



*PEN\*KEY<sup>R</sup> Model 6620*

# *USER'S GUIDE*

.....

**NPN: 961-028-101**  
*Revision A*  
*March 15, 1998*

## " NOTICE

This publication contains information proprietary to Intermecc Technologies Corporation. It is being supplied to you with the express understanding that the information contained herein is for the benefit of the contracting party only, and may not be copied, distributed, or displayed to third parties without the express written consent of Norand Corporation, and shall be returned to Intermecc Technologies Corporation upon written request. If a purchase, license, or nondisclosure agreement has been executed, the terms of that agreement shall govern this document.

This publication is furnished for information only, and the information in it is subject to change without notice. Although every effort has been made to provide complete and accurate information, Intermecc Technologies Corporation assumes no responsibility or liability for any errors or inaccuracies that may appear in this document.

We welcome your comments concerning this publication. Although every effort has been made to keep it free of errors, some may occur. When reporting a specific problem, please describe it briefly and include the book title and part number, as well as the paragraph or figure number and the page number.

Send your comments to:                   Intermecc Technologies Corporation  
  Norand Mobile Systems Division  
  Publications Department  
  Norand Corporation  
  550 Second Street SE  
  Cedar Rapids, Iowa 52401

® Registered trademark; Marca Registrada by Norand Corporation, Cedar Rapids, Iowa, U.S.A.

© Copyright 1998, Intermecc Technologies Corporation. All rights reserved.



This publication printed on recycled paper.

### **Acknowledgements**

*AS/400*, *IBM*, *Microchannel*, *PS/2*, and *OS/2* are registered trademarks of International Business Machines Corporation.

*Borland C* and *C++ for Windows* are trademarks of Borland International, Inc.

*Ethernet* is a trademark of Xerox Corporation.

*MICRO-CLEAN II* is a registered trademark of Foresight International, Inc.

*Microsoft*, *MS*, *MS-DOS*, and *Windows* are registered trademarks and *Visual Basic for Windows*, and *Windows for Pen* are trademarks of Microsoft Corporation.

# CONTENTS

<b>SECTION 1</b>	
<b>General Information</b> .....	<b>1-1</b>
<b>Introduction: About this Manual</b> .....	<b>1-1</b>
<b>Summary of Sections</b> .....	<b>1-2</b>
Section 1 General Information .....	1-2
Section 2 Options and Accessories .....	1-2
Section 3 Operation .....	1-2
Section 4 Maintenance .....	1-2
Section 5 Vehicle Installation .....	1-2
Appendixes .....	1-2
<b>Computer Description</b> .....	<b>1-3</b>
Portable Computers .....	1-3
The PEN*KEY 6620 Computer .....	1-3
Software Compatibility .....	1-4
Computer Description .....	1-4
Display .....	1-5
Pen (input device) .....	1-6
Battery compartment .....	1-6
Infrared window .....	1-6
Connectors .....	1-6
Serial Port .....	1-7
DC power input jack .....	1-7
Mini-DIN connector (keyboard) .....	1-7
Docking connector .....	1-7
Antenna connector (terminal-to-dock) .....	1-8
Status indicators .....	1-11
Controls .....	1-13
Scanner activation .....	1-13
Right mouse activation .....	1-13
Brightness/Contrast Control .....	1-13
Suspend or Resume Switch .....	1-13
Compartment doors .....	1-15
<b>Specifications</b> .....	<b>1-16</b>
Physical .....	1-16
Environmental .....	1-16
Electrical .....	1-16

<b>SECTION 2</b>	
<b>Options and Accessories</b> .....	<b>2-1</b>
General Information .....	2-1
Options .....	2-1
Accessories .....	2-1
Options .....	2-2
Memory Upgrades .....	2-2
Integrated Scanners .....	2-2
Internal Modem .....	2-2
PC Card Devices .....	2-2
Hard Drive .....	2-2
Accessories .....	2-3
Cigarette Lighter Adapter .....	2-3
AC Power Adapter .....	2-4
External Battery Chargers .....	2-4
Docks .....	2-5
Vehicle Dock .....	2-5
Single Dock .....	2-5
Using the Dock .....	2-5
Features .....	2-5
Multidock .....	2-6
Using the Dock .....	2-6
Docking the Computer .....	2-7
Insert Computer Into Dock .....	2-9
Dock Front Panel .....	2-10
Undocking The Computer .....	2-10
Docked Computer .....	2-11
Accessory Cables .....	2-12
Tethered Pen .....	2-12
Adjustable Handstrap .....	2-13
Relocating the Handstrap .....	2-13
Keyed Snap (how to snap, and unsnap) .....	2-13
Adjusting the Handstrap .....	2-15
Closing the Handstrap .....	2-16
Neck or Shoulder Strap .....	2-17
Opening or Closing the Strap .....	2-17

**SECTION 3**

<b>Operation</b> .....	<b>3-1</b>
General Information .....	3-1
PC Cards .....	3-2
General Information .....	3-2
Installing Cards .....	3-2
Removing Cards .....	3-2
Memory .....	3-4
General Information .....	3-4
Required Tools and Equipment .....	3-4
ESD Safety .....	3-4
Hand Tools .....	3-5
Precautions .....	3-5
Memory Installation Procedures .....	3-6
Disassembly .....	3-6
Installation and Reassembly .....	3-8
Batteries .....	3-10
Main Battery Installation .....	3-10
Charging .....	3-11
On/Off Switch .....	3-12
Input/Output .....	3-13
Input .....	3-13
Keyboard Connector .....	3-13
DC Power Jack .....	3-13
Touch Input .....	3-13
Using the Integrated Scanner .....	3-13
Two-Way Communication .....	3-14
Telephone Connection .....	3-14
Ethernet Connection .....	3-14
Serial Communication .....	3-14
Infrared Communication .....	3-14
Remote Antenna Connector (optional) .....	3-14
Docking Connector .....	3-14
Computer Start Up .....	3-15
Start Up Procedures .....	3-15
Restarting the Computer .....	3-16
Warm Restart .....	3-16
Cold Restart .....	3-16
Operation .....	3-16

<b>SECTION 4</b>	
<b>Maintenance</b> .....	<b>4-1</b>
Introduction .....	4-1
Maintenance Procedures .....	4-1
Batteries .....	4-1
Main Battery Pack .....	4-2
Storage and Shipping .....	4-2
Battery Pack Information .....	4-2
Gas Gauge Recalibration .....	4-2
Battery Capacity .....	4-3
Backup Battery .....	4-4
Display .....	4-4
Battery Connectors .....	4-4
Cleaning Instructions .....	4-4
Case and Display .....	4-4
Factory Service .....	4-5
<b>SECTION 5</b> .....	<b>5-1</b>
<b>Vehicle Installation</b> .....	<b>5-1</b>
Vehicle Dock Installation .....	5-1
Tools Required .....	5-2
Installation Procedures .....	5-2
Introduction to Vehicle Installation .....	5-3
Power Cable Routing .....	5-4
Cable Length .....	5-4
Cable installation .....	5-4
Guidelines .....	5-4
Battery Cable Connections .....	5-5
Battery Cable Completion .....	5-5
Cut and Strip the Battery Cable .....	5-5
Prepare the Cable Ends .....	5-6
Connection to Side-mounted Terminals .....	5-7
Connection to Top-mounted Terminals .....	5-8
Secure the Power Cable .....	5-9
Fasten Ground Cable .....	5-9
Mechanical Installation .....	5-10
Attach Mounting Plate .....	5-10
Install Mount .....	5-10

Final Connections .....	5-12
Vehicle Dock Alone .....	5-12
Vehicle Dock and Printer .....	5-12
Connections .....	5-12
Power Connector .....	5-12
Ethernet Connection .....	5-13
COM Serial Ports (COM1, COM2) .....	5-13
LPT1 - Printer Port .....	5-13
Keyboard, Mouse .....	5-13
AUX Connector .....	5-13
Radio Antenna Connector .....	5-13
VGA Connector .....	5-13

### FIGURES

Figure 1-1 The 6620 Computer .....	1-5
Figure 1-2 Visible Connectors .....	1-8
Figure 1-3 Concealed Connectors .....	1-9
Figure 1-4 PC Card Access .....	1-10
Figure 1-5 Status Indicator LEDs .....	1-11
Figure 1-6 Controls .....	1-14
Figure 1-7 Compartment Doors .....	1-15
Figure 2-1 Cigarette Lighter Adapter .....	2-3
Figure 2-2 AC Power Adapter .....	2-4
Figure 2-3 Docking Detail .....	2-8
Figure 2-4 Insert Computer into Dock .....	2-9
Figure 2-5 Docked Computer .....	2-11
Figure 2-6 Tethered Pen .....	2-12
Figure 2-7 Adjustable Handstrap .....	2-14
Figure 2-8 Adjusting the Handstrap .....	2-15
Figure 2-9 Closing the Handstrap .....	2-16
Figure 2-10 Neck or Shoulder Strap .....	2-17
Figure 3-1 PC Card Compartment Door .....	3-3
Figure 3-2 PC Card Slots .....	3-3
Figure 3-3 Prepare Computer for Upgrades .....	3-5
Figure 3-4 RAM and FLASH Access .....	3-6
Figure 3-5 Remove Memory Boards .....	3-7
Figure 3-6 Install FLASH Board .....	3-8
Figure 3-7 Reinstall DRAM Board .....	3-9
Figure 3-8 Install Main Battery .....	3-10
Figure 3-9 Charging Configurations .....	3-11
Figure 3-10 On/Off Switch .....	3-12
Figure 4-1 Battery Pack Capacity Check .....	4-3

Figure 5-1 Strip the Battery Cable .....	5-5
Figure 5-2 Prepare Cable Ends .....	5-6
Figure 5-3 Side-Mount Battery Terminals .....	5-7
Figure 5-4 Top-Mount Battery Terminals .....	5-8
Figure 5-5 Secure Cable .....	5-9
Figure 5-6 Adjustable Mount .....	5-11
Figure 5-7 Composite of ALL Dock Connectors .....	5-14

**TABLES**

Table 1-1 Status Indicators .....	1-12
Table 2-1 Dock Indicator LEDs .....	2-10
Table 5-1 Parts List .....	5-2



# Section 1

## General Information

---

---

### *Introduction: About this Manual*

This manual is divided into five sections plus appendixes. Sections 1, 2, 3, and 4 are for the end-user, while Section 5 is intended for the vehicle installation technician. The main sections are:

- Section 1    General Information
- Section 2    Options and Accessories
- Section 3    Operation
- Section 4    Maintenance
- Section 5    Vehicle Installation

---

## *Summary of Sections*

### *Section 1, General Information*

Tells how this manual is organized, contains a summary of each section, and describes the terminal.

### *Section 2, Options and Accessories*

Depicts and describes options and accessories.

### *Section 3, Operation*

Tells how to put the unit into operation for the first time.

### *Section 4, Maintenance*

This section contains care and maintenance instructions.

### *Section 5, Vehicle Installation*

This section tells how to wire and install a vehicle mount.

## *Computer Description*

### *Portable Computers*

Hand-Held Computers are used by mobile workers to quickly and accurately capture information, print reports, dispatch competitive analysis, and to support field maintenance and sales automation.

Technical advancements help make today's hand-held computers suitable for many other uses.

These units are battery operated, making them extremely portable and well-suited for utility, public safety, transportation, and field service operations.

Typically, programs or data are loaded ("downloaded") into the hand-held computer from a PC or mainframe. Depending upon the options built into the computer, entries are made via screen contact, a keyboard or a scanner. The hand-held computer typically contains (or can access) a database with customer and product information. It does calculations based on product movement, sends information to a printer, and often sends data to a host computer in real time or at the end of the work day.

### *The PEN\*KEY<sup>R</sup> 6620 Computer*

The 6620 Hand-Held Computer is a versatile portable data collection device. It has a large, easily-read display, pen-based data entry, and the power and speed provided by an AMD X5-133 MHz processor. With extensive memory options and the Windows 95 operating system, the 6620 Computer is a powerful, full-function PC with all of the ruggedness and portability we design into every product.

## *Software Compatibility*

Norand equips the computer with software for battery charging and for communicating to peripheral devices. The computer also has a software interface for display control when using windows-type programs.

Since the computer uses the Windows 95 operating system, there are many general programs and publications available for use with the computer.

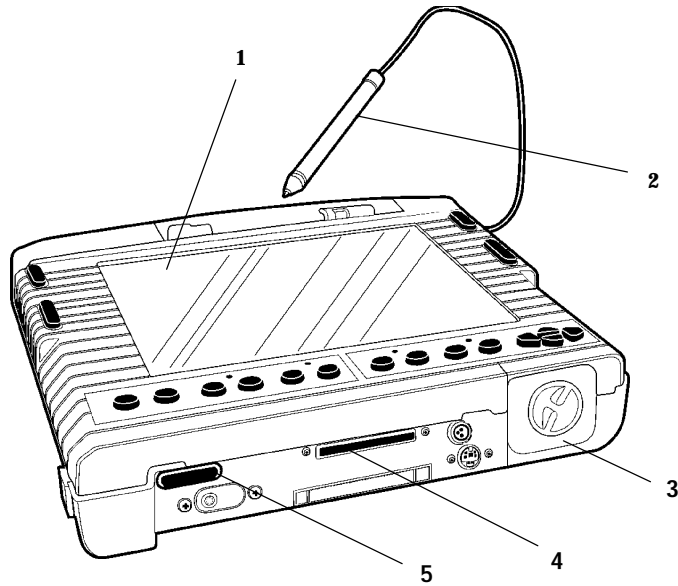
## *Computer Description*

The following illustrations and text will familiarize you with the external features of the 6620 Computer.

At the beginning of each work day, inspect the unit and make sure that the following components are secure:

- Battery compartment door
- PC card compartment door
- Special pen
- Handstrap
- External connectors
- Optional accessory pod

*Correct any problems discovered during this inspection before using the computer.*



1. Display
2. Tethered pen
3. Battery compartment
4. Docking connector
5. Infrared window

*Figure 1-1*  
*The 6620 Computer*

#### Display

The display shows computer or battery status messages, entries, the most recent scan, customer or product lists, calculations, and prompts that require a response from you.

The cursor controls can be shifted to let you adjust the display brightness and contrast (*monochrome display only*) for best viewing.

#### Pen (*input device*)

You can use a scanner or the special pen provided with the computer to make manual entries. The special (passive) pen has a unique tip designed to reduce touch-screen wear and scratching. This pen normally performs the function of the *left mouse button*; keys located near the display on the computer allow you to change the pen function to that of a *right mouse button*.

#### Battery compartment

The easy-access battery compartment contains a rechargeable battery pack. This is a "smart" battery pack because it has internal electronics that monitor and can report the condition of the battery pack. A sensor in the battery compartment detects when the door is in place and fully latched: the unit *will not work* unless the door is latched.

#### Infrared window

An infrared serial port (IrDA standard) provides a wireless, two-way, line-of-sight communication path between the computer and peripheral devices.

### *Connectors*

There are six external connectors at various locations (see figures 1-1 and 1-3) on the Model 6620 Computer. An RJ-45 jack connects to an optional internal modem (*jack is present, whether a modem is installed, or not*). Other connectors include a 9-pin serial port, DC power input jack, a mini-DIN keyboard connector, a docking connector, and a terminal-to-dock antenna connector

#### Serial Port

This 9-pin D-subminiature connector supports RS-232 signals for two-way communication between peripheral devices and is capable of supporting a 5 volt bar code scanner. When the computer is docked, these same signals are carried on the docking connector and are accessed via the RS-232 port on the dock.

#### DC power input jack

This jack allows you to power and recharge the computer from either an external 12 volt ac-dc power supply or an adapter cable to a vehicle cigarette lighter socket or auxiliary power source.

#### Mini-DIN connector (*keyboard*)

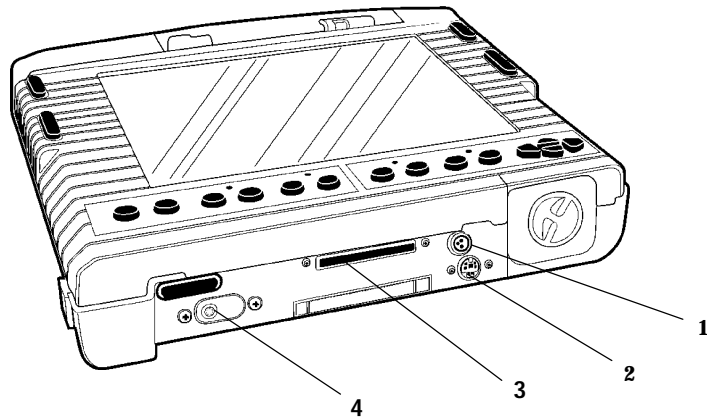
This 6-pin miniature DIN connector directly supports PS/2 or PC AT keyboards through an adapter cable. Keyboard signals are also available on the docking connector to permit the use of an external keyboard when the computer is docked. You can connect a wedge-type scanner or mouse to the computer via the keyboard connector. A special adapter is required to connect a standard, off-the-shelf mouse.

#### Docking connector

This connector provides a reliable electrical interface between the computer and a vehicle or fixed-mount docking station. Both two-way communication signals and power for operating and recharging the battery pack pass through this connector.

Antenna connector (*terminal-to-dock*)

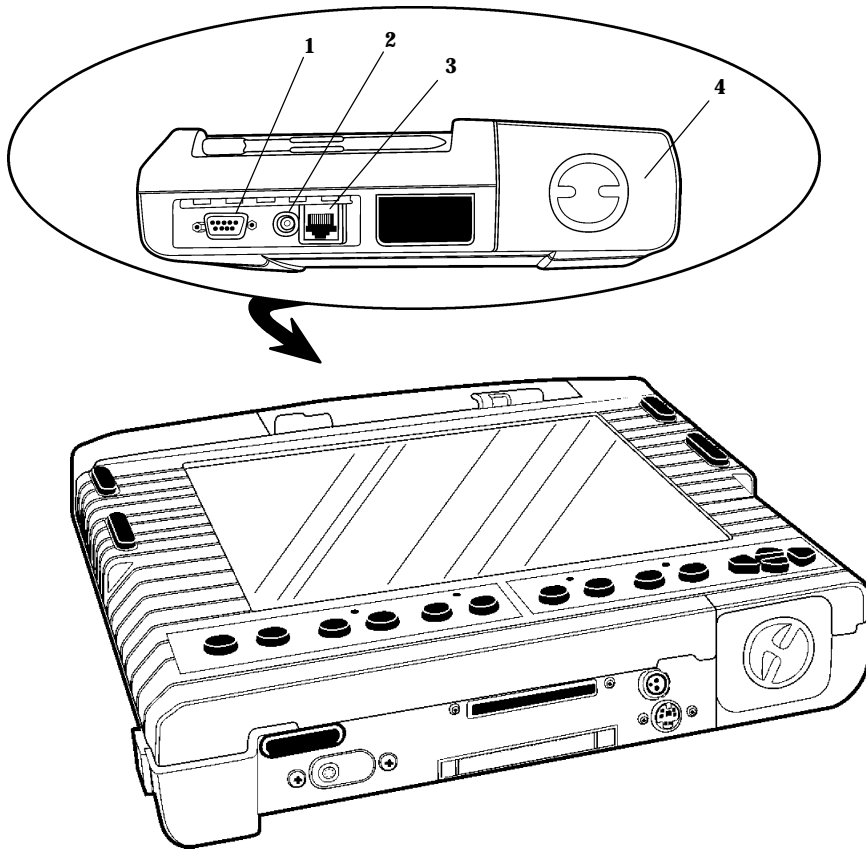
This connector mates with a connector in the dock for use with an external, remotely-located radio antenna.



- 1. DC power input jack
- 2. Keyboard connector
- 3. Docking connector
- 4. Antenna connector (*terminal-to-dock*)

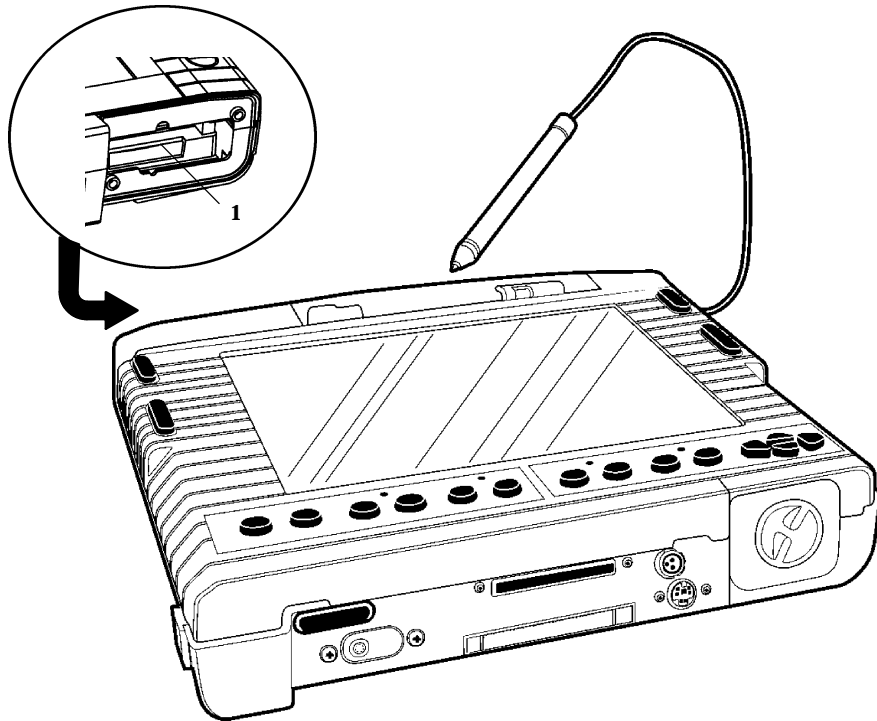
*Figure 1-2*  
*Visible Connectors*





- 1. 9-pin RS-232 male D-sub
- 2. On/Off switch
- 3. RJ-45 (lift flap to access phone jack)
- 4. PC Card access door

*Figure 1-3  
Concealed Connectors*

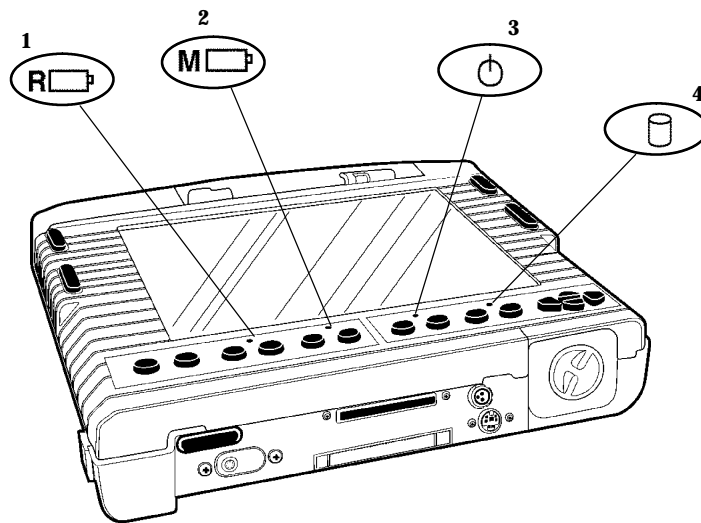


1. PC Card slots

*Figure 1-4*  
*PC Card Access*

## Status indicators

Three bi-color light-emitting diode (LED) indicators located between keys on the front panel tell you the status of various power sources for the computer. A fourth LED comes on (*green only*) whenever the optional hard drive is being accessed. Figure 1-5 identifies each of these LEDs. Table 1-1 shows the meanings for each indicator.



1. Backup ("reserve") battery
2. Main battery
3. External power
4. Internal hard drive

*Figure 1-5*  
Status Indicator LEDs

*Table 1-1*  
*Status Indicators*

<b>Indicator (LED)</b>	<b>Condition</b>	<b>Meaning</b>
<b>Backup Battery</b>	OFF	<i>unit in Suspend mode</i>
	GREEN	<i>b/u battery charged; running, or external power</i>
	<i>blinking</i> GREEN	<i>b/u battery charging; running or on external power</i>
	AMBER	<i>running off backup battery, capacity exceeds 20 percent</i>
	<i>blinking</i> AMBER	<i>running off backup battery, capacity under 20 percent</i>
<b>Main Battery</b>	OFF	<i>unit in Suspend mode</i>
	GREEN	<i>main battery charged; running or on charge power</i>
	<i>blinking</i> GREEN	<i>main battery charging; running or on charge power</i>
	AMBER	<i>running off main battery, capacity exceeds 20 percent</i>
	<i>blinking</i> AMBER	<i>running off main battery, capacity under 20 percent</i>
<b>External Power</b>	OFF	<i>On/Off switch is OFF</i>
	GREEN	<i>running on external power</i>
	<i>blinking</i> GREEN	<i>unit in suspend; running or on charge power</i>
	AMBER	<i>ON, running off battery</i>
	<i>blinking</i> AMBER	<i>unit in Suspend mode, no external power applied</i>

## Controls

The front of the computer has nine software-configurable controls plus four cursor-controls and a *suspend/resume* switch. Two oval buttons on either side near the top of the display allow right or left-handed operation of the (1) scan activation and (2) right mouse-button controls. Controls are described and shown below.

### Scanner activation

Two scanner controls, one on either side of the display, allow you to trigger the optional built-in scanner with either your left or right hand. It is not necessary to push both buttons at once to activate the scanner.

### Right mouse activation

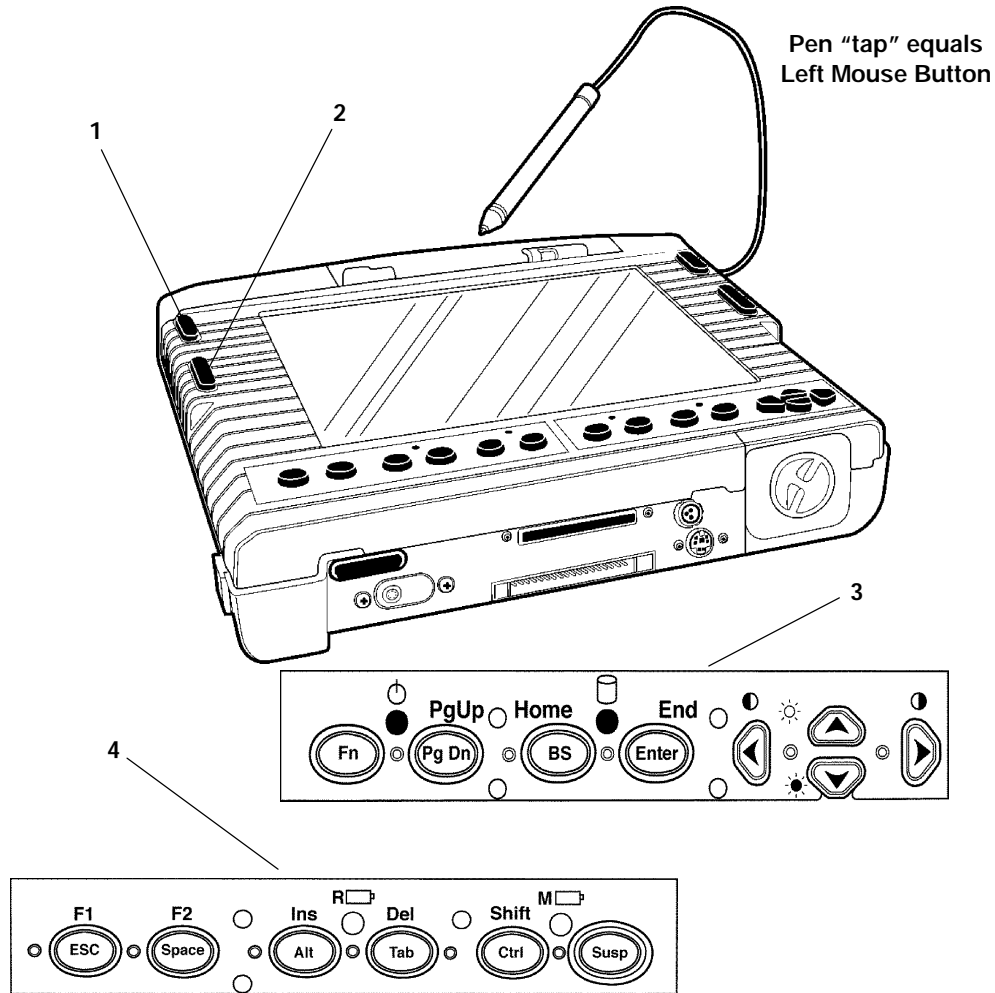
Two controls just below the scanner activate controls allow you to switch the pen function from left mouse to right mouse when necessary.

### Brightness/Contrast Control

Press and hold down on the **Fn** key to use the cursor keys to adjust display brightness. Contrast can also be adjusted on the monochrome (*only*) display.

### Suspend or Resume Switch

The Suspend/Resume switch allows you to suspend operations by manually placing the unit into an almost-off (standby) condition. This will conserve battery power during predictable periods of inactivity. Push the Suspend or Resume switch once to suspend operation; press it again to resume operation.



1. Scanner activate switch
2. Right mouse switch
3. Righthand keyboard overlay
4. Lefthand keyboard overlay

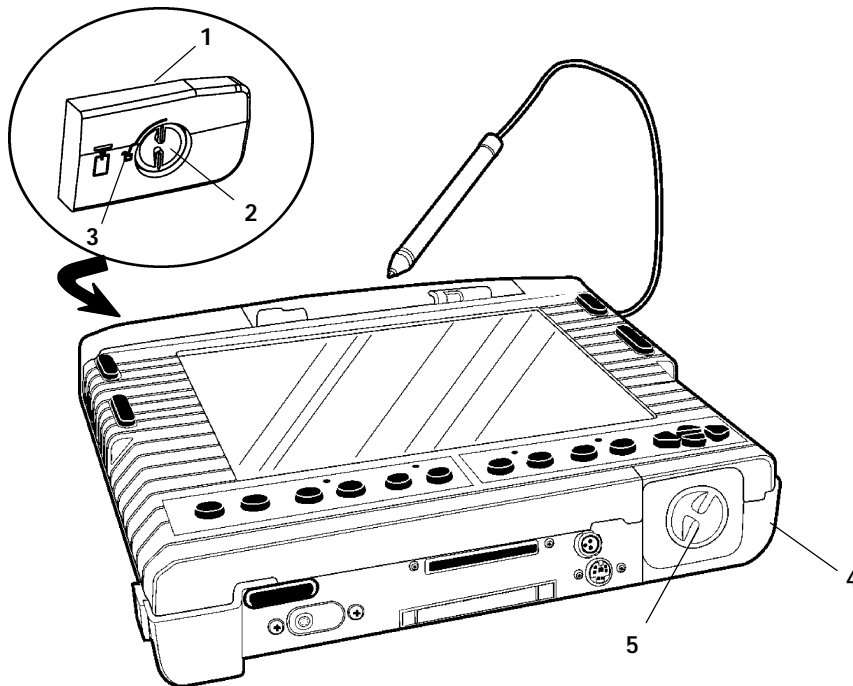
*Figure 1-6*  
*Controls*

## Compartment doors

The illustration below identifies the battery and PC Card compartment doors. You may need a coin or flatblade screwdriver to release the latch knobs.

**CAUTION:** *Close and Lock compartment doors before using computer.*

**NOTE:** *Turn the latch knobs 1/4-turn counterclockwise to open doors.*



1. PC card compartment door
2. Latch knob
3. Unlock icon
4. Battery compartment door
5. Latch knob

*Figure 1-7*  
*Compartment Doors*

## Specifications

### Physical

<b>Size</b>	10.1" x 8.5" x 2.1" (L, W, H)
<b>Weight</b>	63 oz. (with battery and without options)

### Environmental

<b>Operating temp.</b>	-4 to +122°F (-20 to +50 °C) (note: options/peripherals may restrict upper limits)
<b>Storage temp.</b>	-4 to +140°F (-20 to +60 °C)
<b>Humidity</b>	5 to 95% noncondensing

### Electrical

<b>Power Sources</b>	lithium ion "Smart" pack external power sources approved by Norand
<b>Charging</b>	battery packs charge internally or externally (stand-alone fast-charged in 4.5 hours, or less)
<b>Communication</b>	6-pin mini-DIN ( <i>external PS/2 compatible keyboard</i> ) 9-pin D-sub ( <i>serial port connector</i> ) RJ-45 jack ( <i>with optional modem</i> ) IrDA infrared serial port ( <i>4 MB IrDA v1.1, or 115 K baud v1.0</i> ) Ethernet 10BASE-T ( <i>available on docking station</i> )
<b>Standards</b>	FCC Class B, CSA, Cisper 22 Class B, IEC 950, UL
<b>Processor</b>	AMD 5X86, 133MHz
<b>Standard Memory</b>	16MB DRAM; expandable to 20MB or 32MB total
<b>Flash Memory</b>	2MB; 4 MB or 8 MB options
<b>PC Card options</b>	two v.2.0 PCMCIA type II slots, usable as single type III ( <i>user accessible</i> ) one v.2.0 PCMCIA type III slot

### Display

<b>Type</b>	8.4" active matrix color, or 8.7" monochrome
<b>Touch panel</b>	analog resistive type ( <i>passive, no battery required</i> )
<b>Backlight Features</b>	CCFL with brightness control



## Section 2

# Options and Accessories

---

### *General Information*

Options that can be ordered for the 6620 Computer include DRAM and Flash RAM upgrades, an integrated scanner, an internal modem, a 2.5-inch hard drive, and various built-in wireless (radio or cellular) communication devices.

Accessories are items or devices that, when added to the computer, make it more convenient to use or that extend its functionality.

### *Options*

- Memory upgrades
- Integrated scanner
- Internal modem
- PC Card devices
- 2.5-inch hard drive

### *Accessories*

- Cigarette lighter adapter
- AC power adapter
- Single and Quad battery pack chargers
- Single, vehicle, and multidocks

## Options

### *Memory Upgrades*

Each computer requires a certain minimum amount of memory to operate properly. This consists of a specified amount of Flash RAM (a form of programmable memory) and DRAM (dynamic, or continuously changeable, memory). Larger application programs may impose a need for additional memory, and operational speed is usually faster when more memory is available. For these reasons, the 6620 Computer comes with 16M of DRAM, standard, and can be ordered with up to 8M of flash memory.

### *Integrated Scanners*

The 6620 Computer can be ordered with either a standard or long-range, 5 volt laser scanner built-in. This computer also supports tethered (external) CCD, wand, and laser scanners.

### *Internal Modem*

The 6620 Computer can be ordered with a modem built into the unit, with the RJ-45 connector providing external connection to your telephone line. Computers not ordered with an internal modem can have this option installed (by authorized Service Centers) in the future.

### *PC Card Devices*

An internal drive can accommodate approved optional Type III PC card devices. Some Type III options can be installed at the factory or by authorized service technicians.

### *Hard Drive*

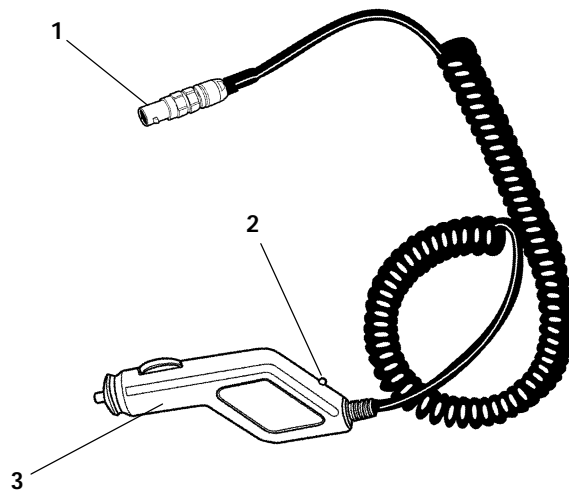
The optional, factory-installed 2.5-inch hard drive is located in the user-accessible PC Card compartment. This drive is available with up to 1.4G of storage space.

---

## Accessories

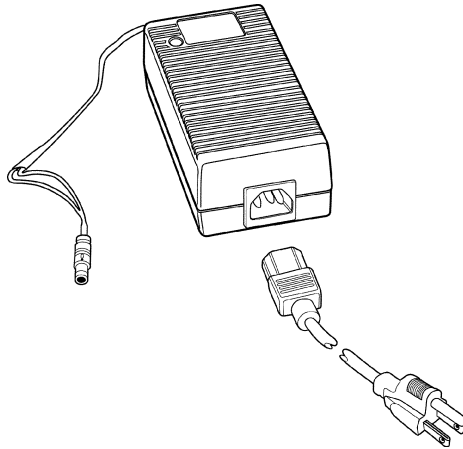
### *Cigarette Lighter Adapter*

The cigarette lighter adapter cable provides a quick and convenient way to power the 6620 Computer from a vehicle electrical system. The DC power plug goes directly into the power jack on the bottom of the computer. A light-emitting diode (LED) power indicator (*item #2, below*) is on when vehicle power is available to the computer.



- 1. DC plug (to computer)
- 2. Power indicator (LED)
- 3. Adapter

*Figure 2-1*  
*Cigarette Lighter Adapter*



*Figure 2-2*  
*AC Power Adapter*

### *AC Power Adapter*

Adapters are available that allow the computer to be operated from standard electrical outlets using an appropriate U.S. or an international power cord to the adapter. The adapter cable plugs directly into the bottom of the computer and charges the main and backup batteries while simultaneously powering the computer.

### *External Battery Chargers*

Pack chargers are available for either U.S. or international applications to recharge the main battery pack while it is out of the computer. These accessories, available in single-pack and four-pack versions, are useful for charging spare battery packs.

## *Docks*

Three basic dock accessories are available for the 6620 Computer. Custom versions of these docks may be created for special uses or to satisfy unique customer requirements.

### *Vehicle Dock*

A vehicle dock provides secure storage in route vehicles while providing battery charging and operating power to the computer directly from the vehicle electrical system. The vehicle dock is shown in the Vehicle Installation section of this manual.

### *Single Dock*

The single dock is similar to the vehicle dock but is in a fixed location such as desktop or shelf. A standard electrical outlet provides power, via either a U.S. or an international power cord, directly to the single dock. The 6620 Computer then receives both charging and operating power when inserted in the single dock. The single dock can be connected to a network, and it can have various accessories or peripheral devices connected to it.

---

## *Using the Dock*

### *Features*

Docks for the 6620 Computer provide reliable electrical connections between the dock and the computer. In addition, a secure mechanical latching system prevents the computer from being released during communications transactions. Since the computer itself controls the final mechanical release, it will perform file closure and housekeeping tasks before allowing the release.

Docks also provide charging power to the computer and may have one or more cables attached for communication between peripheral devices or a network (wired or wireless).

A line-of-sight pass-through opening in the dock permits infrared (short-range wireless) communication between the computer and certain peripherals devices such as a compatible printer.

The front of the dock has two multi-function status indicator lights and a computer release switch. These indicators provide information about power, the on or off condition of the computer, and whether the computer is completely docked. In addition, the amber indicator will flash when the computer performs housekeeping tasks in preparation for undocking.

#### Multidock

The multidock is normally mounted on a countertop or wall. A standard electrical outlet provides power, via either a U.S. or an international power cord, directly to the multidock. Each multidock is designed to hold up to four computers, providing charging power to each computer and an Ethernet communication interface between the 6620 Computers and a host computer. This ensures that batteries are charged regularly and allows for unattended up and downloading of data. Several multidocks can be connected to a common host to accommodate a large number of computers in one location.

---

## *Using the Dock*

The single and vehicle docks are designed to ensure positive electrical connections between the computer and the dock. An especially durable and reliable latching system in the vehicle dock guards against intermittent or failed connections if the computer has been properly docked.

The instructions that follow tell how to properly dock and release the computer.

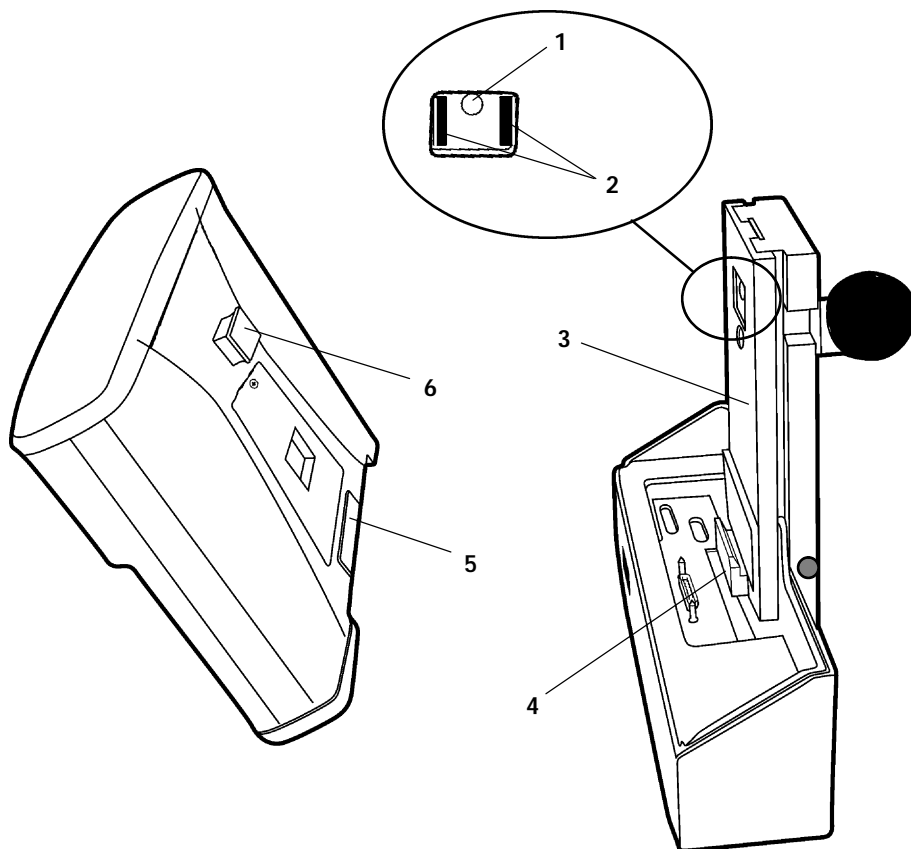
## *Docking the Computer*

Illustrations on the next two pages show computer and dock details to help you understand the critical issues involved in successfully docking the computer.

Look closely at the dock and computer: the bottom of the computer has a *docking bracket* that hooks over the *docking wedge* inside the dock. Farther up, on the slide channel, are two *spring-loaded clamps* and an *interlock button*.

A solid *clamping block* located near the top on the backside of the computer is designed to fit through the spring-loaded clamps in the dock. The block must be pressed completely into the spring-loaded clamps to release the interlock button. If not, the dock cannot be actuated downward to the locking position.

The dock and computer are designed so that once the computer is docked, it cannot be inadvertently removed from the dock while communications are taking place *or* during the housekeeping period while the computer closes down application programs. An opening in the back of the dock allows you to insert a screwdriver to effect an emergency manual release if this should become necessary.



- 1. Interlock button
- 2. Spring-loaded clamps
- 3. Slide channel
- 4. Docking wedge
- 5. Docking bracket
- 6. Clamping block

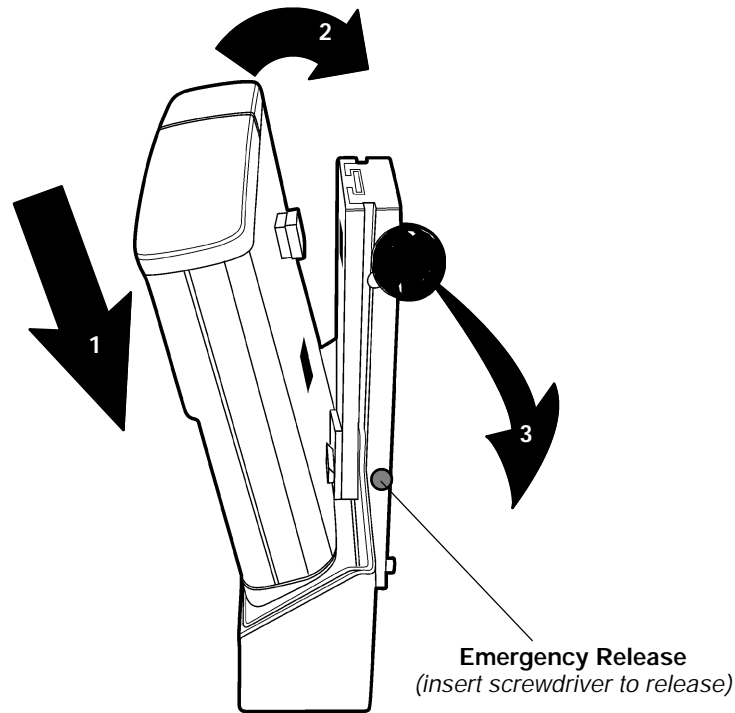
*Figure 2-3*  
*Docking Detail*



### Insert Computer Into Dock

Refer to the illustration below. The directional arrows are numbered to show the steps for docking the computer.

1. Angle the computer into the dock; the docking bracket must engage the docking wedge.
2. Press the computer against the slide channel.
3. Move the lever downward until it locks.



*Figure 2-4*  
*Insert Computer into Dock*

### Dock Front Panel

The illustration on the following page identifies the features of the dock front panel. The table below defines the meaning of the light-emitting diode (LED) indicators.

When using a compatible IrDA (infrared) peripheral device, the infrared window on the dock must be lined up with the infrared window on the device itself. This line-of-sight path must be unobstructed, with the peripheral device located *less than* one meter distant from the dock.

### Undocking The Computer

Press the release button to unlock and release the computer. The computer will then complete communication transactions and close the application program *before allowing* the dock to release the computer.

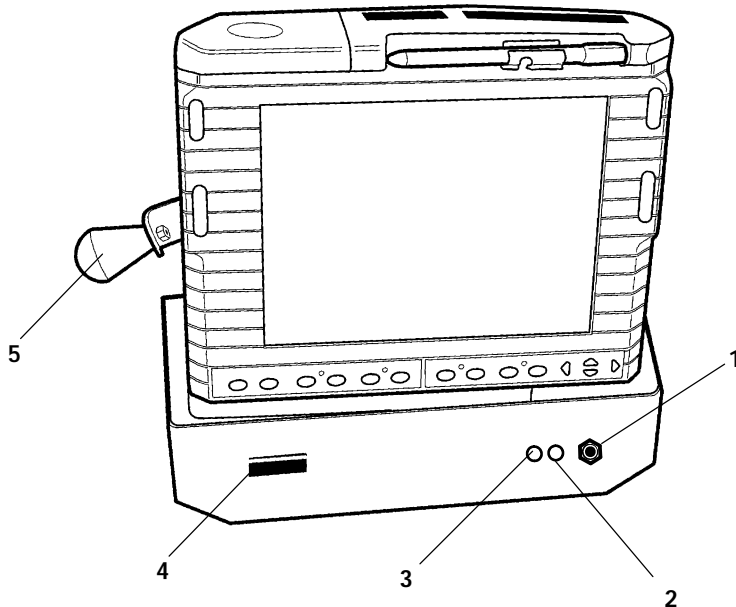
*Table 2-1*  
*Dock Indicator LEDs*

<b>Green</b>	<b>Amber</b>	<b>Meaning</b>
OFF		No external power to the dock.
ON		Dock HAS external power.
	OFF	No computer in the dock, or a computer in the dock is OFF.
	ON	Computer is docked and ON.
	Flashing	Computer is busy; either having just been docked or about to be undocked (released).

### Docked Computer

In the next illustration, the computer is shown fully docked. The locking lever, which can be positioned on either side of the dock, is in the downward, or locked position; also note the meaning of the indicator lights (amber and green LEDs) which is shown in the preceding table.

Press the release button to undock the computer. The amber LED will blink until the computer is released.



1. Release button
2. Amber LED
3. Green LED
4. Infrared window  
(peripheral device must be within  
line-of-sight of this window)
5. Locking lever (shown locked)

*Figure 2-5*  
*Docked Computer*

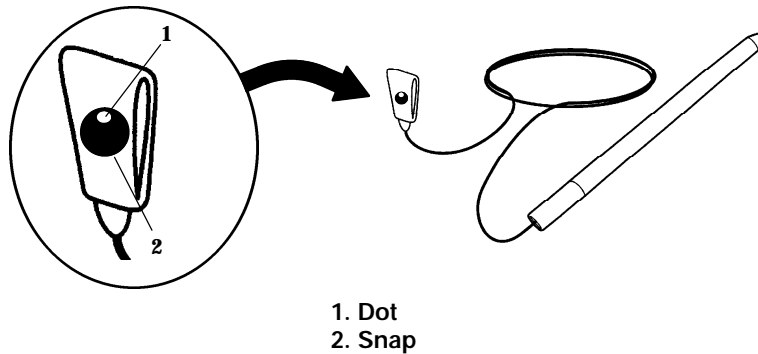
## Accessory Cables

We manufacture all power and communication cables required for dock installations. These are listed in the price guide to assist your sales representative or system engineer in selecting the appropriate cables for your installation.

Cables are also available to connect the 6620 Computer to peripheral devices such as a keyboard or a monitor.

## Tethered Pen

A tethered pen is standard on the 6620 Computer. The tether cord is permanently fastened to the pen and has a special snap on the far end of the tether. You can snap the tab to any unused male snap on the computer. The *edge opposite the dot* must be hooked *first* before pressing the snap firmly into place. When removing the snap, pull on the dot-end of the tab *first* to release the snap.



*Figure 2-6*  
*Tethered Pen*

## *Adjustable Handstrap*

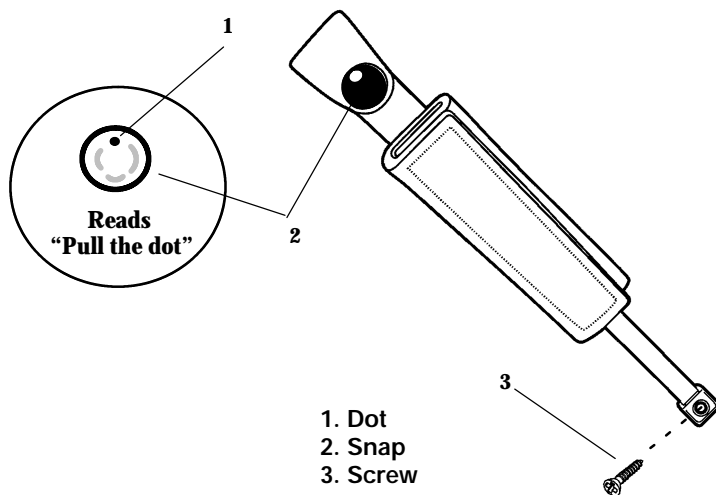
Although the adjustable handstrap is standard on the 6620 Computer, it is described in this section because it also attaches to the unit with a special snap.

### Relocating the Handstrap

The adjustable handstrap is fastened along one side of the computer with a snap on one end and a metal reinforcement and screw on the other end of the strap. You can unsnap the handstrap and lengthen it to reach other male snaps on the computer. You can also move the strap over to the other side of the computer by unsnapping one end and removing the retaining screw and the reinforcement from the other end of the strap. Relocate the strap to the other side of the computer and refasten it.

### Keyed Snap (**how to snap, and unsnap**)

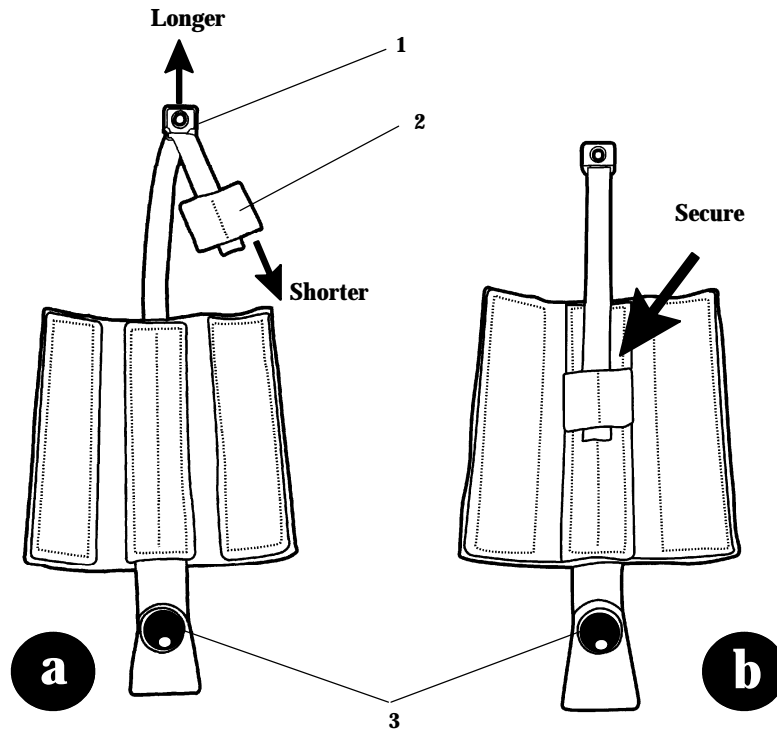
When fastening these snaps, hook the *edge opposite the dot first* before pressing the snap firmly into place. When removing the snap, pull on the dot side of the snap *first* to release it.



*Figure 2-7  
Adjustable Handstrap*

### Adjusting the Handstrap

Open the handstrap and lift the adjusting tab away from the strap. Pull on the metal piece to lengthen the handstrap; hold the metal piece and pull on the adjusting tab to shorten the handstrap. Secure by pressing the adjusting tab into the handstrap as shown below (figure b).

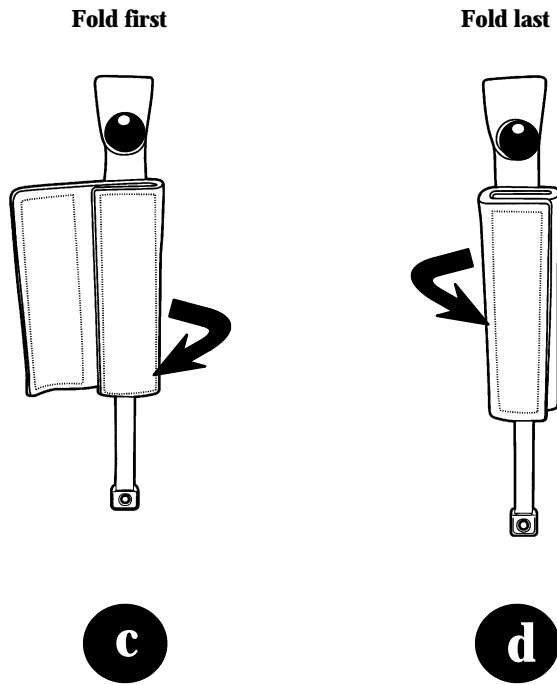


- 1. Metal piece
- 2. Adjusting tab
- 3. Snap

*Figure 2-8*  
Adjusting the Handstrap

### Closing the Handstrap

Look at the illustration below: fold the flap shown in figure c, below, and press it against the handstrap interior. Fold the remaining flap (figure d) as shown and squeeze firmly to close the handstrap.



*Figure 2-9*  
*Closing the Handstrap*

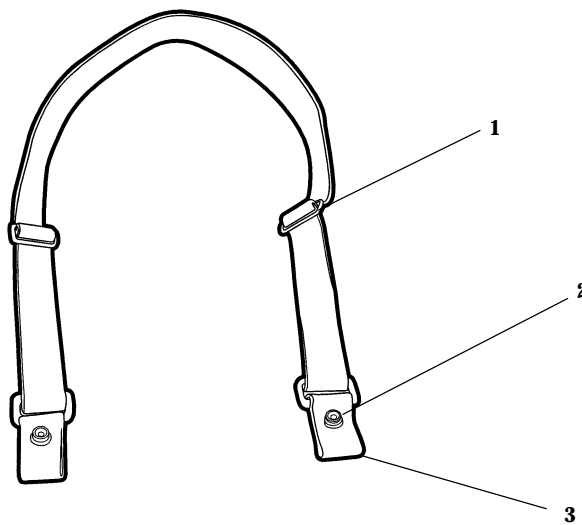


## Neck or Shoulder Strap

This optional adjustable strap attaches to the computer to allow it to be suspended from your shoulder or neck. Special snaps are also used with this strap to guard against accidental release and possible damage to the computer.

### Opening or Closing the Strap

The special snaps use a key to lock them in place. To fasten each snap, first hook the key (visible inside the female snap) onto a mating snap on the computer, then firmly press the snap into place. You can release these snaps by pulling up, or away, on the end of the strap.



1. Adjustment slides
2. Keyed snaps (*male side visible*)
3. End of strap (*pull here to release*)

*Figure 2-10*  
Neck or Shoulder Strap



# Section 3

## Operation

---

---

### General Information

The PEN\*KEY<sup>®</sup> 6620 Hand-Held Computer is shipped with a basic input-output system ("BIOS" firmware) and Windows 95 installed at the factory. This section tells you what must be done to start the computer for the first time, and includes instructions for changing or upgrading DRAM and FLASH RAM. You must do the following *before using the computer for the first time*:

**CAUTION:** *Fully charge the main battery before using the computer away from an external power source.*

- Install any optional PC Card devices.
- Connect peripherals (e.g., printer, keyboard, etc).
- Install the main battery.
- Reinstall the battery compartment door.
- Connect the computer to a charging source  
(or, make sure the battery was previously charged).

**CAUTION:** *All compartment doors must be in place and properly latched for normal operation.*

**CAUTION:** *To prevent scratches or damage to the display, do NOT use a ballpoint pen or a sharp object to make entries directly on the display.*

**CAUTION:** *Use ONLY your finger or the stylus provided to make entries.*

## PC Cards

### General Information

**NOTE:** *If an optional 2.5 inch hard drive is installed, the PC Card slot(s) will be accessible through the rear pod door.*

There are two PC Card slots located behind the PC Card door at the upper end of the computer. Each card slot can accept one type II card, or the lower slot can accept a type III card (*this blocks the upper card slot*).

**NOTE:** *SRAM memory cards may require their own internal battery. The PC Card battery may have to be installed in such cards prior to use. See the card manufacturer's literature for battery installation instructions and the recommended replacement intervals.*

### Installing Cards

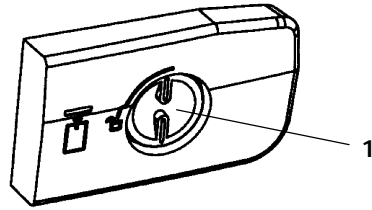
Typically, the *upper* card slot (closest to the display) is referred to as "slot 1" while the *lower* slot is "slot 0." The boot source is designated "drive C:\ " regardless of its physical location.

Open the PC Card compartment door by turning the latch knob 1/4-turn counterclockwise. Use a coin or flatblade screwdriver, if necessary, to open and remove the door. Then, slide the card connector-end first, into the slot. If you encounter resistance, remove the card, flip it over and try again. Reinstall the door and turn the latch knob 1/4-turn clockwise.

### Removing Cards

**NOTE:** *FLASH cards can be damaged if removed during write activity.*

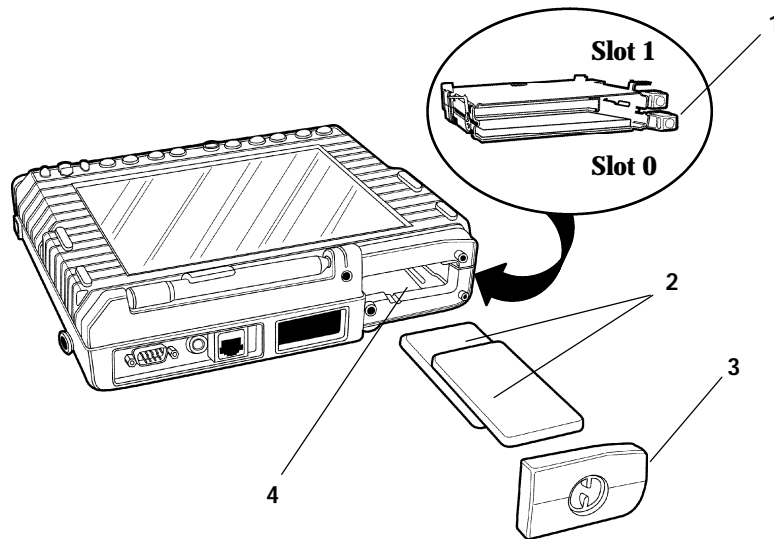
Each slot has a card ejector located on the side of the PC Card slot assembly. Place the computer in *Suspend*, then press in on the ejector to release and partially eject the associated card. Grasp it with your fingers for removal.



1. Latch knob (shown locked)

*Figure 3-1*  
PC Card Compartment Door

**CAUTION:** Close and Lock compartment doors before using computer.



1. Card ejector (lower slot)
2. PCMCIA cards (type II)
3. Compartment door
4. PC Card slots

*Figure 3-2*  
PC Card Slots

## Memory

### *General Information*

An access panel on the bottom of the 6620 Computer allows you to upgrade memory without having to completely disassemble the computer. These procedures require that you have the proper equipment, that you observe all precautions, and that you adhere strictly to the procedures. Failure to do so can result in damage to the unit and may void your warranty or maintenance contracts.

### *Required Tools and Equipment*

#### ESD Safety

The 6620 Computer contains electrostatic discharge sensitive (ESD) components, which can be damaged by static voltages present in most environments. Because of this, you *must* use a static-safe work station whenever an access panel is removed to service internal components or subassemblies. The battery compartment door and the PC card compartment door *are not* considered "access" panels and this requirement does not apply to them.

Your static-safe work station should consist (at minimum) of the following:

- " An approved, grounded, conductive work surface.
- " A personal grounding device, such as a wrist strap grounded through a 1-Megohm resistor.
- " A suitable grounding wire and clip to be attached to the dock connector shell.
- " A wire and clip to ground any tools used in the following procedures (*tools used only when in contact with the operator's hand provide sufficient ground for equipment that is otherwise electrically isolated*).

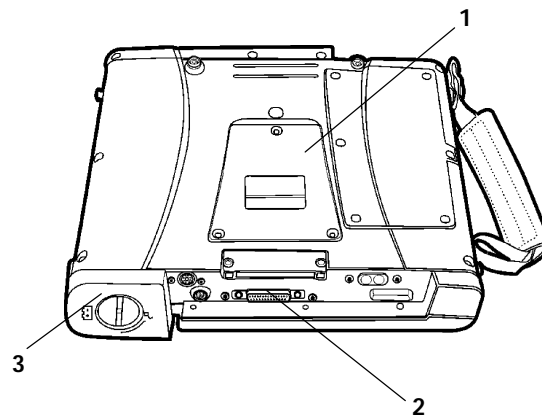
### Hand Tools

A #1 Phillips screwdriver is required to open the access panel and to remove other screws inside the computer. A hex wrench or pliers may be needed to remove the standoff.

### Precautions

You *must* follow the precautions below to ensure that the computer remains undamaged during this procedure:

- Disconnect any external power sources.
- Disable computer operation (*press the On/Off switch*). Verify that all power LEDs are off, then remove the main battery pack.
- Attach a grounding clip to the dock connector shell.
- Make sure that you are properly grounded *before removing the access panel*.



1. Memory compartment access panel
2. Ground the dock connector shell
3. Remove main battery pack

*Figure 3-3*  
*Prepare Computer for Upgrades*

## Memory Installation Procedures

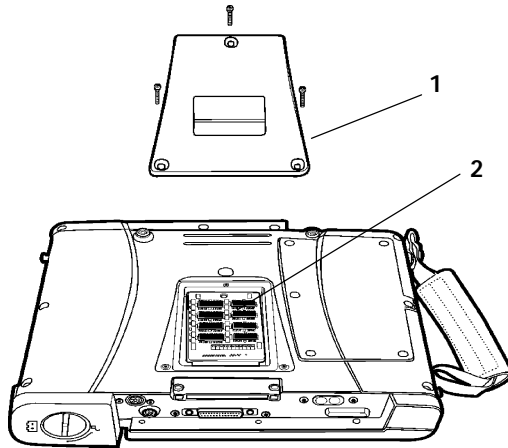
Follow the steps below to remove the DRAM and the Flash cards. Observe all precautions listed previously.

**CAUTION:**

**Do NOT allow screws or any other metal objects to fall into the computer once the access panel has been removed.**

### Disassembly

1. Place the computer on a grounded work surface.
2. Attach grounding device to yourself. *This must be done using an approved device such as a conductive wrist strap wire through a 1 Megohm resistor to ground.*
3. Attach a grounding clip to the dock connector shell.

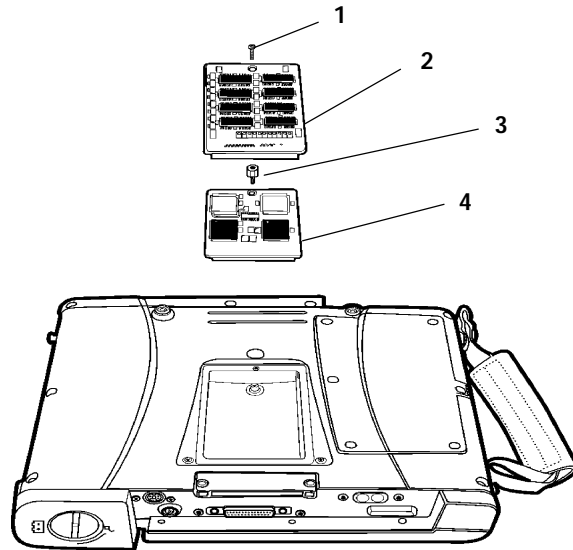


1. Access panel
2. Memory boards

*Figure 3-4*  
*RAM and FLASH Access*



4. Remove the access panel screws.
5. Remove the screw that secures the DRAM board.
6. Use a tool through the screw hole to pry up on the DRAM board.
7. When changing the FLASH board, unscrew the hex standoff (spacer) that separates the two boards. Grasp the foam pad and pull up to remove this board.

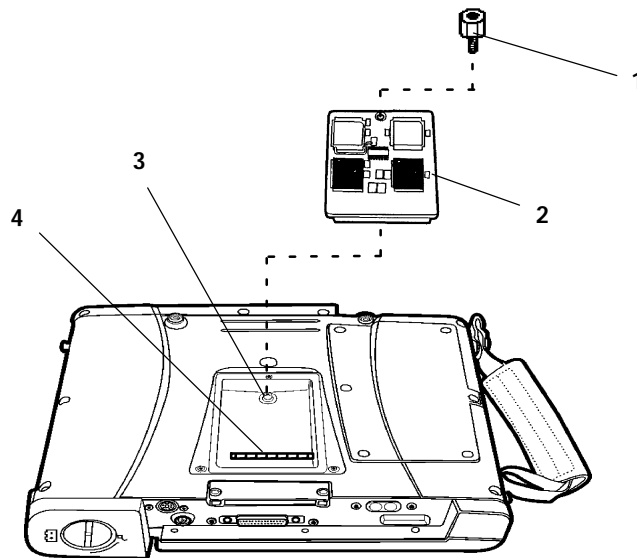


1. Screw
2. DRAM board
3. Hex Standoff
4. FLASH board

*Figure 3-5*  
*Remove Memory Boards*

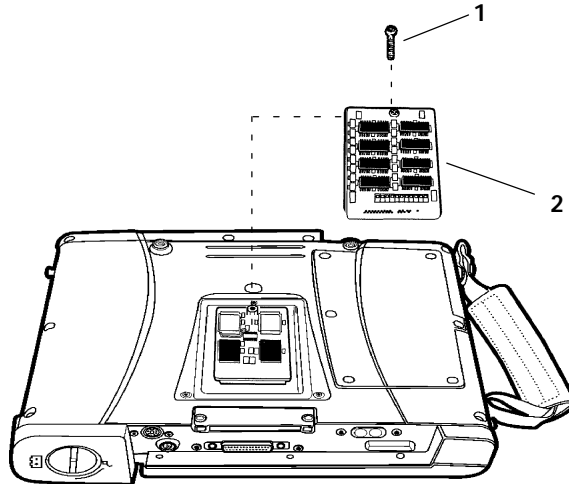
### Installation and Reassembly

1. Hint: Place a round toothpick in the standoff screw hole. This helps align boards during installation.
2. When changing FLASH, install the new board by aligning it to the connector on the main board. Press firmly until the new board is snug against the mating connector and the fixed standoff.
3. Screw the hex standoff through the hole in the FLASH board and into the fixed standoff.



1. Hex standoff
2. FLASH board
3. Fixed standoff
4. Connector (for FLASH board)

*Figure 3-6*  
*Install FLASH Board*



1. Screw
2. DRAM board

*Figure 3-7*  
*Reinstall DRAM Board*

1. Align the DRAM board to the mating connector on the main board. Press firmly until the connectors are seated and the board is snug against the standoff.
2. Install the screw through the memory board and into the hex standoff.
3. Reinstall the access panel.
4. Remove the ground clip from the dock connector shell.
5. Reinstall the main battery pack.
6. Replace the battery compartment door and return the computer to normal service.

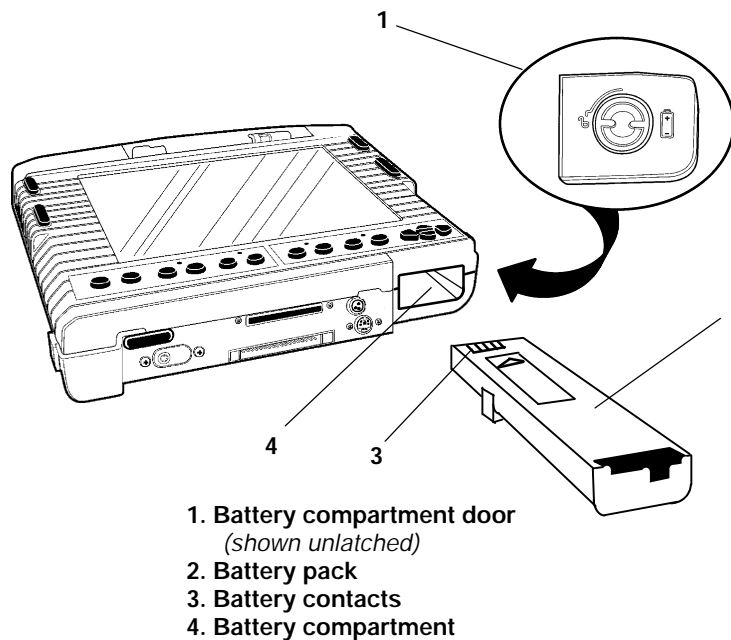
## Batteries

**CAUTION:** *Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent battery type.*

### Main Battery Installation

Open the battery compartment door by turning the latch knob 1/4-turn counterclockwise. Use a coin or flatblade screwdriver to open and remove the door. Slide the battery pack into the compartment, with the contacts oriented as shown below. Reinstall the door and turn the latch knob 1/4-turn clockwise to secure it. The door latch must be fully engaged or the computer will not operate.

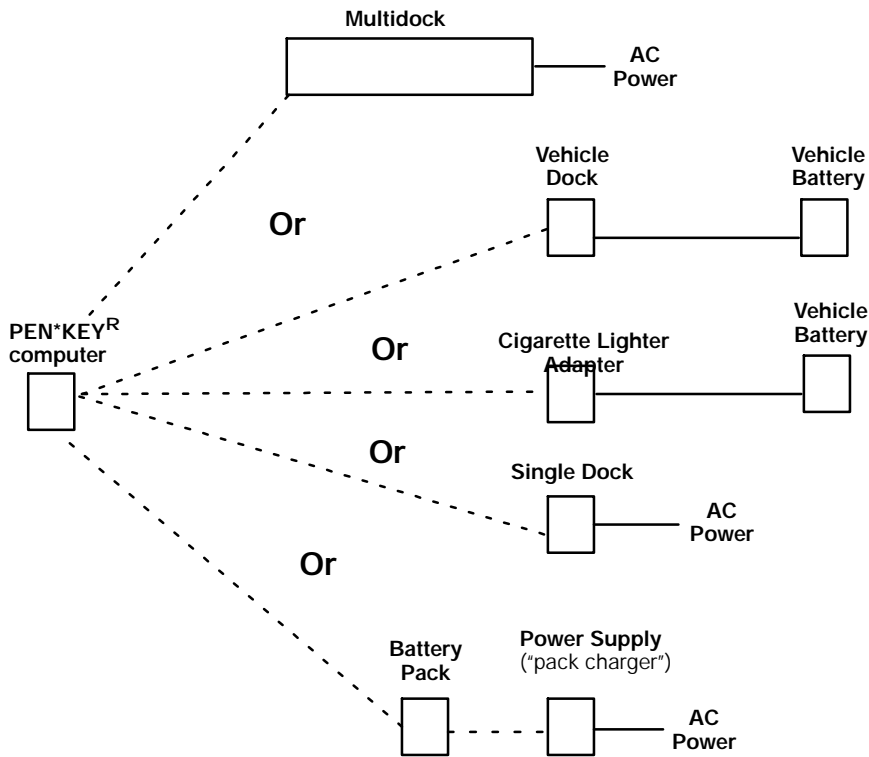
**CAUTION:** *Close and Lock compartment doors before using computer.*



**Figure 3-8**  
*Install Main Battery*

## Charging

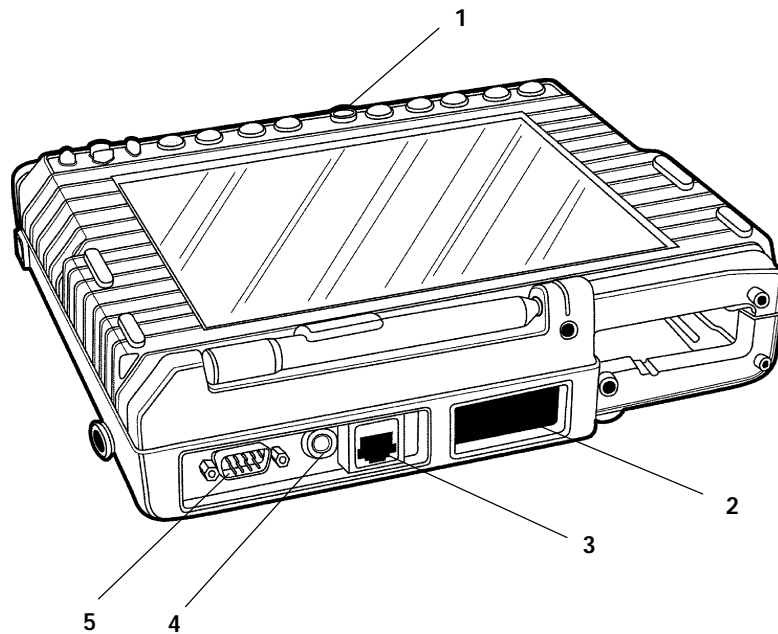
A depleted (*not* "dead") battery pack normally recharges in 4.5 hours, or less. If you intend to use the computer by itself and not connected to a peripheral device, *charge the battery before you begin operation*. If you operate the computer while connected to a charging and power source, the battery pack recharges as you work. The diagrams below show various charging and operating configurations.



*Figure 3-9*  
Charging Configurations

## On/Off Switch

The On/Off switch is located between the connectors at the top end of the computer. Use the On/Off switch to disable the unit when not in use and to perform a "cold start" (resets the computer). When the On/Off switch is pressed OFF, all data stored in DRAM will be lost. Pressing the Suspend/Resume switch also turns the unit ON (*only*) if the unit was previously turned OFF.



1. Suspend/Resume switch
2. Scanner lens (optional)
3. RJ45 connector
4. On/Off switch
5. Serial connector (9-pin D-sub)

*Figure 3-10*  
On/Off Switch

---

## Input/Output

### Input

The most common input device is likely to be the passive pen. Bar code information can be captured and input using the optional integrated scanner or a tethered scanner.

#### Keyboard Connector

This is a 6-pin mini-DIN, PS/2 standard keyboard connector located on the bottom (or "lower") end of the computer near the battery compartment door. Plug a PS/2 type keyboard into this connector for situations where a keyboard is more convenient than other data entry methods.

#### DC Power Jack

This is a 3-pin jack where you plug in the dc connector from a remotely located power source.

#### Touch Input

Simply tap or touch the display to awaken the computer or to make selections: the touch input normally behaves like a mouse with the *left* button depressed. Press one of the mouse buttons on either side of the display to make touch input behave like a mouse with the *right* button depressed.

#### Using the Integrated Scanner

**CAUTION:**

***LASER LIGHT - DO NOT STARE INTO THE BEAM***

***The integrated scanner contains a 670 nanometer laser diode with either 1.0 or 2.5 milliwatt maximum output power.***

The integrated scanner is activated whenever you press one of the scan buttons on either side of the display. The scanner *will timeout* if a scan is unsuccessful: a good scan is signalled by a "beep" from the computer. When scanning, be sure the aiming dot or beam is centered vertically and horizontally on the bar code you are scanning.

## Two-Way Communication

### Telephone Connection

An RJ-45 connector (which accepts RJ-11 connectors) is located behind the flap on the upper end of the computer. It allows you to connect the computer to phone lines if an optional internal modem was ordered. This *is not* an Ethernet connection.

### Ethernet Connection

Although all 6620 Computers have Ethernet capability, the connection is physically located on the single dock or on the multidock.

### Serial Communication

A 9-pin D-subminiature connector (COM1), located behind the flap on the upper end of the computer is used for serial communication with peripheral devices.

### Infrared Communication

An infrared port, located at the lower end of the computer, permits two-way wireless communication between the computer and IrDA-compatible peripheral devices.

### Remote Antenna Connector (*optional*)

Also at the lower end of the computer, just below the infrared connector, is a special terminal-to-dock antenna connector. This can connect the computer to a remotely located antenna when the computer is docked.

### Docking Connector

This connector, located on the bottom of the computer, mates with a connector in docking devices. Most signals are carried on these connectors, including Ethernet, serial, and parallel communication signals, and control voltages. This allows the dock to act as a hardwire interface between the computer and a variety of peripheral devices. A battery charging voltage is also supplied to the computer via the docking connector.



---

## Computer Start Up

When you start up the computer for the first time, or any time after all power has been removed, you are "cold starting" the computer. The start up program is permanently programmed into your computer at the factory. It tests the internal components of the computer, resets all volatile memory to a known state, and determines what peripherals are connected.

**NOTE:** *Close and Lock compartment doors before using computer.*

**NOTE:** *The main battery pack MUST BE adequately charged. If it is not, the computer must be connected to a charging source.*

### Start Up Procedures

Connect all peripheral devices and follow the steps below to perform a cold start:

1. Remove both compartment doors.
2. Insert any optional PC Card devices you will be using.
3. Install the main battery pack, contact-end first.
4. Reinstall the battery compartment door and lock it.
5. Press the On/Off switch to start the computer.

**NOTE:** *Run SETUP if this is the initial Cold Boot.*

6. The computer will "beep" once for a normal start up.
7. Ensure that the computer responds to any installed PC Card options, then reinstall the PC card compartment door and lock it.

**CAUTION:** *Never use a ballpoint pen to make entries on the display.*

**CAUTION:** *Never use a sharp object to make entries on the display.*

8. Setup requires a keyboard, after which you can make entries using your finger or the special stylus, a scanner, or an optional keyboard.

## Restarting the Computer

If your computer locks up or an application program becomes corrupted, it may be necessary to reset the computer before work can continue. In most cases you should attempt a "warm" restart of the computer (if possible) *before* resorting to a total restart.

### Warm Restart

If an external keyboard is connected to the 6620 Computer, you can easily perform a "warm" restart by pressing the **Ctrl + Alt + Del** keys. Data stored in RAM is usually preserved when you perform a warm restart.

Most keyboards that appear on the display will allow you to use this method to perform a warm restart.

#### NOTE:

*Data stored in DRAM will be lost if you press the On/Off switch.*

### Cold Restart

The 6620 Computer *does not* have a separate reset switch, however the On/Off switch allows you to perform a "cold" restart (the same as a "total reset") if necessary.

### Operation

Windows 95 is the standard operating system for the 6620 Computer, for which there are many reference manuals available at most computer stores. Off-the-shelf application programs are usually accompanied by a manual or include on-line help and instructions. Custom applications require that the developer provide you with operating instructions.

# Section 4

## Maintenance

---

---

### *Introduction*

This section contains maintenance procedures for the PEN\*KEY<sup>®</sup> Model 6620 Hand-Held Computer. Although these computers are designed to withstand normal use in your environment, occasional maintenance is required to ensure trouble-free operation. The procedures in this section will help you keep your computer in working order.

Maintenance procedures include instructions on maintaining and charging the main battery pack, replacing the handstrap, plus instructions for cleaning the computer case, display, and scanner lens.

---

### *Maintenance Procedures*

#### *Batteries*

The PEN\*KEY<sup>®</sup> Model 6620 Hand-Held Computer contains a rechargeable lithium ion main battery pack and a smaller rechargeable lithium ion backup battery. The main battery pack contains a gas gauge and protection circuitry to monitor usage and capacity. This "smart" battery pack communicates the battery status to your computer and monitors the rate of charge when the battery pack (or computer it is in) is connected to a charging source.

## Main Battery Pack

### Storage and Shipping

**NOTE:** *Do NOT store lithium ion batteries in high temperature environments.*

**NOTE:** *When the computer will not be used for an extended period of time remove the main battery pack.*

The lithium ion battery pack used in the 6620 Computer should be *charged to 50% capacity* or greater for storage or for shipment. This helps ensure maximum battery pack life and overall performance.

### Battery Pack Information

The lithium ion battery pack keeps track of its lifetime history of charge and discharge cycles, present voltage, and its capacity. The initial reference point for the battery pack is set at the factory. Thereafter, the battery pack regularly communicates its status and history to the computer.

Low battery warnings and battery capacity (“gas gauge”) information display to tell you when charging is required.

**NOTE:** *Shorting or over-discharging the battery pack used in the 6620 Computer will result in loss of calibration of the internal gas gauge.*

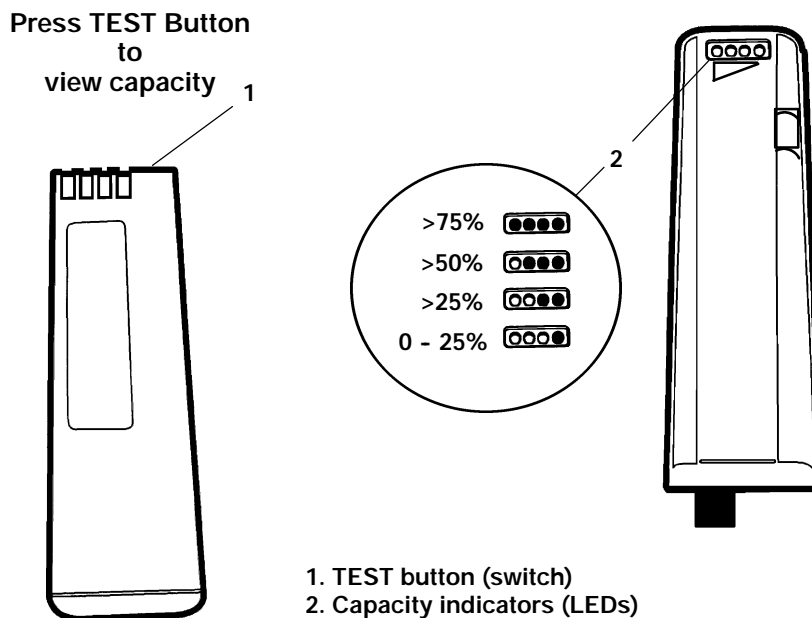
### Gas Gauge Recalibration

The battery pack gas gauge requires one or more “calibration” (charge/discharge/charge) cycles to recalibrate the battery pack. This is a time-consuming process that can be done with the battery pack inside the 6620 Computer using a special application program. A conditioning cycle can also be performed by using specific factory-approved external pack chargers.

In either case, the process takes considerable time and can generally be avoided by (1) taking care *not* to short out the battery pack, and (2) by not allowing the battery pack to become over-discharged.

### Battery Capacity

The display tells you when the batteries are low and need recharging. The main battery pack also contains monitoring electronics and four light-emitting diodes (LEDs) to show the amount of charge in the battery. Press on the test switch, as shown below, to determine the remaining battery charge. When all four LEDs light, the battery charge exceeds 75 percent. Three lighted indicators means the charge exceeds 50 percent while two lighted indicators means the charge is 25 percent or greater. When only one LED lights, the battery charge is 25 percent or less.



*Figure 4-1*  
*Battery Pack Capacity Check*

### *Backup Battery*

When the backup battery no longer accepts a charge, the battery must be replaced. This replacement should only be performed by a factory-approved service provider.

### *Display*

When surface wear eventually makes the display difficult or impossible to read, the computer should be sent into an authorized service center to have the touch panel replaced. This repair *does not* require replacing the entire display.

### *Battery Connectors*

If battery connectors become dirty or tarnished, clean them with a cotton swab dipped in alcohol. It may also be necessary to lightly burnish them with a pencil eraser.

---

## *Cleaning Instructions*

- CAUTION:** *Do not use abrasives or solvents (or any product containing these substances) to clean any part of the unit. Permanent damage to the display cover or the computer will occur if such substances are used.*
- CAUTION:** *Never use ketonic solvents (acetone or ketone) or aromatic solvents (toluene or xylene) to clean any part of the computer. Doing this can damage it.*
- CAUTION:** *Do not pour cleaners directly on the display or the computer case.*

### *Case and Display*

Never apply any liquid cleaner directly on the display or the computer case. Instead, dampen a soft, lint-free cloth with the cleaner and wipe exterior surfaces with this cloth. Keep the display clean to ensure good viewing and touch-screen response.

*MICRO-CLEAN II*, manufactured by Foresight International, Inc., Omaha, Nebraska 68127-0205 (telephone: 1-800-637-1344), is the only cleaner specifically recommended by for this purpose. Use of other cleaners can damage the case or the display.

---

## *Factory Service*

If the unit is faulty, you can ship it to your designated Service Center for factory-quality repair service. Their address and telephone number can be found on the Product Service Information Card which is packaged with every product.

When products must be shipped for repair:

- " Contact the service center to obtain an RMA number
- " Package in the original shipping carton if possible.
- " Fill out a Product Service Information Card and include this card with the product.





## Section 5

# Vehicle Installation

---

---

### Vehicle Dock Installation

The vehicle dock and associated electrical wiring should be installed under the supervision of properly trained and qualified personnel. Follow these installation instructions closely to ensure safe, reliable performance of the computer and any peripheral devices (such as a printer) that may also be installed in the vehicle.

The vehicle electrical system must be in excellent condition. This means the charging circuit must work properly and that vehicle-generated electrical "noise" must be minimized and within specifications.

The charging circuit must neither undercharge nor overcharge the vehicle battery. Either fault condition in the vehicle electrical system can cause a no-charge condition in the computer battery, and printer battery too, if one is installed in the vehicle. In general, the vehicle battery voltage should read approximately 13.0 V dc with the engine *off*, and should rise slightly with the motor running.

Excess electrical noise can be severe enough to defeat the electrical filtering that is built into printers and computers. Defective ignition wiring, damaged insulation, or a faulty vehicle electrical component can cause electrical noise. When this happens, computers and printers can behave unpredictably.

The gray battery cable (NPN: 206-953-009 or 216-964-009) must be connected in strict accordance with the instructions in this manual.

## Tools Required

- Wire Crimping and stripping tool.
- Electric drill, drill bits (3/16" and 9/16").
- Common hand tools.

## Installation Procedures

1. Electrical installation (battery cable).
2. Mechanical installation (computer, peripherals).
3. Final assembly and cable connection.

*Table 5-1  
Parts List*

<b>Kit #</b>	<b>Description</b>	<b>NPN</b>	<b>Qty</b>
-001	battery cable	206-953-009	1
-002	battery cable (with filter)	216-964-009	1
-001/-002	fuse link	216-657-001	1
-001/-002	bolt, 3/8" X 1-1/2"	800-099-001	2
-001/-002	washer, 3/8"	803-099-001	4
-001/-002	nut, 3/8"	802-099-001	4
-001/-002	adjustable clamp	808-011-001	8
-001/-002	self-tap screw #6 X 5/8"	800-008-001	8
-001/-002	3/8" terminal ring	809-165-001	1
-001/-002	self-tap screw #8 X 5/8"	800-012-000	1
-001/-002	#8 flat washer	803-084-000	1
-001/-002	snap-in bushing	807-065-003	1

## Introduction to Vehicle Installation

The vehicle installation kit allows you to wire the vehicle dock in a motor vehicle. Optional cables are available to mount the dock *and* a printer nearby in the same vehicle. When the installation is complete, you will have a secure place to store the computer between stops. In addition, the vehicle electrical system provides power to recharge the computer and to operate a printer (if one is installed).

During this installation, the power cable is wired directly to the vehicle battery. This direct connection reduces the chance of installation problems. It also takes advantage of the natural filtering and regulating characteristics of the vehicle battery.

Since each situation or equipment type may pose unique requirements, mounting hardware selection and mechanical installation shall be the responsibility of the installer. Norand recommends using nuts, bolts, *and* lockwashers for installing the dock mount.

This kit *does contain* nuts, bolts, washers, a terminal ring, and a fuse link for connecting the battery cable *directly* to the vehicle battery. It also contains adjustable wire clamps to secure the cable in place.

**Your tasks are to:**

- Route and install the battery cable.
- Mechanically install the mount (provided by others).
- Connect short cable(s).

Decide where you will mount the vehicle dock, then proceed with the following instructions.

---

## Power Cable Routing

### Cable Length

Remember that a shorter dc power cable connects the vehicle dock to the battery cable. This extends the overall cable length and must be considered as you begin the installation.

If you are installing a printer at the same time, a special "Y" (power) cable *and* a remote computer cable are required. These cables allow you to locate the printer and the vehicle dock up to six feet apart.

### Cable installation

Follow the guidelines (below) and other instructions closely when installing the battery cable.

---

## Guidelines

- Completely install the battery cable *before* connecting the dock.
- Route the battery cable *from* the general area where the unit(s) will be mounted. Work *toward* the vehicle battery.
- Use a snap-in bushing (requires 9/16" hole) if the battery cable passes through the firewall or other sheet-metal.
- Make sure that cable routing does not interfere with other equipment or vehicle controls.
- Make sure that cable routing does not invite damage to the cable.
- Secure the battery cable at least every 18 inches throughout the cable run: use adjustable clamps (provided) or wire-tie to existing vehicle cable runs.

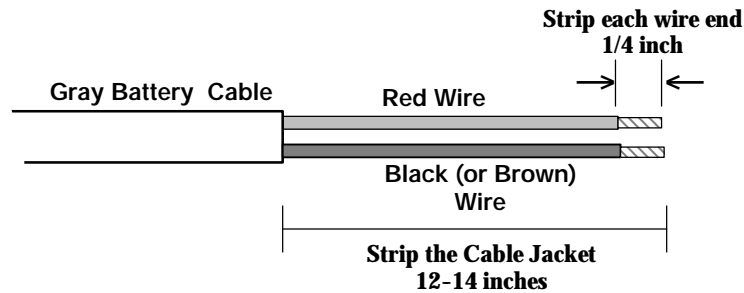
## Battery Cable Connections

### Battery Cable Completion

You must cut the cable to length, cut off a portion of the outer cable jacket and strip the individual wire ends of the cable. (Note: you may end up shortening, and restripping, the red wire when attaching the fuse link). Then, you must install a preassembled in-line fuse link in series with the red wire and install a terminal ring on the black wire. Finally, you must mechanically complete the connections to the vehicle battery.

### Cut and Strip the Battery Cable

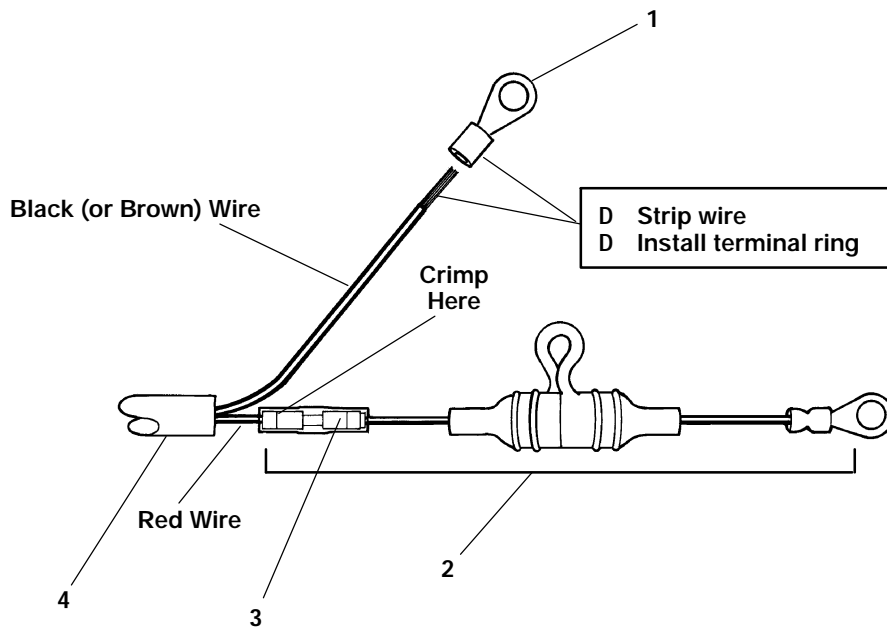
1. Cut the gray battery cable near the battery.
2. Strip the cable jacket back 12-14 inches.
3. Strip 1/4" of insulation from the black wire.



*Figure 5-1*  
Strip the Battery Cable

Prepare the Cable Ends

1. Strip the black wire.
2. Crimp the 3/8" terminal ring (1) onto the black wire.
3. Locate the fuse link (2): it attaches to the red wire.
4. Shorten the red wire if desired.
5. Then, strip 1/4" of insulation from the red wire.
6. Securely crimp the fuse link splice (3) onto the red wire.



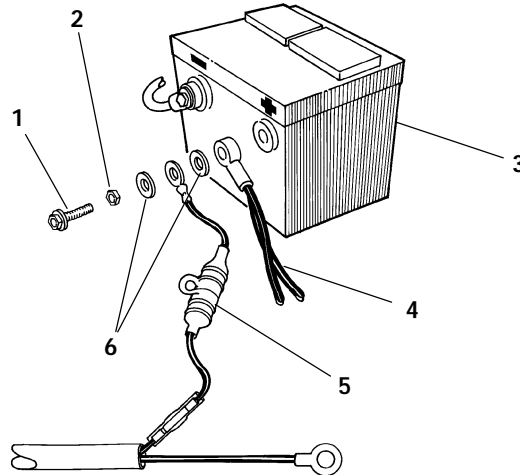
1. 3/8" terminal ring
2. Fuse link assembly
3. Fuse link splice
4. Battery cable

Figure 5-2  
Prepare Cable Ends

### Connection to Side-mounted Terminals

1. Remove both terminal screws from the vehicle battery.
2. Screw a 3/8" nut **(2)** as far as it will go onto a 3/8" X 1-1/2" bolt **(1)** furnished in kit.
3. Slip a 3/8" washer **(6)** onto the bolt.
4. Slide the *positive* (red wire with fuse link **(5)**) terminal ring onto the positive (+) battery terminal bolt.
5. Slip a second 3/8" washer **(6)** onto the bolt.
6. Slide the vehicle *positive* battery cable onto the bolt.
7. Thread the bolt assembly (steps 1-6, above) into the positive battery terminal. Tighten the bolt securely.
8. Tighten the nut against the washers and cables.

Repeat steps #2 thru #8 for the negative wire (black or brown) from the battery cable, hooking up the negative cables to the negative (-) battery terminal.



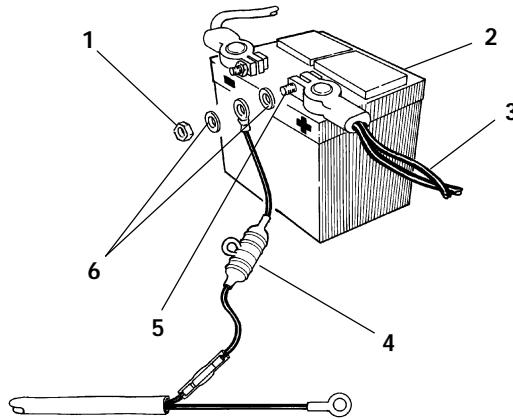
1. Bolt
2. Nut
3. Vehicle battery
4. Vehicle battery cable
5. Fuse link
6. Washers

*Figure 5-3*  
Side-Mount Battery Terminals

### Connection to Top-mounted Terminals

1. Remove the bolts from the vehicle battery terminals.
2. Replace those bolts with 3/8" x 1-1/2" bolts (5) and nuts (1) from the installation kit. Tighten the nuts.
3. Slip a 3/8" washer (6) onto the end of each bolt.
4. Slide the *positive* (fuse link with red wire (4)) terminal ring onto the positive (+) battery bolt (5).
5. Slip a second 3/8" washer (6) onto that bolt (5).
6. Thread a second 3/8" nut (1) onto that bolt (5). Tighten the nut.

Repeat steps #3 thru #6 for the negative wire (black or brown) from the Norand battery cable, connecting the wire to the negative (-) battery computer.



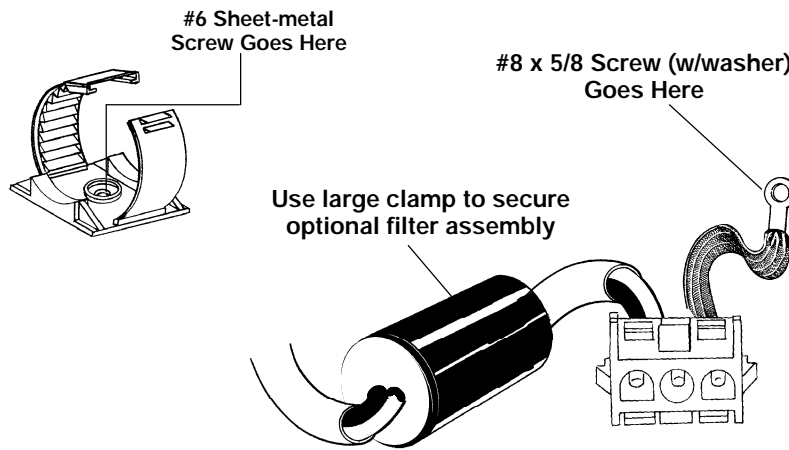
1. 3/8" nut
2. Vehicle battery
3. Vehicle battery cable
4. Fuse link
5. 3/8" X 1-1/2" bolt
6. 3/8" washers

*Figure 5-4*  
*Top-Mount Battery Terminals*



## Secure the Power Cable

Secure the battery cable every 18 inches with adjustable cable clamps. Work from the battery, toward the mounting area for the dock. Remove the paper backing from a clamp and stick the clamp in place while drilling a pilot hole with a #26 drill bit. Use #6 sheet-metal screws to permanently hold clamps in place.



*Figure 5-5*  
Secure Cable

## Fasten Ground Cable

Fasten the ground wire or strap to vehicle sheet-metal to ensure proper cable shielding:

1. Drill a small hole.
2. Use a punch to dimple and enlarge the hole.
3. Scrape a small circle of paint from around the hole.
4. Use a #8 X 5/8" screw and flat washer to secure the ground wire or strap.

## Mechanical Installation

When installing the vehicle dock, be sure to allow clearance for the combined computer, dock and vehicle dock mounting assembly before proceeding. Additional vertical clearance must be provided to allow for inserting or removing the computer from the dock.

In the procedures that follow, you will:

- Attach the mount assembly to the vehicle dock.
- Install the mount base plate in the vehicle.
- Attach the dock/mount assembly to the base plate.
- Make final electrical connections to the dock.
- Adjust the mounted vehicle dock.

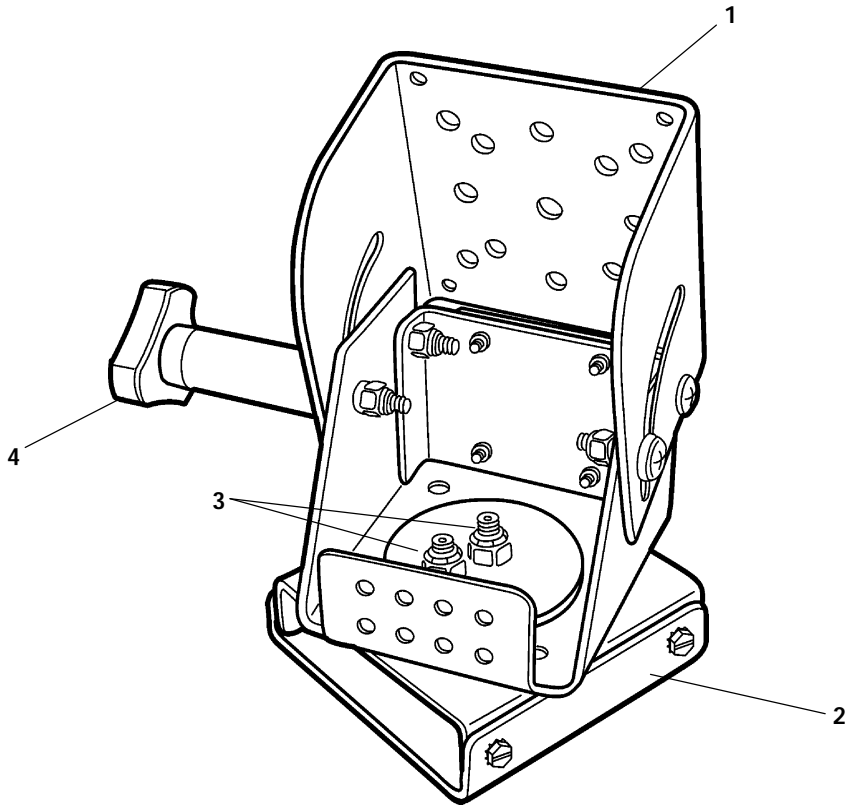
### Attach Mounting Plate

Either the back or the bottom of your vehicle dock will have threaded studs protruding from it. Press the mounting plate over these studs and secure it with the self-locking nuts provided in the kit. Make sure the nuts are thoroughly tightened.

### Install Mount

You must allow clearance for cable connectors, and for computer insertion and removal when choosing your mounting location. Temporarily attach the vehicle dock to your mount, determine a convenient location that will meet all clearance requirements. Then, use the base of your mount as a template to mark the locations for mounting holes.

1. Remove the vehicle dock from the mount  
(*you can remove the mount base plate if necessary*).
2. Drill holes in the vehicle sheet metal.
3. Install the base plate in the vehicle, using nuts, bolts, and lockwashers.
4. Permanently attach dock/mount to the base plate.



- 1. Dock mounting surface
- 2. Base plate
- 3. Swivel adjustment nuts
- 4. Tilt adjust

*Figure 5-6*  
*Adjustable Mount*

---

## *Final Connections*

### *Vehicle Dock Alone*

Connect one end (round connector) of the short dc power cable to the vehicle dock and tighten the collar on the connector. Plug the other end (rectangular connector) into the previously-installed battery cable.

### *Vehicle Dock and Printer*

If you are installing a printer in the vehicle, you must install a "Y" cable to supply power to both the vehicle dock and to the printer. Plug one end of this cable into the printer, the other into the vehicle dock. The rectangular connector plugs into the battery cable.

You must also connect a Remote Computer Cable between the vehicle dock and the printer: this cable allows the computer to communicate with the printer.

### *Connections*

Your dock affords more connectivity than the 6620 Computer offers on its own. For instance, each 6620 Computer has Ethernet capability built-in, however the hardwire connection for Ethernet is made at the dock and not directly to the computer.

Secure all connector locking features, dress cables, and use strain reliefs to minimize stress on connectors. Dock connections and their functions are described below.

#### Power Connector

All docks have a dc power connector to receive a nominal 12 V dc input, either from a vehicle battery or from an external power supply. Each dock contains circuitry to regulate and filter the incoming voltage and current.

#### Ethernet Connection

If you have Ethernet available, this is where you plug the cable in to complete the connection to the computer. *This connector is not present on the vehicle dock.*

#### COM Serial Ports (COM1, COM2)

Each COM serial port has its own address and has a 9-pin *male* connector to attach RS-232 serial devices such as a printer, mouse, external modem or serial network connection. COM1 (*only*) provides 5 V dc to support a tethered scanner.

#### LPT1 - Printer Port

This is an enhanced parallel port with a 25-pin (DB-25) *female*, D-subminiature for connecting parallel devices such as a printer or storage device to the computer.

#### Keyboard, Mouse

Two 6-pin mini-DIN connectors allow you to connect a PS/2 standard external keyboard and mouse to the computer.

#### AUX Connector

This is a 15-pin male D-subminiature connector that can serve as a third 3-wire COM port providing (1) transmit data, (2) receive data, and (3) ground paths. This connector also provides a general purpose open-collector output on pin #11, and a general purpose TTL/CMOS compatible input on pin #10.

#### Radio Antenna Connector

This optional connection allows the computer to be connected to a permanently mounted antenna whenever the computer is docked. Permanently mounted antennas typically provide better performance than the smaller ones mounted directly on, or within, the computer.

#### VGA Connector

Provides RGB, horizontal and vertical synch signals to a remote VGA monitor. *This connector is not present on the vehicle dock.*

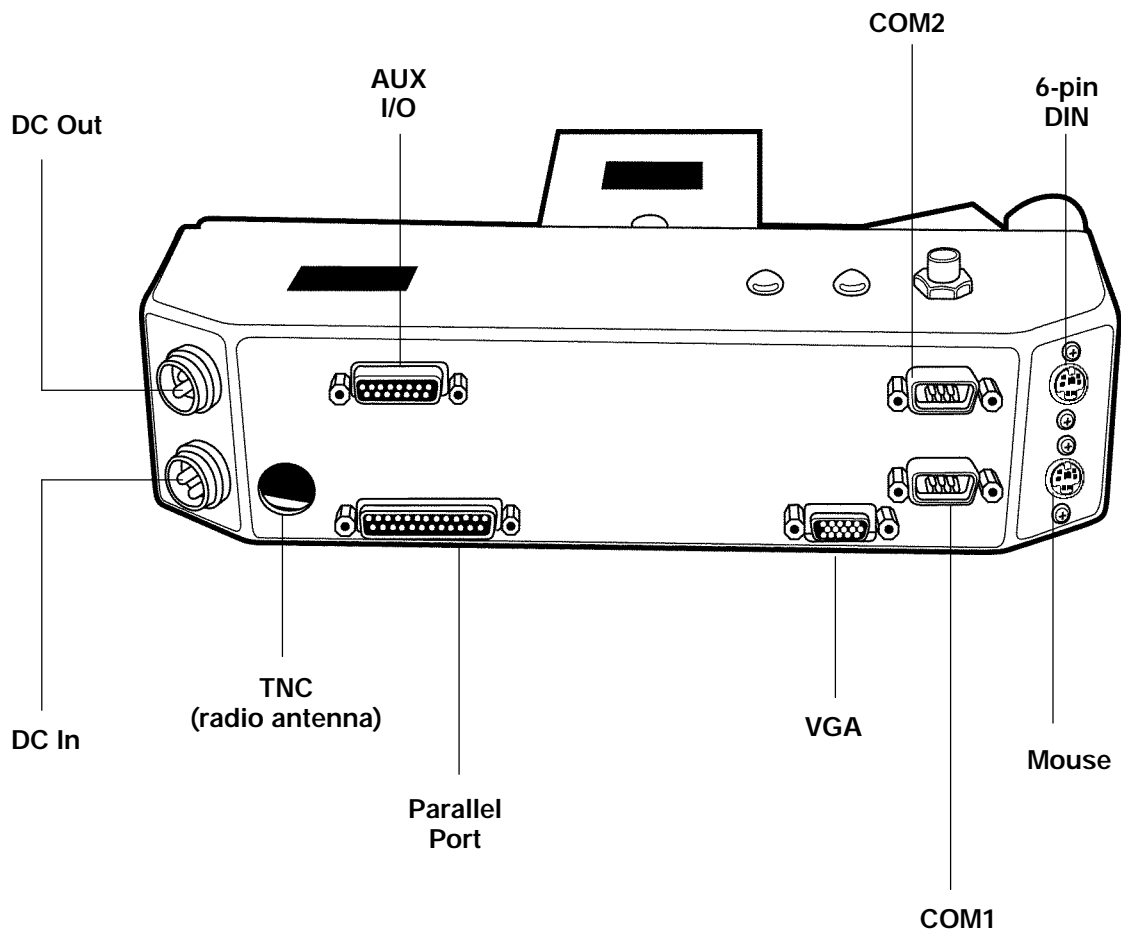


Figure 5-7  
Composite of ALL Dock Connectors

# INDEX

## NOTE:

This index covers all topics. Page numbers in italics are figures, those in bold are tables titles.

## A

About this manual, 1-1  
AC power adapter, 2-4  
Accessories  
  ac power adapter, 2-4  
  battery chargers, external, 2-4  
  cables, 2-12  
  cigarette lighter adapter, 2-3  
  docks, 2-5  
  general information, 2-1  
  handstrap, 2-13  
  neck or shoulder strap, 2-17  
  pen, tethered, 2-12  
Adapters  
  ac power, 2-4  
  cigarette lighter, 2-3  
Antenna  
  connector, 1-8  
  radio, 1-8, 5-13  
  (TNC), 5-14  
  remote connector, 3-14  
AUX connector, 5-13, 5-14

## B

Backup battery  
  maintenance, 4-1  
  replaced by, 4-4  
Backup battery LED  
  icon, 1-11

meaning, **1-12**

Bar code scanner types, 3-13

## Battery

  capacity, 4-3  
  chargers, external, 2-4  
  charging, 3-1, 3-11  
  configurations, 3-11  
  compartment, 1-6, 1-15  
  door, 1-15  
  connectors, 4-4  
  gas gauge recalibration, 4-2  
  installation, 3-10  
  LED capacity check, 4-3  
  lithium ion, 4-2  
  maintenance, 4-1  
  pack, 1-6  
  TEST button, 4-3

Beginning of day tasks, 1-4

BIOS firmware, 3-1

Brightness/contrast control,  
  1-13

## C

Cables, 2-12  
Charging configurations, 3-11  
Cigarette lighter adapter, 2-3  
Cleaning instructions, 4-4  
  case, 4-4  
  display, 4-4  
  MICRO-CLEAN II, 4-5  
Cold boot. *See* cold-start  
Cold-start, 3-15  
  on/off switch, 3-16  
Computer descriptions  
  6620 Computer, 1-5  
  battery compartment, 1-15

connectors, 1-6  
controls, 1-13  
external features, 1-4  
functions, 1-3  
LEDs, 1-11  
PC Card compartment, 1-15  
processor, 1-3  
software compatibility, 1-4  
Windows 95, 1-3

## Connections

  Ethernet, 3-14  
  telephone, 3-14  
  vehicle dock, 5-12

## Connectors, 1-6

  antenna, radio, 1-8  
  dc power input jack, 1-7  
  docking, 1-7  
  external (visible), 1-8  
  internal (concealed), 1-9  
  mini-DIN, 1-7  
  serial port, 1-7

## Controls, 1-14

  brightness/contrast, 1-13  
  right mouse button (pen),  
    1-13  
  scanners, 1-13  
  suspend/resume switch, 1-13

## D

DC power  
  input jack, 1-7, 1-8, 3-13  
  vehicle dock connector, 5-12  
Display, 1-5  
  brightness/contrast control,  
    1-13  
  replacing the, 4-4  
  specifications, 1-16  
Docking connector, 1-7, 1-8

**Docks**

- composite of all connectors, 5-14
  - computer connector, 3-14
  - emergency release, 2-9
  - features, 2-5
  - inserting the computer, 2-7, 2-8
  - LEDs, **2-10**, 2-11
  - multidock, 2-6
  - release button, 2-10, 2-11
  - removing (undocking) the computer, 2-10
  - single, 2-5
  - use of, 2-6
  - vehicle, 2-5
- Downloading data, 1-3
- DRAM, 2-1
- computer access, 3-6
  - loss due to On/Off switch, 3-16
  - memory boards
    - installing, 3-9
    - removing, 3-7
  - memory upgrade, 2-2
  - on/off switch, 3-12
  - removing card, 3-6

**E**

- Electrical specifications, 1-16
- Emergency release (dock), 2-9
- End-user - sections 1-4, 1-1
- Environmental specifications, 1-16
- ESD components, 3-4
- ESD safety, 3-4
- Ethernet connection, 3-14
- External battery chargers, 2-4
- External features, 1-4
  - battery compartment, 1-6
  - display, 1-5
  - infrared window, 1-6
  - pen (input device), 1-6
- External power LED
  - icon, 1-11
  - meaning, **1-12**

**F**

- Factory service, 4-5
- Flash RAM, 2-1
  - computer access, 3-6
  - damage to cards, 3-2
  - memory boards
    - installing, 3-8
    - removing, 3-7
  - memory upgrade, 2-2
  - removing card, 3-6

**G**

- Gas gauge recalibration, 4-2
- Ground cable, 5-9

**H**

- Handstrap
  - adjusting, 2-15
  - closing, 2-16
  - keyed snap, 2-13, 2-14
  - relocating, 2-13
- Hard drive option, 2-2

**I**

- Infrared
  - communication, 3-14
  - window, 1-6
- Initial start-up, 3-15
- Input devices, 3-13
  - two-way communication, 3-14
- Inserting
  - computer into dock
    - descriptions, 2-7
    - details, 2-8
    - steps, 2-9
  - PC Card, 3-2
- Installation technician - section 5, 1-1
- Installing with printer, 5-4, 5-12
  - LPT1-printer port, 5-13
- Integrated scanners, 2-2
  - use of, 3-13
- Internal hard drive LED
  - icon, 1-11

meaning, 1-11

Internal modem, 2-2

Introduction, 1-1

- IrDA peripheral device
  - communications serial port, 1-16
  - docks, 2-10
  - infrared communication, 3-14
  - infrared window, 1-6

**K**

- Keyboard
  - connector, 1-8, 3-13
  - overlays, 1-14
  - start-up, 3-15

**L**

- LEDs
  - battery capacity, 4-3
  - computer, 1-11
  - docks, **2-10**, 2-11
  - icons, 1-11
- Left mouse button (pen), 1-6
- Light emitting diodes. *See* LEDs
- Lithium ion battery, 4-1
  - information, 4-2
  - storage, 4-2
- LPT1 (printer port), 5-13, 5-14

**M**

- Main battery LED
  - icon, 1-11
  - meaning, **1-12**
- Maintenance
  - batteries, 4-1
  - cleaning, 4-4
  - factory service, 4-5
- Memory upgrades
  - disassembly, 3-6
  - ESD safety, 3-4
  - general information, 3-4
  - installation, 3-8
  - removing memory boards, 3-7
  - precautions, 3-5
  - reassembly, 3-8
  - static-safe workstation, 3-4



- MICRO-CLEAN II, 4-5  
 Mini-DIN connector (keyboard),  
 1-7, 1-8, 3-13  
 Modem, internal, 2-2  
 Mounting plate, vehicle dock,  
 5-10  
 Multidock, 2-6
- N**
- Neck or shoulder strap, 2-17
- O**
- On/Off switch, 3-12  
 cold-start, 3-16  
 DRAM, loss of, 3-16  
 versus suspend/resume  
 switch, 3-12  
 Open-collector output, 5-13  
 Operating system.  
*See* Windows 95  
 Options  
 general information, 2-1  
 hard drive, 2-2  
 integrated scanners, 2-2  
 memory upgrades, 2-2  
 modem, internal, 2-2  
 PC Card devices, 2-2
- P**
- PC Card  
 compartment, 1-15  
 door, 1-15  
 device options, 2-2  
 general information, 3-2  
 installing/removing, 3-2  
 memory upgrade, 3-4  
 access (slots), 1-10  
 slots 1/0, 3-3  
 SRAM, 3-2  
 Pen (input device), 1-6  
 tethered, 2-12  
 Physical specifications, 1-16  
 Power cable routing  
 installation, 5-4  
 length, 5-4  
 securing, 5-9  
 Precautions for memory up-  
 grades, 3-5  
 Processor, 1-3  
 Programs (data), downloading,  
 1-3  
 PS/2 standard external  
 keyboard, 6-pin DIN  
 connector, 5-13, 5-14
- R**
- Radio antenna.  
*See* Antenna, radio  
 Release button (dock), 2-11  
 Relocating handstrap, 2-13  
 Remote antenna connector, 3-14  
 Removing PC Cards, 3-2  
 Repair service, 4-5  
 Restarting the computer, 3-16  
 Right mouse button (pen), 1-6  
 controls, 1-13  
 switch, 1-14  
 RJ-11 connectors, 3-14  
 RJ-45 jack, 1-6, 3-12  
 modem, internal, 2-2  
 telephone connection, 3-14
- S**
- Scanner  
 activation, 1-13  
 integrated, 2-2  
 lens, 3-12  
 switch, 1-14  
 Serial port, 1-7, 3-12, 3-14  
 final connections, 5-13  
 Setting up the computer, 3-1  
 Shipping for repair, 4-5  
 Side-mount vehicle battery, 5-7  
 Single dock, 2-5  
 details, inserting, 2-8  
 Snap on handstrap, 2-13  
 Software compatibility, 1-4  
 Specifications, 1-16  
 SRAM cards, 3-2  
 Static-safe workstation, 3-4  
 Storage space (data), 2-2  
 Suspend/resume switch,  
 1-13, 3-12  
 versus on/off switch, 3-12
- T**
- Telephone connection, 3-14  
 Top-mount vehicle battery, 5-8  
 TTL/CMOS compatible input,  
 5-13
- V**
- Vehicle (gray) battery cable  
 cable ends, 5-6  
 connect to  
 side-mount terminal, 5-7  
 top-mount terminal, 5-8  
 connections, 5-5  
 cutting and stripping, 5-5  
 guidelines, 5-4  
 part number, 5-1  
 stripping, 5-5  
 Vehicle battery  
 side-mount, 5-7  
 top-mount, 5-8  
 Vehicle dock, 2-5  
 connections, 5-12  
 installation, 5-1  
 mount, 5-11  
 mounting plate, 5-10  
 parts list, 5-2  
 power connector, 5-12  
 Vehicle electrical system  
 cigarette lighter adapter, 2-3  
 installation, 5-1  
 Vehicle installation, 5-3  
 electrical, 5-4  
 final connections, 5-12  
 mechanical, 5-10  
 power cable routing, 5-4  
 VGA connector, 5-13, 5-14

**W**

Warm boot. *See* warm-start

Warm-start, 3-16

Windows 95, 1-3, 3-16

**Y**

“Y” power cable, 5-4