assembly	Ref	9804434-8001
Magnet, Close Cover Detect	Ref	2249047-0001
Warranty Label	Ref	9798834-0002
Logo Label	Ref	9804558-0001
Hinge Cover	Ref	9804452-0001
Nameplate Label, TravelMate 6020	Ref	9804535-0001
Spring Torsion, Rear Door	6.6.13	9804454-0002
Keyboard Support Stiffener	6.6.4	9811476-0001
Solenoid, Media Bay	Ref	9811436-0001
Mask, Pick Button	Ref	9804481-0001

Table A-3 6000 Series Customer-Replaceable Units (CRUs)

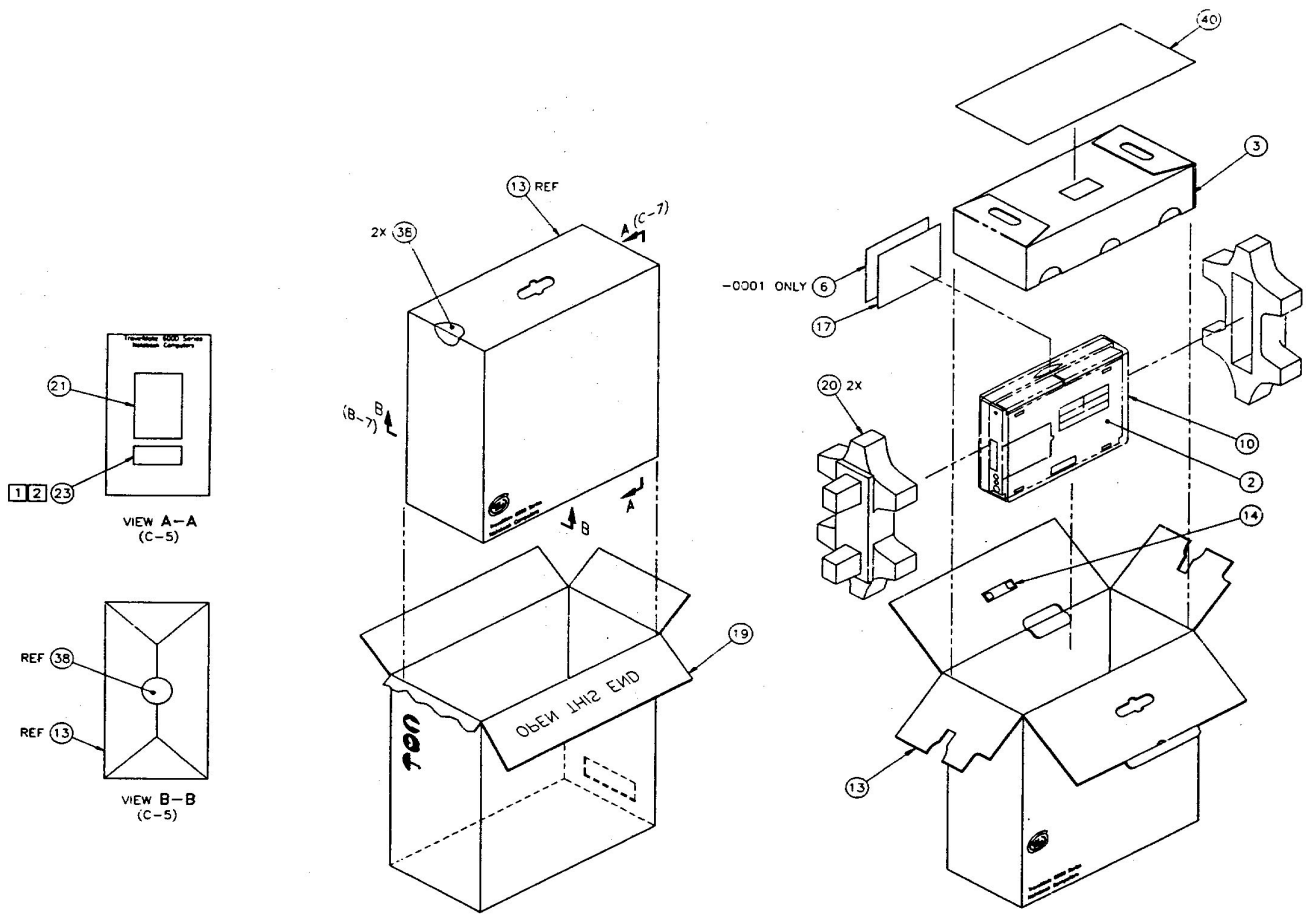
Customer-Replaceable Unit Description	TI Part No.
PCM Assemblies	
AC Adapter Kit	9811459-0001
Spare Li-Ion Battery Kit	9811457-0001
2.1 GB HDD with Pack	9811478-0001
Avatar HDD Module with Pack	9811479-0001
FDD Module with Pack	9804447-8001
CD-ROM 6X Module with Pack	9811477-0003
28.8 K Modem/Fax with SpeakerphoneReplacement Kit	2249163-8003
Display Bumper	9804520-0001
PCMCIA Slot Filler Card	9811454-0001
Weight-Reduction Module	9811464-0001
8 MB RAM Module Kit	9811456-0001
16 MB RAM Module Kit	9811456-0002

A.4 FRU Removal/Replacement Procedures

Refer to Section 6 for field service-level removal/replacement procedures for all TravelMate 6000 Series Notebook Computers.

A.5 Factory-Level Illustrated Parts Breakdown

Figure A-4 shows the TravelMate 6020 with pack accessories. The associated parts listing is provided in Table A-4.



9804411–1001	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, ELC
9804411–0100	COMMON PARTS FOR 9804411, PACK
9804411–0019	TM6020 PCK, P120, 1.08GB, 8MB, 11.3T, APAC
9804411–0018	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, LA
9804411–0016	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, AUST
9804411–0015	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, BEL
9804411–0014	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, FIN
9804411–0013	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, NOR
9804411–0012	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, DEN
9804411–0011	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, S/F
9804411–0010	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, SWE
9804411–0009	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, W.E.
9804411–0008	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, POR
9804411–0007	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, IT
9804411–0006	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, SW/GE
9804411–0005	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, SP
9804411–0004	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, FR
9804411–0003	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, GER
9804411–0002	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, UK
9804411–0001	TM6020 PACK, P120, 1.08GB, 8MB, 11.3T, DOM
PART NUMBER	DESCRIPTION

Figure A-4 TravelMate 6020 Notebook Computer with Pack (P/N 9811481-0001)

Table A-4 Domestic TravelMate 6020 With Pack Parts Listing (P/N 9811481-0001)

Item	Part No.	Quantity	Description
1	9804411-0100	1	COMMON PARTS FOR 9804411, PACK
2	9804412-0001	1	TM6020 UNT,P120,1.08GB,8MB,11.3T,DOM
3	9804466-0001	1	ACCESSORY KIT, WIN95, TM6000,ENGLISH

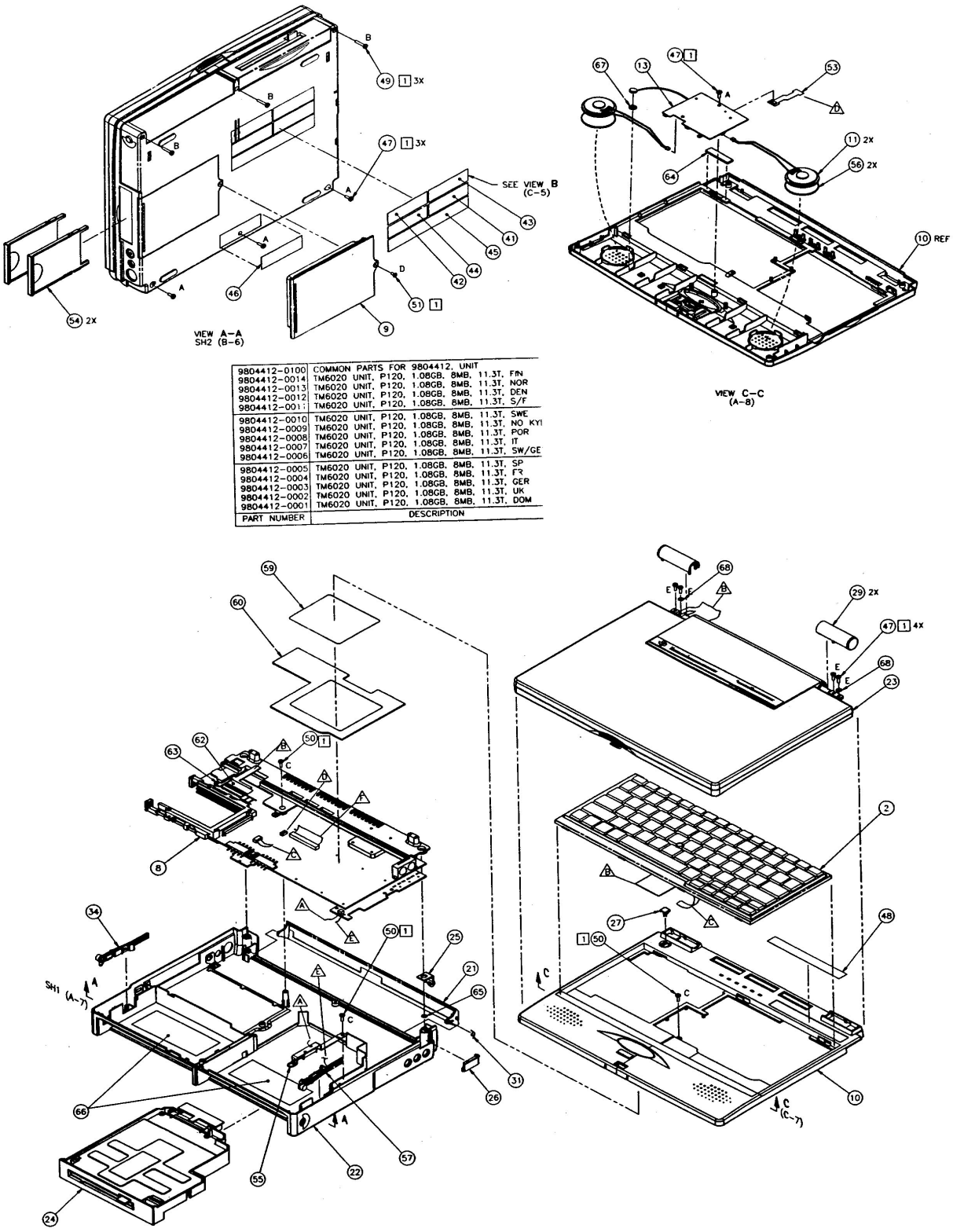
Note: The following is a listing of the common parts associated with Part No. 9804411-0100 (item 1 above).

Table A-4 Domestic TravelMate 6020 Common Parts (9804411-0100)

Item	Part No.	Quantity	Description
10	2560764-0010	1	BAG,CLEAR,13.50W X 13.00L X .0015T
13	9804504-0001	1	PACK BOX, W/GRAPHICS, TM6000
14	2568053-0001	1	HANDLE, HD ESCORT, 8 IN, BLACK, 100 LB CAP
17	9786432-0001	1	SW LICENSE AGREEMENT, WIN95 DUAL LD
19	9804505-0001	1	OVERPACK BOX, TM6000
20	2581250-0003	2	EPP ENDCAPS,TM6000 SERIES

A.5.1 TravelMate 6020 Unit Assembly Parts Breakdown

Figure A-5 shows the major components that comprise the TravelMate 6020 Notebook Computer. The associated parts list is provided in Table A-5.



PART NUMBER	DESCRIPTION
9804412-0100	COMMON PARTS FOR 9804412, UNIT
9804412-0014	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, FIN
9804412-0013	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, NOR
9804412-0012	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, DEN
9804412-0011	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, S/F
9804412-0010	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, SWE
9804412-0009	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, NO KYI
9804412-0008	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, POR
9804412-0007	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, IT
9804412-0006	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, SW/GE
9804412-0005	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, SP
9804412-0004	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, FR
9804412-0003	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, GER
9804412-0002	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, UK
9804412-0001	TM6020 UNIT, P120, 1.08GB, 8MB, 11.3T, DOM

Figure A-5 Domestic TravelMate 6020 Unit Assembly (P/N 9804412-0001)

Table A-5 Domestic TravelMate 6020 Unit Assembly (P/N 9804412-0001) Parts Listing

Item	Part No.	Quantity	Description
1	9804412-0100	1	COMMON PARTS FOR 9804412, 6020 UNIT
2	9804437-0001	1	KEYBOARD,BROTHER,W/POINTER,3MIL TRAV,DOM

Note: The following is a listing of the common parts associated with item 1 above.

Table A-5 Domestic TravelMate 6020 Unit Assembly Common Parts Listing (9804412-0100) (continued)

Item	Part No.	Quantity	Description
8	9804587-0004	1	HEATPLATE/PWB ASSY, 8MB, 120, E57
9	9804435-0004	1	HARD DRIVE ASSY, 1.08GB, TM6000 (IBM)
10	9804543-0001	1	COVER ASSY,TM6000 SERIES
11	9804434-0001	2	SPEAKER ASSY,TM6000
13	9804420-0001	1	PWB ASSY,PICK BUTTON,TM6000
21	9804430-0001	1	DOOR,CONNECTOR,TM6000
22	9804553-0002	1	BASE ASSY,W/O MODEM/RJ11, TM6000
23	9804438-0004	1	LCD ASSY,11.3 SHARP SVGA,TM6000
24	9804447-0001	1	FLOPPY DRIVE MODULE ASSY, ECLIPSE
25	9804515-0001	1	DOOR RELEASE BUTTON, TM6000
26	9804516-0001	1	WINDOW, IR, TM6000
27	9804517-0001	1	BUTTON, SUSPEND, TM6000
29	9804452-0001	2	COVER, HINGE, TM6000
31	9804454-0002	1	SPRING,TORSION, 3.167 TURNS, TM6000
34	9804457-0001	1	LATCH, MEDIA BAY RELEASE, ECLIPSE
46	9798834-0002	1	WARRANTY LABEL, FCC, TAMPER EVIDENT
47	2249135-0002	8	SCREW,MACHINE,PAN HEAD, 2-56 X .250, T8COM
48	9804535-0001	1	LABEL,NAMEPLATE,TM6020

Table A-5 Domestic TravelMate 6020 Unit Assembly Common Parts Listing (9804412-0100) (continued)

49	2249135-0004	3	SCREW,MACHINE,PAN HEAD,2-56 X 1.125, T8CO
50	2249135-0003	3	CREW, MACHINE, PAN HEAD, 2-56 X .375, T8COM
51	2249136-0006	1	SCREW,MACH,FLAT HEAD,4-40 X .188,T8
53	9804584-0001	1	FLEX CABLE,PICK BUTTON BRD,TM6000
54	9811454-0001	2	FILLER CARD,PCMCIA,TM6000
55	9811436-0001	1	SOLENOID LATCH BLOCKING ASSY,TM6000
56	9786294-0001	2	SPEAKER GRILL ASSY,TM6000 SERIES
57	9804523-0001	1	LATCH ASSY,MEDIA BAY,TM6000

A.6 Logic Diagrams

Logic diagrams for the TravelMate 6020 Series Notebooks are provided in the following appendices:

- Top Board Logic Diagram (Part No. 9811427) - Appendix E
- Bottom Board Logic Diagram (Part No. 9804410) - Appendix F
- Pick Button Board Logic Diagram (Part No. 9804422) - Appendix G

B
Model 6030 Maintenance Data

B.1 Introduction

This section contains model-dependent maintenance data for the TravelMate Model 6030 Notebook Computer.

B.2 Model 6030 Features Summary

The TravelMate Model 6030 has a 12.1-inch Super VGA Display, comes standard with a 1.38 GB Hard Drive and is powered by a 133 MHz Pentium processor. All other features are common for the TravelMate 6000 Series as described in Sections 1 through 6 of this manual.

Detailed specifications for the TravelMate 6030 are provided in Table B-1.

Table B-1 TravelMate Model 6030 Notebook Computer Specifications

Hardware/ Software Function	Specifications
Processor	Intel Pentium P54CSLM, 133 MHz (initially); 2.9 Volt **Bus Type**: VL Local Bus; bridge to 30 MHz PCI Bus
Memory	16 MB DRAM, 60-ns, page-interleaved, expandable to 72 MB 2 MB FLASH ROM
Internal Cache	16 KB
L2 Cache	256 KB
LCD Type	12.1-inch (Diagonal) TFT, Color SVGA
Primary Hard Disk Drive	**Disk Storage Capacity**: 1.38 GB **Disk size**: 12.5 mm **Average access time**: 12 ms or less **Throughput:** 11+ Million I/O's per second
CD-ROM Drive	6X, Mode 2
Floppy Disk Drive	1.44 MB, 3.5-inch floppy disk drive; installed in Modular Bay or connected externally to the Parallel Port

Table B-1 TravelMate Model 6030 Notebook Computer Specifications

Hardware/ Software Function	Specifications
Internal Keyboard	3-mm Key movement Integrated numeric keypad Inverted T Cursor Control Key Layout
Pointing Device	The Point (embedded in keyboard; select buttons on keyboard palm rest)
Video Subsystem	**Controller:** Cirrus GD7548 Controller **LCD Aspect Ratio**: 1-1 **Graphic Accelerator:** 64-bit BLT **Emulations:** VGA **Video Memory (EDO)**: 2 MB **Video Bus**: 32 bits **Simultaneous LCD and external VGA display** **LCD Resolution:** 640 x 480 pixels bit-mapped at 16.77 million colors; 600 x 800 at 65K colors. **LCD Characters/Line**: 80 **LCD Lines/Screen:** 25
External CRT Monitor Interface	**Connector Type**:15-Pin, female, D-type connector **Monitors Supported**: 640 x 480 with 16.7 million colors on CRT 800 x 600 with 65K colors on CRT 1024 x 768 with up to 256 colors on CRT 1280 x 1024 with 256 colors on CRT (interlaced)
Parallel Port	EPP/ECP Bidirectional; Parallel Printer Port: 25-Pin, DC-25 Connector Also supports external Floppy Disk Drive with appropriate cable (refer to Figure 2-7 in Section 2 of this manual)
Serial Port	**RS-232-D Serial Port**: 9-Pin, male, suC-D-type connector **Method**: EIA RS-232-D **Type**: synchronous transmission **Bits per second:** 110, 200, 300, 600, 1200, 2400, 4800, 9600, 19200 **Parity: Transmit**: odd, even, mark, space **Receive:** data check: odd, even **Line control**: READY/BUSY, DC1/DC3 **Data word**: 7- or 8-bit
Serial I/R Port	115K baud
PS/2 Port	Supports either external mouse or keyboard (or both with Y-type cable)

Table B-1 TravelMate Model 6030 Notebook Computer Specifications

Hardware/ Software Function	Specifications
Audio Jacks	**Line in:** 3.5-mm bayonet connector; input Z of 10K ohms; 3.5 V_{RMS} maximum input. **Speaker Out**: 3.5-mm bayonet connection to drive external amplified or headphones; 400 mW output into 8 ohm speaker/ headphones. **Mic In:** 3.5-mm bayonet connector to connect an external condenser-type mic to the notebook; 10 to 100 mW input level.
Audio Features	ESS Chip set; Sound Blaster Pro 16 compatible Built-in power amplifier with volume control 3-D Expansion (Spatializer)
Battery Pack **Recharge Time**	40 Watt-Hour, 8-cell, Li-Ion intelligent battery with built-in charge indicator circuitry and display 4 Hours with unit off; 4.5 to 10 hours with unit on
Power	**Input Voltage:** 100 to 250 VAC **Input Current:** 0.7 to 0.4 Amps **Input Frequency**: 50 to 60 Hz **Wattage:** 35 Watts
AC Adapter	**Output Voltage**: +9.0 VDC to +18VDC
Card Bus Interface	Two Type I/II PCMCIA Cards or one Type III Card
Physical Characteristics	**Size:** 12 inches x 9 inches x 2 inches **Weight**: 5.92 pounds (including battery pack and Floppy Disk Drive) (model dependent)*
Environmental Operating	**Temperature**: 50 degrees F to 95 degrees F (10 degrees C to 35 degrees C) **Relative humidity**: 20 to 80 percent, noncondensing **Shock:** 6G applied in 6-orientations (pos. and neg. X, Y and Z axes) **Vibration**: Sinusoidal; 5 to 20 Hz limited to 0.0244-inch (0.6 mm) peak-to-peak maximum displacement; 0.5g, 20 to 400 Hz **Altitude:** 8200 ft (2500 m) maximum
Environmental Storage	**Temperature**: -4 degrees F to 140 degrees F (-20 degrees C to +60 degrees C) **Relative humidity**: 10 to 90 percent, noncondensing 2500 ft (2.2 C per 305 m over 762 m) **Shock:** 60G pulse applied in 6-orientations (pos. and neg. X, Y and Z axes) **Vibration**: Sinusoidal; 5 to 20 Hz limited to 0.244-inch (0.6 mm) peak-to-peak maximum displacement; 5.0g, 20 to 400 Hz

B.3 FRU Removal/Replacement

Refer to Section 6 for field service-level removal/replacement procedures for all TravelMate 6000 Series Notebook Computers.

B.4 TravelMate 6030 FRUs

A listing of Field-Replaceable Units (FRUs) for the TravelMate Model 6030 Notebook Computer is provided in Table B-2.

Table B-2 Top Cover Assembly Field-Replaceable Units (FRUs)

FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
Display Assembly, TFT 12.1-inch SVGA SAMS	6.6.6	9804438-8001
LCD Panel, TFT 12.1-inch SVGA	6.6.6	9804467-8001
Inverter Board, TFT 12.1-inch	6.6.12	9804480-8001
Display Cable, TFT 12.1-inch SAMS	6.6.6	9804445-0001
Ferrite for Display Cable	6.6.6	2248836-0002
Bezel, TFT 12.1-inch SAMS	6.6.11	9804448-8001
LCD Cover, TFT, SVGA w/insulator	6.6.11	9804425-8001
LCD Latch	Ref	9804451-0001
Foam for LCD Latch	Ref	9804459-0001

B.4.1 System Base Assembly

As shown in Figure B-1, the System Base Assembly houses a variety of field-replaceable subassemblies and components. The associated FRU removal/replacement paragraph references to Section 6 and the associated TI part numbers for the various FRUs are provided in Table B-2.

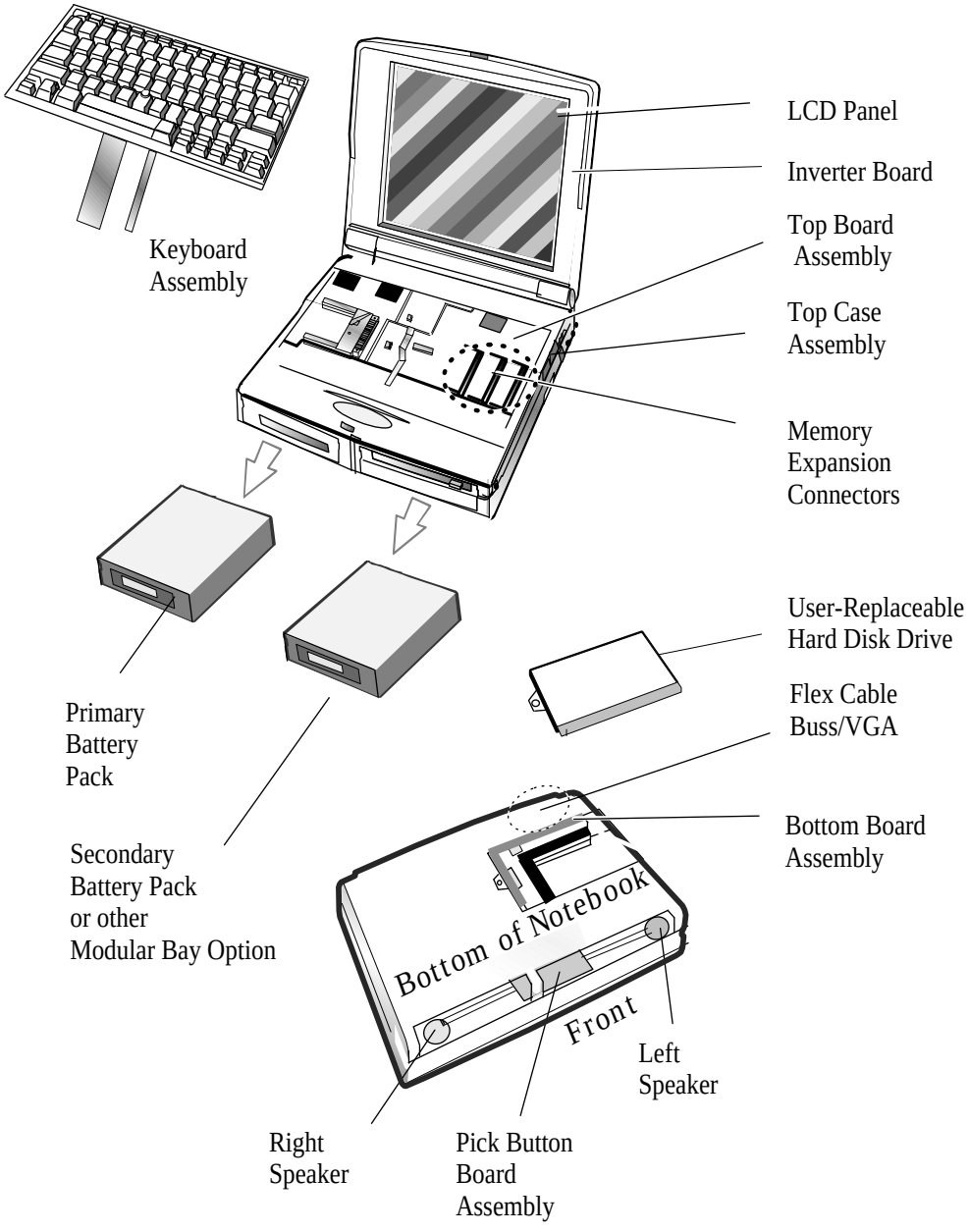


Figure B-1 TravelMate 6030 Base Assembly FRUs

Table B-2 TravelMate 6030 Base Assembly FRUs

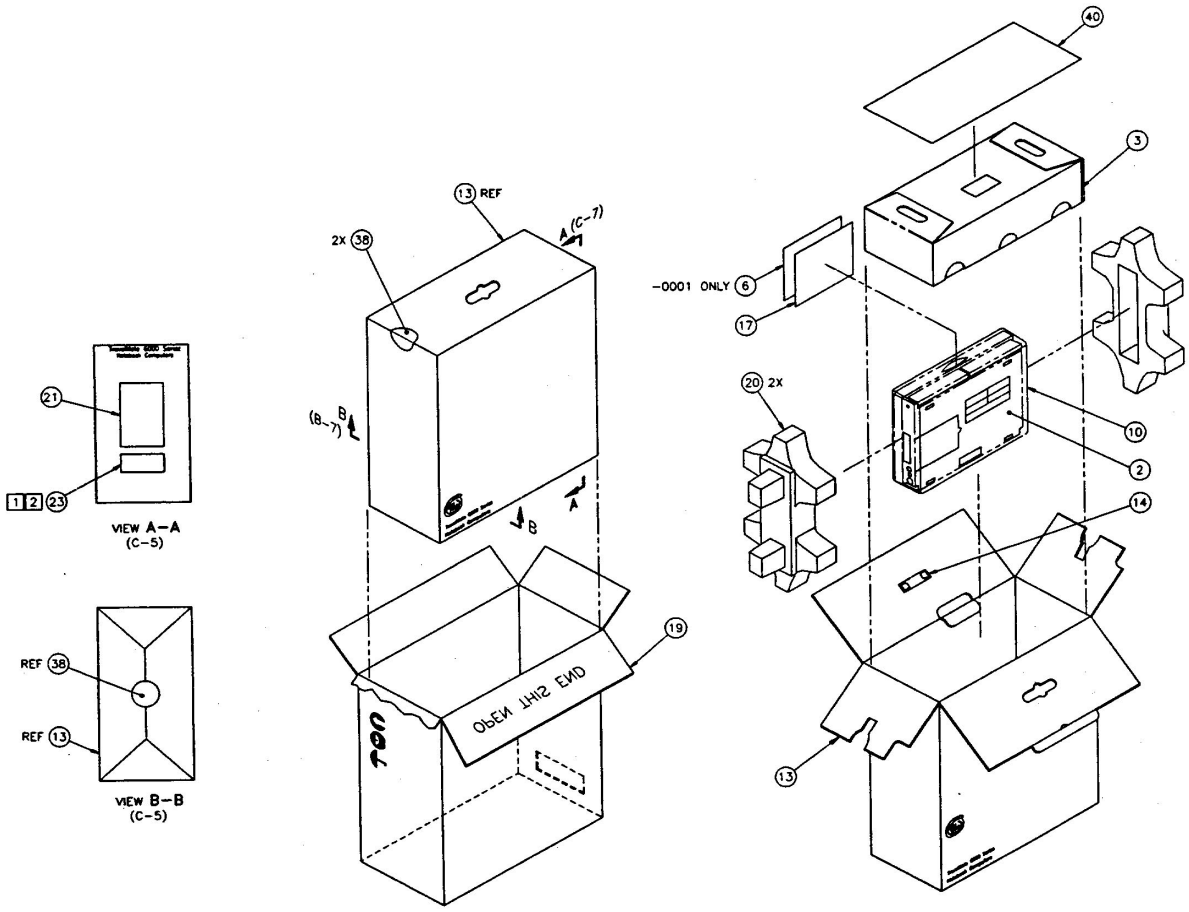
Base Assembly FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
PCB Assemblies		
Top PCB Assembly, 133 E57 w/Heat sink	6.6.9	9811425-8002
Bottom PCB Assembly, E57	6.6.9	9804408-8002
Flex Cable, Bus/VGA	6.6.10	9804585-8001
Pick Button Assembly	6.6.8	9804420-8002
Keyboard Assembly	6.6.4	9804437-0001
Cables		
HDD Cable, 12.5 mm	6.6.3	9804544-0001
HDD Cable, 17 mm	6.6.3	9804548-0001
HDD Cable, Avatar	6.6.2	9804586-0001
FDD Cable	6.6.2	9804545-0001
CD-ROM Cable, 6X KME	6.6.2	9804546-0001
Pick Button Cable	6.6.8	9804584-0001
Peripherals		
Microfloppy Drive	6.6.2	9786185-8003
HDD, 1.35 GB, 12.5 mm	6.6.3	9804569-8002
HDD, 2.1 GB	6.6.2	9786285-8003
HDD, Avatar	6.6.2	9804472-8001
CD-ROM Drive, 6X KME	6.6.2	9804470-8002
Covers, Doors, Buttons		
Top Cover Assembly	6.6.7	9804543-8001
Base Assembly (not for sale domestically)	Ref	9804553-8002
Rear Door	Ref	9804430-0001
HDD Door	6.6.3	9804491-0001
HDD Door Insulator	6.6.3	9804522-0003
IR Lens	Ref	9804516-0001

Table B-2 TravelMate 6030 Base Assembly FRUs

Base Assembly FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
Speaker Assembly	Ref	9804434-8001
Magnet, Close Cover Detect	Ref	2249047-0001
Warranty Label	Ref	9798834-0002
Logo Label	Ref	9804558-0001
Hinge Cover	Ref	9804452-0001
Nameplate Label, TM6030	Ref	9804535-0002
Spring Torsion, Rear Door	6.6.13	9804454-0002
Keyboard Support Stiffener	6.6.4	9811476-0001
Mask, Pick Button Board	Ref	9804481-0001

B.5 Illustrated Parts Breakdown

Figure B-2 shows the TravelMate 6030 with pack accessories. The associated parts listing is provided in Table B-3.



PART NUMBER	DESCRIPTION
9804414-2001	TM6000 PCK, P133, 1.35GB, 16MB, 12.1SHV, ELC
9804414-1001	TM6000 PCK, P133, 1.35GB, 16MB, 12.1SAV, ELC
98C4414-0119	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, APAC
9804414-0118	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, LA
9804414-0116	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, AUST
9804414-0115	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, BEL
9804414-0114	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, FIN
9804414-0113	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, NOR
9804414-0112	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, DEN
9804414-0111	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, FR
9804414-0109	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, WE
9804414-0108	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, POR
9804414-0107	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, IT
9804414-0106	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, SW/GE
9804414-0105	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, SP
9804414-0104	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, FRE
9804414-0103	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, GER
9804414-0102	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, UK
9804414-0101	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SHV, DOM
9804414-0100	COMMON PARTS 9804414-1 THRU -19, 6030PACK
9804414-0019	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, APAC
9804414-0018	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, LA
9804414-0016	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, AUST
9804414-0015	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, BEL
9804414-0014	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, FIN
9804414-0013	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, NOR
9804414-0012	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, DEN
9804414-0011	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, S/FR
9804414-0010	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, SWE
9804414-0009	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, WE
9804414-0008	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, POR
9804414-0007	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, IT
9804414-0006	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, S/G
9804414-0005	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, SP
9804414-0004	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, FR
9804414-0003	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, GER
9804414-0002	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, UK
9804414-0001	TM6030 PCK, P133, 1.35GB, 16MB, 12.1SAV, DOM

Figure B-2 TravelMate Model 6030 With Pack Assembly

Table B-3 Domestic TravelMate 6030 With Pack Parts Listing (TI Part No. 9804414-0001)

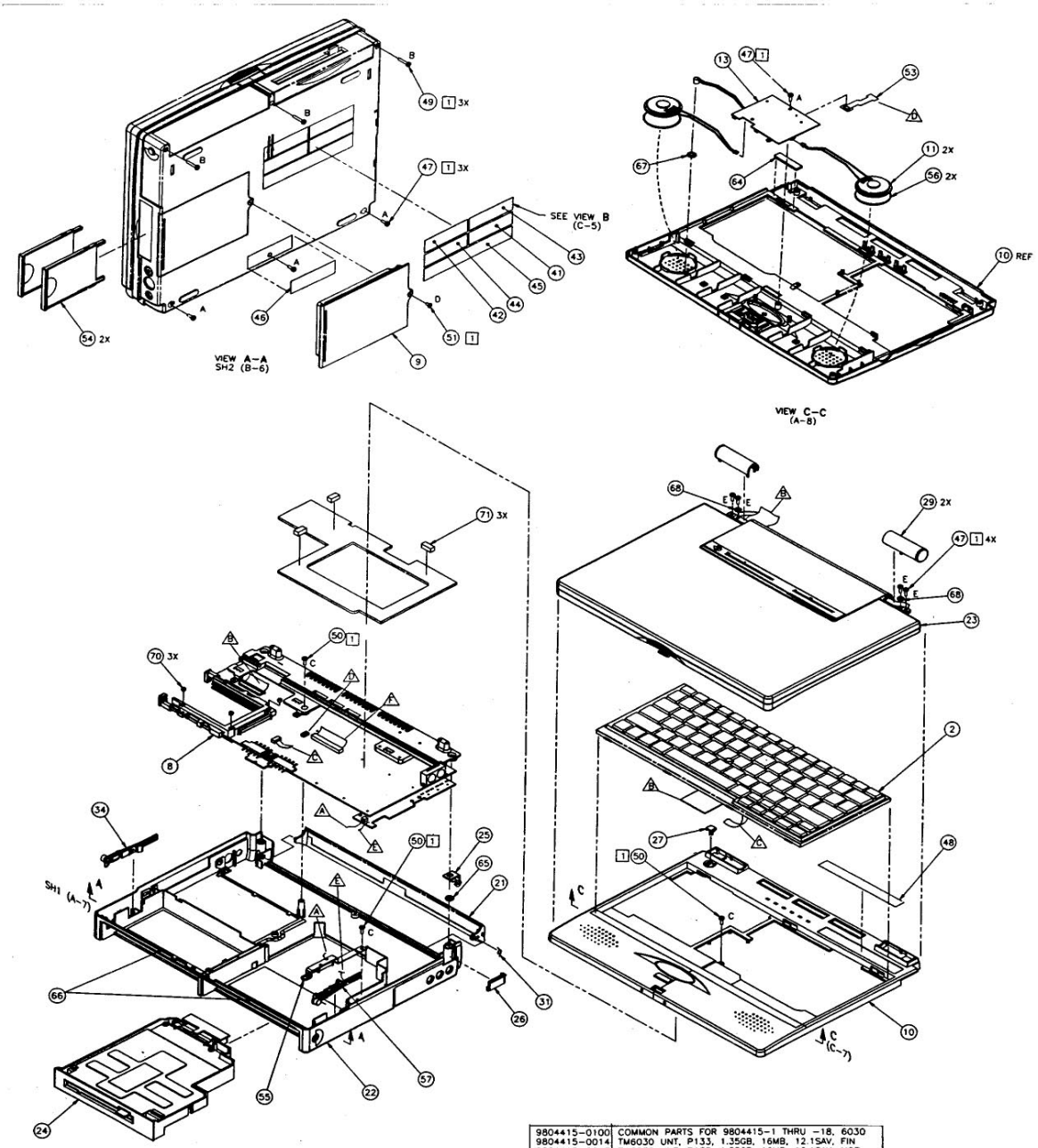
Item	Part No.	Quantity	Description
1	9804414-0100	1	COMMON PARTS FOR 9804414, 6030 PACK
2	9804415-0001	1	TM6030 UNT,P133,1.35GB, 16MB,12.1 SAV,DOM
3	9804466-0001	1	ACCESSORY KIT, WIN95, TM6000,ENGLISH
40	9804503-0001	1	INATALLATION POSTER, DOMESTIC, TM6000

Note: The following is a listing of the common parts associated with Part No. 9804414-0100 (item 1 above).

Item	Part No.	Quantity	Description
10	2560764-0010	1	BAG,CLEAR,13.50W X 13.00L X .0015T
13	9804504-0001	1	PACK BOX, W/GRAPHICS, TM6000
14	2568053-0002	1	HANDLE, HD , 6 IN, BLACK, 45 LB CAPACITY
17	9786432-0001	1	SW LICENSE AGREEMENT, WIN95 DUAL LD
19	9804505-0001	1	OVERPACK BOX, TM6000
20	2581250-0003	2	EPP ENDCAPS,TM6000 SERIES

B.5.1 TravelMate 6030 Unit Assembly Parts Breakdown

Figure B-3 shows the major components that comprise the TravelMate 6030 Notebook Computer. The associated parts list is provided in Table B-4.



9804415–0100	COMMON PARTS FOR 9804415–1 THRU –18, 6030
9804415–0014	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, FIN
9804415–0013	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, NOR
9804415–0012	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, DEN
9804415–0011	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, SW/F
9804415–0010	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, SWE
9804415–0009	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, –KYBD
9804415–0008	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, POR
9804415–0007	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, IT
9804415–0006	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, SW/G
9804415–0005	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, SP
9804415–0004	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, FR
9804415–0003	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, GER
9804415–0002	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, UK
9804415–0001	TM6030 UNT, P133, 1.35GB, 16MB, 12.1SAV, DOM
PART NUMBER	DESCRIPTION

Figure B-3 TravelMate Model 6030 Unit Assembly

Table B-4 Domestic TravelMate 6030 Unit Assembly (TI Part No. 9804415-0001) Parts Listing

Item	Part No.	Quantity	Description
1	9804415-0100	1	COMMON PARTS FOR 9804415, 6030 UNIT
2	9804437-0001	1	KEYBOARD,BROTHER,W/POINTER,3MIL TRAV,DOM

Note: The following is a listing of the common parts associated with item 1 above.

Table B-4 Domestic TravelMate 6030 Unit Assembly Parts Listing (continued)

Item	Part No.	Quantity	Description
8	9804587-0005	1	HEATPLATE/PWB ASSY, 16MB, 133, E57, TM6000
9	9804435-0001	1	HARD DRIVE ASSY, 1.35GB, TM6000 (IBM)
10	9804543-0001	1	COVER ASSY,TM6000 SERIES
11	9804434-0001	2	SPEAKER ASSY,TM6000
13	9804420-0002	1	PWB ASSY,PICK BUTTON,2ND GEN.,TM6000
21	9804430-0001	1	DOOR,CONNECTOR,TM6000
22	9804553-0002	1	BASE ASSY,W/O MODEM/RJ11, TM6000
23	9804438-0001	1	LCD ASSY,12.1 SAMSUNG SVGA,TM6000
24	9804447-0001	1	FLOPPY DRIVE MODULE ASSY, ECLIPSE
25	9804515-0001	1	DOOR RELEASE BUTTON, TM6000
26	9804516-0001	1	WINDOW, IR, TM6000
27	9804517-0001	1	BUTTON, SUSPEND, TM6000
29	9804452-0001	2	COVER, HINGE, TM6000
31	9804454-0002	1	SPRING,TORSION, 4.167 TURNS, TM6000
34	9804457-0001	1	LATCH, MEDIA BAY RELEASE, ECLIPSE
46	9798834-0002	1	WARRANTY LABEL, FCC, TAMPER EVIDENT
47	2249135-0013	4	SCREW,MACHINE,PAN HEAD, 2-56 X .250, T8PATCH
48	9804535-0002	1	LABEL,NAMEPLATE,TM6030

Table B-4 Domestic TravelMate 6030 Unit Assembly Parts Listing (continued)

49	2249135-0004	3	SCREW,MACHINE,PAN HEAD,2-56 X 1.125, T8COM
50	2249135-0003	3	SCREW, MACHINE, PAN HEAD, 2-56 X .375,T8COM
51	2249136-0006	1	SCREW,MACH,FLAT HEAD,4-40 X .188,T8
53	9804584-0001	1	FLEX CABLE, PICK BUTTON BOARD, TM6000
54	9811454-0001	2	FILLER CARD, PCMCIA,TM6000
55	9811436-0001	1	SOLENOID LATCH BLOCKING ASSY,TM6000
56	9786294-0001	2	SPEAKER GRILL ASSY,TM5000 SERIES
57	9804523-0001	1	LATCH ASSY,MEDIA BAY,TM6000
59	9811489-0001	1	LABEL, MEMORY INSTALLATION, TM6000
60	9811476-0001	1	SUPPORT, KEYBOARD, TM6000 Series
62	2248836-0002	1	CORE, FERRITE, ONE PIECE, FPC, 31 x 12 x 3
63	2249135-0001	1	SCREW, MACHINE, PAN HEAD, 2-56 x .125, T8COM
64	9811517-0001	1	SHIELD, KEYBOARD. TM6000
65	2221868-0016	1	WASHER, FLAT, MYLAR, .260ID, .500 OD, .010 THICK
66	9804426-0001	2	INSULATOR, MODULE BAY, TM6000
67	2607793-0003	1	TAPE, FOAM, URETHANE, BLACK, .438 DIA
68	2249191-0001	2	WASHER, FLAT, NON-METALIC, #2

B.6 TravelMate 6030 Logic Diagrams

Logic diagrams for the TravelMate 6030 Series Noebooks are provided in the following appendices:

- Top Board Logic Diagram (Part No.9811427) - Appendix E
- Bottom Board Logic Diagram (Part No. 9804410) - Appendix F
- Pick Button Board Logic Diagram (Part No.9804422) - Appendix G

C
Model 6050 Maintenance Data

C.1 Introduction

This section contains model-dependent maintenance data for the TravelMate Model 6050 Notebook Computer.

C.2 Model 6050 Features Summary

The TravelMate Model 6050 has a 12.1-inch Super VGA Display, comes standard with a 1.35 GB Hard Drive and is powered by a 150 MHz Pentium processor. All other features are common for the TravelMate 6000 Series as described in Sections 1 through 6 of this manual.

Detailed specifications for the TravelMate 6050 are provided in Table C-1.

Table C-1 TravelMate Model 6050 Notebook Computer Specifications

Hardware/ Software Function	Specifications
Processor	Intel Pentium **Bus Type**: VL Local Bus; bridge to PCI Bus
Memory	16 MB DRAM, 60-ns, page-interleaved, expandable to 72 MB 2 MB FLASH ROM
Internal Cache	16 KB
L2 Cache	256 KB, Level 2
LCD Type	12.1-inch (Diagonal) TFT, Color SVGA
Primary Hard Disk Drive	**Disk Storage Capacity**: 1.35 GB **Disk size**: 12.5 mm **Average access time**: 12 ms or less **Throughput:** 11+ Million I/O's per second
CD-ROM Drive	6X, Mode 2
Floppy Disk Drive	1.44 MB, 3.5-inch floppy disk drive; installed in Modular Bay or connected externally to the Parallel Port
Internal Keyboard	3-mm Key movemen Integrated numeric keypad Inverted T Cursor Control Key Layout

Table C-1 TravelMate Model 6050 Notebook Computer Specifications

Hardware/ Software Function	Specifications
Pointing Device	The Point (embedded in keyboard; select buttons on keyboard palm rest)
Video Subsystem	**Controller:** Cirrus GD7548 Controller **LCD Aspect Ratio**: 1-1 **Graphic Accelerator:** 64-bit BLT **Emulations:** VGA **Video Memory (EDO)**: 2 MB **Video Bus**: 32 bits **Simultaneous LCD and external VGA display** **LCD Resolution:** 640 x 480 pixels bit-mapped at 16.77 million colors; 600 x 800 at 65K colors. **LCD Characters/Line**: 80 **LCD Lines/Screen:** 25
External CRT Monitor Interface	**Connector Type**:15-Pin, female, D-type connector **Monitors Supported**: 640 x 480 with 16.7 million colors on CRT 800 x 600 with 65K colors on CRT 1024 x 768 with up to 256 colors on CRT 1280 x 1024 with 256 colors on CRT (interlaced)
Parallel Port	EPP/ECP Bidirectional; Parallel Printer Port: 25-Pin, DB-25 Connector Also supports external Floppy Disk Drive with appropriate cable (refer to Figure 2-7 in Section 2 of this manual)
Serial Port	**RS-232-D Serial Port**: 9-Pin, male, sub-D-type connector **Method**: EIA RS-232-D **Type**: synchronous transmission **Bits per second:** 110, 200, 300, 600, 1200, 2400, 4800, 9600, 19200 **Parity: Transmit**: odd, even, mark, space **Receive:** data check: odd, even **Line control**: READY/BUSY, DC1/DC3 **Data word**: 7- or 8-bit
Serial I/R Port	115K baud
PS/2 Port	Supports either external mouse or keyboard (or both with Y-type cable)

Table C-1 TravelMate Model 6050 Notebook Computer Specifications

Hardware/ Software Function	Specifications
Audio Jacks	**Line in:** 3.5-mm bayonet connector; input Z of 10K ohms; 3.5 V_{RMS} maximum input. **Speaker Out**: 3.5-mm bayonet connection to drive external amplified or headphones; 400 mW output into 8 ohm speaker/ headphones. **Mic In:** 3.5-mm bayonet connector to connect an external condenser-type mic to the notebook; 10 to 100 mW input level.
Audio Features	ESS Chip set; Sound Blaster Pro 16 compatible Built-in power amplifier with volume control 3-D Expansion (Spatializer)
Battery Pack **Recharge Time**	40 Watt-Hour, 8-cell, Li-Ion intelligent battery with built-in charge indicator circuitry and display 4 Hours with unit off; 4.5 to 10 hours with unit on
Power	**Input Voltage:** 100 to 250 VAC **Input Current:** 0.7 to 0.4 Amps **Input Frequency**: 50 to 60 Hz **Wattage:** 35 Watts
AC Adapter	**Output Voltage**: +9.0 VDC to +18VDC
Card Bus Interface	Two Type I/II PCMCIA Cards or one Type III Card
Physical Characteristics	**Size:** 12 inches x 9 inches x 2 inches **Weight**: 5.92 pounds (including battery pack and Floppy Disk Drive) (model dependent)*
Environmental Operating	**Temperature**: 50 degrees F to 95 degrees F (10 degrees C to 35 degrees C) **Relative humidity**: 20 to 80 percent, noncondensing **Shock:** 6G applied in 6-orientations (pos. and neg. X, Y and Z axes) **Vibration**: Sinusoidal; 5 to 20 Hz limited to 0.0244-inch (0.6 mm) peak-to-peak maximum displacement; 0.5g, 20 to 400 Hz **Altitude:** 8200 ft (2500 m) maximum
Environmental Storage	**Temperature**: -4 degrees F to 140 degrees F (-20 degrees C to +60 degrees C) **Relative humidity**: 10 to 90 percent, noncondensing 2500 ft (2.2 C per 305 m over 762 m) **Shock:** 60G pulse applied in 6-orientations (pos. and neg. X, Y and Z axes) **Vibration**: Sinusoidal; 5 to 20 Hz limited to 0.244-inch (0.6 mm) peak-to-peak maximum displacement; 5.0g, 20 to 400 Hz

C.3 FRU Removal/Replacement

Refer to Section 6 for field service-level removal/replacement procedures for all TravelMate 6000 Series Notebook Computers.

C.4 TravelMate 6050 FRUs

A listing of Field-Replaceable Units (FRUs) for the TravelMate Model 6050 Notebook Computer is provided in Table C-2.

Table C-2 Top Cover Assembly Field-Replaceable Units (FRUs)

FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
Display Assembly, TFT 12.1-inch SVGA SAMS	6.6.6	9804438-8001
LCD Panel, TFT 12.1- inch SVGA	6.6.6	9804467-8001
Inverter Board, TFT 12.1-inch	6.6.12	9804480-8001
Display Cable , TFT 12.1-inch SAMS	6.6.6	9804445-0001
Ferrite for Display Cable	6.6.6	2248836-0002
Bezel, TFT 12.1-inch SAMS	6.6.11	9804448-8001
LCD Cover, TFT, SVGA w/insulator	6.6.11	9804425-8001
LCD Latch	Ref	9804451-0001
Foam for LCD Latch	Ref	9804459-0001

C.4.1 System Base Assembly

As shown in Figure C-1, the System Base Assembly houses a variety of field-replaceable subassemblies and components. The associated FRU removal/replacement paragraph references to Section 6 and the associated TI part numbers for the various FRUs are provided in Table C-3.

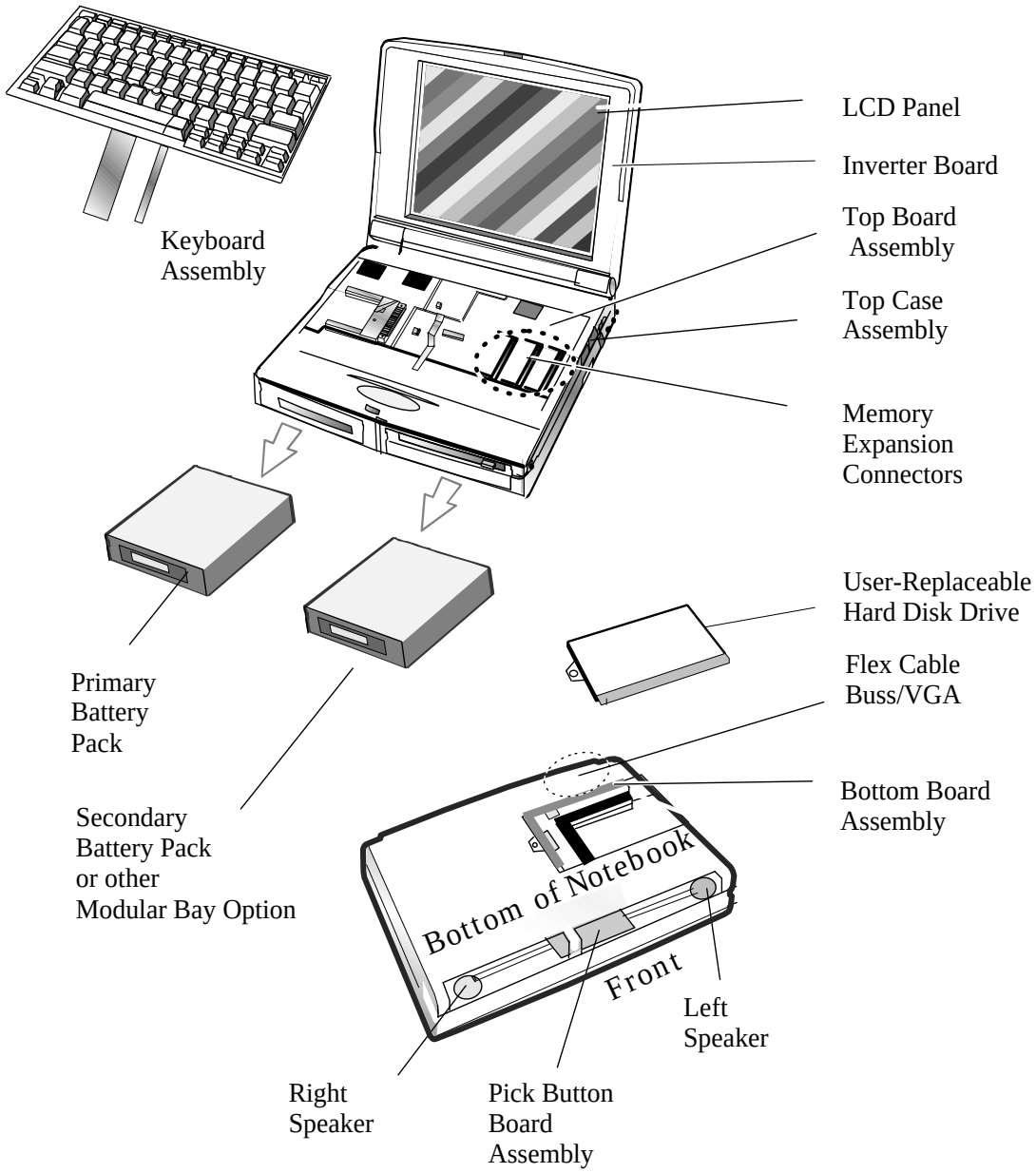


Figure C-1 TravelMate 6050 Base Assembly FRUs

Table C-3 TravelMate 6050 Base Assembly FRUs

Base Assembly FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
PCB Assemblies		
Top PCB Assembly, 150 E57 w/Heat sink	6.6.9	9811425-8003
Bottom PCB Assembly, E57	6.6.9	9804408-8002
Flex Cable, Bus/VGA	6.6.10	9804585-8001
Pick Button Assembly	6.6.8	9804420-8002
Keyboard Assembly	6.6.4	9804437-0001
Cables		
HDD Cable, 12.5 mm	6.6.3	9804544-0001
HDD Cable, 17 mm	6.6.3	9804548-0001
HDD Cable, Avatar	6.6.2	9804586-0001
FDD Cable	6.6.2	9804545-0001
CD-ROM Cable, 6X KME	6.6.2	9804546-0001
Pick Button Cable	6.6.8	9804584-0001
Peripherals		
Microfloppy Drive	6.6.2	9786185-8003
HDD, 1.35 GB, 12.5 mm	6.6.3	9804569-8002
HDD, 2.1 GB	6.6.2	9786285-8003
HDD, Avatar	6.6.2	9804472-8001
CD-ROM Drive, 6X KME	6.6.2	9804470-8002
Covers, Doors, Buttons		
Top Cover Assembly	6.6.7	9804543-8001
Base Assembly (not for sale domestically)	Ref	9804553-8002
Rear Door	Ref	9804430-0001
HDD Door	6.6.3	9804491-0001
HDD Door Insulator	6.6.3	9804522-0003
IR Lens	Ref	9804516-0001

Table C-3 TravelMate 6050 Base Assembly FRUs

Base Assembly FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
Speaker Assembly	Ref	9804434-8001
Magnet, Close Cover Detect	Ref	2249047-0001
Warranty Label	Ref	9798834-0002
Logo Label	Ref	9804558-0001
Hinge Cover	Ref	9804452-0001
Nameplate Label, TM6050	Ref	9804535-0003
Spring Torsion, Rear Door	6.6.13	9804454-0002
Keyboard Support Stiffener	6.6.4	9811476-0001
Mask, Pick Button Board	Ref	9804481-0001

C.5 Illustrated Parts Breakdown

Figure C-2 shows the TravelMate 6050 with pack assembly (Texas Instruments Part No. 9804484). The associated parts listing is provided in Table C-4.

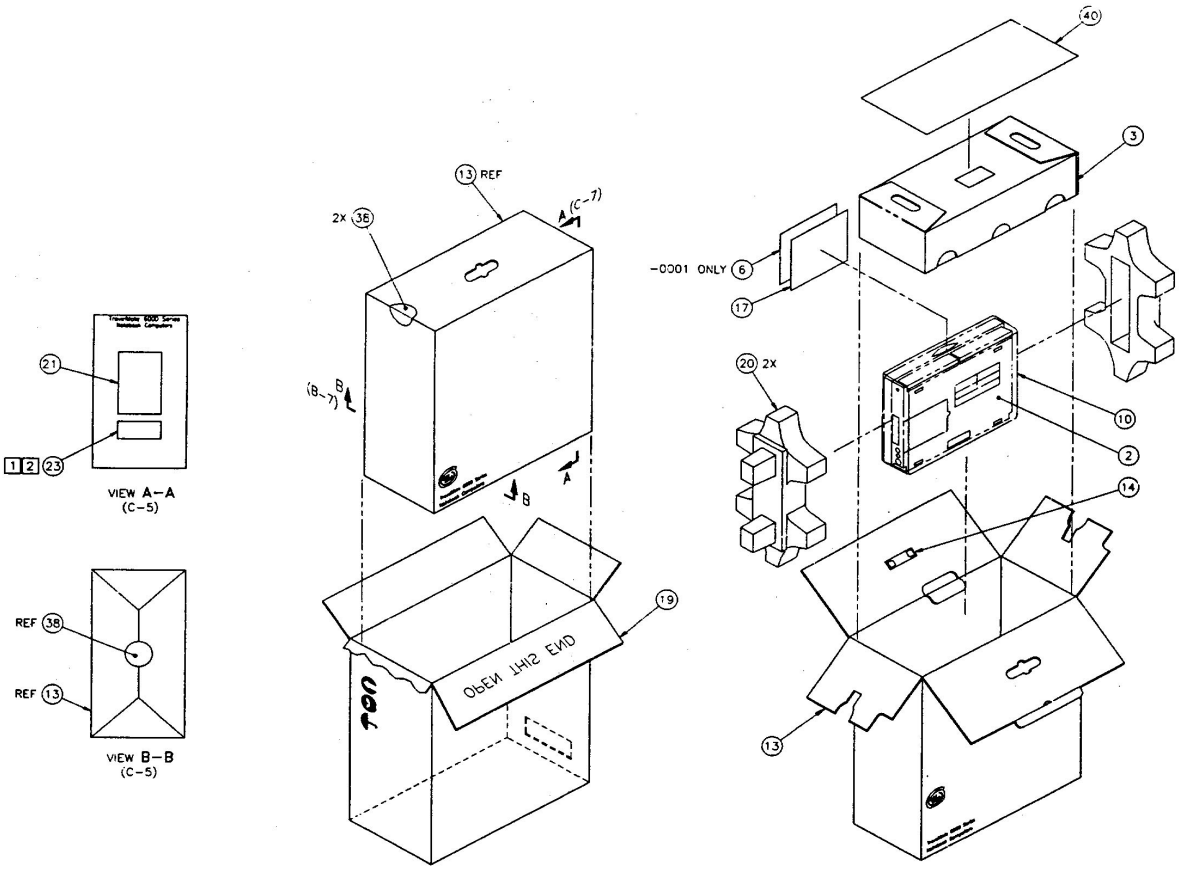


Figure C-2 TravelMate Model 6050 with Pack Assembly

Table C-4 Domestic TravelMate 6050 with Pack (P/N 9804483-1) Parts Listing

Item	Part No.	Quantity	Description
1	9804483-0100	1	COMMON PARTS FOR 9804483, 6050 PACK
2	9804484-0001	1	TM6050 UNT,P150,1.35GB, 16MB,12.1 SAV,DOM
3	9804466-0001	1	ACCESSORY KIT, WIN95, TM6000,ENGLISH
40	9804503-0001	1	INSTALLATION POSTER, DOMESTIC, TM6000

Note: The following is a listing of the common parts associated with Part No. 9804483-0100 (item 1 above).

Item	Part No.	Quantity	Description
10	2560764-0010	1	BAG,CLEAR,13.50W X 13.00L X .0015T
13	9804504-0001	1	PACK BOX, W/GRAPHICS, TM6000
14	2568053-0002	1	HANDLE, HD, 6 IN, BLACK, 45 LB CAPACITY
17	9786432-0001	1	SW LICENSE AGREEMENT, WIN95 DUAL LD
19	9804505-0001	1	OVERPACK BOX, TM6000
20	2581250-0003	2	EPP ENDCAPS,TM6000 SERIES

C.5.1 TravelMate 6050 Unit Assembly Parts Breakdown

Figure C-3 shows the major components that comprise the TravelMate 6050 Notebook Computer. The associated parts list is provided in Table C-5.

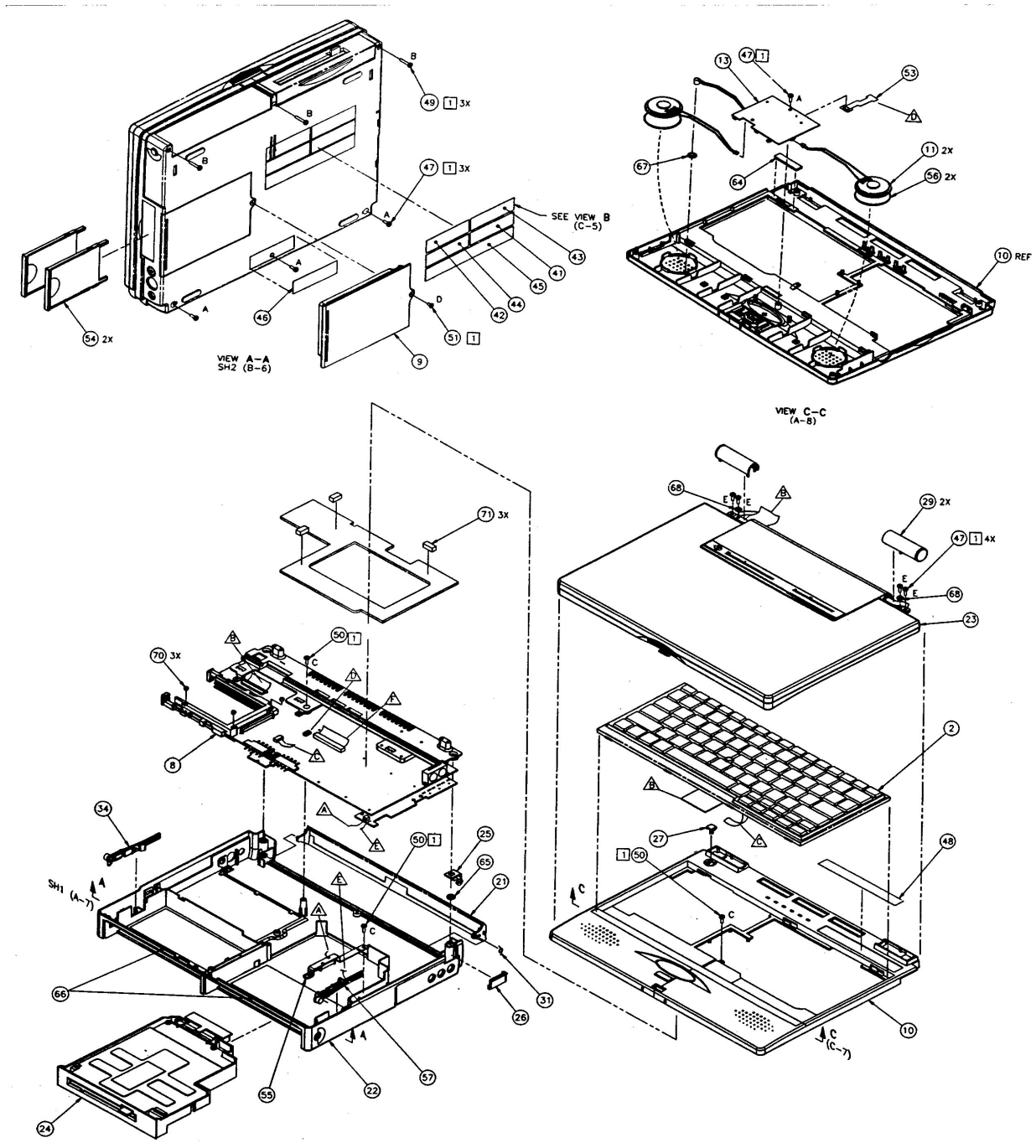


Figure C-3 TravelMate Model 6050 Unit Assembly (P/N 9804484)

Table C-4 Domestic TravelMate 6050 Unit Assembly (P/N 9804484-0001) Parts Listing

Item	Part No.	Quantity	Description
1	9804484-0100	1	COMMON PARTS FOR 9804484, 6050 UNIT
2	9804437-0001	1	KEYBOARD,BROTHER,W/POINTER,3MIL TRAV,DOM

Note: The following is a listing of the common parts associated with item 1 (P/N 9804484-0100) above.

Table C-4 Domestic TravelMate 6050 Unit Assembly (P/N 9804484-0001) Parts Listing (continued)

Item	Part No.	Quantity	Description
8	9804587-0001	1	HEATPLATE/PWB ASSY, 16MB, 150, E57, TM6000
9	9804435-0001	1	HARD DRIVE ASSY, 1.35GB, TM6000 (IBM)
10	9804543-0001	1	COVER ASSY,TM6000 SERIES
11	9804434-0001	2	SPEAKER ASSY,TM6000
13	9804420-0002	1	PWB ASSY,PICK BUTTON,2ND GEN.,TM6000
21	9804430-0001	1	DOOR,CONNECTOR,TM6000
22	9804553-0002	1	BASE ASSY,W/O MODEM/RJ11, TM6000
23	9804438-0001	1	LCD ASSY,12.1 SAMSUNG SVGA,TM6000
24	9804447-0001	1	FLOPPY DRIVE MODULE ASSY, ECLIPSE
25	9804515-0001	1	DOOR RELEASE BUTTON, TM6000
26	9804516-0001	1	WINDOW, IR, TM6000
27	9804517-0001	1	BUTTON, SUSPEND, TM6000
29	9804452-0001	2	COVER, HINGE, TM6000
31	9804454-0002	1	SPRING,TORSION, 4.167 TURNS, TM6000
34	9804457-0001	1	LATCH, MEDIA BAY RELEASE, ECLIPSE
46	9798834-0002	1	WARRANTY LABEL, FCC, TAMPER EVIDENT
47	2249135-0013	4	SCREW,MACHINE,PAN HEAD, 2-56 X .250, T8PATCH
48	9804535-0003	1	LABEL,NAMEPLATE,TM6050

Table C-4 Domestic TravelMate 6050 Unit Assembly (P/N 9804484-0001) Parts Listing (continued)

49	2249135-0004	3	SCREW,MACHINE,PAN HEAD,2-56 X 1.125, T8COM
50	2249135-0003	3	SCREW, MACHINE, PAN HEAD, 2-56 X .375, T8COM
51	2249136-0006	1	SCREW,MACH,FLAT HEAD,4-40 X .188,T8
53	9804584-0001	1	FLEX CABLE, PICK BUTTON BOARD, TM6000
54	9811454-0001	2	FILLER CARD, PCMCIA,TM6000
55	9811436-0001	1	SOLENOID LATCH BLOCKING ASSY,TM6000
56	9786294-0001	2	SPEAKER GRILL ASSY,TM6000 SERIES
57	9804523-0001	1	LATCH ASSY,MEDIA BAY,TM6000
59	9811489-0001	1	LABEL, MEMORY INSTALLATION, TM6000
60	9811476-0001	1	SUPPORT, KEYBOARD, TM6000 Series
62	2248836-0002	1	CORE, FERRITE, ONE PIECE, FPC, 31 x 12 x 3
63	2249135-0001	1	SCREW, MACHINE, PAN HEAD, 2-56 x .125, T8COM
64	9811517-0001	1	SHIELD, KEYBOARD. TM6000
65	2221868-0016	1	WASHER, FLAT, MYLAR, .260ID, .500 OD, .010 THICK
66	9804426-0001	2	INSULATOR, MODULE BAY, TM6000
67	2607793-0003	1	TAPE, FOAM, URETHANE, BLACK, .438 DIA
68	2249191-0001	2	WASHER, FLAT, NON-METALIC, #2
70	9804520-0001	3	BUMPER, LCD DISPLAY
71	9813357-0001	3	KEYBOARD, SUPPORT BUMPER
72	9804481-0001	1	MASK, PICK BUTTON BOARD
74	9804477-0002	2	SHIM, MEDIA BAY
75	2249135-0002	4	SCREW, MACHINE, PAN HEAD, 2-56 X .250, T8COM
76	9811524-0002	1	SUPPORT, FOAM
78	9813380-0001	1	WIRE HARNESS, MODIFIED, DISPLAY CABLE
79	9804482-0001	1	CONTACT, MEDIA BAY SENSOR

C.6 TravelMate 6050 Logic Diagrams

Logic diagrams for the TravelMate 6050 Notebook series are provided in the following appendices:

- Top Board Logic Diagram (Part No.9811427) - Appendix E
- Bottom Board Logic Diagram (Part No. 9804410) - Appendix F
- Pick Button Board Logic Diagram (Part No.9804422) - Appendix G

D
Model 6100 Maintenance Data

D.1 Introduction

This section contains model-dependent maintenance data for the TravelMate Model 6160 Series Notebook Computer. For installation, operation, troubleshooting and maintenance data common to the TravelMate 6000/6100 families, refer to Sections 1 through 6 of this manual.

D.2 Model 6160 Features Summary

The TravelMate Model 6160 Series is equipped with some of the existing TravelMate 6000 features (described in detail in Section 1 and listed in Table D-1) plus a variety of powerful new features described in this appendix.

D.2.1 Powerful Processor/Memory/Multimedia Subsystem

The TravelMate 6160 Series Notebooks are equipped with a 166 MHz Pentium Processor with MMX technology, 32 MB of EDO RAM (expandable to 96 MB), and an expanded 512 KB L2 cache. The new MMX technology will permit dramatic improvements in multimedia performance for such applications as:

- ♦ Video conferencing
- ♦ Multimedia presentations
- ♦ Internet/Intranet applications such as Web browsing and publishing
- ♦ Image and video processing

D.2.2 Video Features

All members of the 6160 Series incude the following video features:

- ♦ 12.1-inch display with a NeoMagic 128-bit Graphics Controller (Super VGA display)
- ♦ Backlit Inverters
- ♦ 32-bit BitBLT Graphic Accelerator
- ♦ MPEG1 decode available through Zoomed Video Port (bottom PC card Slot)
- ♦ PCI multimedia video controller and PCI local bus with burst mode support

D.2.3 Integrated Modem Features

Some models also incude a built-in 33.6 Kbps Modem with digital simultaneous voice/ data and telephony capabilities (DSVD). The integrated modem includes advanced telephony features such as:

- Caller I.D.
- Distinctive ring
- Answering machine
- Full-duplex speakerphone that allows users to talk with and listen to the person on the other end without interrupting the normal flow of conversation.
- X2 technology that allows data reception at rates up to 56 Kbps from many Internet and corporate servers using a compatible modem.

D.2.4 Higher Capacity HDD

The TravelMate 6160 Series implements a 2.1 GB, 2.5-inch, IDE interface Hard Disk Drive, user-replaceable. Average access time for this drive is 16 milliseconds or less and can transfer data in or out of a 120 KB budder up to a 5.5 MB per second rate across an ISA interface. The recording method is 2 of 7 RLL code.

D.2.5 Modular Bay Features

The 6160 Series contains a TravelMate 6000 style modular bay that can accept ***one*** of the following media bay devices:

- 1.44 MB Floppy Drive (comes Standard with notebook)
- 10X CD-ROM Drive (comes Standard with notebook)
- Secondary Lithium-Ion Battery (Option)
- High Capacity Diskette Drive (Option)
- Cellular Phone Battery Charger (Option)
- Personal Organizer Module (Option)
- Weight-Reduction Module (Option)
- Second HDD (2.1 GB) (Option)

The 6160 Model with Windows 95 allows user's to hot swap devices in the Modular Bay without interruption to the operating system. Models using Windows for Workgroups require rebooting to identify the newly inserted device (cold swapping).

D.2.6 External Ports

The TravelMate 6160 Series Notebooks contain the following external ports:

- ♦ PS/2 style mouse/keyboard - install either an external mouse or keyboard
- ♦ DB-25 Parellel (ECP/EPP)- supports external parallel device such as a parallel printer or external Floppy Disk Drive (permits installing a CD-ROM Drive in the Modular Bay and connecting a Floppy Disk Drive simultaneously.
- ♦ DB-9 Serial 16c550 UART - supports all standard serial devices
- ♦ DB-15 Analog VGA - permits attaching an external monitor
- ♦ Line In/Out and Microphone In audio jacks for multimedia applications. The audio jacks are 3.5-mm Bayonet sockets. The mincrophone input supports an Electret Condenser Microphone with 10 to 100 milliwatts input level.
- ♦ Expansion Bus that permits attaching a TravelMate 5000 Series Docking System - pin-compatible with the Expansion Bus on the TravelMate 5000 Series Notebook.

D.2.7 Expansion Features

- ♦ Two stacked 16-bit PC Card slots - supports one Type III or two Type I/II option cards. However, only the lower PC slot is enabled for zoom video devices (steers zoom video PC-Card signals directly to the notebook's internal video controller).
- ♦ Modular Bay - allows any one of up to 9 devices to be installed in Modular Bay as described in Paragraph E.2.4
- ♦ Three standard 144-pin so-DIMM connectors for memory expansion to 96 MB maximums (each Memory Module can have 16 or 32 MB of so-DIMM memory)
- ♦ Docking System Option- supports all TravelMate 5000 Docking Systems

D.3 TravelMate 6160 Series Specifications

The TravelMate 6160 Series specifications are provided in Table E-1).

Table D-1 TravelMate Model 6160 Notebook Computer Specifications

Hardware/ Software Function	Specifications
Processor	Intel Pentium, 166 MHz with MMX Technology **Bus Type**: VL Local Bus; bridge to PCI Bus **Core Logic**: ACC Micro ACC2057- integrates the DRAM controller, PCI Bus Interface, ISA Bus Interface, Power Management and L2 Cache Control.
Memory	32 MB DRAM, 60-ns, page-interleaved, expandable to 96 MB 2 MB FLASH ROM
Internal Cache	16 KB
L2 Cache	512 KB
LCD Type	12.1-inch (Diagonal) TFT, Color SVGA
Modular Bay	Holds one peripheral device (10x CD-ROM Drive or 1.44 MB Floppy Drive included) or one of the following options: 2.1 GB Secondary Hard Disk Drive, Secondary Lithium-Ion Battery, 210 MB High Capacity Diskette Drive with removable cartridge, Weight-Reduction Module, Cellular Phone Battery Charger, or Personal Organizer Module Pack)
Primary Hard Disk Drive	**Disk Storage Capacity**: 2.1 GB **Disk size**:12.5 mm **Average access time**: 12 ms or less **Throughput:** 5.5 MB per second
CD-ROM Drive	10X; standard (installs in Media Bay)
Floppy Disk Drive	1.44 MB, 3.5-inch floppy disk drive; standard; installs in Modular Bay or connects externally to the Parallel Port
Internal Keyboard	3-mm Key movemen Integrated numeric keypad Inverted T Cursor Control Key Layout
Pointing Device	"The Point" - embedded in keyboard; select buttons on keyboard palm rest IBM TrackPoint II and ROM TI BIOS and Interface Microsoft IntelliPoint v1.0

Table D-1 TravelMate Model 6160 Notebook Computer Specifications

Hardware/ Software Function	Specifications
Video Subsystem	**Controller:** NeoMagic MagicGraph 128ZV Controller **LCD Aspect Ratio**: 1-1 **Graphic Accelerator:** 32-bit BLT **Emulations:** SVGA **Video Memory (EDO)**: Integrated allowing 128-bit path between video controller and video DRAM) **Video Bus**: 32 bits **Simultaneous LCD and external VGA display** **LCD Resolution:** 640 x 480 pixels bit-mapped at 16.77 million colors; 600 x 800 at 65K colors. **LCD Characters/Line**: 80 **LCD Lines/Screen:** 25
External CRT Monitor Interface	**Connector Type**:15-Pin, female, E-type connector **Monitors Supported**: 640 x 480 x 16 million colors, non-interlaced 800 x 600 x 65,000 colors (non-interlaced 1024 x 768 x 256 colors (non-interlaced) 1280 x 1024 x 256 colors (interlace)
Parallel Port	EPP/ECP Bidirectional; Parallel Printer Port: 25-Pin, DB-25 Connector Also supports external Floppy Disk Drive with appropriate cable (refer to Figure 2-7 in Section 2 of this manual)
Serial Port	**RS-232-D Serial Port**: 9-Pin, male, sub-E-type connector **Method**: EIA RS-232-D **Type**: synchronous transmission **Bits per second:** max. Baud rate: 19,200 **Parity: Transmit**: odd, even, mark, space **Receive:** data check: odd, even **Line control**: READY/BUSY, DC1/DC3 **Data word**: 7- or 8-bit
Serial I/R Port **Transfer Rate**	IRDA Compliant 115kb transfer rate at 1 meter
PS/2 Port	Supports either external mouse or keyboard (or both with Y-type cable)

Table D-1 TravelMate Model 6160 Notebook Computer Specifications

Hardware/ Software Function	Specifications
Audio Jacks	**Line in:** 3.5-mm bayonet connector; input Z of 10K ohms; 3.5 V_{RMS} maximum input. **Speaker Out**: 3.5-mm bayonet connection to drive external amplified or headphones; 400 mW output into 8 ohm speaker/ headphones. **Mic In:** 3.5-mm bayonet connector to connect an external condenser-type mic to the notebook; 10 to 100 mW input level.
Audio Features	ESS Spatializer sound, 16 bit Sound Blaster Pro 16 Compliant 3D Expansion Audio Rack applications software, internal microphone, internal stereo speakers for full surround sound, audio in/out, microphone in. Fn PgUp (Volume Up) Fn PgDn (Volume Down) Fn End (Mute On/Off)
Battery Pack **Capacity** **Type** **Recharge Time**	2 Amp/hr - 14.4v/Battery 28.8 watt/hr (per battery) Intelligent Li-ion Avg 2.5-4 hr usage*
Power	**Input Voltage:** 100 - 240 Vac Auto-sense **Input Current:** 0.7 to 0.4 Amps **Input Frequency**: 50 to 60 Hz **Wattage:** 36 Watts maximum
AC Adapter **(Same as TravelMate 5000 Adapter)**	**Output Voltage**: 13v at 2.77A
Card Bus Interface	TI 1130 Controller 1 x PCMCIA type III slot 2 x 68 pin connectors 2 x Type II or Type I 1 Zoom Video in bottom Slot

Table D-1 TravelMate Model 6160 Notebook Computer Specifications

Hardware/ Software Function	Specifications
Software	Windows 95 and Windows for Workgroups
Physical Characteristics	**Size:** 12 inches x 9 inches x 2 inches **Weight**: 5.92 pounds (including battery pack and Floppy Disk Drive) (model dependent)*
Environmental Operating	**Temperature**: 50 degrees F to 95 degrees F (10 degrees C to 35 degrees C) **Relative humidity**: 20 to 80 percent, noncondensing **Shock:** 6G applied in 6-orientations (pos. and neg. X, Y and Z axes) **Vibration**: Sinusoidal; 5 to 20 Hz limited to 0.0244-inch (0.6 mm) peak-to-peak maximum displacement; 0.5g, 20 to 400 Hz **Altitude:** 8200 ft (2500 m) maximum
Environmental Storage	**Temperature**: -4 degrees F to 140 degrees F (-20 degrees C to +60 degrees C) **Relative humidity**: 10 to 90 percent, noncondensing 2500 ft (2.2 C per 305 m over 762 m) **Shock:** 60G pulse applied in 6-orientations (pos. and neg. X, Y and Z axes) **Vibration**: Sinusoidal; 5 to 20 Hz limited to 0.244-inch (0.6 mm) peak-to-peak maximum displacement; 5.0g, 20 to 400 Hz

D.4 FRU Removal/Replacement

FRU removal/replacement procedures for the TravelMate 6160 Series Notebooks is identical to that of the TravelMate 6000 Series (refer to Section 6 for field service-level removal/replacement procedures for all TravelMate 6000/6100 Series Notebook Computers).

D.5 TravelMate 6160 FRU Listing

A listing of Field-Replaceable Units (FRUs) for the TravelMate Model 6160 Notebook Computer is provided in Tables D-2 and D-3.

Table D-2 Model 6160 Top Cover Assembly FielE-Replaceable Units (FRUs)

FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
Display Assembly, TFT 12.1-inch SVGA SAMS	6.6.6	9804438-8009
LCD Panel, TFT 12.1- inch SVGA	6.6.6	9804467-0001
Inverter Board, TFT 12.1-inch	6.6.12	9804480-8001
Display Cable, TFT 12.1-inch SAMS	6.6.6	9813378-0002
Ferrite for Display Cable	6.6.6	2248836-0002
Bezel, TFT 12.1-inch SAMS	6.6.11	9804448-8001
LCD Cover, TFT, SVGA w/insulator	6.6.11	9804425-0004
LCD Latch	Ref	9804451-0001
Foam for LCD Latch	Ref	9804459-0001
Logo Label (on LCD Cover)	Ref	9804558-0001

D.5.1 System Base Assembly

As shown in Figure D-1, the System Base Assembly houses a variety of field-replaceable subassemblies and components. The associated FRU removal/replacement paragraph references to Section 6 and the associated TI part numbers for the various FRUs are provided in Table D-3.

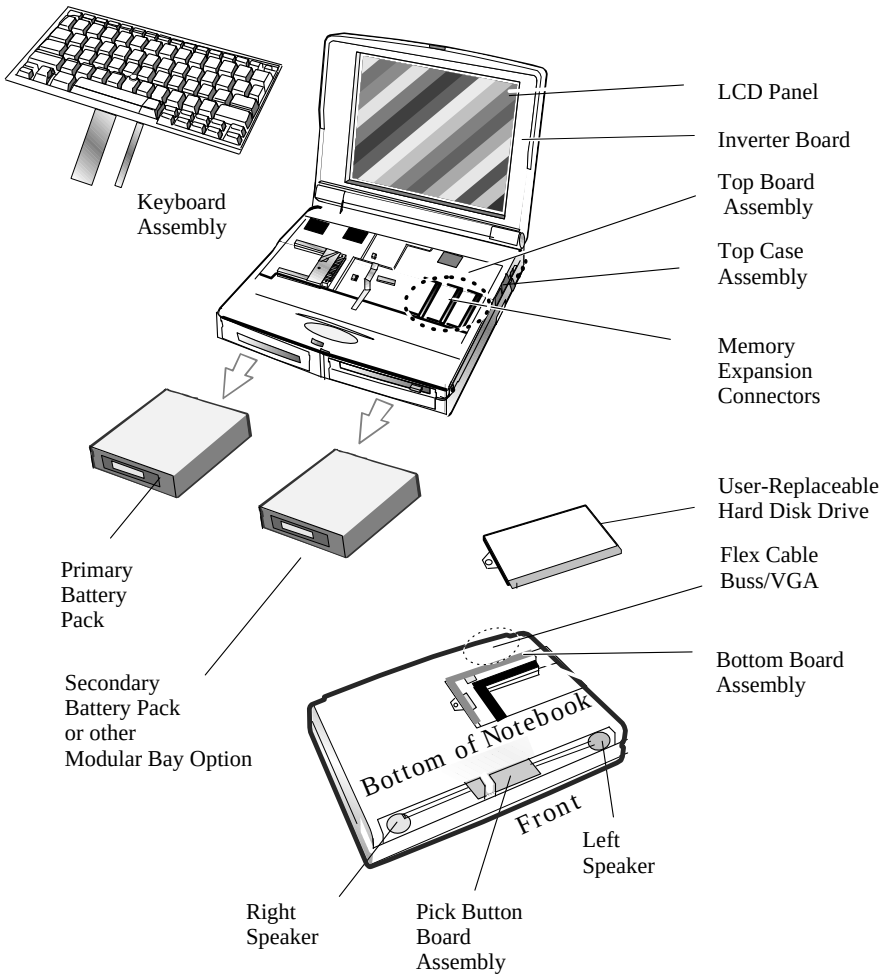


Figure D-1 TravelMate 6160 Base Assembly FRUs

Table D-2 TravelMate 6160 Base Assembly FRUs

Base Assembly FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
PCB Assemblies		
Top PCB Assembly, E61	6.6.9	9813372-8002
Bottom PCB Assembly	6.6.9	9804508-8001
Flex Cable, Bus/VGA	6.6.10	9804585-8001
Pick Button Assembly	6.6.8	9804420-8002
Keyboard Assembly	6.6.4	9804437-0001
Internal DAA Assembly	Ref	9804539-8001
Cables		
HDD Cable, 12.5 mm	6.6.3	9804544-0001
HDD Cable, Avatar	6.6.2	9804586-0001
FDD Cable	6.6.2	9804545-0002
CD-ROM Cable, 6X KME	6.6.2	9804546-0001
Pick Button Cable	6.6.8	9804584-0001
Peripherals		
Microfloppy Drive	6.6.2	9786185-0001
HDD, 2.0 GB, 12.5 mm	6.6.3	9804569-0003
CD-ROM Drive, 10X KME	6.6.2	9804550-0002
Covers, Doors, Buttons		
Top Cover Assembly w/Speaker and Pick Board	6.6.7	9804543-8001
Base Assembly (not for sale domestically)	Ref	9804553-8003
Rear Door	Ref	9804430-0001
HDD Door	6.6.3	9804491-0001
HDD Door Insulator	6.6.3	9798846-0002
IR Lens	Ref	9804516-0001
Speaker Assembly	Ref	9804434-8001
Magnet, Close Cover Detect	Ref	2249047-0001

Table D-2 TravelMate 6160 Base Assembly FRUs

Base Assembly FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
Warranty Label	Ref	9798834-0002
Logo Label	Ref	9804558-0001
Hinge Cover	Ref	9804452-0003
Nameplate Label, TM6160	Ref	9804535-0008
Spring Torsion, Rear Door	6.6.13	9804454-0002
Keyboard Support Stiffener	6.6.4	9811476-0001
Mask, Pick Button Board	Ref	9804481-0001

Table D-3 Customer-Replaceable Units (CRUs).

Base Assembly FRU Description	Assembly/ Disassembly Paragraph	TI Part No.
AC Adapter Kit		9811459-0001
Spare Battery Kit, Li-Ion		9811457-0001
HDD, 2.1GB Module W/ Pack		9811478-0001
AVATAR HDD Module (210MB) W/ Pack		9811479-0002
FDD Module W/ Pack		9804447-8001
CD ROM (6X) Module W/ Pack		9811477-0001
28.8K Speaker Phone Replacement Kit		2249163-8003
10X CD Drive Module Replacement Kit		9811477-8002
Other		
Bumper (LCD)		9804520-0001
PCMCIA Slot Blanks		9811454-0001
Weight Reduction Module		9811464-0001
Expansion memory Modules		
8 MB RAM Module Kit	2.3.1	9811456-0001
16 MB RAM Module Kit	2.3.1	9811456-0002
32 MB RAM Module Kit	2.3.1	9811456-0003

D.6 Factory-Level Illustrated Parts Breakdown

Figure D-2 shows the TravelMate 6160 with pack accessories. The associated parts listing is provided in Table D-4.

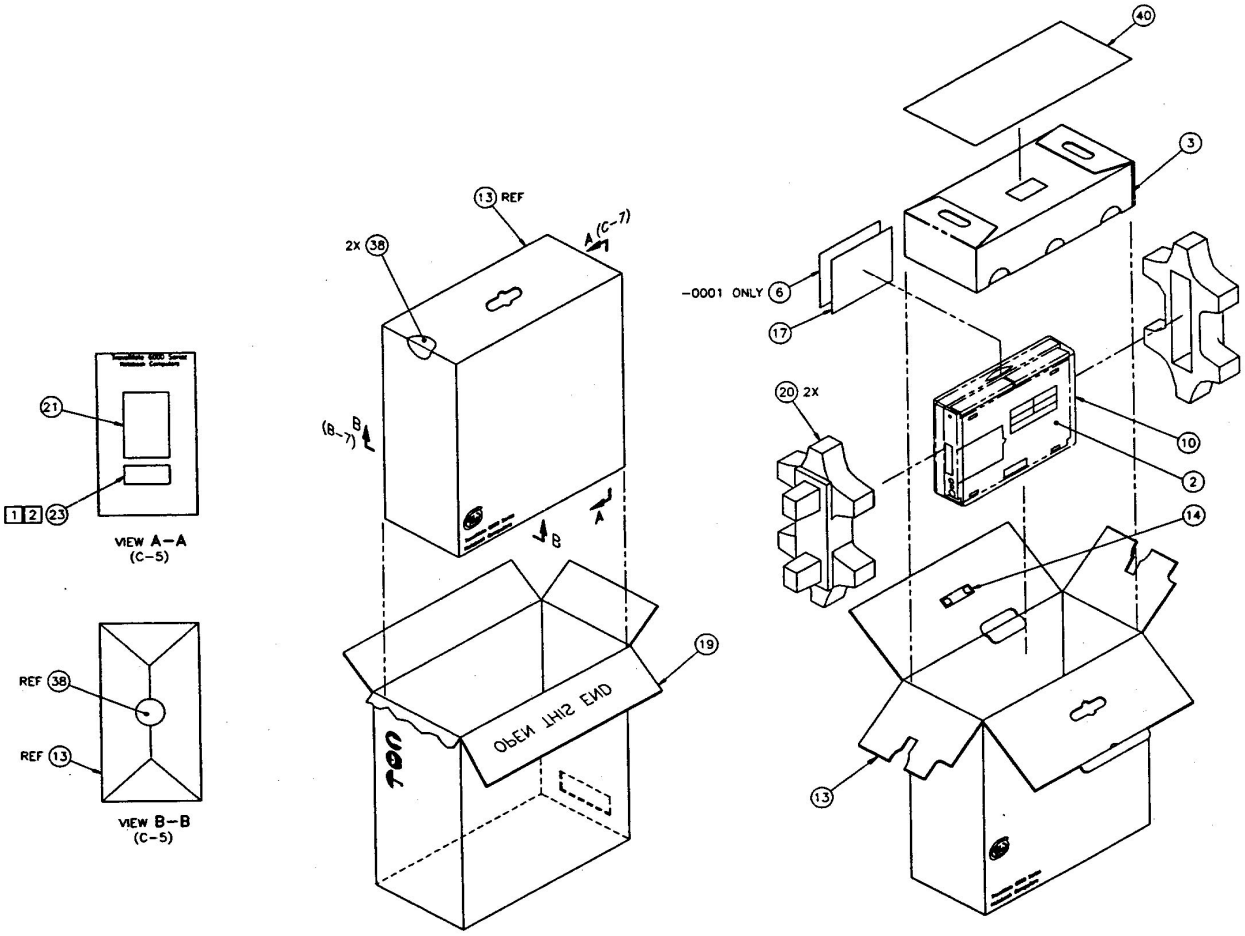


Figure D-2 TravelMate Model 6160 With Pack Assembly

Table D-4 Domestic TravelMate 6160 With Pack Parts Listing (TI Part No. 9814455-0001)

Item	Part No.	Quantity	Description
1	9804414-0100	1	COMMON PARTS FOR 9814455, 6160 PACK
2	9814456-0001	1	TM6160 UNT,P166,2.0GB, 32MB,DOM
3	9814472-0001	1	ACCESSORY KIT, WIN95, TM6100,DOM
6	2566358-0002	1	LABEL, CSL/TI EXPRESS, USA/CANADIAN
40	9814481-0001	1	INSTALLATION POSTER, TM6100
99	9814463-0001	1	COMPLIANCE STATEMENT, FCC, MDL 6160/ 6160X

Note: The following is a listing of the common parts associated with Part No. 9814455-0100 (item 1 above).

Table D-4 Domestic TravelMate 6160 With Pack Parts Listing (TI Part No. 9814455-0001) (continued)

Item	Part No.	Quantity	Description
10	2560764-0012	1	BAG,CLEAR,14.63W X 13.63L X .0015T
13	9804504-0001	1	PACK BOX, W/GRAPHICS, TM6000
14	2568053-0002	1	HANDLE, HD , 6 IN, BLACK, 45 LB CAPACITY
17	9814507-0001	1	SW LICENSE AGREEMENT, WFG/WIN95/WNT
19	9804505-0001	1	OVERPACK BOX, TM6000
20	2581250-0003	2	EPP ENDCAPS,TM6000 SERIES

D.6.1 TravelMate 6160 Unit Assembly Parts Breakdown

Figure D-3 shows the major components that comprise the TravelMate 6160 Notebook Computer. The associated parts list is provided in Table D-5.

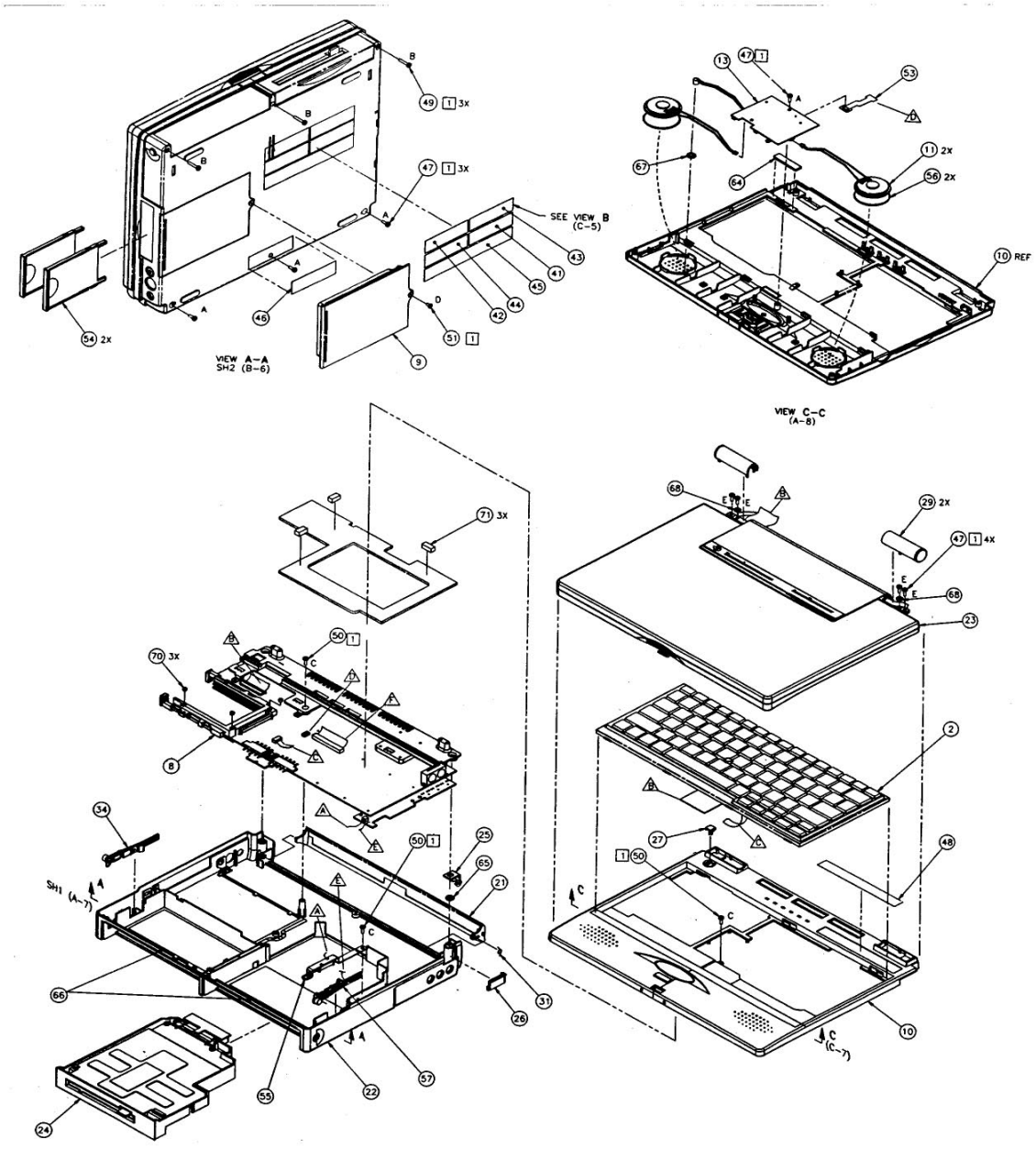


Figure D-3 TravelMate Model 6100 Unit Assembly (P/N 9804484)

Table D-4 Domestic TravelMate 6160 Unit Assembly (P/N 9814456-1) Parts Listing

Item	Part No.	Quantity	Description
1	9814456-0100	1	COMMON PARTS FOR 9814456, 6160 UNIT
2	9804437-0001	1	KEYBOARD,BROTHER,W/POINTER,3MIL TRAV, DOM

Note: The following is a listing of the common parts associated with item 1 (P/N 9814456-0100) above.

Table D-4 Domestic TravelMate 6160 Unit Assembly (P/N 9814456-1) Parts Listing (continued)

Item	Part No.	Quantity	Description
8	9804587-0009	1	HEATPLATE/PWB ASSY, 32 MB, 166 MHz, E61, XGA
9	9804435-0002	1	HARD DRIVE ASSY, 2.0 GB, TM6000 (IBM)
10	9804543-0001	1	COVER ASSY,TM6000 SERIES
11	9804434-0001	2	SPEAKER ASSY,TM6000
12	9804513-0001	1	DOOR, MODEM
13	9804420-0002	1	PWB ASSY,PICK BUTTON,2ND GEN.,TM6000
14	9804514-0001	1	DOOR, RJ11, TM6000
21	9804430-0001	1	DOOR,CONNECTOR,TM6000
22	9804553-0003	1	BASE ASSY,W/O MODEM/RJ11, TM6000, MOD.
			* ALT P/N 9814528-0001 (LM ITEM 85)
23	9804438-0003	1	LCD ASSY,12.1 SAMSUNG XGA,TM6000
24	9804447-0001	1	FLOPPY DRIVE MODULE ASSY, ECLIPSE
25	9804515-0001	1	DOOR RELEASE BUTTON, TM6000
26	9804516-0001	1	WINDOW, IR, TM6000
27	9804517-0001	1	BUTTON, SUSPEND, TM6000
29	9804452-0002	2	COVER, HINGE, 5 SNAP, TM6000
31	9804454-0002	1	SPRING,TORSION, 4.167 TURNS, TM6000
34	9804457-0002	1	LATCH, MEDIA BAY RELEASE, w/RIBS, ECLIPSE

Table D-4 Domestic TravelMate 6160 Unit Assembly (P/N 9814456-1) Parts Listing (continued)

40	9814457-0001	1	SHT LBL, RTG/AGENCY/TM6160, 2XL
46	9798834-0002	1	WARRANTY LABEL, FCC, TAMPER EVIDENT
47	2249135-0013	4	SCREW,MACHINE,PAN HEAD, 2-56 X .250, T8PATCH
48	9804535-0006	1	LABEL,NAMEPLATE,TM6160X
49	2249135-0004	3	SCREW,MACHINE,PAN HEAD,2-56 X 1.125, T8COM
50	2249135-0003	3	SCREW, MACHINE, PAN HEAD, 2-56 X .375, T8COM
51	2249136-0006	1	SCREW,MACH,FLAT HEAD,4-40 X .188,T8
53	9804584-0001	1	FLEX CABLE, PICK BUTTON BOARD, TM6000
54	9811454-0001	2	FILLER CARD, PCMCIA,TM6000
56	9786294-0001	2	SPEAKER GRILL ASSY,TM6000 SERIES
57	9804523-0002	1	LATCH ASSY, W/O CAP, MEDIA BAY,TM6000
59	9811489-0001	1	LABEL, MEMORY INSTALLATION, TM6000
60	9811476-0001	1	SUPPORT, KEYBOARD, TM6000 Series
62	2248836-0002	1	CORE, FERRITE, ONE PIECE, FPC, 31 x 12 x 3
63	2249135-0001	1	SCREW, MACHINE, PAN HEAD, 2-56 x .125, T8COM
64	9811517-0001	1	SHIELD, KEYBOARD. TM6000
65	2221868-0016	1	WASHER, FLAT, MYLAR, .260ID, .500 OD, .010 THICK
66	9804426-0001	2	INSULATOR, MODULE BAY, TM6000
67	2607793-0003	1	TAPE, FOAM, URETHANE, BLACK, .438 DIA
68	2247795-0026	2	WASHER, FLAT, NYLON, .094" ID, .250" OD, .031"T
70	9804520-0001	3	BUMPER, LCD DISPLAY
71	9813357-0001	3	KEYBOARD, SUPPORT BUMPER
72	9804481-0001	1	MASK, PICK BUTTON BOARD
74	9804477-0002	2	SHIM, MEDIA BAY
75	2249135-0017	4	SCREW, MACHINE, PAN HEAD, 2-56 X .312, T8PATCH
78	9813384-0001	1	CLIP, CABLE DISPLAY

Table D-4 Domestic TravelMate 6160 Unit Assembly (P/N 9814456-1) Parts Listing (continued)

79	9804482-0001	1	CONTACT, MEDIA BAY SENSOR
81	2249191-0001	1	WASHER, FLAT, NON-METALLIC, #2
85	9814528-0001	REF	BASE ASSY, MODIFIED, TM6100
			* ALT P/N 9804553-0003 (PRIMARY), LM ITEM 22

D.7 6100 Logic Diagrams

Logic diagrams for the TravelMate 6100 Series Top and Bottom Board Assemblies are provided in Appendices H and I respectively.

K

TravelMate 6000/6100 Display Modes

K.1 Introduction

This appendix summarizes the display modes supported by the 6000/6100 Notebook Computer's internal video display adapter.

Tables K-1 and K-2 list the features associated with the screen standard VGA and extended VGA modes for LCD Displays.

Tables K-3 and K-4 list the features associated with the screen standard VGA and extended VGA modes for external monitors attached to the notebook.

Table K-1 Supported LCD Display Features for Standard VGA

VESA Mode	Pixel Resolution	No. of Colors	Display Mode	Char. Per Row	Char. Cell (pixels)	Video Clock (MHz)	Horz. Freq (kHz)	Vert Freq (Hz)
0, 1	360 x 400	16	Text	40 x 25	9 x 16	28.322	31.5	70
2, 3	720 x 400	16	Text	80 x 25	9 x 16	28.322	31.5	70
4, 5	320 x 200	4	Graphics	40 x 25	8 x 8	25.175	31.5	70
6	640 x 200	2	Graphics	80 x 25	8 x 8	25.175	31.5	70
7	720 x 400	Mono	Text	80 x 25	9 x 16	28.322	31.5	70
D	320 x 200	16	Graphics	40 x 25	8 x 8	25.175	31.5	70
E	640 x 200	16	Graphics	80 x 25	8 x 8	25.175	31.5	70
F	640 x 350	Mono	Graphics	80 x 25	8 x 14	25.175	31.5	70
10	640 x 350	16	Graphics	80 x 25	8 x 14	25.175	31.5	70
11	640 x 480	2	Graphics	80 x 30	8 x 16	25.175	31.5	60
12	640 x 480	16	Graphics	80 x 30	8 x 16	25.175	31.5	60
13	320 x 200	256	Graphics	40 x 25	8 x 8	25.175	31.5	70

Table K-2 Supported LCD Display Features, Extended VGA

VESA Mode	Pixel Resolution	No. of Colors	Display Mode	Char. Per Row	Char. Cell (pixels)	Video Clock (MHz)	Horz. Freq (kHz)	Vert Freq (Hz)
100	640 x 400	256	Graphics	80 x 25	8 x 16	25.175	31.5	70
101	640 x 480	256	Graphics	80 x 30	8 x 16	25.175	31.5	60
101	640 x 480	256	Graphics	80 x 30	8 x 16	31.5	37.9	72
101	640 x 480	256	Graphics	80 x 30	8 x 8	31.5	37.5	75
101	640 x 480	256	Graphics	80 x 30	8 x 16	36	43.3	85
102	800 x 600	16	Graphics	100 x 37	8 x 16	40	37.8	60
102	800 x 600	16	Graphics	100 x 37	8 x 16	50	48.1	72
102	800 x 600	16	Graphics	100 x 37	8 x 16	49.5	46.9	75
102	800 x 600	16	Graphics	100 x 37	8 x 16	56.25	53.7	85
103	800 x 600	256	Graphics	100 x 37	8 x 16	40	37.8	60
103	800 x 600	256	Graphics	100 x 37	8 x 16	50	48.1	72
103	800 x 600	256	Graphics	100 x 37	8 x 16	49.5	46.9	75
103	800 x 600	256	Graphics	100 x 37	8 x 16	56.25	53.7	85
10D	320 x 200	32K	Graphics	40 x 25	8 x 8	25.175	31.5	70
10E	320 x 200	64K	Graphics	40 x 25	8 x 8	25.175	31.5	70
110	640 x 480	32K	Graphics	80 x 30	8 x 16	25.175	31.5	60
110	640 x 480	32K	Graphics	80 x 30	8 x 16	25.175	31.5	60
110	640 x 480	32K	Graphics	80 x 30	8 x 16	31.5	37.9	72
110	640 x 480	32K	Graphics	80 x 30	8 x 16	31.5	37.5	75
111	640 x 480	64K	Graphics	80 x 30	8 x 16	25.175	31.5	60
111	640 x 480	64K	Graphics	80 x 30	8 x 16	31.5	37.9	72
111	640 x 480	64K	Graphics	80 x 30	8 x 16	31.5	37.9	75
111	640 x 480	64K	Graphics	80 x 30	8 x 16	36.0	43.3	85
112	640 x 480	16M	Graphics	80 x 30	8 x 16	25.175	31.5	60
112	640 x 480	16M	Graphics	80 x 30	8 x 16	31.5	37.9	72
112	640 x 480	16M	Graphics	80 x 30	8 x 16	31.5	37.5	75
112	640 x 480	16M	Graphics	80 x 30	8 x 16	31.5	37.5	75
113	800 x 600	32K	Graphics	100 x 37	8 x 16	40.0	37.8	60
113	800 x 600	32K	Graphics	100 x 37	8 x 16	50.0	48.1	72
113	800 x 600	32K	Graphics	100 x 37	8 x 16	49.5	46.9	75
113	800 x 600	32K	Graphics	100 x 37	8 x 16	56.25	53.7	85
114	800 x 600	64K	Graphics	100 x 37	8 x 16	40.0	37.8	60
114	800 x 600	64K	Graphics	100 x 37	8 x 16	50.0	48.1	72
114	800 x 600	64K	Graphics	100 x 37	8 x 16	49.5	46.9	75
114	800 x 600	64K	Graphics	100 x 37	8 x 16	56.25	53.7	85

a: IBM standard VGA mode enhanced for higher vertical frequency. b: Mode 54 uses 1056 x 344 addressable pixels (text mode), however, it uses 1056 x 350 timing. c: Applications should use mode 6A rather than mode 58 to retain compatibility with other VGA BIOS

Table K-3 External Monitor Supported Features, Standard VGA

VESA Mode	Pixel Resolution	No. of Colors	Display Mode	Char. Per Row	Char. Cell (pixels)	Video Clock (MHz)	Horz. Freq (kHz)	Vert Freq (Hz)
0, 1	360 x 400	16	Text	40 x 25	9 x 16	28.322	31.5	70
2, 3	720 x 400	16	Text	80 x 25	9 x 16	28.322	31.5	70
4, 5	320 x 200	4	Graphics	40 x 25	8 x 8	25.175	31.5	70
6	640 x 200	2	Graphics	80 x 25	8 x 8	25.175	31.5	70
7	720 x 400	Mono	Text	80 x 25	9 x 16	28.322	31.5	70
D	320 x 200	16	Graphics	40 x 25	8 x 8	25.175	31.5	70
E	640 x 200	16	Graphics	80 x 25	8 x 8	25.175	31.5	70
F	640 x 350	Mono	Graphics	80 x 25	8 x 14	25.175	31.5	70
10	640 x 350	16	Graphics	80 x 25	8 x 14	25.175	31.5	70
11	640 x 480	2	Graphics	80 x 30	8 x 16	25.175	31.5	60
12	640 x 480	16	Graphics	80 x 30	8 x 16	25.175	31.5	60
13	320 x 200	256	Graphics	40 x 25	8 x 8	25.175	31.5	70

Table K-4 External Monitor Features, Extended VGA

VESA Mode	Pixel Resolution	No. of Colors	Display Mode	Char. Per Row	Char. Cell (pixels)	Video Clock (MHz)	Horz. Freq (kHz)	Vert Freq (Hz)
100	640 x 400	256	Graphics	80 x 25	8 x 16	25.175	31.5	70
101	640 x 480	256	Graphics	80 x 30	8 x 16	25.175	31.5	60
101	640 x 480	256	Graphics	80 x 30	8 x 16	31.5	37.9	72
101	640 x 480	256	Graphics	80 x 30	8 x 8	31.5	37.5	75
101	640 x 480	256	Graphics	80 x 30	8 x 16	36	43.3	85
102	800 x 600	16	Graphics	100 x 37	8 x 16	40	37.8	60
102	800 x 600	16	Graphics	100 x 37	8 x 16	50	48.1	72
102	800 x 600	16	Graphics	100 x 37	8 x 16	49.5	46.9	75
102	800 x 600	16	Graphics	100 x 37	8 x 16	56.25	53.7	85
103	800 x 600	256	Graphics	100 x 37	8 x 16	40	37.8	60
103	800 x 600	256	Graphics	100 x 37	8 x 16	50	48.1	72
103	800 x 600	256	Graphics	100 x 37	8 x 16	49.5	46.9	75
103	800 x 600	256	Graphics	100 x 37	8 x 16	56.25	53.7	85
104	1024 x 768	16	Graphics	128 x 48	8 x 16	65.0	48.3	60
105	1024 x 768	256	Graphics	128 x 48	8 x 16	65.0	48.3	60
105	1024 x 768	256	Graphics	128 x 48	8 x 16	78.75	60.0	75
109	1056 x 350	16	Text	132 x 43	8 x 14	41.5	31.5	70
10B	1056 x 400	16	Text	132 x 50	8 x 8	41.5	31.5	70

10D	320 x 200	32K	Graphics	40 x 25	8 x 8	25.175	31.5	70
10E	320 x 200	64K	Graphics	40 x 25	8 x 8	25.175	31.5	70
110	640 x 480	32K	Graphics	80 x 30	8 x 16	25.175	31.5	60
110	640 x 480	32K	Graphics	80 x 30	8 x 16	25.175	31.5	60
110	640 x 480	32K	Graphics	80 x 30	8 x 16	31.5	37.9	72
110	640 x 480	32K	Graphics	80 x 30	8 x 16	31.5	37.5	75
111	640 x 480	64K	Graphics	80 x 30	8 x 16	25.175	31.5	60
111	640 x 480	64K	Graphics	80 x 30	8 x 16	31.5	37.9	72
111	640 x 480	64K	Graphics	80 x 30	8 x 16	31.5	37.9	75
111	640 x 480	64K	Graphics	80 x 30	8 x 16	36.0	43.3	85
112	640 x 480	16M	Graphics	80 x 30	8 x 16	25.175	31.5	60
112	640 x 480	16M	Graphics	80 x 30	8 x 16	31.5	37.9	72
112	640 x 480	16M	Graphics	80 x 30	8 x 16	31.5	37.5	75
112	640 x 480	16M	Graphics	80 x 30	8 x 16	31.5	37.5	75
113	800 x 600	32K	Graphics	100 x 37	8 x 16	40.0	37.8	60
113	800 x 600	32K	Graphics	100 x 37	8 x 16	50.0	48.1	72
113	800 x 600	32K	Graphics	100 x 37	8 x 16	49.5	46.9	75
113	800 x 600	32K	Graphics	100 x 37	8 x 16	56.25	53.7	85
114	800 x 600	64K	Graphics	100 x 37	8 x 16	40.0	37.8	60
114	800 x 600	64K	Graphics	100 x 37	8 x 16	50.0	48.1	72
114	800 x 600	64K	Graphics	100 x 37	8 x 16	49.5	46.9	75
114	800 x 600	64K	Graphics	100 x 37	8 x 16	56.25	53.7	85

a IBM standard VGA mode enhanced for higher vertical frequency

b Mode 54 uses 1056 x 344 addressable pixels (text mode), however, it uses 1056 x 350 timing.

c Applications should use mode 6A rather than mode 58 to retain compatibility with other VGA BIOS

L

TravelMate 6000/6100 Character Sets

L1 Introduction

This appendix contains a listing and description of the character sets used with the TravelMate 6000/6100 Series Notebook Computers. The TravelMate 6000/6100 character sets are identical to the IBM® Code Pages for MS-DOS. This appendix shows the character sets for Code Page 437 (United States), 850 (Multilingual), 863 (Canadian-French), and 865 (Nordic), with the decimal and hexadecimal codes for each character.

The four-character sets contain differences in the international, symbol, and graphics characters above decimal code 128 (extended ASCII characters).

Note: The extended ASCII characters that are not on the keyboard (128 to 255 decimal) can be displayed at the DOS prompt and in many applications. Press **Alt**, and type the ASCII decimal code for the character using the keys with numbers on their front face and also using Fn or Num Lk on. Release the Alt key and the character is displayed on the screen. Your printer may or may not print the extended characters. Refer to the character code tables in your printer documentation.

United States - Code Page 437

Decimal Value	→	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
↓	Hexa-decimal Value	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
0	-0		▶		0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	-1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▓	┴	╤	β	±
2	-2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú	|	├	╙	π	≤
4	-4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	—	╘	Σ	∫
5	-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	∫
6	-6	♠	—	&	6	F	V	f	v	ª	û	ª	╢	╞	╓	μ	÷
7	-7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	-8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	•
10	-A	◙	→	*	:	J	Z	j	z	è	Ü	¬	‖	╩	┌	Ω	·
11	-B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	■	δ	√
12	-C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▬	∞	n
13	-D	♪	↔	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
14	-E	♫	▲	.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	ε	■
15	-F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	╧	▬	∩	

Multilingual - Code Page 850

Decimal Value	→	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
↓	Hexa-decimal Value	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
0	-0		▶		0	@	P	`	p	Ç	É	á	▒	└	ð	Ó	-
1	-1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▓	┴	Đ	ß	±
2	-2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	=
3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú	|	├	Ë	Ò	¾
4	-4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	—	È	õ	¶
5	-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	┼	ı	Õ	§
6	-6	♠	—	&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7	-7	•	↨	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8	-8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	©	╚	Ï	Þ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
10	-A	◙	→	*	:	J	Z	j	z	è	Ü	¬	╠	╩	┌	Û	•
11	-B	♂	←	+	;	K	[	k	{	ï	ø	½	╗	╦	▉	Ù	¹
12	-C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▬	ý	³
13	-D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	¢	═	¦	Ý	²
14	-E	♫	▲	.	>	N	^	n	~	Ä	×	«	¥	╬	ì	-	■
15	-F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	»	┐	¤	▬	´	

Canadian-French - Code Page 863

Decimal Value	→	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
↓	Hexa-decimal Value	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
0	-0		▶		0	@	P	`	p	Ç	É	¦	⣿	└	╨	α	≡
1	-1	☺	◀	!	1	A	Q	a	q	ü	È	′	▒	┴	╤	β	±
2	-2	☻	↕	"	2	B	R	b	r	é	Ê	ó	⣷	┬	╥	Γ	≥
3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú	⎸	├	╙	π	≤
4	-4	♦	¶	$	4	D	T	d	t	Â	Ë	¨	┤	—	╘	Σ	⌠
5	-5	♣	§	%	5	E	U	e	u	à	Ï	˘	╡	┼	╒	σ	⌡
6	-6	♠	–	&	6	F	V	f	v	¶	û	³	╢	╞	╓	μ	÷
7	-7	•	↨	'	7	G	W	g	w	ç	ù	ˉ	╖	╟	╫	τ	≈
8	-8	◘	↑	(	8	H	X	h	x	ê	¤	Î	╕	╚	╪	Φ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ô	⌐	╣	╔	┘	Θ	•
10	-A	■	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
11	-B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╤	⣿	δ	√
12	-C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╧	▬	∞	n
13	-D	♪	↔	-	=	M	]	m	}	=	Ù	¾	╜	═	▌	φ	²
14	-E	♫	▲	.	>	N	^	n	~	À	Û	«	╛	╬	▐	ε	■
15	-F	☼	▼	/	?	O	_	o	⌂	§	ƒ	»	┐	╧	▬	∩	

Nordic - Code Page 865

Decimal Value	→	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
↓	Hexa-decimal Value	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
0	-0		▶		0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	-1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▓	┴	╤	β	±
2	-2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	-3	♥	!!	#	3	C	S	c	s	â	ô	ú	|	├	╙	π	≤
4	-4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	—	╘	Σ	⌠
5	-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	-6	♠	—	&	6	F	V	f	v	ȧ	û	ª	╢	╞	╓	μ	÷
7	-7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	~
8	-8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	-9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	•
10	-A	■	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
11	-B	♂	←	+	;	K	[	k	{	ï	ø	½	╗	╦	■	δ	√
12	-C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▬	∞	n
13	-D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	╜	═	▌	φ	²
14	-E	♫	▲	.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	ε	■
15	-F	☼	▼	/	?	O	_	o	⌂	Å	ƒ	¤	┐	╧	▬	∩	

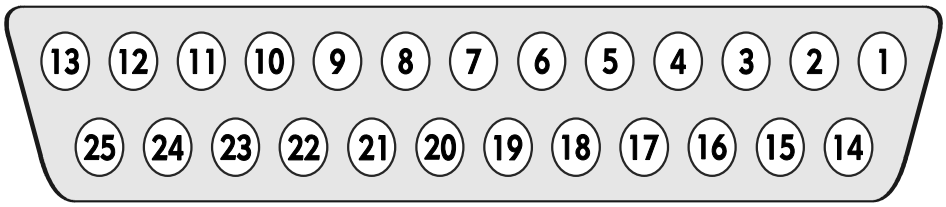
M
TravelMate 6000/6100 Connector Pinouts

M.1 Introduction

This appendix contains connector pinouts for the I/O connectors on the TravelMate 6000/6100 Series Notebook Computers.

M.1.1 Parallel Port

The following table shows the pinout information for the parallel connector. This connector can be used to attach a parallel device such as printer or plotter (SPP Mode) or an external Floppy Disk Drive (FDC Mode).



External Monitor Connector

Table M-1 Parallel Port Pinouts

Pin No.	SPP Mode	Direction	FDC Mode	Direction
1	STB	I/O	($\overline{DS0}$)	I/(O)
2	PD0	I/O	INDEX	I
3	PD1	I/O	TRKO	I
4	PD2	I/O	WP	I
5	PD3	I/O	RDATA	I
6	PD4	I/O	DSKCHG	I
7	PD5	I/O	MEDIA_ID0	I
8	PD6	I/O	($\overline{MTR0}$)	I/(O)
9	PD7	I/O	MEDIA_ID1	I
10	ACK	I	DS1	O
11	BUSY	I	nMTR1	O

Table M-1 Parallel Port Pinouts

Pin No.	SPP Mode	Direction	FDC Mode	Direction
12	PE	I	WDATA	O
13	SLCT	I	WGATE	O
14	AFD	I/O	DSEL	O
15	ERR	I	HDSEL	O
16	INIT	I/O	DIR	O
17	SLIN	I/O	STEP	O
18-25	Ground	N/A	Ground	N/A

M.1.2 VGA Connector

The following illustration and table show pinout information for the VGA connector used to attach an external monitor to the TravelMate 6000/6100 Series Notebook Computer.

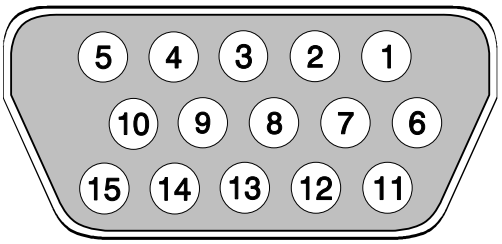


Table M-2 VGA Connector Pinouts

Pin No.	Signal Name	Direction
1	Red video	Output
2	Green video	Output
3	Blue video	Output
4	Not used	
5	Ground	
6	Red return	Input
7	Green return	Input
8	Blue return	Input
9	Not used	
10	Ground	
11	Not used	
12	Not used	
13	Horizontal sync	Output
14	Vertical sync	Output
15	Not used	

Note: Monochrome monitors use green video for all video input and ignore red and blue video.

M.1.3 PS/2 Connector

The following table shows the pinout information for the 6-pin mini-DIN mouse or keyboard connector

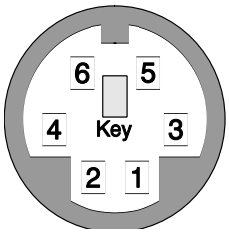


Table M-3 PS/2 Connector Pinouts

Pin No.	Signal Name
1	Data
2	Not used
3	Ground
4	+5 volts
5	Clock
6	Not used

M.1.4 Serial Connector

The following illustration and table show the pinout information for the serial connector.

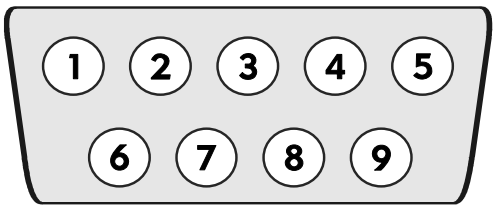
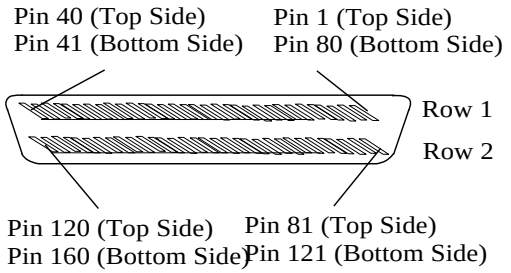


Table M-4 Serial Port Pinouts

Pin No.	Signal Name	Acronym	Direction
1	Carrier detect	CD	Input
2	Receive data	RD	Input
3	Transmit data	TD	Output
4	Data terminal ready	DTR	Output
5	Signal ground	SG	
6	Data set ready	DSR	Input
7	Request to send	RTS	Output
8	Clear to send	CTS	Input
9	Ring indicator	RI	Input

M.1.5 PCI Expansion Bus Connector

The PCI Expansion Bus connector and pinouts are provided in the following illustration and table.



PCI Expansion Bus Pinouts

PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
1	GND	61	AD12	121	VCC3
2	LMICIN	62	AD15	122	GND
3	MICGND	63	GND	123	FCDCLK
4	RMICIN	64	AD17	124	GND
5	LFLNOUT	65	AD20	125	FCEVIDEO
6	LNOUTGND	66	GND	126	OVRW
7	RTLNOUT	67	AD23	127	FCP0
8	IRQ15	68	AD25	128	FCP2
9	IRQ11	69	GND	129	GND
10	IRQ7	70	AD28	130	FCP4
11	IRQ6	71	AD31	131	FCP6
12	IRQ5	72	GND	132	GND
13	IRQ4	73	PAR	133	FCESYNC-
14	Reserved	74	TRDY-	134	GND
15	GND	75	GND	135	AD1
16	GND	76	DEVSEL-	136	AD2
17	POFFLTCH	77	SERR-	137	GND
18	PWROFF-	78	GND	138	AD6
19	Reserved	79	SDONE	139	CBE0-
20	PWRON-	80	SBO-	140	GND
21	REQ2-	81	EXP_SMI-	141	AD11
22	LOCK-	82	VCC	142	AD13
23	PWRGOOD	83	GND	143	GND
24	GNT2-	84	FCVCLK	144	AD16
25	VDC	85	GND	145	AD18
26	GND	86	FCBLANK-	146	GND
27	VDC	87	GND	147	AD22
28	GND	88	FCP1	148	CBE2-
29	VDC	89	FCP3	149	GND
30	GND	90	GND	150	AD27
31	KBDDAT	91	FCP5	151	AD29
32	GND	92	FCP7	152	GND
33	KBDCLK	93	GND	153	IRDY-
34	GND	94	AD0	154	PERR-
35	DIN_DAT	95	GND	155	GND
36	GND	96	AD3	156	REQ0-
37	DIN_CLK	97	AD4	157	REQ1-
38	GND	98	GND	158	GND
39	RESERVED	99	AD8	159	VDC
40	GND	1 00	AD10	160	VCC
41	LFLNIN	101	GND		
42	LINGND	102	AD14		
43	RTLNIN	103	CBE1-		
44	GND	104	GND		
45	GND	105	AD19		
46	MIDIRXD	106	AD21		
47	MIDITXD	107	GND		
48	IRQ14	108	AD24		
49	IRQ10	109	AD26		
50	GND	110	GND		
51	IRQ9	111	AD30		
52	IRQ3	112	CBE3-		
53	RESERVED	113	GND		
54	GND	114	FRAME-		
55	PCICLKBS	115	STOP-		
56	GND	116	GND		
57	AD5	117	GNT0-		
58	AD7	118	GNT1-		
59	AD9	119	GND		
60	GND	120	DOCK-		

N
TravelMate 6000/6100 Keyboard Layouts

N.1 Introduction

This appendix contains keyboard layouts for all TravelMate 6000/6100 international and domestic keyboards including

- American
- British
- Belgian
- Danish
- French
- German
- Italian
- Norwegian
- Portuguese
- Spanish
- Swedish
- Swiss

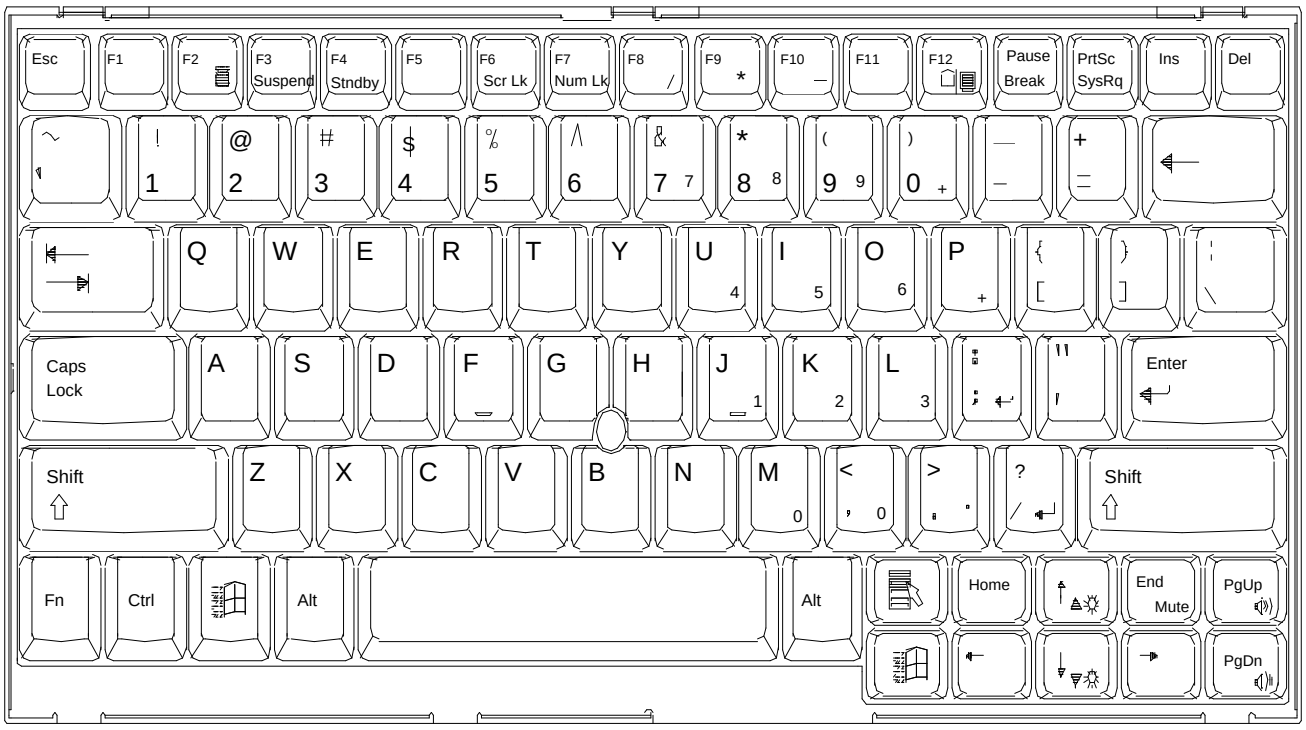


Figure N-1 American Keyboard layout

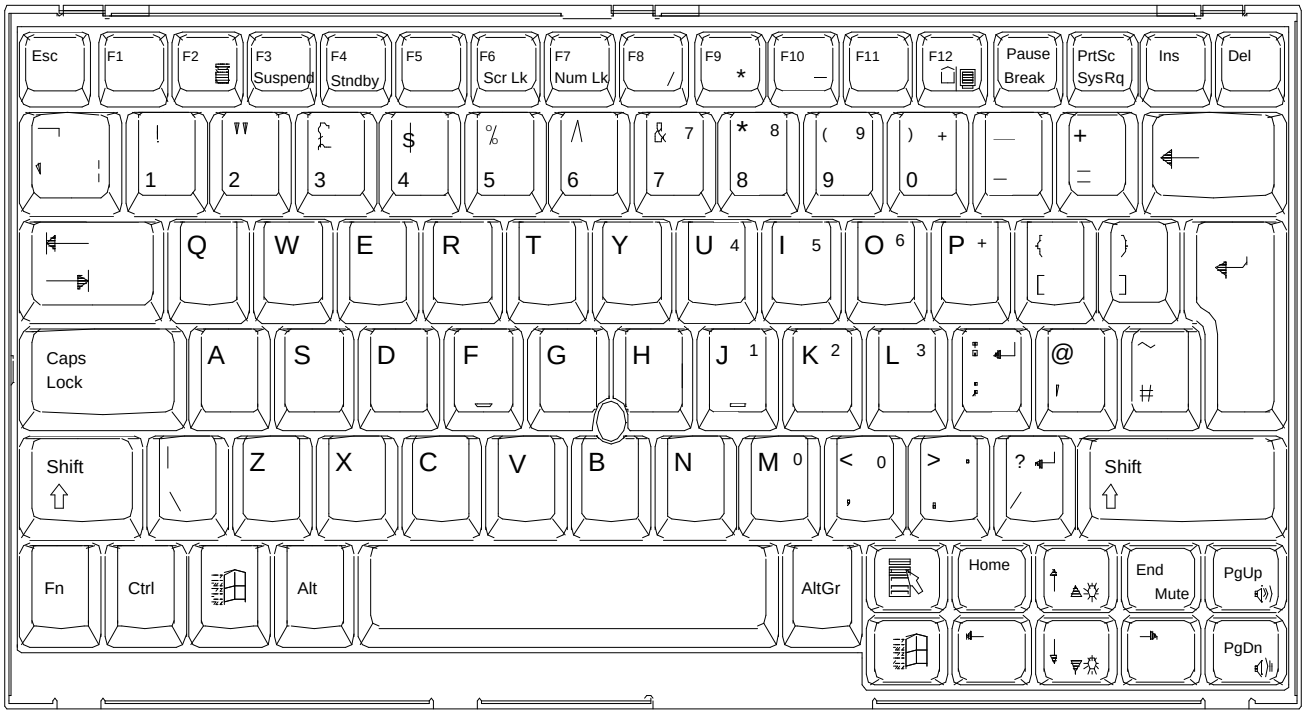


Figure N-2 British Keyboard Layout

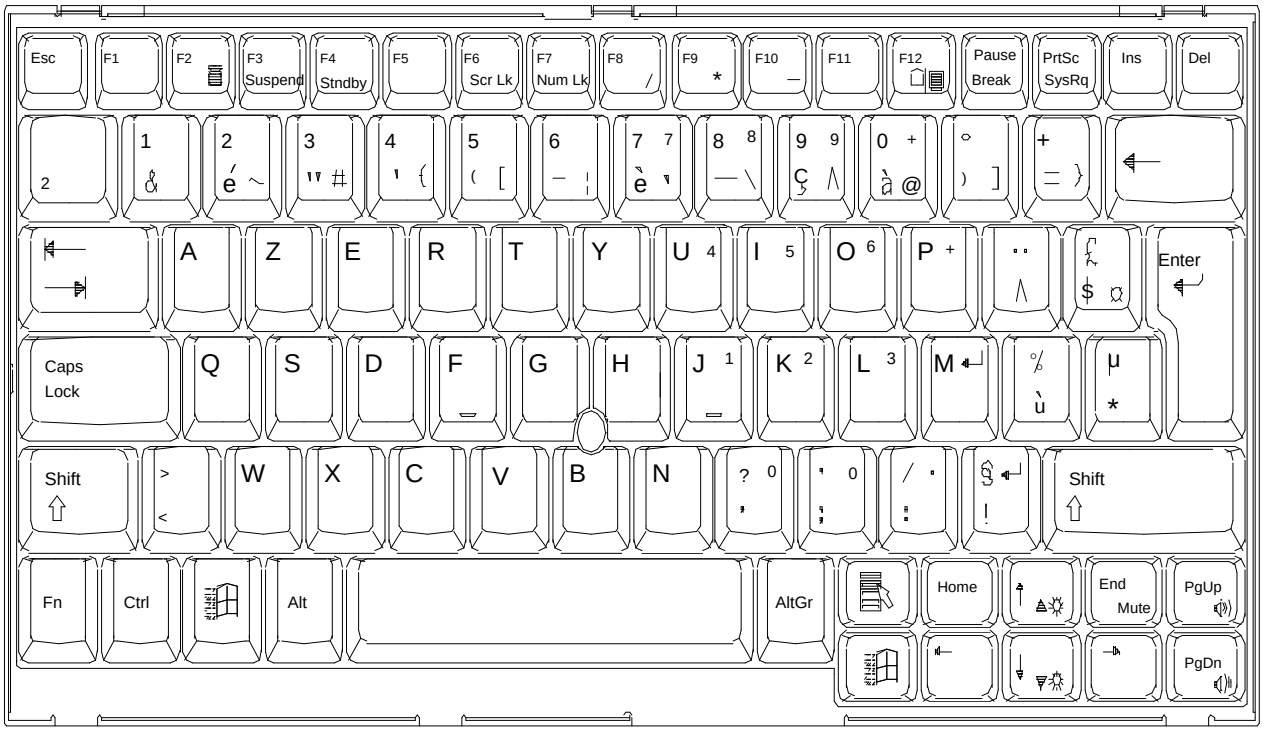


Figure N-3 Belgium Keyboard Layout

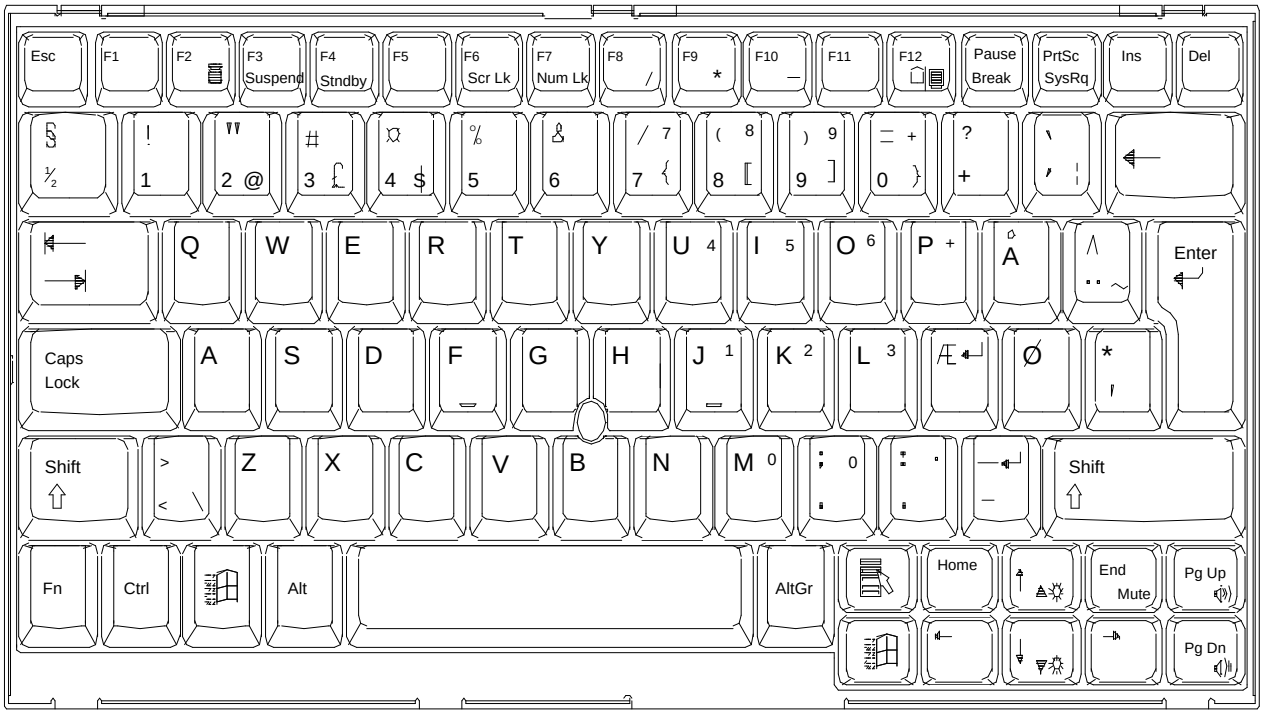


Figure N-4 Danish Keyboard Layout

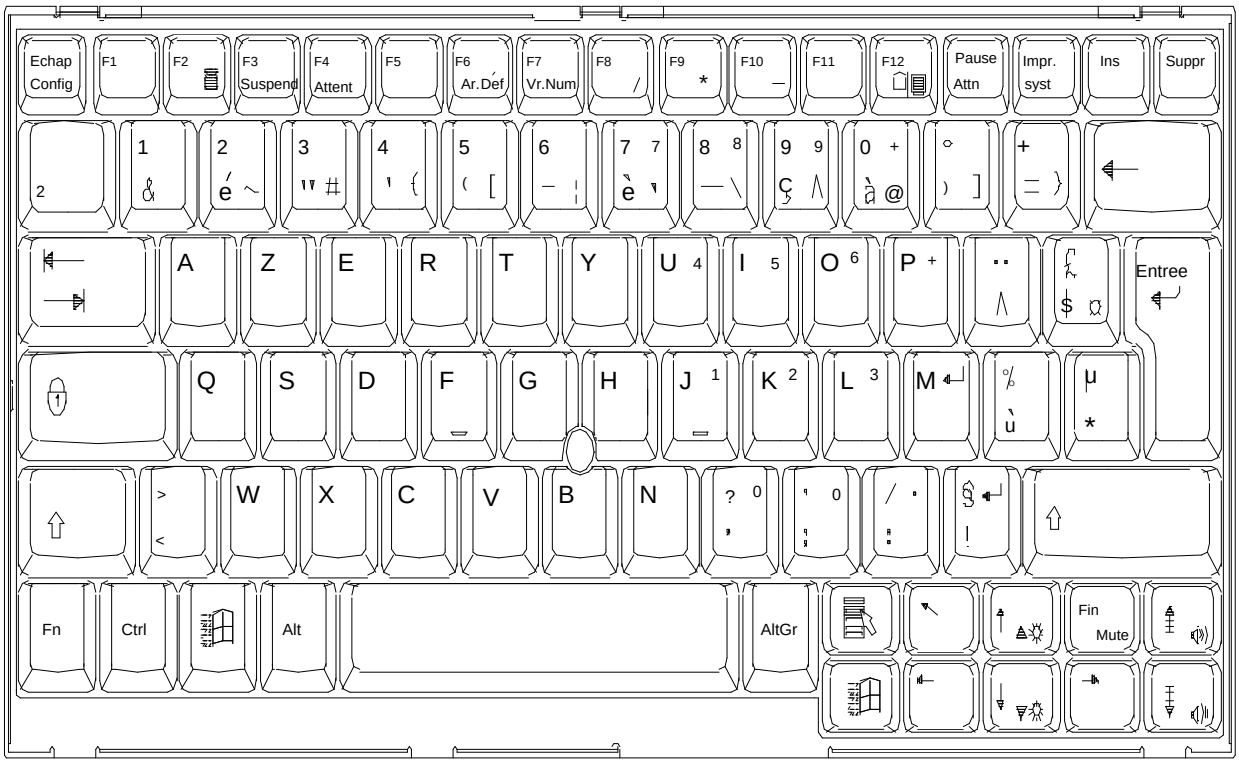


Figure N-5 French Keyboard Layout

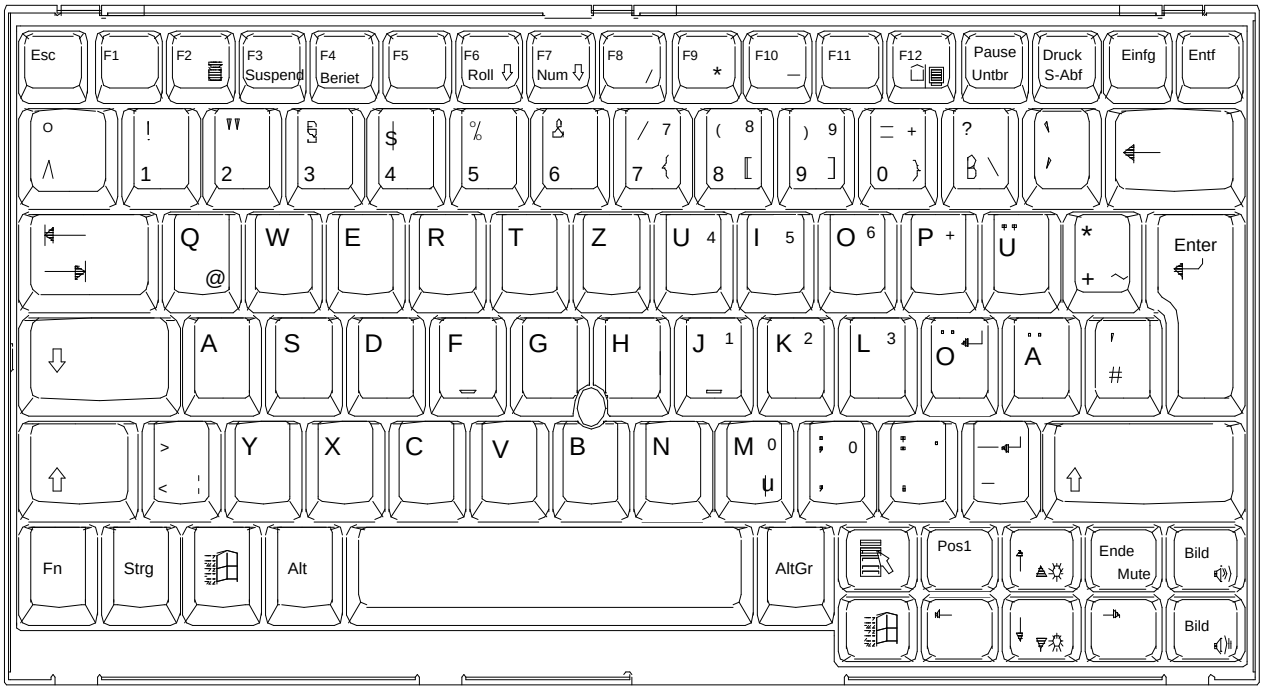


Figure N-6 German Keyboard Layout

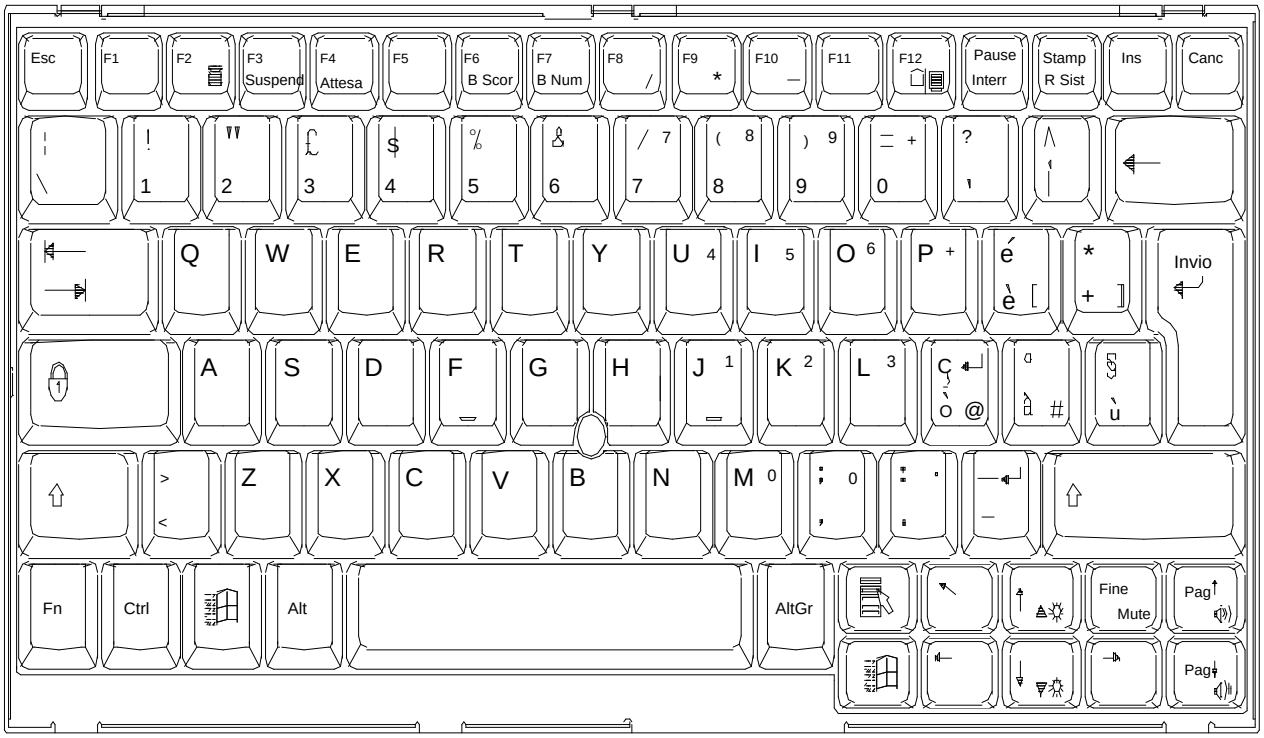


Figure N-7 Italian Keyboard Layout

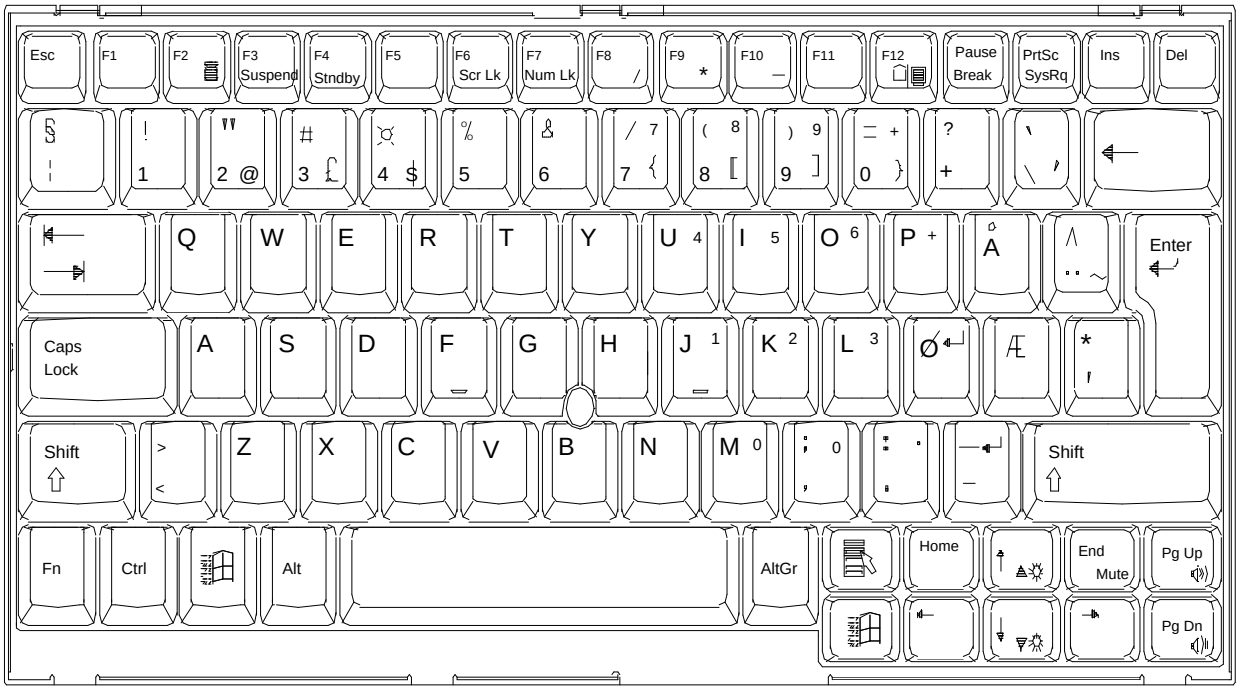


Figure N-8 Norwegian Keyboard Layout

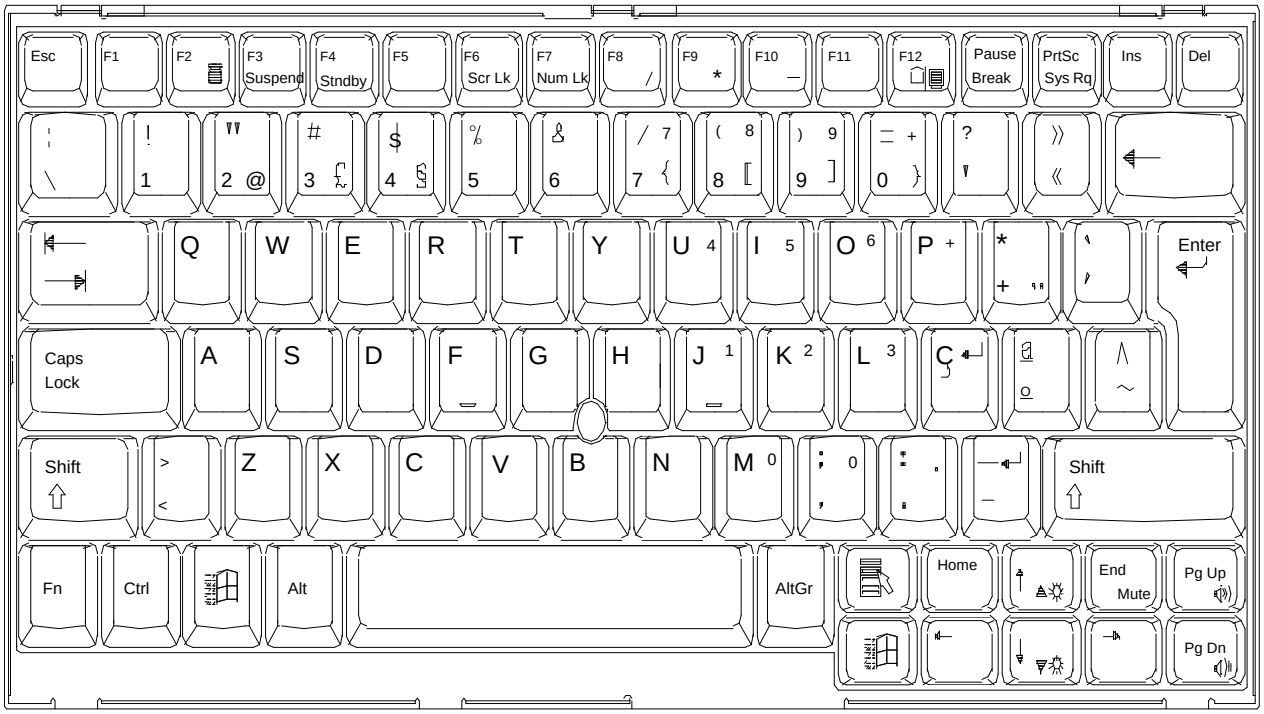


Figure N-9 Portuguese Keyboard Layout

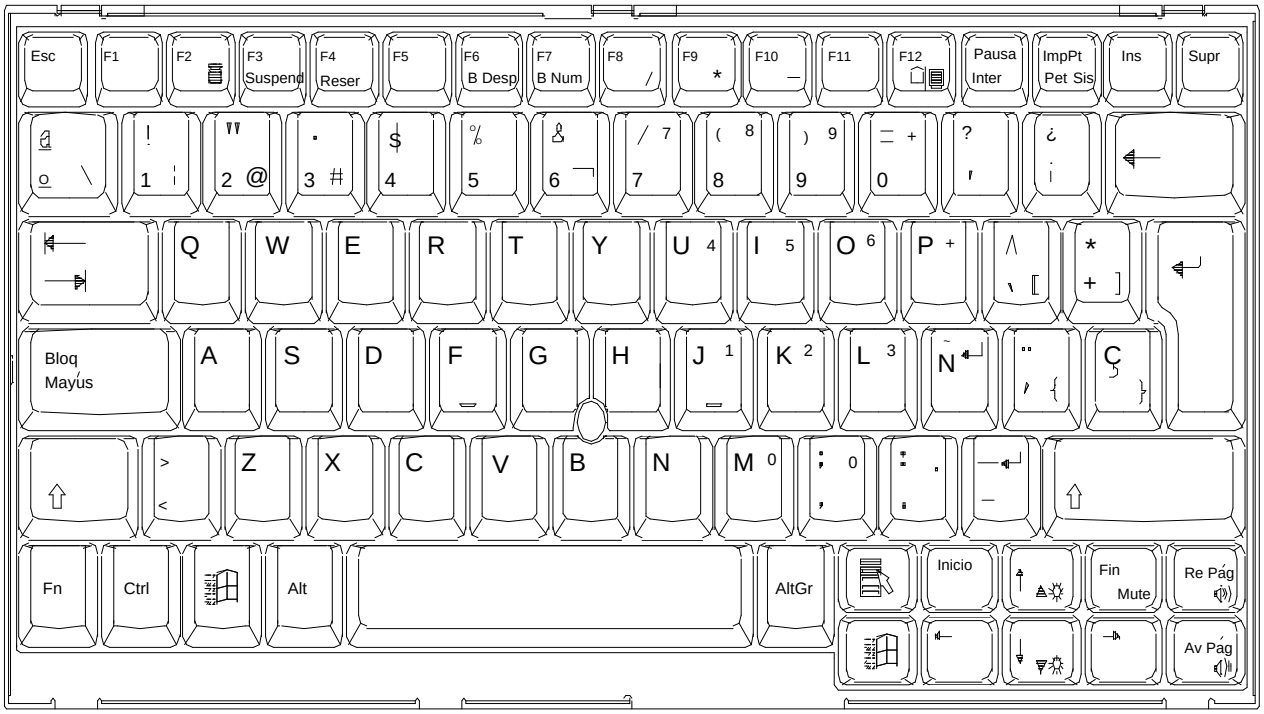


Figure N-10 Spanish Keyboard Layout

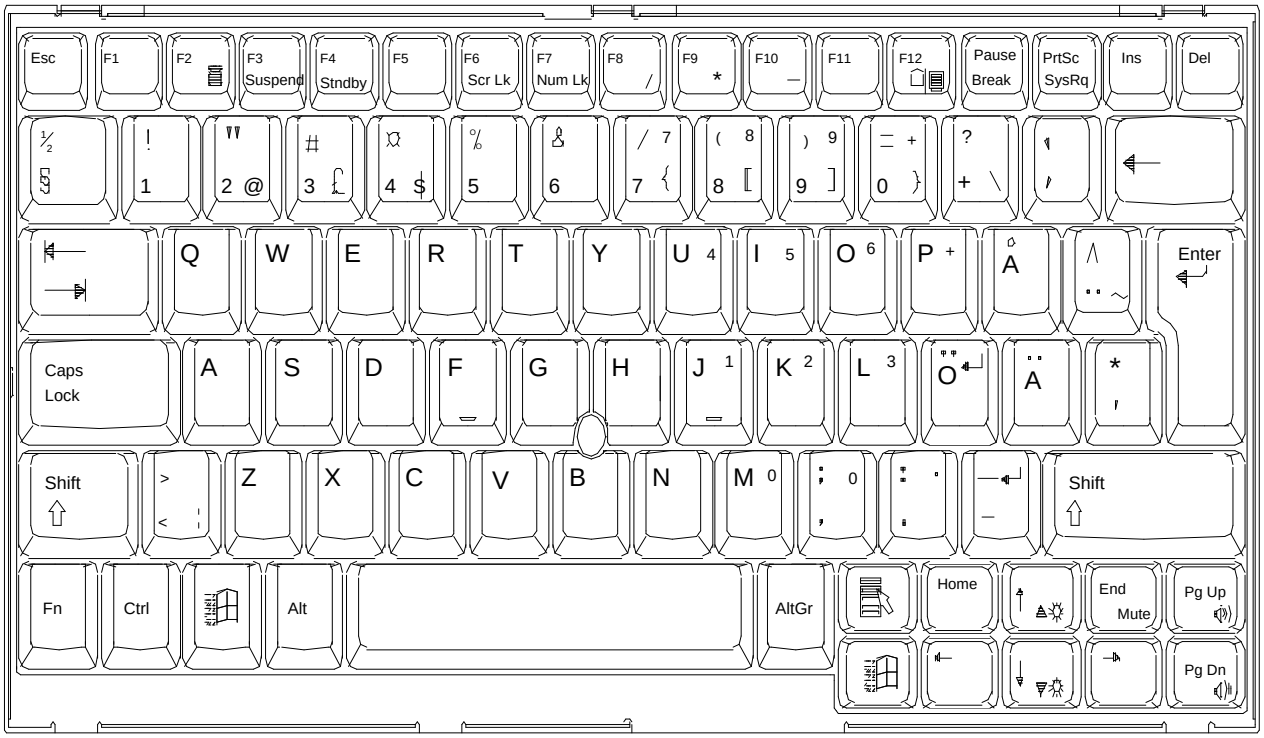


Figure N-11 Swedish Keyboard Layout

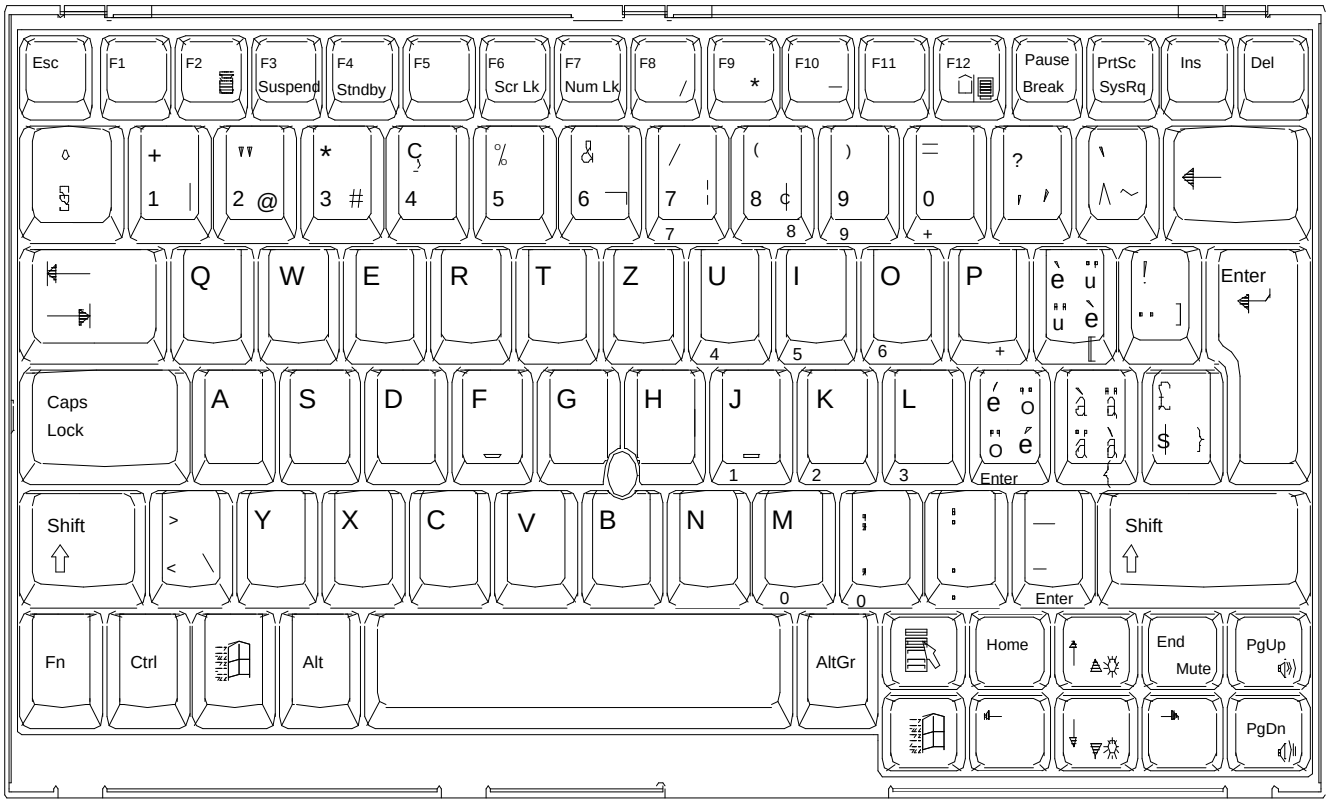


Figure N-12 Swiss Keyboard Layout

O

TravelMate 6000/6100 Memory Management

O.1 Introduction

This appendix describes the various areas of RAM and how you can make it more efficient by configuring it with the memory management device drivers supplied with your computer.

O.1.1 Memory Areas

MS-DOS directly accesses up to 640 KB of RAM for the execution of programs and commands and for storing temporary data. MS-DOS cannot directly access memory beyond this 640 KB limit. The amount of standard default RAM (640 KB) in the computer is displayed on the Setup Program menu as *Standard* (Memory), and it can be changed in 64 KB increments if required by your application.

O.1.2 Extended Memory

Extended memory is internal system RAM above 1024 KB. DOS or your applications (that support extended memory) can access Extended memory if your system is configured with an extended memory driver (XMS).

Extended memory drivers manage the extended memory ensuring that two programs do not use the same part of memory. The Enhanced mode of Windows for Workgroups uses extended memory to multitask applications.

DOS includes the HIMEM.SYS extended memory driver. HIMEM.SYS is defined in your CONFIG.SYS file where it is automatically loaded each time you boot the system.

HIMEM.SYS also enables DOS programs to use an extra 64 KB region located just above the 1-MB mark for storage of code and data. This area is known as high memory area (HMA).

Note: DOS can also be loaded in HMA to free up conventional memory. Refer to your *MS-DOS User's Manual* for instructions.

Note: Some application programs that run in 386 Enhanced mode (such as Windows) require special extended memory managers. Use the extended memory manager provided with your application, if available. Otherwise, use HIMEM.SYS, the MS-DOS version furnished with your computer.

You can define part of extended memory as one or more RAM disks using the RAMDRIVE.SYS device driver.

O.1.3 Expanded Memory

Expanded memory conforms to the Expanded Memory Specification (EMS) developed by Lotus®/Intel/Microsoft (LIM) known as LIM-EMS. Your TravelMate 6100 Series computer supports EMS version 4.0.

Expanded memory is accessed by allocating an area (usually 64 KB) of system memory between 640 KB and1 MB (and between 256 KB and 640 KB when the /O option is used) as a *window*. Pages or segments of data are passed to and from Expanded memory through this window, which is called the *page frame*. The page frame is divided into at least four physical pages of 16 KB each.

The total amount of internal memory above 640 KB can be assigned to either Extended memory (XMS) or Expanded memory (EMS), depending on your requirements and which driver is installed.

Note: Windows can use both XMS and EMS in 386 Enhanced mode when properly configured. Refer to your *Windows User's Guide* for details and instructions.

The Expanded Memory Manager included with DOS (EMM386.EXE) manages the interface between the program and Expanded memory, bringing data in and out through the page frame as required.

Before you can use Expanded memory, you must install the EMM386.EXE device driver as described in the next subsection, *Memory Device Drivers*. You need not install the Expanded memory driver if your application does not support Expanded memory.

O.1.4 Memory Device Drivers

The following device drivers included in the **c:\windows** (Windows 95) **c:\dos** (in Windows for Workgroups) directory are provided to manage memory:

- **HIMEM.SYS** — an extended memory manager that supervises the computer's Extended memory so that no two applications use the same memory at the same time.
- **EMM386.EXE** — supports LIM-EMS Expanded memory
- **RAMDRIVE.SYS** — supports RAM disks in standard, Extended, and Expanded memory.
- **SMARTDRV.EXE** — for use with a hard disk drive and Extended or Expanded memory that supports disk-caching to speed up reading from the hard disk.

O.1.5 Installing Device Drivers

To install a driver, add a DEVICE command line to your CONFIG.SYS file similar to the following, using the MS-DOS EDIT utility or a word processor that saves text files in ASCII format:

O.1.5.0.1 In Windows 95:

DEVICE=C:\WINDOWS\XXXXXXXX.XXX [options]

O.1.5.0.2 In Windows for Workgroups:

DEVICE=C:\DOS\XXXXXXXX.XXX [options]

Where XXXXXXXX.XXX is the name of the device driver, for example, HIMEM.SYS. You must then restart the computer to load the new CONFIG.SYS settings and activate the driver(s).

O.1.6 EMM386.EXE

The EMS memory manager provided with your computer, EMM386.EXE, conforms to version 4.00 of the Lotus/Intel/Microsoft Expanded Memory Specification (EMS). EMM386.EXE enables areas of system memory to be used as Expanded memory.

The EMM386.EXE device driver must be installed before you can use Expanded memory. To install EMM386.EXE in its simplest form, include the following command line in your CONFIG.SYS file *before* any other DEVICE commands that use Expanded memory (for example, RAMDRIVE.SYS) but *after* the HIMEM.SYS command line. This allows other device drivers to use the memory manager.

O.1.6.0.1 In Windows 95:

DEVICE=C:\WINDOWS\EMM386.EXE [options]

O.1.6.0.2 In Windows for Workgroups:

DEVICE=C:\DOS\EMM386.EXE [options]

Parameters (also called *switches* or *options*) for the EMM386.EXE driver are described in the *Microsoft Windows User's Guide*. After it loads, the memory manager determines the amount of Expanded memory in the system and performs any required initialization.

Note: The 386 Enhanced mode of Windows allows you to simulate part of extended memory as expanded memory using the EMM386.EXE device driver. However, this is not recommended as it degrades system performance. MS-DOS also uses EMM386.EXE to enable Upper Memory Area (UMA). This allows you to load TSR programs and device drivers in this area to free up conventional memory. Again, this may degrade performance. Refer to the *Microsoft Windows User's Guide* or *MS-DOS User's Guide* for details.

Some applications may require *backfill* memory, which is the unused area of standard memory that can be used by EMM386.EXE as Expanded memory. For example, an application may require only 256 KB or 512 KB of standard memory, leaving 384 KB and 128 KB of backfill memory space, respectively, for use as Expanded memory.

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