



4500 Hand-Held Computer
USER S GUIDE



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Publications Department
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according to its instructions, it may interfere with radio signals. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning our equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▶ Reorient or relocate the radio or television receiving antenna.
- ▶ Increase the separation between the computer equipment and receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the radio or television receiver is connected.
- ▶ Consult the dealer or an experienced radio or television technician for help.

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The following notices apply to equipment that may be connected to telephone lines or systems. For your personal safety, and to protect this equipment from potential electrical or physical damage, do NOT connect equipment to telephone lines or data communication equipment unless the following warnings have been read, understood, and complied with.

- ▶ Never install telephone wiring during a lightning storm.
- ▶ Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- ▶ Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- ▶ Use caution when installing or modifying telephone lines.
- ▶ Avoid using a telephone (other than cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- ▶ Do not use the telephone to report a gas leak in the vicinity of the leak.

Installation du téléphone : avertissements

Les avertissements qui suivent s'appliquent à tout équipement qui peut être branché aux lignes ou systèmes téléphoniques. Pour votre sécurité personnelle et pour protéger l'équipement de tout dommage électrique ou physique potentiel, NE PAS brancher un ordinateur tablette électronique ou ses périphériques aux lignes téléphoniques ou équipements avant que les avertissements suivants aient été lus, compris et observés :

- ▶ Ne jamais installer de câblage téléphonique pendant un orage électrique.
- ▶ Ne jamais installer de prise téléphonique dans un endroit humide à moins que la prise ait été spécifiquement conçue pour être utilisée dans les endroits humides.
- ▶ Ne jamais toucher les fils de téléphone ou de l'équipement terminal non isolés à moins que la ligne téléphonique n'ait été débranchée de l'interface réseau.
- ▶ User de prudence lors de l'installation ou de la modification de lignes téléphoniques.

- ▶ Éviter d'utiliser un téléphone (autre qu'un appareil téléphonique sans fil) pendant un orage électrique. Il pourrait y avoir un faible risque d'électrocution par la foudre.
- ▶ Ne pas utiliser le téléphone afin de signaler une fuite de gaz à proximité de la fuite.

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▼ **CAUTION:** Intermec Technologies Corporation recommends that you only purchase Norand Mobile Systems Division certified modems. Intermec does not certify all modems available in the marketplace. Intermec does not warrant noncertified modems; furthermore, these modems may cause problems from electrostatic discharge and may not conform to FCC regulations. For a list of Norand Mobile Systems Division certified modems call Customer Support at 1-800-221-9236 in United States or (country code) 800-633-6149 in Canada.



WARNING: *The lithium ion battery may explode if replaced incorrectly. Replace only with the same or equivalent type.*



ADVERTISSEMENT: *La batterie au lithium peut exploser si elle est remplacée de manière incorrecte. Elle ne doit être remplacée que par une batterie identique ou similaire.*



WARNING: *Lithium ion batteries may explode or catch fire if overcharged due to improper dock installation.*



ADVERTISSEMENT: *Les batteries au lithium peuvent exploser ou prendre feu si elles sont trop chargées à cause d'une mauvaise installation de la station d'accueil.*

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Section 1

Introduction

Hand-held computers are used in the distribution sales marketplace to perform a wide variety of tasks. The hand-held computers are rugged for use in harsh environments such as vehicles, warehouses, factories, and retail stores. Other specialized applications such as utility companies use them to record meter readings.

These units are battery-operated, making them extremely portable and well suited to route industries such as beverage, bakery, snack and dairy distributors. Programs or data can be loaded (or “downloaded”) into the hand-held computer from a PC or mainframe. The keyboard allows manual entries.

The hand-held computer typically contains a database with customer and product information. It performs calculations based on product movement, sends information to a printer, and is often used to send (upload) data to a host (larger) computer.

The chart below lists some things (Dos and Don'ts) to be aware of as you use your 4500 hand-held computer.

DO	DO NOT
After installing and charging your main battery pack (Nickel Cadium), make sure that the backup battery shipping insulator is removed on your 4500 hand-held computer.	Overtighten screws.
Ensure that batteries are fresh and properly installed.	Use solvents or abrasive cleaners on the hand-held computer.
Charge the hand-held computer equipped with a Nickel Cadium battery pack for 11 hours before using it the first time.	Use metal tools on the interior of the hand-held computer.
Ensure that the hand-held computer remains securely connected to printers (or other devices) throughout printing or other operations.	Use metal tools to grasp or handle delicate components such as the optional memory card.
Use a soft cloth moistened with a quality glass-cleaner to maintain the appearance of the hand-held computer.	
Follow the instructions in this manual.	

Hand-Held Computer Description

Figure 1-1 shows the components for your 4500 hand-held computer. The computer features a display, a keyboard, and a high-impact thermoplastic case with a customer-replaceable hand strap. You will notice the top (display end) of the

hand-held computer is equipped with an endcap that can be removed. At the bottom of the hand-held computer is the battery compartment and the surface connector electrical contacts.

Random Access Memory (RAM)

Your 4500 hand-held computer contains 1, 2, 3, or 4 megabytes of Random Access Memory (RAM) for data storage and application software.

Processor Speed

Your 4500 hand-held computer operates at 10 MHz.

Display

On the front of the hand-held computer is a high contrast black on white liquid crystal display (LCD) just above the keyboard. You can adjust the contrast of the display (refer to **Adjusting Display Contrast** in Section Two).

Your 16-line display is capable of graphic presentations. Keyboard-controlled backlighting makes the display more visible.

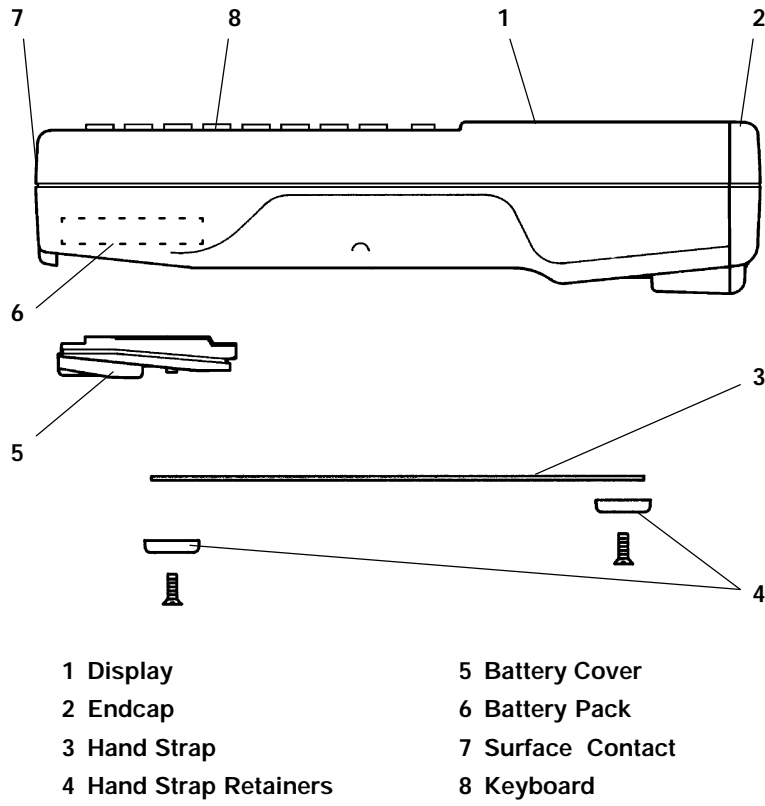


Figure 1-1
Hand-Held Computer Main Components

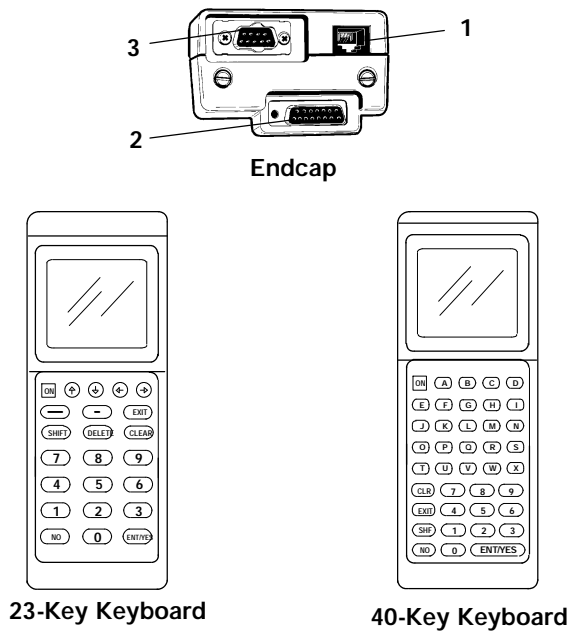
Hand-Held Computer Options

Your 4500 hand-held computer is available with either a 23-key or a 40-key keyboard. Various peripheral endcap options are available for your 4500 hand-held computer. The endcap will always contain a 15-pin RS-232 connector and may also have one or more of the following connectors:

- 9-pin scanner interface connector (optional scanner board is required)
- telephone jack (optional internal modem required)

Your 4500 hand-held computer is designed to allow the use of either Nickel Cadmium (NiCd) or alkaline battery packs. Charging is provided when NiCd packs are used.

Figure 1-2 shows components for your 4500 hand-held computer options.



- 1 RJ-11 Phone Jack (with optional internal modem)
- 2 Standard 15-Pin RS-232 Connector
- 3 9-Pin Scanner Connector (optional)

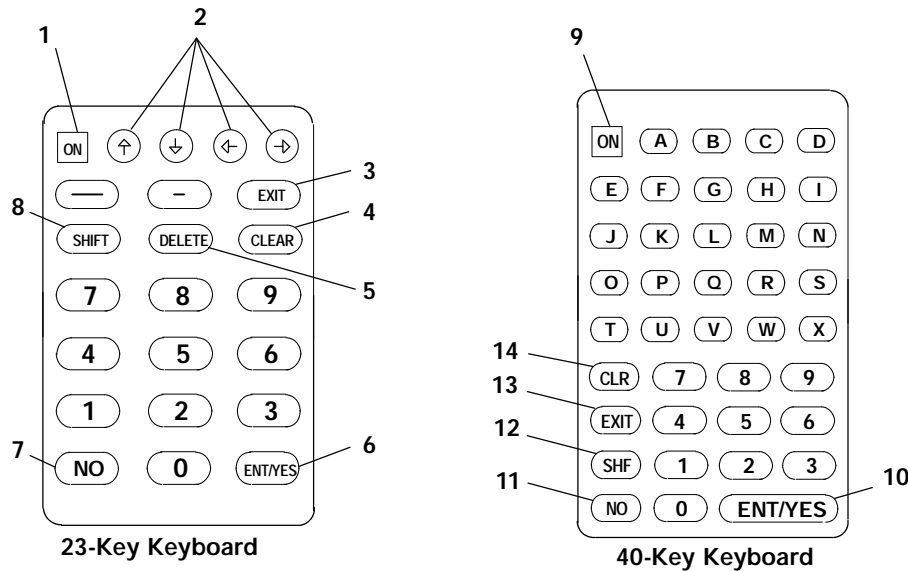
*Figure 1-2
Hand-Held Computer Options*

Keyboard Use

Your hand-held computer can have either a 23-key (numeric) or a 40-key (alphanumeric) keyboard. You will use the keyboard to make:

- " entries
- " changes
- " corrections

- control input to the unit and to peripherals such as a printer or communication device.



- 1 ON Key
- 2 Arrow Scroll Keys
- 3 EXIT Key
- 4 CLEAR Key
- 5 DELETE Key
- 6 ENTER/YES Key
- 7 NO Key
- 8 SHIFT Key

- 9 ON Key
- 10 ENTER/YES Key
- 11 NO Key
- 12 SHIFT Key
- 13 EXIT Key
- 14 CLEAR Key

*Figure 1-3
Keyboard Options*

Numeric keyboards (23-key) are used where you are not making letter or word entries. To speed daily operations, these keyboards have **UP/DOWN, LEFT/RIGHT** arrows in addition to large keys with the numbers zero

through nine (0-9) conveniently arranged in a calculator keypad format.

Alphanumeric keyboards (40-key) have smaller keys labeled with 24 letters (the remaining two letters are achieved using the **SHIFT** key). The numbers zero through nine (0-9) are in a standard ten-key format. With this keyboard, you can make complete word entries or alter existing information.

Both keyboards activate the backlight when you press the **SHIFT** key and then the **LIGHT** key.

Specific Keys

You will use the keyboard to control the hand-held computer. All keys are labeled and are generally self-explanatory. If you have a custom application (one specially written or modified), one or more keys may have unique meanings and uses which will be covered in training sessions or in the users manual for the custom application. Custom keyboard overlays are also available.

A few of the standard keys, which are listed below, require special attention.

***ON** Key*

Note the **ON** key (top left). Press this key once to wake your hand-held computer up. Press the key a second time to place your computer in the sleep mode. Sleep mode will conserve battery life while retaining all data and your place in the program. If you leave your computer on but do not use it for awhile, it will automatically go off after a programmed period of time to conserve the main battery.

“OFF” entries are ignored when the hand-held computer is performing a task such as printing.

The **ON** key is also used to adjust the contrast of your display. To adjust you press the **ON** key the second time as described above, this puts your hand-held computer to sleep,

then hold down on the key to achieve the contrast level you want.

ENT/YES Key

You will normally press this key to enter information into your computer, or to respond “Yes” to a question on your display.

NO Key

Press this key if you disagree with the displayed information, or answer “No” to a question.

SHIFT or SHF Key

Each key has a number, letter, or word on it for identification. Above some keys on the keyboard overlay is its shifted value. To enter the shifted value of a key, first press the **SHIFT** or **SHF** Key and then press the appropriate key. Examples include:

- punctuation
- spaces
- scroll arrows
- letters **Y** and **Z** (40-key keyboard)
- application (special) functions

Press the **SHIFT** key, then the **LIGHT** key to activate the backlight.

Endcap Options

Peripheral Endcaps

Endcaps make electrical connection to the hand-held computer, and external devices. These include an RS-232 device (e.g., printer) and optionally a scanner and or internal modem.

4805 Endcap Printer

The 4805 40-column endcap printer is available for your 4500 hand-held computer. This option is normally ordered from the factory and has a separate manual (part number: 961-019-003) for the printer.

Section 2

Operation

Introduction

Unpack your 4500 hand-held computer and inspect it for signs of physical damage that may have occurred in shipment or storage.

The information in this section tells you how to:

- install the main batteries
- “power-up” the computer
- activate the optional backup battery
- install an optional memory card
- connect to peripheral devices

Main Battery Installation

You must install the battery pack (NiCd) or individual alkaline cells before the hand-held computer will operate. Follow the instructions below to open the battery compartment and install batteries.

1. Place the hand-held computer face down on a soft, clean surface.
2. Use a flat blade screwdriver or the edge of a coin, to turn the battery cover latch in the direction (counterclockwise) of the raised arrow to unlock the battery cover.
3. Pull up on the hand strap to remove the door

You can use either the special NiCd battery pack, or individual AA size alkaline cells to power your 4500 hand-held

computer. The empty battery compartment is shown below. Notice the raised battery shaped drawings in the bottom. These show the direction of each battery when you use individual alkaline cells.

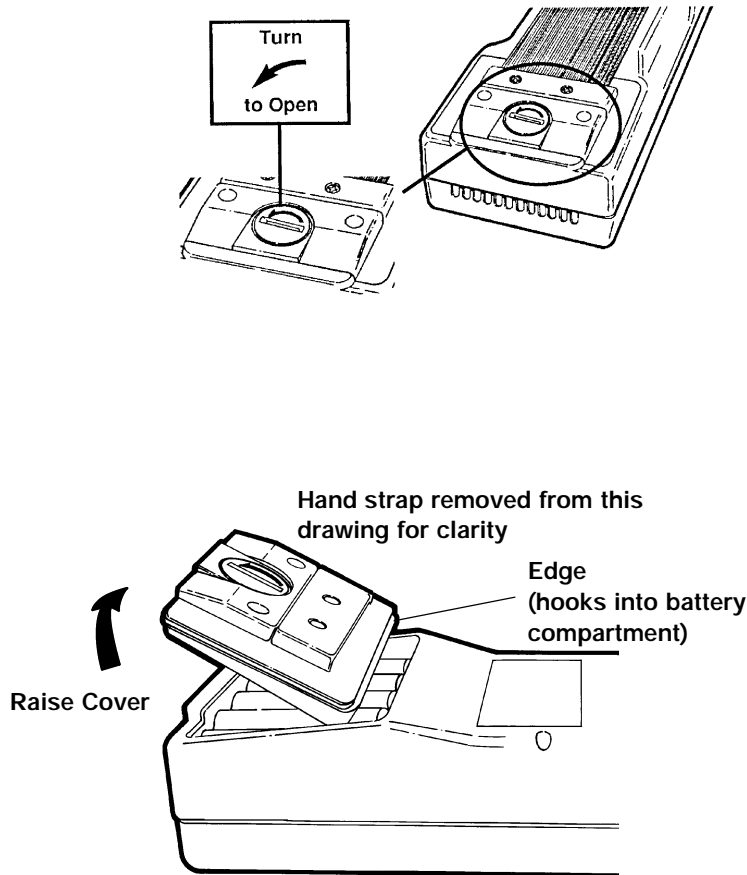
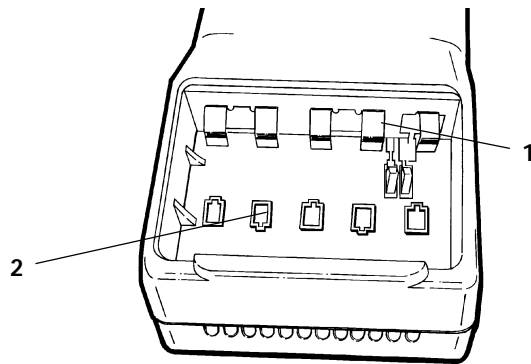


Figure 2-1
Opening Main Battery Door

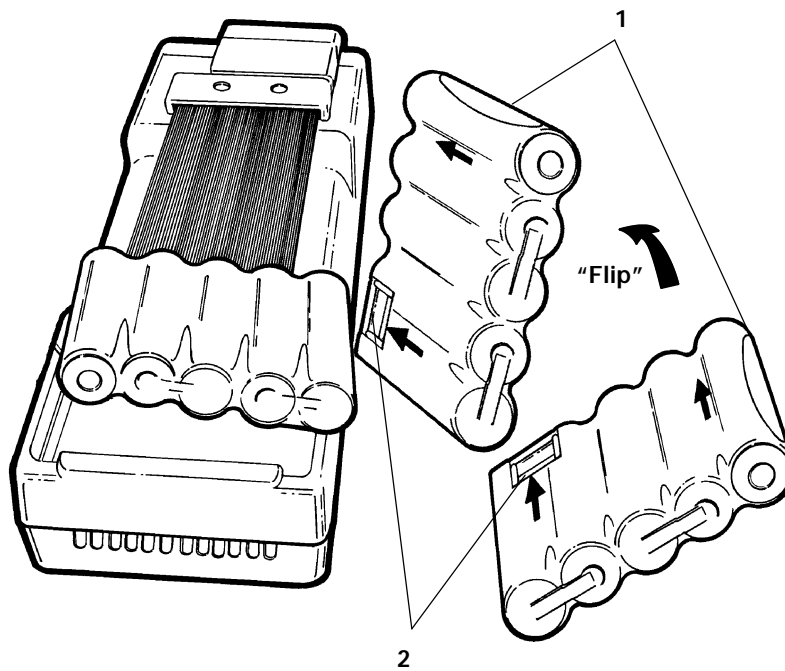


- 1 Battery Contacts
- 2 Battery Shaped Drawings

Figure 2-2
Battery Compartment

4. Install the NiCd battery pack or the individual AA alkaline cells.

The NiCd battery pack has three exposed electrical contacts: The two round contacts are the positive and negative terminal of the battery pack, while the rectangular contact is a switch plate that completes the charging circuit.



- 1 Rounded Edge
- 2 Rectangular Contact

Figure 2-3
NiCd Pack Installation

5. Reinstall battery compartment door.
6. Secure battery cover latch (clockwise).
7. If using the NiCd battery choice, you must fully charge the battery before using your 4500 hand-held computer. Charging takes 11 hours.

Charging the NiCd Battery

Charge the NiCd battery by connecting your 4500 hand-held computer to a peripheral device that provides a charging current such as the following equipment:

- 4960 MultiDock
- 4950 Single Dock
- 4810, 4815, or 4820 fixed-mount printer
- many modems also provide charging current

A complete charge of the NiCd battery pack requires 11 hours.

Backup Battery

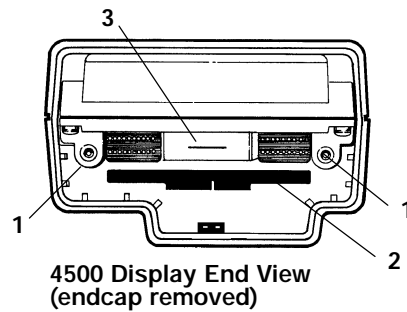
The lithium backup battery provides more than 10 days of memory protection in the absence of main battery power. It is disabled for shipping and storage by a small insulator.

Remove this insulator after

- you have installed and charged the NiCd batteries
- before you use your 4500 hand-held computer for the first time

The backup battery shipping insulator sticks out from the display end of the hand-held computer, and bears the sentence:

“Remove Tab & Tighten Screws Before Use.”



- 1 Screws (2) one on each side
- 2 Memory Card Slot
- 3 Backup Battery Shipping Insulator


Figure 2-4
Removing Backup Battery Shipping Insulator

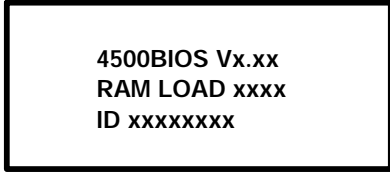
1. Grasp and remove (pull) the backup battery shipping insulator to activate the backup battery.
2. Use a small coin or flatblade screwdriver to tighten the endcap screws.

The insulator cannot be reinstalled.

Power-up

Follow the steps below to power-up your hand-held computer for the first time. Remember, you must

- install batteries
 - charge the NiCd battery pack
 - enable the Basic Input-Output System (BIOS) for the hand-held computer to go to “sleep” (battery conservation mode) when not actually in use
1. Press down on the “**A**” key located to the right of the **ON** key (40-key keyboard), or the  Up Arrow key (23-key keyboard). As you close the battery cover a long “beep” can be heard.
 2. Release that key. The hand-held computer displays:



```
4500BIOS Vx.xx  
RAM LOAD xxxx  
ID xxxxxxxx
```

The first line identifies the firmware date. The second line tells RAM size. The third line tells the unique serial number for your particular hand-held computer.

3. **Press** the **ENTER** key.

After the first time you use your 4500 hand-held computer, the following steps will occur.

1. If the first line of the screen displays **REMOTE PGM LOAD** the hand-held computer has enabled the BIOS and is ready to receive a program from an external source.

In some cases the **REMOTE PGM LOAD** display may not appear and you will need to follow steps 2 and 3, below, before it does display.

2. If the next display is **RESUME?**, press the **NO** key.
3. If the next display is **SAVE DATABASE?**, press the **NO** key. (BIOS is now enabled).

Adjusting Display Contrast

1. Press the **ON** key to turn your hand-held computer Off.
2. Press and hold the **ON** key until the screen cycles to the desired contrast (see Figure 2-5).

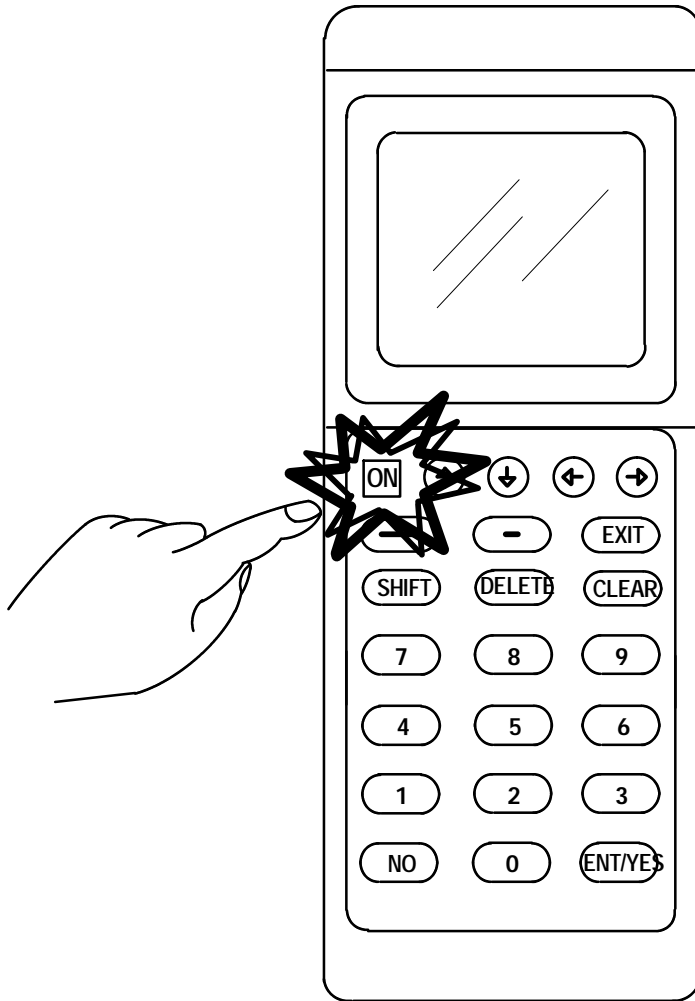


Figure 2-5
Display Contrast Adjustment

Memory Protection

Your hand-held computer contains three ways to ensure you can operate and maintain stored data, these are:

- the main battery pack which will maintain memory storage for up to 30 days even after your terminal displays the **LOW BATTERY** warning. It is always in your best interest to place your hand-held on a charging device as soon as this warning displays. You should not remove the main battery pack unless you are replacing it.
- the second method of protection for data retention is the internal capacitor. This internal capacitor retains memory for only 5 minutes. It is intended only for short time periods like when you are changing the main battery pack.
- a backup lithium battery that should only be depended upon when the main battery pack is removed or completely dead and the internal capacitor has been exhausted. Although the lithium battery has a life of 10 days, you should not depend on this for long periods of time. Each time you use it you deplete its energy and when fully used you must send your hand-held to an authorized Customer Support Center for replacement of the lithium cell.

It is very important that you not ignore the first signs of low battery conditions.

Optional Memory Card

If your hand-held computer came with an un-installed memory card, make sure it has a battery in it (see the Maintenance section of this manual) before installing the card.

1. Use a small coin or flatblade screwdriver to remove the endcap.

2. Hold the hand-held computer in a vertical position with the endcap opening up.
3. Gently fit the memory card into the wide slot. Make sure the shutter goes into the slot first, and that the shutter and the display on the hand-held computer are facing the same direction, such as up or to your left. The backup battery contained in the memory card can be replaced by you when needed. The procedures for doing that are described in **Section Four, Memory Card Battery Replacement**, page 4-4.
4. Allow the memory card to drop into place.
5. Press firmly on the card to seat it inside the computer (you can feel it make solid contact).
6. Reinstall the endcap. Do not overtighten screws.

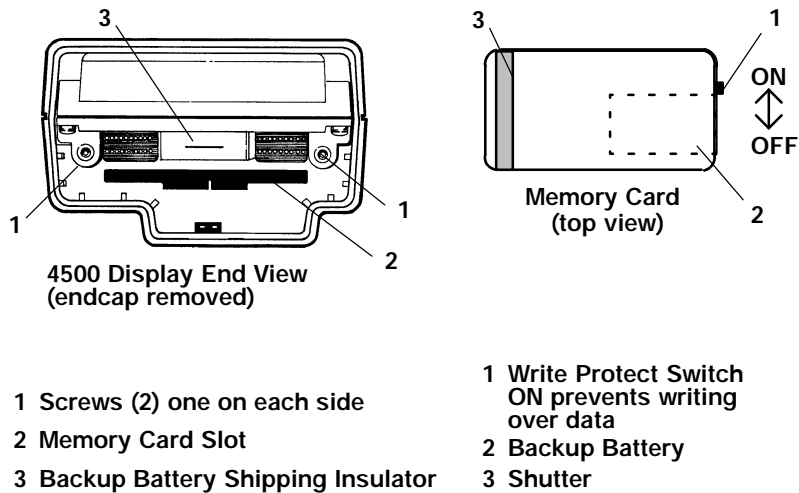


Figure 2-6
Memory Card Installation

Peripheral Endcap

A 9-pin standard scanner interface can be ordered as part of the peripheral endcap. The 15-pin RS-232 connector is not standard and therefore may require special cables for connection to various peripherals like printers and external modems. For product direction regarding this, contact your sales team or Customer Support Center. The peripheral endcap has a phone jack for units that are equipped with an optional internal modem.

Peripheral Endcap Installation

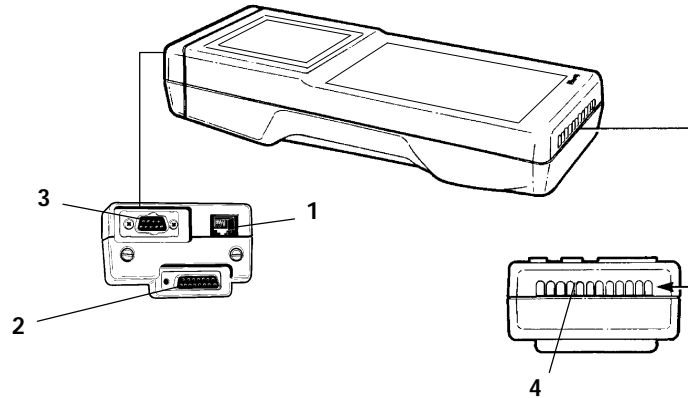
Use a small coin or flatblade screwdriver to remove the endcap. Carefully align the two 10-pin connectors on the peripheral endcap to the mating connectors in the hand-held computer. Press together gently and tighten both screws.

Connections

Surface Connector Electrical Contacts (4500 Hand-Held Peripherals)

Connections are made to peripherals (single dock, multi-dock, some printers, etc.) via the surface contacts (on the battery-end of the hand-held computer) or the peripheral endcap. In most instances, simply slide your hand-held computer into its holder on the peripheral device and contact will be made automatically.

If a retaining or locking mechanism is present on the peripheral device, refer to the device's User's Guide to learn how to insert and connect your hand-held computer.



- 1 RJ-11 Phone Jack
(with optional internal modem)
- 2 15-Pin RS-232 Connector
- 3 9-Pin Scanner Connector
- 4 Surface Connectors

Figure 2-7
Hand-Held Computer Contact Connectors

Routine Operation

Daily

Hand-held computers are designed to work with you throughout the day, without special attention. The application program (which is designed specifically for your type of business) will guide you in making entries, printing receipts and reports, and in performing other routine tasks.

The main NiCd battery pack is being charged every time it is placed into a charging device. To get the longest service from your NiCd batteries, use your hand-held computer by itself, relying on the rechargeable battery pack for power.

Your hand-held computer will display when it is necessary to place it on a charger (or replace in the case of alkaline

batteries). When your hand-held computer goes into a low battery condition, place it in a charging source (i.e. printer, modem, dock etc.) and continue to operate without fear of losing your data.

When placed in a charging source the design allows for bypassing the main battery pack and powering your hand-held computer directly from the charge source. The backup capacitor and lithium battery, are used only when in low battery and not connected to a charge source.

Here are some examples of charging sources:

- fixed mount printers (models 4810, 4815, or 4820)
- portable printers (models 4810, 4810C, 4815, or 4820) connected to an external power source
- multidock (model 4960)
- single dock (model 4950)
- selected modems (check modem specifications)

LOW BATTERY (*condition*)

This message displays briefly to warn you that the batteries are low. You should recharge the NiCd battery pack or replace the alkaline cells.

After the **LOW BATTERY** message first displays, it is to your benefit for safe operations to recharge (NiCd only) as soon as possible. When using alkaline cells you should replace soon after seeing

LOW BATTERY display. Refer back to the **Memory Protection** section page 2-11 for a complete description of how your hand-held is designed to avoid data loss.

As your battery pack becomes depleted the **LOW BATTERY** message will display more frequently, you should replace the main battery pack. Your 4500 hand-held computer with a NiCd battery pack, is designed to last about 500 charges before it needs replacing. This number is approximate and depends on your application, and the care given to the battery.

The hand-held computer will not work (except for the **LOW BATTERY** message on the display) when batteries are depleted. It will operate normally when connected to peripheral devices that provides charging current.

Weak batteries should remain in the hand-held computer until you are ready to replace or recharge them. These weak batteries can still furnish enough power to retain memory (data entries you have made) while minimizing the drain on the backup power source. This practice extends the useful life of the backup battery.

Before storing your hand-held for more than 10 days you should upload all data to your host computer, turn your hand-held Off, and ensure that a fully charged NiCd battery pack or fresh alkaline cells are installed in your hand-held. This provides power for the hand-held computer to maintain memory without drawing power from the lithium backup battery.

Section 3

Troubleshooting

Introduction

If you encounter difficulties in routine operation, printing, or communications, there are a few things you may be able to do to correct the problem.

- Refer to your applications (software user) manual for printing and telecommunication procedures.
- Ensure that electrical and mechanical connections are secure and undamaged (including the peripheral end-cap, if so equipped).
- The chart below lists displays you might see and offers some basic remedies:

TROUBLE CHART	
Low Battery	Replace alkaline cells or recharge the NiCd battery pack.
Printer Not Ready	Check the printer selection and correct if needed.
Bad TCOM	Review and retry communications procedures.

If these basic solutions do not solve your problem, there could a number of reasons. Additional things to do are:

1. If you have available the Error Codes Reference Guide (part number: 979-000-001), check the Table of Contents for the problem you are having.

2. Refer to the software documentation written for your application. This documentation contains troubleshooting information.
3. Contact the Customer Support Specialist at your Customer Service Center. Your regional Customer Support Center is fully staffed and equipped to repair your hand-held computer. Customer Support Center addresses and telephone numbers are printed on a Product Service Information card. This document is packed with all products.
4. Call the 24-hour Customer Response Hot-Line 1-800-221-9236 U.S. or 1-800-663-6149 in Canada.

Repair Service

Be sure to carefully pack the unit and include a description of the problem and the steps you took to correct it.

If possible, include any printout (if applicable) or write down displayed error messages to illustrate the problem.

Section 4

Maintenance

Introduction

Maintenance includes:

- battery care
- hand strap replacement
- memory card battery replacement

Main Battery Care

When the hand-held computer displays **LOW BATTERY**, it is time to replace the alkaline cells, or, to recharge the NiCd battery pack.

Charging

Charge the NiCd battery by connecting the hand-held computer to a peripheral device that provides a charging current such as the following equipment:

- 4960 MultiDock
- 4950 Single Dock
- 4810, 4815, or 4820 fixed-mount printers
- portable printers (models 4810, 4810C, 4815, or 4820) connected to an external power source
- many modems also provide charging current

A complete charge of the NiCd battery pack requires 11 hours.

When a hand-held computer equipped with a NiCd battery pack is first placed into service, it should be charged for at least 11 hours. The same holds true whenever a replacement NiCd battery pack is first installed.

Thereafter, the NiCd battery pack normally maintains a good charge if the hand-held computer is docked in a charging source overnight (e.g., single dock, multidock, fixed-mount printer, or selected modems).

Backup Battery Replacement

Backup battery replacement requires major disassembly of the hand-held computer, and is only performed by authorized service center personnel.

Hand Strap Replacement

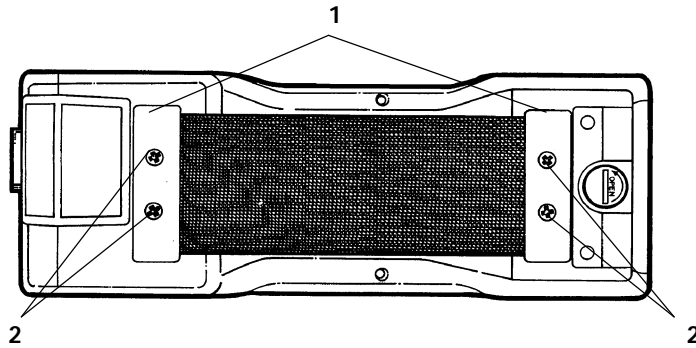
You can replace a worn or damaged hand strap using a Phillips screwdriver.

Place the hand-held computer, keyboard and display side down, on a clean work surface. A soft cloth or newspaper can be used to prevent scratches. Notice the two retainers.

1. Remove the two Phillips-head screws on each hand strap retainer.
2. Pry up on the retainers with a flat tool or screwdriver.
3. Remove and discard the worn hand strap.
4. Lay the new hand strap on the hand-held computer. Determine if new retainers are included with the replacement hand strap: if so, discard the originals and use only the new retainers in steps 5 and 8.
5. Install one hand strap retainer. Tighten the screws.
6. Stretch the other end of the hand strap over the alignment pins at the other end of the computer.

7. Use one hand to push the hand strap so that it does not pull against the alignment pins. This relieves stress on the elastic and aligns the screw holes.
8. Install the retainer on this end of the hand strap. Tighten the screws, then release tension on the hand strap.

Do not over tighten screws as this can damage the case.



1 Retainers

2 Screws

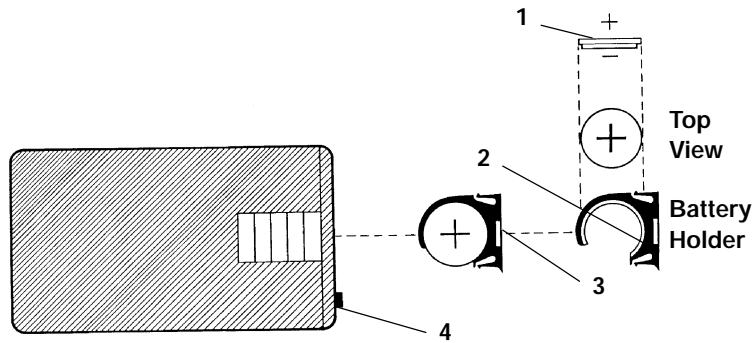
Figure 4-1
Hand-Strap Replacement

Memory Card Battery Replacement

If your hand-held computer is equipped with a memory card, it is advisable to replace the memory card battery approximately every two years. **Data stored in the memory card will be lost and must be restored following battery replacement.**

To change the memory card battery follow these instructions. Operator level maintenance is not required.

1. Remove the endcap from the hand-held computer.
2. With your fingers, pull the memory card out of the hand-held computer. **Do not use metal tools.**
3. Locate the battery holder. Grip it between your thumbnail and forefinger. Pull it out.
4. Observe how the battery is positioned in the holder (positive terminal up), then discard (recycle) the used battery.
5. Place the new battery (part number: 317-065-001) in the holder. Reinstall the battery holder in the memory card.
6. Reinstall the memory card into the hand-held computer.
7. Reinstall the endcap, restore data then resume normal operation.



- 1 Battery (edge view)
- 2 Recess (bevel edge)
- 3 Grip Point
- 4 Write Protect Switch

Figure 4-2
Memory Card Battery Changing

Routine Cleaning

Periodic cleaning will help maintain the appearance and reliability of the hand-held computer. When cleaning the hand-held computer, inspect the keyboard, hand strap, end-cap, battery cover and surface connector electrical contacts, display, and entire case for obvious signs of damage, wear, or impending failure.

Clean the exterior of the hand-held computer by using a soft cloth dampened with MICRO-CLEAN II cleanser, made by Foresight International, Inc., 4887 F Street, Omaha, Nebraska 68127-0205 (phone: 402-731-2111).

Do not use solvent solutions.

Section 5

Specifications

Size:	8.75 inches long 3.31 inches wide 1.90 inches high
Temperature:	
operating:	-20 to + 60_C (4 to +140_F)
storage:	-30 to + 65_C (-22 to +149_F)
Humidity:	90% noncondensing
Power source:	
main battery:	AA size alkaline (<i>standard</i>) NiCd battery pack (<i>optional</i>)
backup:	capacitor lithium battery
Charging rate:	
0 to +60_C: (+14 to 140 °F)	normal charge
below 0_C:	trickle charge
Communication:	
interface:	E.I.A. standards RS-232 and RS-485
protocol:	Proprietary Communications Protocol, X modem/Y modem

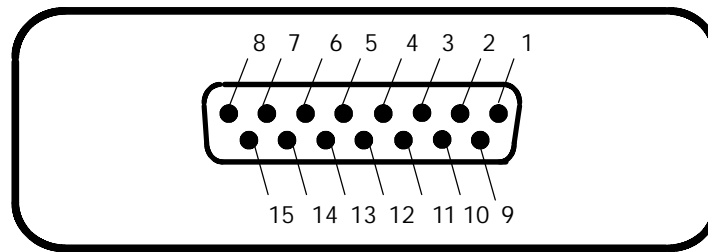
System Components:

BIOS Firmware: 512K byte OTP ROM

PSRAM: 1, 2, 3, or 4 megabytes

Processor: NEC V25 10 Mhz.

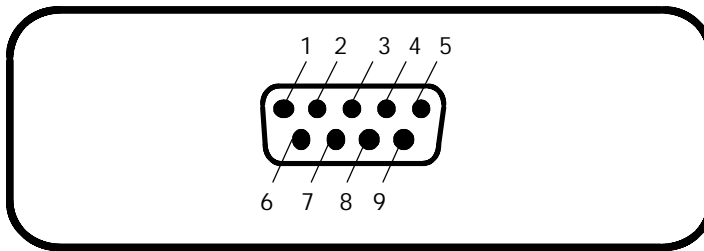
15-Pin Connector Pin-Outs



15-Pin RS-232 Connector (hand-held)

<u>Pin Number</u>	<u>Signal Name</u>
1	PCLK
2	DTR
3	RTS
4	TXD
5	RXD
6	CTS
7	DSR
8	CHARGE
9	GROUND
10	N/C
11	N/C
12	N/C
13	N/C
14	N/C
15	SWV+

9-Pin Connector Pin-Outs



9 Pin D-Sub

9 Pin D-Sub

<u>Pin Number</u>	<u>Signal Name</u>
1	SSOS
2	S DATA
3	SCNLED
4	NOT USED
5	TRIGGER
6	ENABLE
7	GROUND
8	GROUND
9	V SCAN+

