HAND HELD PRODUCTS

Dolphin® 7200 Handheld Computer and HomeBase™ User's Guide

7200UG Rev. E

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Before You Begin

Welcome

Congratulations on the purchase of your new Dolphin 7200 handheld computer. You have made a wise choice in selecting the Dolphin 7200, a device known worldwide for its ergonomic shape, light weight, versatility and single-handed data collection features.

The patented shape allows true, one-handed operation and fits either hand comfortably. Built to last, the Dolphin's ruggedly built case houses a 386 microprocessor and DOS operating system that is easily programmable with standard programming tools like Microsoft Visual C/C++, Borland C/C++, Visual Basic or RF Simplicity.

Dolphin is one of the most durable devices available, and is designed to withstand repeated five-foot drops onto a concrete floor. It also resists extreme temperatures, humidity levels and dust conditions.

The Dolphin's basic features include long-lasting Nickel Metal Hydride (NiMH) batteries, a large, easy-to-read 8 line x 20 character backlit display that can display text or graphics, a natural scan and viewing angle, and two keypad options. The multiple configurations available for the Dolphin 7200 make it one of the most versatile terminals in the automatic data collection industry. The terminal may be equipped with a scan engine capable of reading all standard bar code symbologies. Dolphin 7200 is also available with the IMAGETEAM ™ 4250 Image Engine, a low power, high-resolution digital image engine for omni-directional and auto-discrimination reading and decoding of linear barcodes, stacked linear (PDF417) and 2D matrix codes. The image engine functions like a digital camera and also provides OCR (Optical Character Recognition) functionality. Dolphin hand held computer also is available with an iButton reader. The Dolphin 7200 RS-232 terminal features a micro-DB9 RS-232 for serial data input/output and charging in addition to the infrared port. The Dolphin Wand product package is a non-scan Dolphin 7200 RS-232 and a SCANTEAM 6180 bar code wand reader/decoder. The Dolphin 7200 RF terminal may be equipped with an 802.11b or WLIF 2.4 GHz radio for real-time data collection applications.

Load up the Dolphin with your custom software application and the ultimate data collection solution for your business fits in the palm of your hand.

Safety

The Dolphin 7200 handheld computer/bar code scanner meets or exceeds the requirements of all applicable standards organizations for safe operation. However, as with any electrical equipment, the best way to ensure safe operation is to know the possible risks.

The following safety guidelines are designed to protect both you and others around you. Please read them carefully before using your Dolphin.

Required Safety Labels

Dolphin 7200 hand held computers use a low power Visible Laser to scan bar codes. Short-term exposure to CDRH Class II laser light is not known to be harmful. As with any bright light source, such as the sun, you should avoid direct eye exposure. The following are required safety labels, as they should appear on the back panel of the Dolphin:

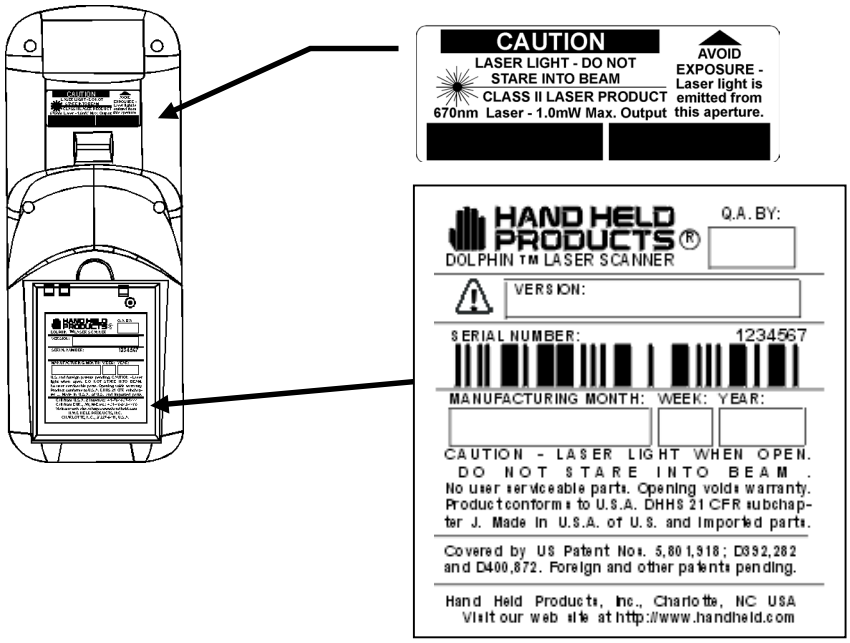


Figure 1 Required Safety Labels for Dolphin 7200 laser-equipped batch terminals

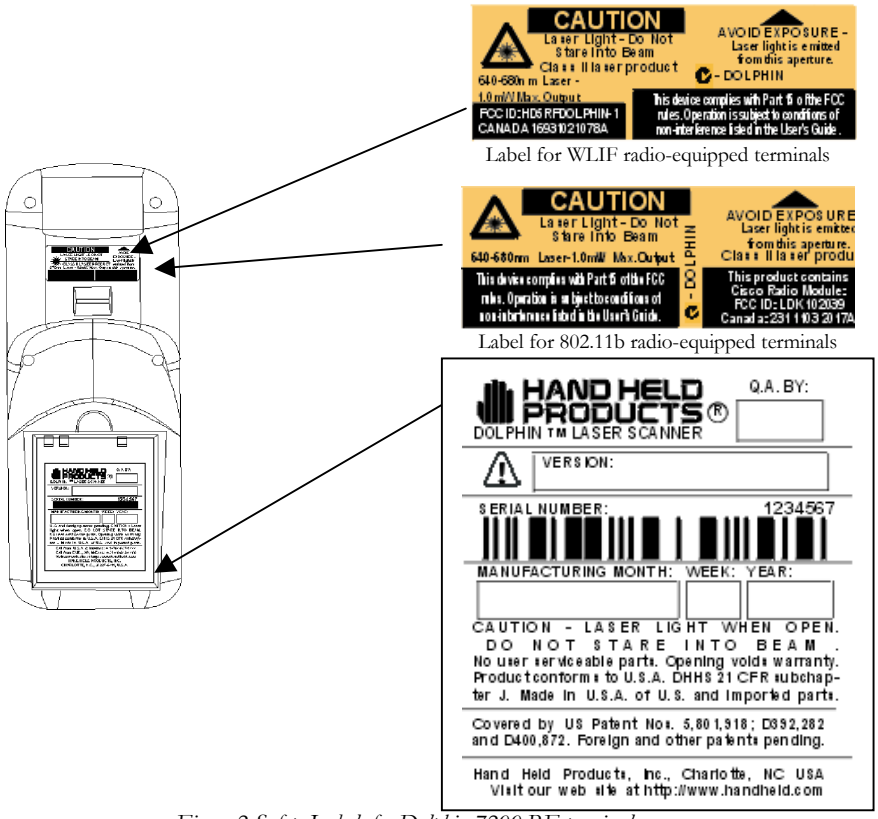


Figure 2 Safety Labels for Dolphin 7200 RF terminals

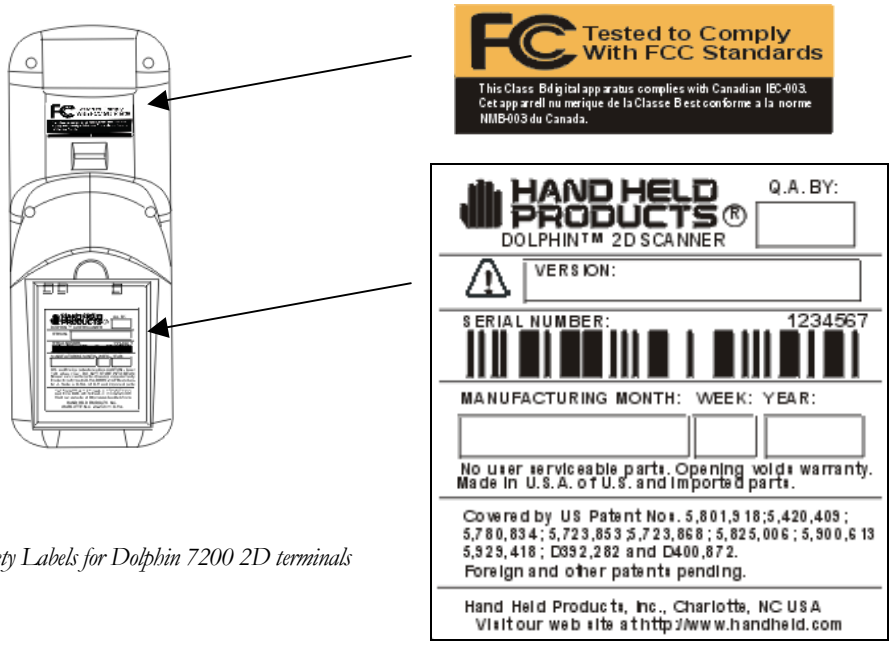


Figure 3 Safety Labels for Dolphin 7200 2D terminals

RF Energy

The Dolphin 7200 RF™ terminal is designed to comply with the most current applicable standards on safe levels of RF energy developed by the Institute of Electrical and Electronics Engineers (IEEE) and the American National Standards Institute (ANSI) and has been recommended for adoption by the Federal Communications Commission (FCC). In addition, the Dolphin RF complies with the specifications for an intentional radiator in Subpart C of Part 15 of the FCC's code of federal regulations. The Dolphin RF also complies with the European specifications ETS 300328 (Type Test of Radio LAN to European standards) and ETS 300826 (EMC Testing of radio equipment).

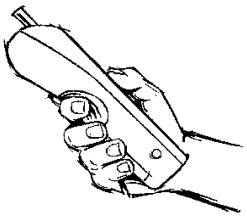
Statement of Agency Compliance

The Dolphin Batch and Dolphin RF terminals both comply with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. Devices may not cause harmful interference.

2. Devices must accept any interference received, including interference that may cause undesired operation.

FCC Class A Compliance Statement



This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. 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 the 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 receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Caution: Any changes or modifications made to this device that are not expressly approved by Hand Held Products may void the user's authority to operate the equipment.

Canadian Notice

This equipment does not exceed the Class A limits for radio noise emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

CDRH Laser Safety Statement: 7200 Batch and RF Laser Models

This product complies with US DHHS 21 CFR J Part 1040.10. This product is a CLASS II LASER PRODUCT with a maximum output of 1.0 mW at 670 nanometers and continuous wave.

EN 60825-1 Laser Safety Statement

This product is classified as a CLASS 2 LASER PRODUCT with a maximum output of 9.0 mW at 670 nanometers per EN 60825-1:1994, Issue 2, June 1997.

R&TTE Directive: 7200 802.11 Model

The Dolphin 7200 RF is in conformity with all essential requirements of the R&TTE Directive (1999/5/EC). This equipment has been assessed to the following standards: ETS 300 328 ETS 300 826 (November, 1997); EN 60950: 1992, Incl Amdt 1-4, 11.

This product is marked with CE 1680 signifying conformity with Class II product requirements specified in the R&TTE Directive.

The equipment is intended for use throughout the European Community, but its authorization for use in France is restricted as follows: PAN European Frequency Range: 2.402 - 2.480 GHz; Restricted Frequency Range for use in France: 2.448 - 2.480 GHz.

R&TTE Directive: 7200 Proxim Model

The Dolphin 7200 RF is in conformity with all essential requirements of the R&TTE Directive (1999/5/EC). This equipment has been assessed to the following standards: ETS 300 328 ETS 300 826 (November, 1997); EN 60950: 1992, Incl Amdt 1-4, 11.

This product is marked with CE ① signifying conformity with Class II product requirements specified in the R&TTE Directive.

The equipment is intended for use throughout the European Community, but its authorization for use in France is restricted as follows: PAN European Frequency Range: 2.402 - 2.480 GHz; Restricted Frequency Range for use in France: 2.448 - 2.480 GHz.

Regulatory and Safety Agency Approvals

Parameter	Specification
U.S.A. Canada Europe Others	FCC Part 15, Class A IEC 0003 EN 55022 (CISPR22) Class A ETS 300 826 Type Certified EMC 89/336/EEC EN 50082-1:1997, EN55024
RF Approvals U.S.A. Canada Europe	 FCC Part 15.247 Certified RSS 210 Certified ETS 300 328 Certified

The CE mark on the product indicates that the system has been tested to and conforms with the provisions noted within the 89/336/EEC Electromagnetic Compatibility Directive and the 73/23/EEC Low Voltage Directive.

For further information please contact,
Hand Held Products (UK) Ltd.
1st Floor
Dallam Court Dallam Lane
Warrington, Cheshire WA2 7LT
England

Hand Held Products shall not be liable for use of our product with equipment (i.e., power supplies, personal computers, etc.) that is not CE marked and does not comply with the Low Voltage Directive.

Interference

Pacemakers, Hearing Aids and Other Electrically Powered Devices

Most manufacturers of medical devices adhere to the IEC 601-1-2 standard. This standard requires devices to operate properly in an EM Field with a strength of 3V/m over a frequency range of 26 to 1000MHz.

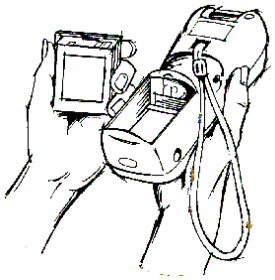
The maximum allowable field strength emitted by the Dolphin is 0.3V/m according to Subpart B of Part 1 of the FCC rules. Therefore, the Dolphin RF will have no effect on medical devices that meet the IEC specification.

Microwaves

The radio in the Dolphin RF terminal operates on the same frequency band as a microwave oven. Therefore, if you use a microwave within range of the Dolphin RF terminal you may notice performance degradation in your wireless network. However, both your microwave and your wireless network will continue to function.

The Dolphin Batch terminal does not contain a radio, and therefore, is not affected by microwave ovens.

Batteries



- Use only the battery supplied with your Dolphin or a replacement battery supplied, recommended, or approved by HHP.
- Replace a defective battery immediately as it could damage the Dolphin terminal.
- Never throw a used battery in the trash. It contains heavy metals and should be recycled according to local guidelines.
- Don't short-circuit a battery or throw it into a fire. It can explode and cause severe personal injury.
- Excessive discharge damages a battery. Recharge the battery when your Dolphin indicates low battery power.
- Although your battery can be recharged many times, it will eventually be depleted. Replace it after the recommended usage period (about 500 charge cycles for the 1500 mAh NiMH battery) or if the battery does not hold a charge.
- If you are not sure the battery or charger is working properly, please send it to HHP or an authorized HHP service center, for inspection.

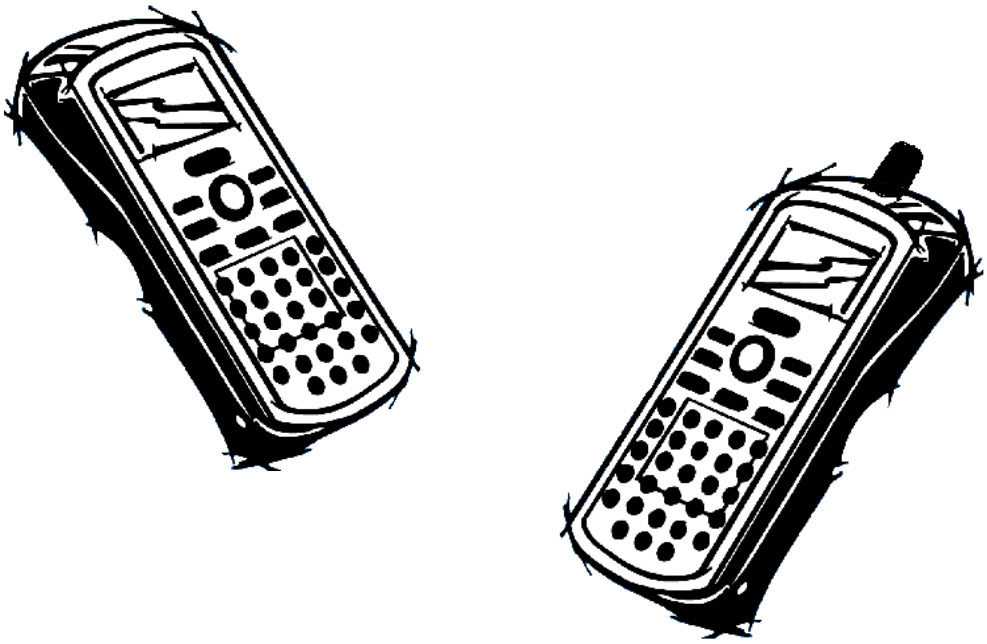
The Dolphin handheld computer/bar code scanner meets or exceeds all applicable standards and has been manufactured to the highest level of quality.

Care and Cleaning of the Dolphin

When needed, clean the laser engine window and the LCD display with a clean non-abrasive, lint-free cloth.

Chapter 1 Getting Started

Summarizes the Dolphin's features, functions and accessories and getting it started for the first time.

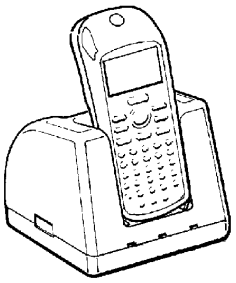


About the Dolphin 7200 Handheld Computer

The Dolphin is a handheld computer and imager/bar code scanner designed for easy, single-handed data collection. It has a 386 33 MHz microprocessor that runs with GS-DOS and is PC-compatible.

Accessories for the Dolphin

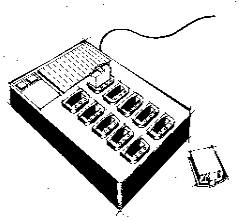
The Dolphin 7200 is part of a data collection system that includes accessories specifically designed for vehicle, desktop and hub operations. Accessories available include serial and networkable communications/charging cradles, serial communications/charging cables, desktop "gang chargers" and vehicle mounted charging/communication cradles.



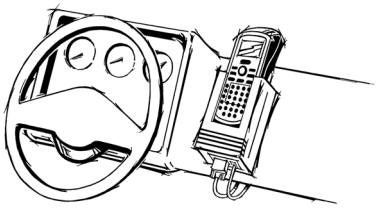
You can use these accessories with the Dolphin:

Dolphin HomeBase Dolphin terminal charging, one-slot auxiliary battery charging and communication station, includes power adapter.

Dolphin HomeBase power adapter Replacement power adapter for Dolphin HomeBase. Note: Use only power adapters approved for use by Hand Held Products. Failure to do so may result in improper operation or damage to the unit.

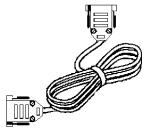


10 Slot Battery Charger for Dolphin Charges and reconditions 10 batteries in under four hours. Supports 90-264V.

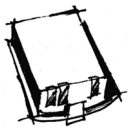


VehicleBase Vehicle Kit for Dolphin Battery charging and communications cradle providing connectivity to any serial device including printers, radio modems, GPS, on-board computers and vehicle monitoring systems.

Wrist Strap for Dolphin A convenient way to carry the Dolphin. *(Note: Lanyard ring for attaching strap not available with Dolphin 7200 RF or Dolphin 7200 RS-232.)*



Holster Another convenient way to carry the Dolphin. Available in leather or cordura, a rugged synthetic fabric.



NiMH Battery Pack Nickel Metal Hydride (NiMH) 3.6V rechargeable battery for the Dolphin.

Communication/Charging Cable for Dolphin 7200 RS-232 Connects the Dolphin 7200 RS-232 terminal directly to host computer using micro-DB9 to DB9 serial cable, and recharges the battery using the Universal Power Adapter PS9U-11.

SCANTEAM® 6180 Bar Code Wand Reader/Decoder connects to the Dolphin 7200 through the terminal's Micro-DB9 RS-232 port. For use only with non-scan Dolphin 7200 RS-232 terminal as part of Dolphin 7200 Wand product package.

6' RS-232 Serial Cable Connects HomeBase to your desktop PC.

NOTE

Use your Dolphin only with accessories supplied, recommended or approved by Hand Held Products, Inc. Use of non-approved accessories can be dangerous and will invalidate any warranty or liability claims.

Contact your Value-Added Reseller for more information. For details about how to install or use any of these accessories, refer to the documentation provided with the product.

Dolphin 7200 Models and Options

Hand Held Product's family of Dolphin 7200 handheld portable data collection terminals includes these models:

The **Dolphin® 7200 Batch** terminal is a DOS programmable handheld computer/bar code scanner with a unique, ergonomic shape designed for single-handed use. The basic terminal has 2MB RAM and 8MB FLASH EEPROM memory. It also features an IrDA infrared transceiver for data communications.

The **Dolphin® 7200 with iButton Reader** handheld computer integrates the basic functionality of the Dolphin Batch terminal with iButton™ technology that allows the terminal to read and write data from and to iButtons. The iButton reader is a function and feature extension of the Batch terminal.

The **Dolphin® 7200 RF** terminal integrates the basic functionality of the Batch terminal with a 2.4GHz RF interface that allows the terminal to communicate with a host computer via a wireless local area network (WLAN). There are two options for this terminal: an 802.11b direct sequence spread spectrum radio or a WLIF frequency hopping spread spectrum radio.

The **Dolphin® 7200 RS-232** terminal is identical to the Dolphin 7200 Batch terminal except that it features a micro-DB9 RS-232 port for serial data input/output and charging.

The **Dolphin® 7200 Wand** is a product package consisting of a non-scan Dolphin 7200 RS-232 terminal loaded with factory-installed drivers and a SCANTEAM® 6180 bar code wand reader/decoder.

The **Dolphin® 7200 2D** terminal uses IQ Imaging™, a suite of features that offer increased productivity when reading all major linear, stacked linear (PDF417), and matrix bar code symbologies, OCR fonts, and performing image capture. It features the IMAGETEAM™ 4250 Image Engine, a low power, high-resolution digital image engine for omni-directional and auto-discrimination reading and decoding.

These following options are available for the Dolphin 7200 terminal:

.

Dolphin Batch	Dolphin RF
36-key alphanumeric keypad **or** 20-key numeric keypad with shifted alpha characters	36-key alphanumeric keypad **or** 20-key numeric keypad with shifted alpha characters
Standard High Performance, Long-Range or High Density scan engines	Standard High Performance, Long-Range or High Density scan engines
2 MB RAM with 8 MB non-volatile FLASH memory (expandable to 16 MB on Dolphin 7200 Batch only)	2 MB RAM with 8 MB non-volatile FLASH memory
No scan engine (manual entry only)	No scan engine (manual entry only)
iButton reader	Terminal emulation software and keypad overlays for IBM 3270, IBM 5250 and DEC VT220 emulation.
Integrated image engine	802.11b direct sequence spread spectrum radio **or** WLIF frequency hopping spread spectrum radio
Micro-DB9 RS-232 serial port	

Bar Code Symbologies Supported

The Dolphin 7200 series of terminals supports the following 1D linear codes:
Code 3 of 9, Interleaved 2 of 5, Code 11, MSI, UPC A, UPC EO, UPC EI, EAN/EAN13, Codabar, Code 128, Code 93, UPC

The Dolphin 7200 Wand (Non-scan Dolphin 7200 RS-232 and a SCANTEAM 6180 bar code wand reader/decoder) product package supports the following 1D linear codes:
Code 39, Interleaved 2 of 5, Code 2 of 5, UPC-E/A, MSI, EAN/JAN, Codabar, Code 128, Code 11 and Code 93.

In addition, the Dolphin 7200 2D terminal supports the following:
2D codes:
PDF417, microPDF, Maxicode, Datamatrix, Aztec, QR Code, Code 49
Composite codes:
RSS-14, CODABLOCK, AZTEC MESA

OCR codes (Optical Character Recognition):
OCR A and OCR B
Postal Codes:
Postnet and most international 4 state codes, PLANET CODE, BPO 4 STATE, CANADIAN 4 STATE, DUTCH POSTAL, AUSTRALIAN 4 STATE, JAPANESE POSTAL

Using Dolphin for the First Time

This section will show you how to:

1. Be sure that you've received all items included with your Dolphin order
2. Charge the battery
3. Turn the Dolphin on and off
4. Set the date and time

NOTE

Be sure to keep the original carton and packaging in the event that the Dolphin terminal or Dolphin HomeBase™ should need to be returned for service.

1 Checking Your Package

If you ordered a Dolphin 7200 Batch, iButton, 2D or RF terminal, inspect the package to see that the following standard items and accessories (if ordered) are included:

- Dolphin 7200 hand held computer
- Battery (1500 mAh, Nickel Metal Hydride (NiMH)
- Dolphin 7200 HomeBase
- AC-DC Power Adapter for Dolphin HomeBase

If you ordered a Dolphin 7200 RS-232 terminal, inspect the package to see that the following standard items and accessories (if ordered) are included:

- Dolphin 7200 RS-232 hand held computer
- Battery (1500 mAh, Nickel Metal Hydride (NiMH)
- Dolphin 7200 RS-232 Communication/Charging Cable
- AC-DC Universal Power Adapter

If you ordered a Dolphin 7200 Wand (non-scan Dolphin 7200 RS-232 terminal and SCANTEAM 6180 bar code wand reader/decoder), inspect the package to see that the following standard items and accessories (if ordered) are included:

- Dolphin 7200 RS-232 non-scan hand held computer
- SCANTEAM 6180 bar code wand reader/decoder
- Battery (1500 mAh, Nickel Metal Hydride (NiMH)
- Dolphin 7200 RS-232 Communication/Charging Cable
- AC-DC Universal Power Adapter

NOTE

Be sure to keep the original carton and packaging in the event that the Dolphin terminal or Dolphin HomeBase™ should need to be returned for service.

2 Charging the Battery

NOTE

For maximum battery life, Hand Held Products recommends that you deep-cycle (service) the battery twice before initial use and then, once a month thereafter.

CAUTION: Use only 3.6V battery packs provided by Hand Held Products. The use of any other battery pack in the Dolphin terminal will void your warranty and may result in damage to the Dolphin terminal or battery.

The terminal's NiMH battery is not conditioned at the factory and is shipped discharged of all power and inserted in the Dolphin terminal. For maximum battery life, Hand Held Products recommends that you deep-cycle the battery **twice** before initial use.

WARNING: Although the Dolphin 7200 terminal is received with the battery inserted, it is NOT ready for charging and/or deep-cycling. Remove the plastic insulator located between the terminal and battery connectors. Failure to remove the insulator may result in damages to the terminal.

To deep-cycle, insert the battery into the HomeBase auxiliary battery well. Then, push and hold the **Service Aux Batt** button for at least four seconds.

You may also use the CycleBat software utility to deep-cycle the battery. This utility is available for download from the Partners Area of http://www.hhp.com/.

If you have a Dolphin 7200 RS-232 terminal and are using the communication/charging cable instead of a HomeBase to charge the battery, charge the terminal for 24 hours before initial use.

After deep cycling the battery, you may charge the battery using one of these methods:

- Place the battery in the auxiliary battery well on the Dolphin HomeBase™. Time to Charge: 3 hours
- Place the battery in the 10-slot Dolphin multiple battery charger. Time to Charge: 3 hours
- Install the battery in the Dolphin, place the Dolphin in the HomeBase and connect the HomeBase to an external power source. Time to Charge: 5 ½ hours
- Plug the micro-DB9 end of the communication/charging cable into Dolphin 7200 RS-232 terminal's RS-232 port and connect to an external power source. Time to Charge: 5 ½ hours

For help, see the chapter on the Dolphin. To learn more about managing the terminal's battery power, see *"Maintaining the Dolphin's Batteries"* in Chapter 2.

Inserting the Battery Pack

1. Hold the Dolphin with the front panel (keypad) facing down.

2. Insert the end without the locking tab into the bottom of the battery opening and snap the battery into place with a hinging motion. The battery case serves as the back cover of the Dolphin.

Removing the Battery Pack

1. Hold the Dolphin with the front panel (keypad) facing down.

2. Push the locking tab on the battery pack down and pull the battery out from the Dolphin terminal with a hinging motion.

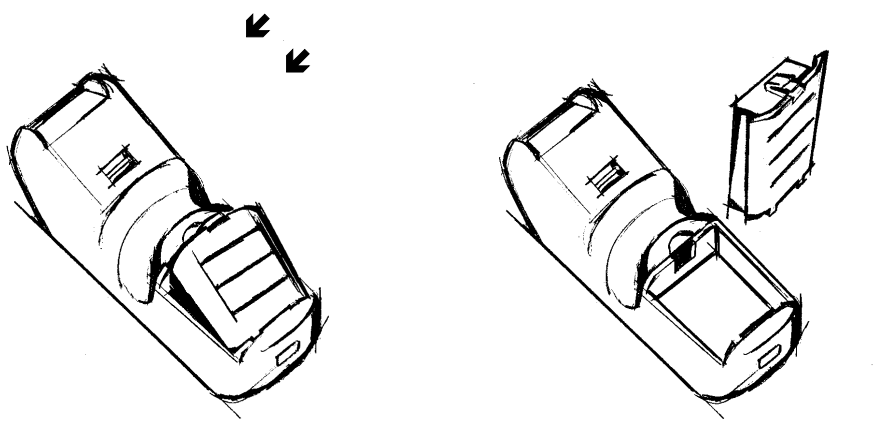


Figure 2 Inserting and Removing the Battery

3 Turning the Dolphin On And Off

Turning On the Dolphin

1. Install the charged battery pack in the Dolphin.

2. Hold the Dolphin in the palm of your hand so that you can press the ON/SCAN key easily with your thumb.

3. Press the ON/SCAN key to turn the Dolphin on. Your Dolphin will boot up just like a desktop PC and the title screen for the HHP Demo Application will appear on the display.

   If the title screen does not appear on the display of your Dolphin, the HHP Demo Application has been removed from your terminal. Therefore, you will see a DOS prompt on the screen. Example: C:\ or A:\ .

Note: If using the Dolphin for first time or if the terminal has been without a battery pack for more than 30 minutes and you are now inserting a battery, you may receive a CMOS error when the terminal boots up. Don't worry, the terminal is OK. This simply means that the internal back-up battery needs to be recharged and the date and time need to be reset. To recharge the internal backup battery and reset the date and time, insert a fully charged battery in the Dolphin and then use the DOS date and time function to set the correct date and time. The internal back-up battery requires a minimum of 5 hours of charging time in order to perform and maintain the system as described on page 30.

Turning the Dolphin Off

The Dolphin is never actually turned off. To conserve power, the Dolphin goes into "sleep mode" when it is inactive for a programmed period of time as defined by your application. The screen is blank when the Dolphin is in "sleep mode."

4 Setting the Date and Time

Use the DOS date and time function to set the correct date and time for your Dolphin terminal.

To set the date on an alphanumeric Dolphin:

1. Enter <DATE> at the Dolphin's DOS prompt.

2. Press NUM LOCK to put the Dolphin in numeric mode.

3. Enter the new date <mm-dd-yyyy>.

4. Press <ENTER>.

To set the date on a numeric Dolphin:

1. Press <SHIFT> to put the Dolphin in alpha mode.
2. Enter <DATE> at the Dolphin's DOS prompt. See the section called *Using the Numeric Keypad* in Chapter 2 for more information.
3. Press <SHIFT> to put the Dolphin back in numeric mode.
4. Enter the new date <mm-dd-yy>.
5. Press <ENTER>.

To enter the new time, enter <TIME> at the Dolphin's DOS prompt instead of <DATE> and follow the directions for the Dolphin model you are using.

Chapter 2 Dolphin Basics

Describes system features and explains how to use the Dolphin's keypad, display, batteries, drives and scanner.

System Features

CPU

The Dolphin's computing power is provided by a highly integrated AMD ELAN SC310 386SX 33 MHz microprocessor.

Disk Drives

The Dolphin contains two disk drives that provide storage for system files, applications, and data. A third drive is also present if you purchase the FLASH expansion option.

NOTE

Drive C is an image of the A drive and not a physical drive.

Drive A

Drive A contains a 120K executable FLASH EEPROM to store system utilities and to initialize the boot process. This drive is read-only and is not usable by the developer/end-user.

Drive C

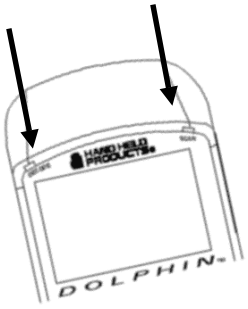
Drive C is an 8MB FLASH virtual hard drive used for program and data storage.

Drive D

If you add the expanded memory module to your Dolphin Batch terminal, it will appear as Drive D. Eight (8)MB of additional FLASH memory can be added via the FLASH expansion module. *Note: This option is only available for the Dolphin batch and Dolphn iButton terminals.*

Front Panel Physical Features

This section describes features on the Dolphin's front panel. The alphanumeric and numeric Dolphins have identical back panels.



Light Emitting Diodes (LED)

The red LED located at the upper right corner of the LCD display is labeled 'SCAN'. This LED illuminates when the user presses the ON/KEY key and activates the scan engine.

The green LED located at the upper left corner of the LCD display is labeled 'DECODE.' This LED illuminates when the bar code software successfully decodes a bar code. Both LEDs are software programmable.

Liquid Crystal Display (LCD)

The alphanumeric, scrollable LCD consists of nine rows with 20 character positions per row and 119 x 73 graphics pixels, which are software addressable. The electroluminescent backlight allows you to view the display in low light conditions. To conserve power, the backlight is automatically turned off after 30 seconds. The on/off function and contrast is software programmable.

Note: The ninth row is used for system icons and application-defined icons.

Speaker

The Dolphin Batch terminal's internal speaker emits a sound level of 80dB at 10 cm. The sound level for the Dolphin RF terminal's external speaker is 90dB at 10 cm.

RF Antenna

The Dolphin RF terminal's 1.36 inch (34.5 mm) antenna is a unity gain, helically-loaded, monopole antenna.

Using the Alphanumeric Keypad

The Dolphin's alphanumeric, splash-resistant keypad has 36 epoxy coated keys. The keyboard's yellow background enhances the readability of the numeric and special character keys.

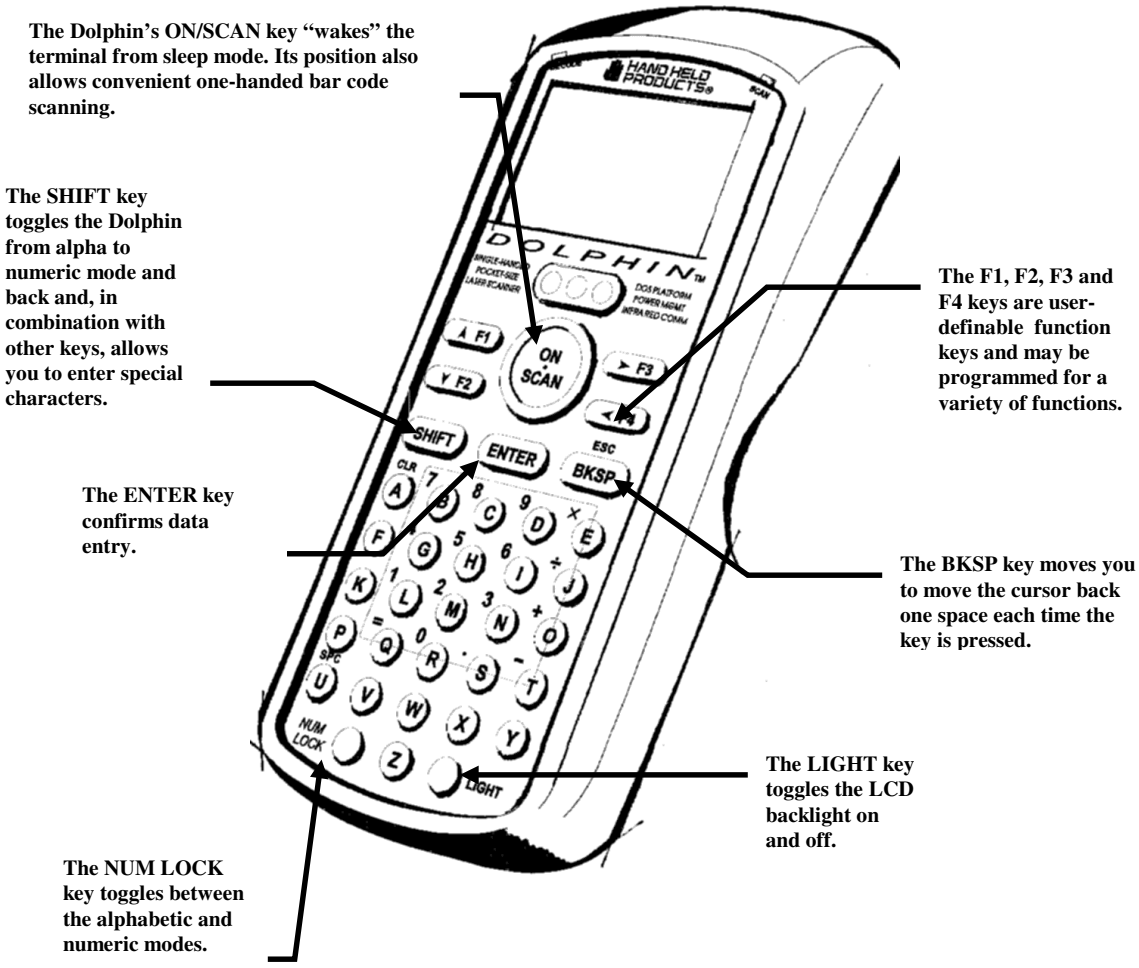


Figure 3 Dolphin Alphanumeric Keypad

Key Combinations For Keypad Functions and Special Characters

Use the key combinations listed below to access certain keypad functions or to use special characters that are not defined on the Dolphin keypad.

Key Combination	Function/Special Character
ESC (SHIFT + BKSP)	The ESC function performs a cancel action.
SPC (SHIFT + U)	The SPC function moves the cursor forward one space at a time.
CLR (SHIFT + A)	The CLR function erases the line of data just entered, if the ENTER key has not yet been pressed.
SHIFT + F	#
SHIFT + K	@
SHIFT + P	&
SHIFT + V	$
SHIFT + W	%
SHIFT + X	!
SHIFT + Y	\
SHIFT + Z	:
SHIFT + E	*
SHIFT + J	/
SHIFT + LIGHT	Changes Contrast

Figure 4 Key Combinations for Alphanumeric Keypad

Using the Numeric Keypad

The Dolphin's numeric, splash-resistant keypad has 20 epoxy coated keys. The large, amber-color keys are large, easy-to-read, and comfortably spaced to help prevent errors in data entry. Digits can be entered without using the shift key.

Though designed primarily for numeric data entry, you can use the SHIFT key to switch between numeric and alpha modes or to use special characters.

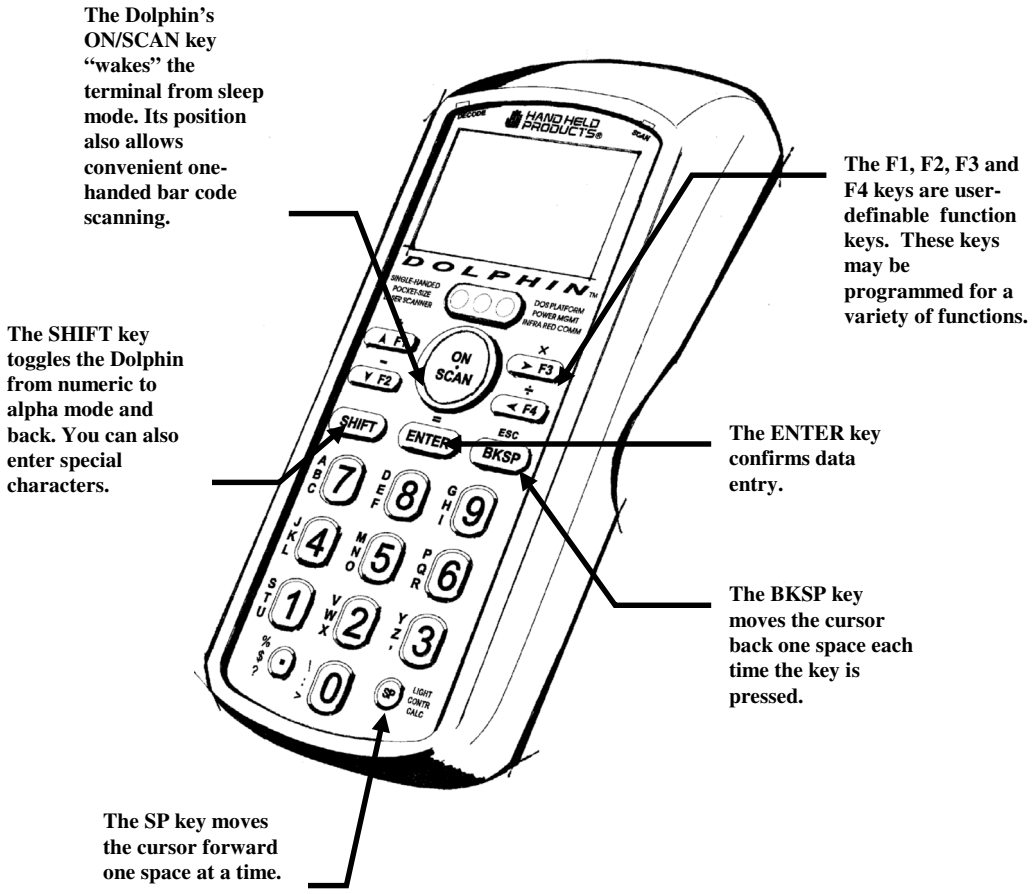


Figure 5 Dolphin Numeric Keypad

Key Combinations For Keypad Functions and Special Characters

Key Combination	Function
ESC (SHIFT + BKSP)	The ESC function performs a cancel action.
LIGHT (SHIFT + SP)	This action toggles the LCD backlight on and off. Press the SHIFT key to put the Dolphin in alpha mode and press the SP key once.
CONTR (SHIFT + SP+SP)	The CONTR function adjusts the LCD contrast. Press the SHIFT key to put the Dolphin in alpha mode and press the SP key twice. Use the **F1** and **F2** keys to adjust the contrast up or down. When finished, press the BKSP key.
CALC	This function is undefined. However, it can be programmed by a custom application to load a calculator utility.

Figure 6 Key Combinations and What They Do
Numeric Keypad

Entering Alpha and Special Characters

1. Press the **SHIFT** key to switch the numeric keypad to alpha mode. This is indicated by the **<ABC>** symbol indicated on the LCD. Each numeric key, as well as the "." Key has three letters or symbols listed beside it.

2. To display the first letter or symbol next to a key, press the numeric key once.

3. To display the second letter/symbol, press the key next to the desired letter/symbol **twice** within one second.

4. To display the third letter/symbol, press the key next to the desired letter/symbol **three** times within one second.

For example, to enter a letter "G" into the Dolphin terminal, press the **SHIFT** key to put the Dolphin in alpha mode. Press the "9" key **once** and the letter "G" will be entered.

To enter a "T" into the Dolphin terminal, press the **SHIFT** key to put the Dolphin in alpha mode. Press the "1" key **twice** and the letter "T" will be entered.

Display Symbols

Here is a list of the symbols that can appear on the LCD display of your Dolphin and their meanings.

Battery Charge

Battery charging symbol blinks while main battery in the Dolphin terminal is charging in the Dolphin 7200 HomeBase. Located in lower left-hand corner of the LCD.

NOTE

The battery charge level symbol is only an estimate of the remaining battery life.

Battery charging symbol blinks while the main battery in the Dolphin terminal is discharging when using the battery deep-cycling utility program

Battery charging symbol shown above switches from a blinking arrow to a blinking check when the unit has completed charging in the HomeBase.

Indicates charge level of the Dolphin terminal's main battery when the terminal is in use. The charge symbol decreases in size as the charge level drops. Located in lower left-hand corner of the LCD.

When this symbol is blinking, the battery's charge is critically low and you should recharge it as soon as possible.

For information on battery capacity and charging, see the section on Maintaining the Dolphin's Batteries later in this chapter.

Keyboard Mode

These symbols indicate which mode is operational on the keyboard and are located next to the battery charge indicator. Use the SHIFT key to toggle between numeric to alpha mode on Dolphin.

Alpha mode -- alphabetic characters are active

Numeric mode -- numeric characters are active

Back Panel Features

This section describes features on the Dolphin's back panel. The alphanumeric and numeric Dolphins have identical back panels.

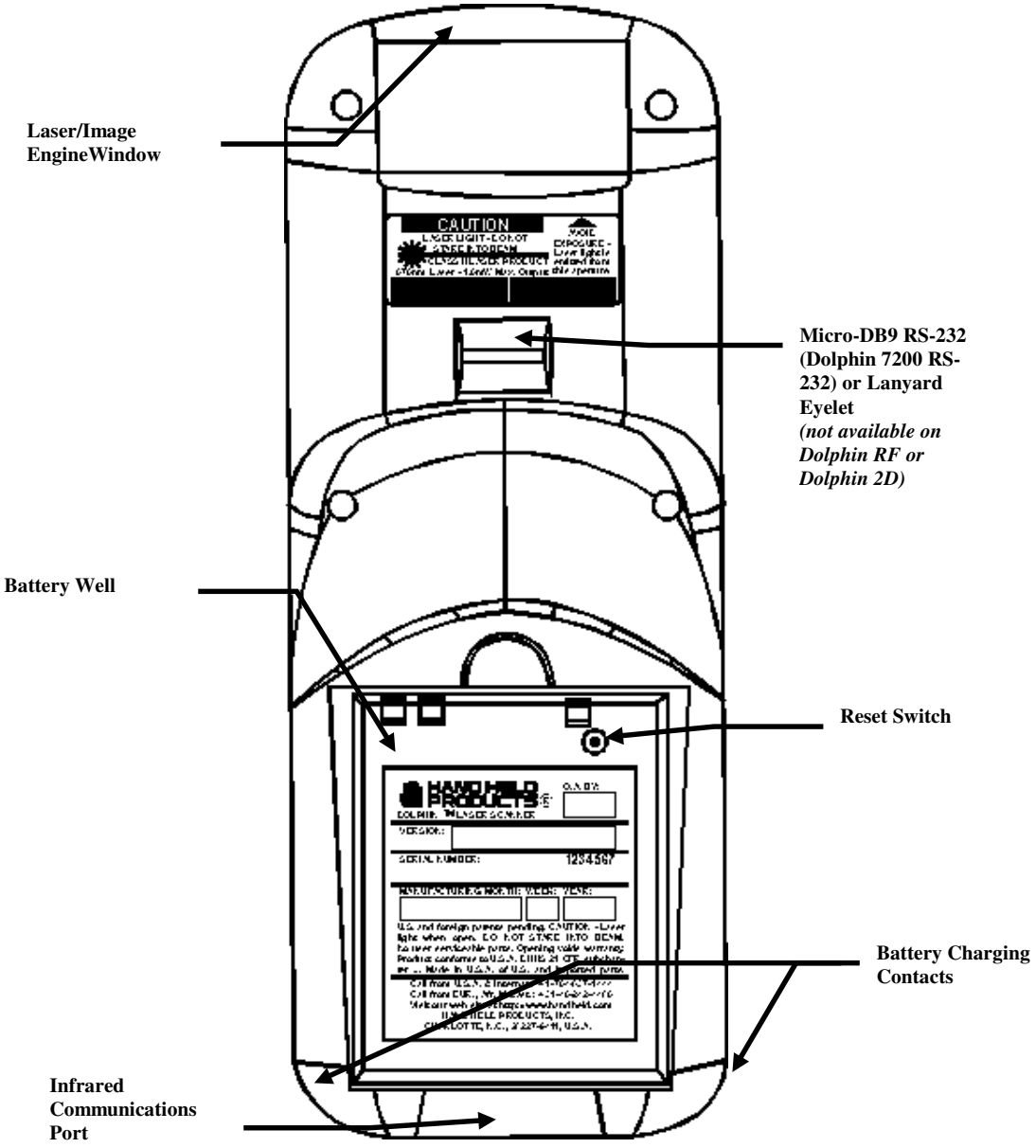


Figure 7 Dolphin Back Panel

Laser Engine

The Dolphin 7200 is currently available with four scanning options:

- Standard range
- Long range
- High density scanning
- No scan engine

The laser engine converts reflected light into a digital pattern that represents the bar code data. A clear window covers the laser engine to protect it from dust and dirt.

Image Engine

The Dolphin 7200 2D terminal is available with the following imaging options:

- Standard image engine: scans 2 to 9 in. (5 to 23 cm)
- High-Density: scans 2 to 4 in. (5 to 12 cm)
- LX image engine: scans 2 to 15 in. (5 to 38 cm) on low density bar codes

Lanyard Eyelet for Optional Wrist Strap

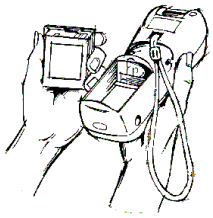
This feature allows a strap to be attached to the Dolphin terminal so that it can be conveniently secured around the wrist or hooked on to a belt. Not available on the Dolphin 7200 RF, the Dolphin 7200 2D or the Dolphin 7200 RS-232 terminals.

NOTE

Under normal circumstances, you should never need to reset your Dolphin terminal.

Battery Well

The Battery Well is a recessed area on the back of the Dolphin that holds the 3.6V battery pack.



Reset Switch

The Reset Switch is located inside the Dolphin terminal and is accessible through a small opening within the battery well. To reset the Dolphin, remove the label covering the opening and press the reset switch with a small blunt object such as a paper clip.

Infrared Communications Port

The Infrared Communications Port allows the Dolphin to communicate through the Dolphin HomeBase to a host serial device.

Battery Charging Contacts

When the Dolphin is placed in the main well of the Dolphin HomeBase, the Dolphin's battery pack is charged through these contacts.

Maintaining the Dolphin's Batteries

CAUTION: Use only the 3.6V battery packs provided by Hand Held Products. The use of any other battery pack in the Dolphin 7200 terminal will void your warranty and may result in damage to the Dolphin terminal or battery.

There are two batteries in the Dolphin:

Internal NiMH Backup Battery
Located inside the Dolphin, this battery backs up the RAM and clock when the NiMH main battery is discharged or removed from the terminal.

NOTE

Never insert the Dolphin into the HomeBase without the NiMH main battery pack inserted.

NiMH Battery Pack
The battery pack is the primary power source for operating the Dolphin.

Internal NiMH Backup Battery

The Dolphin's internal backup battery prevents the terminal from being reset if you need to remove and replace the main battery pack. The battery retains RAM data and allows the real-time clock to remain operational for up to 30 minutes when the battery pack is removed. If the internal back-up battery becomes discharged of power, it requires a minimum of 5 hours of charging time in order to perform and maintain the system as described above.

The internal backup battery is charged by the Dolphin's main battery pack. If the terminal is left without the main battery pack for more than 30 minutes, the internal backup battery needs to be recharged.

Note: Data and programs on Drives C and D remain safe even if the internal backup battery fails. However, you must reset the real-time clock using the DOS Time and Date function.

NOTE

Return the Dolphin to an authorized service center when the internal battery needs to be replaced.

Follow these guidelines to maximize the life of the Dolphin's backup battery:

- Keep a charged NiMH battery pack in the Dolphin. The internal battery will prematurely discharge if there is not at least a partially charged battery in the terminal.
- Put the Dolphin in the HomeBase when the terminal is not in use.

NiMH Battery Pack

The 3.6V, 1500 mAh Nickel-Metal-Hydride (NiMH) battery pack is the primary power source for the Dolphin. Other Nickel-Metal-Hydride batteries may be approved by Hand Held Products, Inc. to work with your Dolphin. Contact Hand Held for more information.

The 1500 mAh NiMH battery is designed to operate in temperature range of –10 to 50 °C (14 to 122° F). For maximum performance, charge the batteries between 10 and 35 °C (50 and 95° F).

NOTE

Keep a charged battery pack in the Dolphin at all times to conserve the internal back-up battery.

***WARNING**: Although the Dolphin 7200 terminal is received with the battery inserted, it is **NOT** ready for charging and/or deep-cycling. Remove the plastic insulator located between the terminal and battery connectors. Failure to remove the insulator may result in damages to the terminal.*

Performance specifications for a fully charged 1500 mAh NiMH battery (using power management function calls within application):

Up to 20 hours of usage in a Dolphin Batch terminal with a full battery charge

Up to 10 hours of usage in a Dolphin RF terminal with a full battery charge

Up to 20 hours of usage in a Dolphin 2D terminal with a full battery charge

Keep a charged battery pack in the Dolphin at all times to conserve the internal back-up battery. When you remove a battery pack, insert another battery pack in the Dolphin. The internal battery will prematurely discharge if there is not at least a partially charged battery in the terminal.

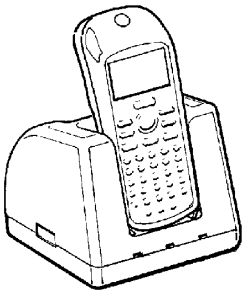
NOTE

*For maximum battery life, Hand Held Products recommends that you deep-cycle (service) the battery **twice** before initial use and then, once a month thereafter.*

Servicing the Battery Pack

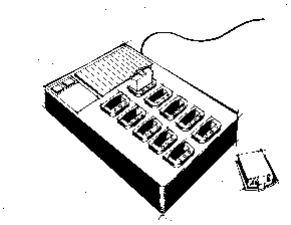
For maximum battery life, Hand Held Products recommends that you deep-cycle the battery **twice** before initial use. It is also recommended that you service, or calibrate the battery once per month. To deep cycle, insert the battery into the HomeBase auxiliary battery well. Then, push and hold the **Service Aux Batt** button for at least 4 seconds. For more information, see the section on the *Service Aux Batt* feature of the HomeBase in Chapter 7.

You may also deep cycle the battery using the CycleBat battery utility conditioning software which is available from the Partners area of the Hand Held Products website, http://www.hhp.com/. More information on this utility is available from the help file that comes with the software.



Charging the Battery Pack

You can recharge an individual battery pack using the auxiliary battery well of the Dolphin HomeBase, or the Dolphin 10-Slot Multiple Battery Charger. Both accessories use a charging method that senses when the battery pack is fully charged and then drops to a trickle charge to keep the battery pack at full capacity.



For more details, see the section on *Charging Batteries in the HomeBase* in Chapter 7.

Storing Batteries

To maintain top performance from batteries, follow the guidelines below when storing them:

- Avoid storing batteries outside of the specified range of -4 to 104° F (-20 to 40°C) or in extremely high humidity.
- For prolonged storage, do not keep batteries stored in the terminal.
- During long-term storage, battery deactivation may tend to occur which may cause charging to stop early during recharging after storage. Charging and discharging the battery several times can handle this issue. Also, the first charging after prolonged storage may yield a lower than normal capacity. While this will vary depending on the storage conditions, charging and discharging the battery several times will almost completely restore capacity.

Chapter 3 Dolphin® 7200 RF Handheld Computer

About the Dolphin 7200 RF Handheld Computer

The **Dolphin 7200 RF®** terminal integrates the basic functionality of the Batch terminal with an 802.11b or a WLIF™ interface that allows the terminal to communicate with a host computer via a wireless local area network (WLAN). Both radio options operate in the 2.4 GHz frequency band. Terminal emulation software and keypad overlays for IBM 3270, IBM 5250 and DEC VT100/220 emulation are available for both radio options. The terminal's DOS compatible 386 microprocessor is easy to program and developers can create wireless applications linked to a host PC, using RF Simplicity® and MS Visual Basic™.

Refer to Chapters 1 and 2 in this manual for more on basic operation of the Dolphin terminal and accessories available.

802.11b-Compliant Dolphin 7200 RF Terminal

The 802.11b-compliant Dolphin 7200 RF incorporates a Cisco® 802.11b Micro-ISA radio. The radio uses direct sequence spread spectrum (DSSS) technology, which spreads its signal continuously over a wide frequency band, and provides an Ethernet-like data rate of up to 11 megabits per second. The radio may also provide up to 128-bit Wired Equivalent Privacy (WEP) encryption. WEP is used to encrypt and decrypt data signals transmitted between Wireless LAN (WLAN) devices. It is an optional security encryption mechanism defined within the 802.11 standard that makes a wireless LAN link as secure as a traditional wired link. The optional WEP security mechanism is available with 128-bit or 40-bit encryption.

Dolphin 7200 RF is interoperable with other 802.11b compliant products to allow network expansion as needed. It can be connected to other devices, such as printers and PCs via PC-card adapters.

Configuring Your 802.11b- Compliant Dolphin 7200 RF Terminal

The Dolphin 7200 RF Utilities program provides basic functions required to prepare your terminals for use. The program also includes a Scan Demo, Help, and an Inventory Control demo.

When you cold-boot or reset the terminal, the title screen shown below appears. Press the <**ENTER**> key to continue.

Dolphin 7200 RF Title Screen

Main Menu

The Dolphin 7200 RF Main Menu shown appears after the title screen:

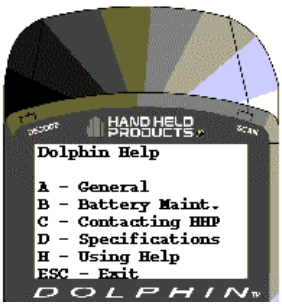
Dolphin 7200 RF Main Menu

F1-Scan

F1-Scan Menu

This option demonstrates how the Dolphin 7200 RF terminal scans bar codes. Press F1 to configure the terminal to read linear barcodes. Follow the directions on the screen to set-up which bar codes you want the terminal to read. Once the terminal is configured, press <**ESC**> and then the <**ON/SCAN**> Button to scan a bar code.

F2-Help



F2-Help Menu

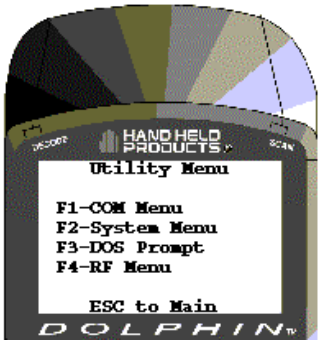
This option is an online help file with general information about using the Dolphin 7200 RF terminal, battery maintenance, contacting Hand Held Products, specifications and navigating through the help file.

F3-HHP Demo

F3-HHP Demo

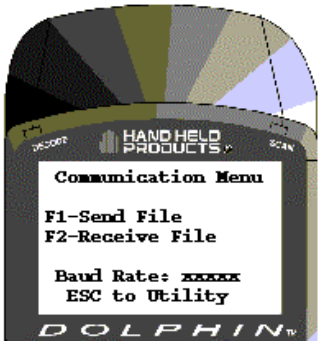
The HHP Demo is a sample inventory control program.

F4-Utilities Menu



F4-Utility Menu

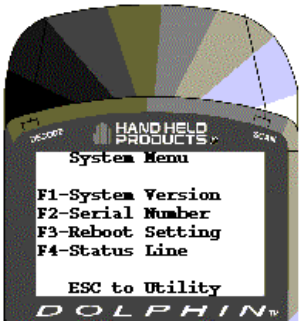
F1-COM Menu



F1-COM Menu

Use this menu to send and receive files when transmitting data via HomeBase or VehicleBase to the local area network. Press **<F1>** to send a file. Press **<F2>** to receive a file. For more information on sending or receiving files with the Dolphin 7200 HomeBase, see the section on Setting Up For Communications in Chapter 7. See Chapter 8 for more information on communications with the Dolphin 7200 Compact HomeBase.

F2-System Menu



F2-System Menu

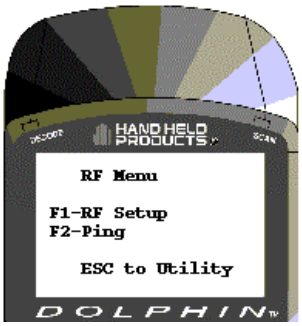
This option allows you to view system information such as version and serial numbers about specific Dolphin 7200 RF terminals. You may also enable or disable the reboot setting and turn the display status line on or off.

F3-DOS Prompt

Press <**F3>** to exit to the DOS prompt.

F4-RF Menu

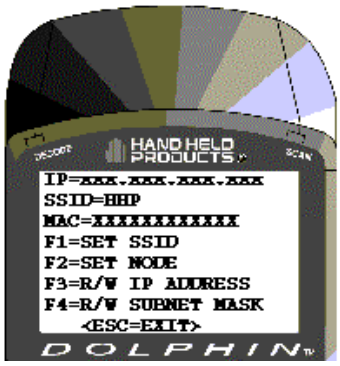
Press <**F4>** and the menu below will appear. Use options from this menu to configure the Dolphin 7200 RF for use in your wireless local area network.



F4-RF Menu

F1 RF Setup

To configure the terminal for use in a local area network, press <**F1>** and enter the data for each of the options on the screen shown below:



RF Setup Menu

You cannot change the MAC address on the Dolphin terminal. Each terminal has its own unique factory-set MAC address. The MAC address is a standardized data link layer address that is required for every port or device that connects to a LAN. Other devices in the network use this address to locate specific ports in the network and to create and update routing tables and data structures.

F1 SET SSID

NOTE

The **SSID** and **Subnet Mask** on the Dolphin terminal must match the settings on the access point.

Press <**F1>** to set the SSID. This value is case sensitive. Enter a value for the SSID option and press <**ENTER**>. Once the SSID is written, the Dolphin 7200 RF terminal must be reset to activate the new SSID.

The SSID (Service Set Identifier) is a unique, case-sensitive identifier that is attached to selected packets sent out over the radio network. Nodes associating to the access point must use the same SSID or their association requests will be ignored. The SSID can have up to 32 characters.

F2 SET NODE

Press **F2** to set a system name for the Dolphin 7200 RF terminal. Enter a value for the NODE option and press <**ENTER**>. Once the NODE is written, the Dolphin 7200 RF terminal must be reset to activate the new NODE. The name should describe the location or principal users of the Access Point.

NOTE

Reset the Dolphin terminal by pressing and releasing the <**SHIFT**>, <**ON/SCAN**> and <**BKSP**> keys. All three keys must be held down and released at the same time.

F3 R/W IP ADDRESS

Press **F3** to enter the IP address. Enter a value for the IP Address option and press <**ENTER**>. Once the IP Address is written, the Dolphin 7200 RF terminal must be reset to activate the new IP Address.

The IP address is a 32-bit address assigned to hosts using TCP/IP. An IP address belongs to one of five classes (A, B, C, D, or E) and is written as four octets separated by periods (dotted decimal format). Each address consists of a network number, an optional sub network number, and a host number.

F4 R/W SUBNET MASK

Press **F4** to enter the Subnet Mask. Enter a value for the Subnet Mask option and press <**ENTER**>. Once the Subnet Mask Address is written, the Dolphin 7200 RF terminal must be reset to activate the new Subnet Mask.

NOTE

The Dolphin need not be reset after each configuration change, but can be done once all configurations changes have been made.

The Subnet Mask is the portion of an IP address that is specified as the sub network by the subnet mask.

Setting WEP Modes And Keys On The 802.11b Radio Card

This section describes how to set WEP (Wired Equivalent Privacy) modes and keys on the Cisco® 802.11b radio card.

WEP is used to encrypt and decrypt data signals transmitted between Wireless LAN (WLAN) devices. WEP is an optional IEEE 802.11 feature used to provide data confidentiality that is equivalent to the confidentiality of a wired LAN that does not employ crypto techniques to enhance privacy. WEP makes a wireless LAN link as secure as a wired link.

The **wep.bat** utility is used to set WEP modes and keys for the Cisco® 802.11b radio card. The wep.bat file uses three files:

wepdos.exe – an executable file that configures WEP values for the Cisco radio

keys.exe – an executable file that calls the functions for setting WEP values

cscpkt.ini – a configuration file for the Cisco radio

All four files are located in the Dolphin **c:\rf directory** that is part of the **stackcsc.exe** file.

If the user will be setting WEP keys using the batch mode, the user must create a **keys.txt** file using a text editor such as Notepad and then copy it to the c:\rf directory. This file will contain the encryption keys used when operating in WEP mode. For obvious security reasons, this file will be automatically deleted upon running the **wep.bat** utility. HHP recommends that you verify that the **keys.txt** file has been deleted.

Refer to the Cisco documentation for complete descriptions of the various WEP modes. The current radio card may not support some modes.

Running the WEP.BAT Utility

This section describes usage and command line options for the WEP.BAT utility.

NOTE

Reset the Dolphin terminal by pressing and releasing the <**SHIFT**>, <**ON/SCAN**> and <**BKSP**> keys. All three keys must be held down and released at the same time.

Note: The WEP.BAT file must be run with the radio driver **NOT** loaded. Reboot the Dolphin 7200 RF terminal with the ON/SCAN key depressed so that the driver will not load.

WEP [BATCH] [HEX] [ASCII] [STATUS] [SELECTKEY#] [CLEARKEY#] [OPEN] [WEPSHARED] [WEPOPEN]

WEP OPTIONS

BATCH	Sets radio WEP keys using the file keys.txt .
HEX	Sets radio WEP keys using a hex string entered via the keyboard.
ASCII	Sets radio WEP keys using ASCII characters entered via the keyboard.
STATUS	Displays encryption level and key lengths.
SELECTKEY #	Selects operating key used during operation with access point.
CLEARKEY #	Clears operating key.
OPEN	Disables WEP operation even if keys have been set (no encryption) .
WEPSHARED	Sets WEP mode to WEPSHARED. In this mode, the Access Point sends a plain-text, shared-key query to any device attempting to communicate with the Access Point.
WEPOPEN (default)	Sets WEP mode to WEPOPEN which allows any device, regardless of its WEP settings, to authenticate and then attempt to communicate with the Access Point.

Example 1: To configure WEP using the batch mode, create the keys.txt file using a text editor as shown:

Sample ASCII **keys.txt** file for 40-bit encryption where **x** is the key code:

```
ASCII
xxxxx
xxxxx
xxxxx
xxxxx
xxxxx
```

Sample HEX **keys.txt** file for 128-bit encryption where **x** is the key code:

```
HEX
xxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxx
```

After creating the **keys.txt** file, copy it to the **c:\rf directory** and enter:

```
C:>\WEP BATCH
```

Result: The WEPOPEN operating mode is automatically set (the WEP mode can be changed using commands shown later in this document). One of the following messages will display on the terminal:

`Need keys.exe and keys.txt` (if both files are not present)

or

`Error(s): Retry` (if error occurred writing to radio card)

or

`Done` (if keys successfully set)

Example 2: To set the WEP keys using an ASCII character string via the Dolphin terminal keyboard, enter

```
C:\> WEP ASCII 11111 X 33333 X
```

There are four WEP keys to set. To skip a key code, enter <**X**> for each blank entry. In the example above, only keys 1 and 3 have a value; 2 and 4 have no value. An ASCII character string of 5 characters sets 40-bit encryption and 13 characters sets 128-bit encryption on the terminal.

Result: This will set key1 to 11111 and key3 to 33333. Keys 2 and 4 are not set. 40 bit WEP will be used. The terminal will display one of the following screens:

Error(s): Retry (if an error occurred writing to radio card)

or

Done (if keys successfully set)

Example 3: To configure WEP using a HEX string via the Dolphin terminal keyboard, enter:

```
C:\> WEP HEX 11111111111111111111111111  X  X X
```

There are four WEP keys to set. To skip a key code, enter <**X**> for each blank entry. In the example above, only key 1 has a value; 2, 3 and 4 have no value. A HEX string of 10 characters sets 40-bit encryption and 26 characters sets 128-bit encryption.

Result: Sets key1 to 11111111111111111111111111. Keys 2, 3 and 4 are not set. 128 bit WEP will be used. The terminal will display one of the following screens:

Error(s): Retry (if error occurred writing to radio card)

or

Done (if keys successfully set)

Example 4: To display the radio's WEP settings, enter

```
C:\>WEP STATUS
```

Result: The terminal will displays the settings as shown below:

```
WEP128 encryption
Key 1  Len:13
Key 2  Len:13
Key 3  Len:13
Key 4  Len:13
key index is 1
```
(i.e. the active key)

Note: The first line indicates the capability of the radio; not the encryption level.

Example 5: To select the key to be used during operation with the access point, enter

```
C:\>WEP SELECTKEY 2
```

Result: The terminal will display the following:

```
Setting transmit key index to 2.
Key2 Selected.
```

Example 6: To clear the active key, enter

```
C:\>WEP CLEARKEY 2
```

Result: The terminal will display the following:

```
Clearing DefaultKey  2.
Key2 Cleared.
```

Example 7: To enable the WEP WEPSHARED mode, enter

```
C:\>WEP  WEPSHARED
```

Result: Sets the AuthType parameter in the cscpkt.ini file to "WEPSHARED". The terminal will displays the following:

```
WEP mode WEPSHARED
```

WLIF™-Compliant Dolphin 7200 RF Terminal

The WLIF-compliant Dolphin 7200 RF™ terminal incorporates a high performance radio that uses frequency hopping spread spectrum technology compliant to the Proxim ® WLI Forum/OpenAir™ specification. The radio operates at a data rate of up to 1.6 megabits per second, with 15 independent channels available.

Frequency hopping technology is inherently secure in that the signal hops among a variety of frequencies and, at any instant in time, the signal is broadcast on only one frequency. The transmission remains on each frequency for only a short period (up to 0.4 second) before moving to the next frequency.

Dolphin 7200 RF is interoperable with all WLIF-compliant products to allow network expansion as needed. It can be connected to other devices, such as printers and PCs via PC-card adapters.

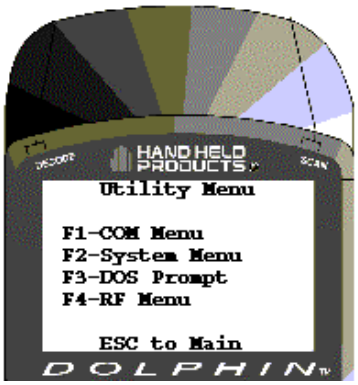
Configuring Your WLIF-Compliant Dolphin 7200 RF Terminal

The Dolphin 7200 RF Utilities program provides basic functions required to prepare your terminals for use. The **F1** Scan Demo, **F2** Help, and **F3** HHP Demo programs on the main menu shown below function the same as they do for the 802.11b-compliant Dolphin 7200 RF unit. For more information, refer to the section on the main menu for the 802.11b terminal.

Dolphin 7200 RF Main Menu

F4 Utilities Menu

Press <**F4>**, the following screen will appear:

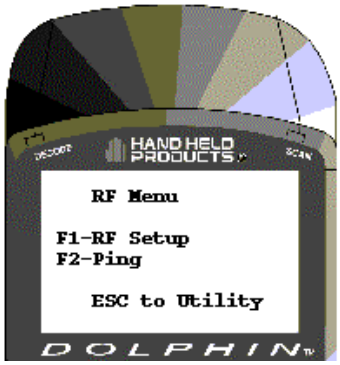


F4-Utility Menu

The **F1**, **F2** and **F3** functions on the Utility menu for WLIF-compliant terminals are the same as the 802.11b-compliant terminals. For more information, refer to the section on the **Utility Menu** in the configuring 802.11b terminals section.

F4 RF Menu

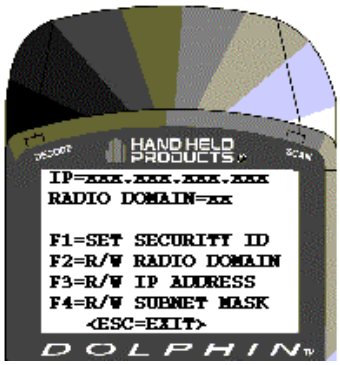
Press <**F4>** and the menu shown below will appear:



F4-RF Menu

F1 RF Setup

To configure the terminal for use in a local area network, press <**F1>** and enter the data for each of the options on the screen shown below.



F1-RF Setup

F1 SET SECURITY ID

NOTE

Reset the Dolphin terminal by pressing and releasing the <**SHIFT**>, <**ON/SCAN**> and <**BKSP**> keys. All three keys must be held down and released at the same time.

Press <**F1>** to set the Security ID. Enter a value for the Security ID option and press <**ENTER**>.

The Security ID is a unique, 20 character alphanumeric string defined and configured by the user. It must be identically configured in every radio intended to communicate with others in the same network.

F2 R/W RADIO DOMAIN

Press **<F2>** to enter the Radio Domain. Once the Radio Domain is written, the Dolphin 7200 RF terminal must be reset to activate the new Radio Domain.

The Domain is the area within a LAN that defines a region administered by an access point. It is a software filter that does not affect the actual radio frequency or the frequency hopping sequence. The Domain is a number between 0 and 15. It is the equivalent of a wireless subnet.

NOTE

The Dolphin need not be reset after each configuration change, but can be done once all configurations changes have been made.

F3 R/W IP ADDRESS

Press <**F3**> to enter the IP address. Once the IP Address is written, the Dolphin 7200 RF terminal must be reset to activate the new IP Address.

The IP address is a 32-bit address assigned to hosts using TCP/IP. An IP address belongs to one of five classes (A, B, C, D, or E) and is written as four octets separated

NOTE

The **Security ID**, **Radio Domain** and **Subnet Mask** on the Dolphin terminal must match the settings on the access point.

by periods (dotted decimal format). Each address consists of a network number, an optional sub network number, and a host number.

F4 R/W SUBNET MASK

Press <**F4**> to enter the Subnet Mask. Once the Subnet Mask is written, the Dolphin 7200 RF terminal must be reset to activate the new Subnet Mask.

The Subnet Mask is the portion of an IP address that is specified as the sub network by the subnet mask.

Dolphin 7200 RF Peripherals

Peripherals for building wireless networks using Dolphin 7200 RF terminals include PC cards, access points, and antennas. Peripherals available for 802.11b Direct Sequence radio networks are Wi-Fi™ certified; peripherals for Frequency Hopping radio networks are OpenAir® compliant.

PC Cards

PC cards provide devices such has laptop and desktop computers with wireless connectivity to the RF network.

Access Points

Access Points link a wired network to a wireless Dolphin 7200 RF handheld computer network.

There are a wide range of mounting brackets and antenna cabling options available to provide wireless coverage for a customer's entire facility. Access points can be easily configured and managed from a server or using a web browser or telnet session.

See your Access Point user's guide for more information.

Antennas

Various antenna options are available to extend the range of access points in your 802.11b or WLIF wireless network. Antennas available include:

- Omnidirectional
- Patch
- Yagi

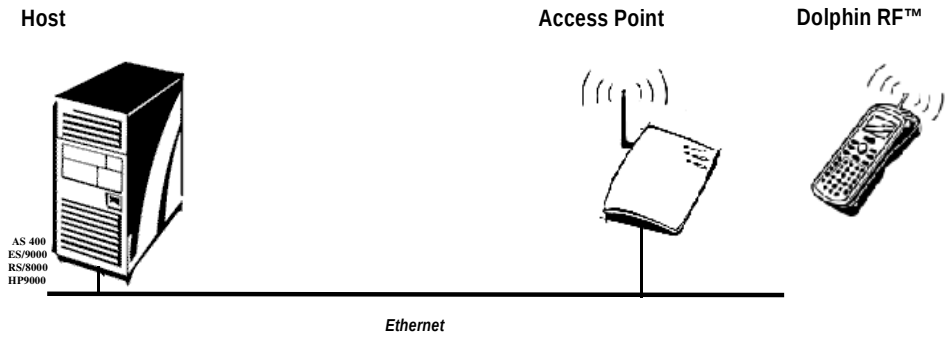
Host Connectivity

HHP offers several host connectivity options for Dolphin 7200 RF wireless LAN solutions. Direct Connect TN Client software is a thick-client solution that connects Dolphin 7200 RF™ computers directly to host applications via TN3270, TN5250 or TNVT terminal emulation using industry-standard TCP/IP protocol. Another option

is a three-tier client server solution, or thin-client implementation, for 3270, 5250 and VT100/220 terminal emulation that uses a Universal Gateway. The Gateway establishes communication to a host such as an AS400 and maintains communication to both the Dolphin 7200 RF terminal and the host.

Thick-Client Terminal Emulation

PowerNet TN Client (telnet client) software allows the Dolphin 7200 RF terminal to communicate directly with applications running on AS/400, ES/9000, HP/6000 or other hosts connected to an Ethernet backbone and that support TCP/IP. The TNVT, TN3270, and TN5250 emulations use TCP/IP to communicate from the Dolphin 7200 RF™ terminal through the access point to the host. There is no network controller or server.

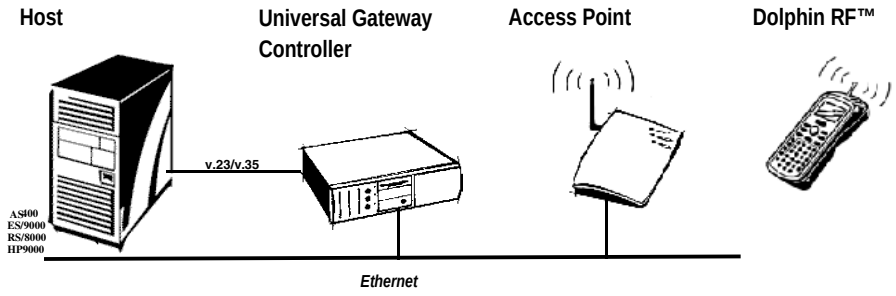


Telnet VT220, TN3270, or TN5250 Terminal Emulation with Direct Connect TN Client

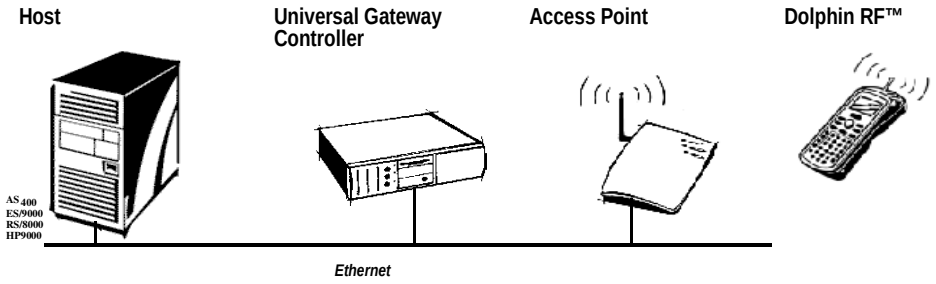
For more information on thick-client terminal emulation, see the PowerNet TN for Dolphin 7200 RF User's Guide.

Thin-Client Terminal Emulation

Hand Held Products' thin-client terminal emulation solution uses a Universal Gateway to provide host connectivity. The Universal Gateway connects to the hosts such as AS/400, ES/9000 and HP/6000 via Ethernet and communicates to the application via Ethernet for 3270, 5250 or telnet for DEC VT220 terminal emulation environments.



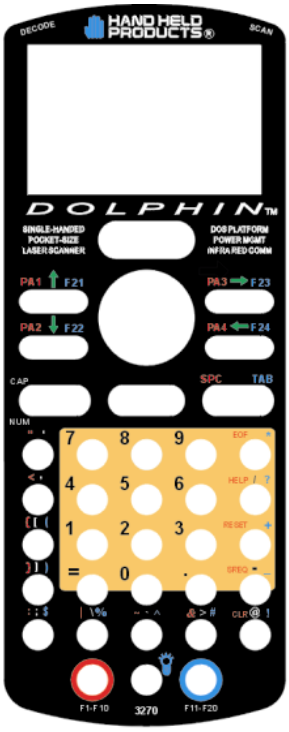
3270 or 5250 Terminal Emulation



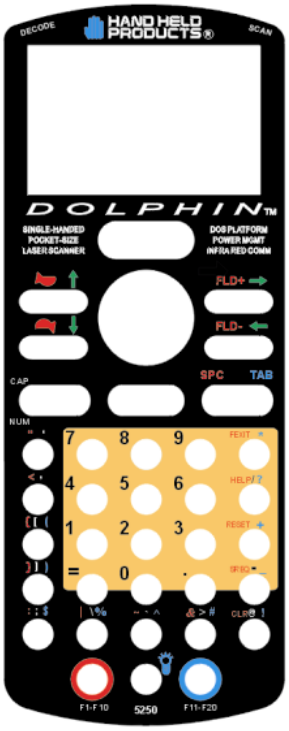
Telnet VT220, TN3270, or TN5250 Terminal Emulation with Universal Gateway Controller

Terminal Emulation Keyboard Overlays

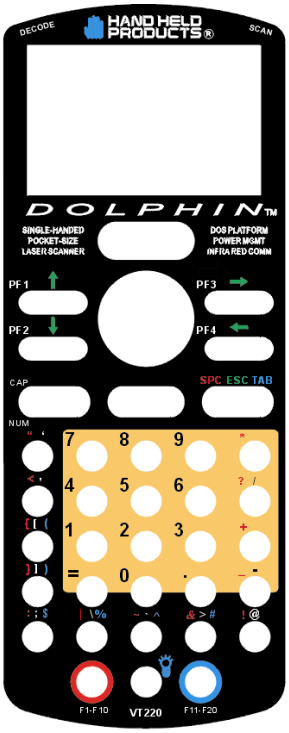
There are host-specific keyboard overlays supporting all necessary program keys, character sets, and control and display functions.



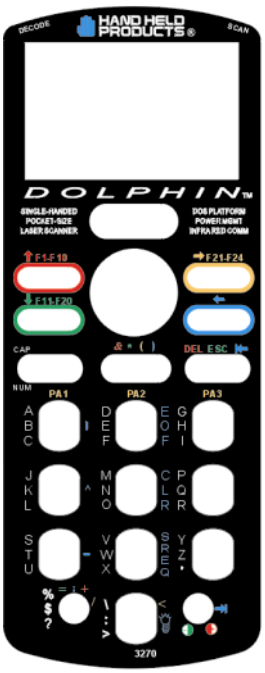
Alphanumeric 3270



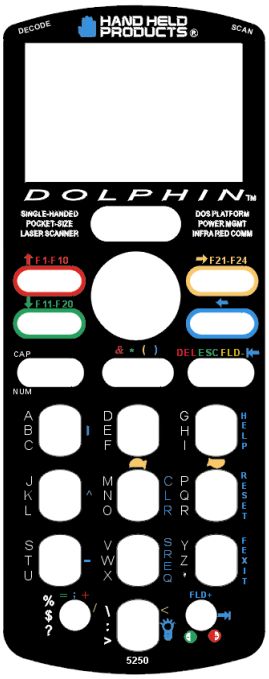
Alphanumeric 5250



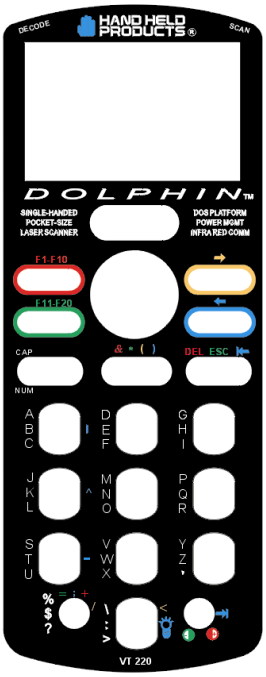
Alphanumeric VT220



Numeric 3270



Numeric 5250



Numeric VT220

Chapter 4 Dolphin® 7200 with iButton Reader Handheld Computer

Describes the iButton reader and how to use it.

About Dolphin with iButton Reader Handheld Computer

The Dolphin with iButton Reader handheld computer integrates the basic functionality of the Dolphin Batch terminal with iButton™ technology that allows the terminal to read and write data from and to iButtons.

The iButton reader is a function and feature extension of the Batch terminal. Like the batch versions, Dolphin iB can be equipped with up to 8 Mb of flash memory and will support all scan engine versions available for the Dolphin platform. Refer to Chapters 1 and 2 in this manual for more on basic operation of the Dolphin terminal and accessories available.

What is an iButton?

iButton technology was developed by Dallas Semiconductor. The iButton is a 16mm computer chip housed in a stainless steel can. The iButton can be worn by a person or attached to an object for up-to-date information at the point of use.

There are a variety of buttons with different features. Each starts with a guaranteed-unique registration number engraved in the silicon. Some buttons add computer memory to store typed text; information can be updated as often as needed with a simple, momentary contact.

Working with iButtons

In order to communicate with an iButton, the Dolphin iButton reader must make proper contact with the iButton during the time frame of the communication session. Intermittent contact can result in slow data communication or the need for re-attempts.

To transfer data between iButtons and Dolphin iButton reader:

Make sure that both the iButton and the iButton reader are clean and dry.

Touch the iButton reader against the iButton you want to communicate with. The reader and the iButton must have full surface-to-surface contact for data transfer to be completed.

Keep the iButton reader touched against the iButton until the application generates a beep or displays a message on the Dolphin's screen indicating the data transfer is completed.

IButtons supported by Dolphin with iButton Reader

The types of iButtons that Dolphin iButton reader may read and write data to depends on the software development tools used.

Read/write iButton types that Dolphin iButton reader can read/write to include:

- DS 197X range EEPROM Devices
- DS 199X range NVRAM devices (with the exception of DS1990A, which is read only)
- DS 1954 Crypto iButton
- DS 1963 Monetary iButton
- DS 1921 Thermochron iButton

Compatible read-only iButton types that Dolphin iButton reader can read include:

- DS 1990A Serial number iButton
- DS 1920 Temperature iButton

Compatible read/write iButtons that the Dolphin iButton reader can read include:

- DS 198X EPROM devices

Developing Applications with Dolphin with iButton Reader

Hand Held Products has a Software Developer's Kit (SDK) that includes the following:

1. API for iButton functions that support the most commonly used iButton types and concern file handling and data manipulation of iButton specific features. May be used in conjunction with Dolphin Development System.
2. Demo software and source code examples

Note: In addition, developers need the MicroSoft C/C++ or Borland C/C++ compiler.

Chapter 5 Dolphin® 7200 RS-232 Handheld Computer

About Dolphin 7200 RS-232 Hand Held Computer

The Dolphin® 7200 hand held computer with a Micro-DB9 RS-232 port is a compact, high performance data collection terminal with standard connectivity at a low cost. Capable of reading all popular linear barcodes, the Dolphin 7200 terminal fits into an array of environments.

Through the terminal's micro-DB9 RS-232 port, the Dolphin 7200 can be connected to a host computer to send and receive data. The terminal's battery can be recharged through the RS-232 port using the Dolphin 7200 communication/charging cable and a power adapter or the Dolphin HomeBase™ charging/communications cradle.

The Dolphin 7200 can connect to self-powered, RS-232-compliant peripherals, such as external modems and printers, GPS receivers, electronic scales, and various input devices via the micro-DB9 RS-232 port. Wireless IrDA connectivity remains available, allowing users to connect with IrDA-compliant printers through the IR port.

Dolphin 7200 Wand

The Dolphin 7200 Wand is two-product package featuring a special configuration of the Dolphin 7200 RS-232 and a SCANTEAM 6180 bar code wand reader/decoder. The Dolphin 7200 RS-232 terminal featured in the wand package is a non-scan unit and has a special micro-DB-9 connector that provides power for the wand scanner. Therefore, the wand scanner will only work with this configuration of the Dolphin 7200 RS-232 terminal.

For programming/configuring the wand, refer to the SCANTEAM® 6180 Programming Menu and SCANTEAM Technical Menu.

Cables

The following table shows pinout for the Dolphin 7200 terminal's micro-DB9 RS-232 port. *Note: The "RF_card" function call will turn off the 5V supplied on pin 9 of the 7200 RS-232 non-scan units. This already exists in OS4.1 API.*

The pin-out configuration is as follows:

Pin #	Signal	Description	Direction
1	VCHG	9V charging voltage	Input
2	TXD	Transmit Data	Output
3	RXD	Receive Data	Input
4	DSR	Data Set Ready	Input; looped to Pin 6
5	GND	Ground	
6	DTR	Data Terminal Ready	Output; looped to Pin 4
7	CTS	Clear To Send	Input
8	RTS	Request To Send	Output
9	/	No Connect add +5VDC	Non scanning (blind) models only

Charging The Battery Through The RS-232 Port

Before initial use, the Dolphin 7200 RS-232 terminal should be charged for 24 hours. Follow these steps to charge the Dolphin 7200 RS-232 terminal using the RS-232 port:

1. Plug the adapter into electrical outlet.

2. Insert a battery pack into the battery well of the terminal.

3. Insert the micro-DB-9 RS-232 connector on the communication/charging cable into the micro-DB-9 port on the back of the Dolphin 7200 RS-232 terminal.

4. Connect the Universal Power Charging Adapter (Part #PS9U-11) into the adapter end of the communication/charging cable. *Note: The charging adapter is a regulated 9V power supply and, due to the different connector, cannot be used with the HomeBase.*

For more on maintaining the batteries, see the section on *Maintaining Batteries* in Chapter 2.

Sending and Receiving Data

The Dolphin 7200 RS-232 terminal can be connected to a host computer to send and receive data via the micro-DB9 RS-232 port using the YX.EXE Utility or the Dolphin File Transfer Program.

Follow these steps to set up the terminal for sending and receiving data:

1. Insert a battery pack into the battery well of the terminal.

2. Insert the micro-DB-9 RS-232 connector to the Dolphin communication (only) cable into the micro-DB-9 port on the back of the Dolphin 7200 RS-232 terminal.

3. Connect the DB-9 connector to your PC's serial port.

4. Run the YX.EXE utility or the Dolphin File Transfer Program.

For more on sending and receiving data using YX.EXE and the Dolphin File Transfer Program, see the section on Transferring Files to or From Dolphin in Chapter 9.

Chapter 6 Dolphin® 7200 2D Terminal

About the Dolphin 7200 2D Hand Held Computer

The Dolphin® 7200 2D hand held computer features the IMAGETEAM ™ 4250 Image Engine, a low power, high-resolution digital image engine for omni-directional and auto-discrimination reading and decoding of linear barcodes, stacked linear (PDF417) and 2D matrix codes. The image engine functions like a digital camera and also provides OCR (Optical Character Recognition) functionality.

The terminal is available in several configurations with alphanumeric and numeric keyboard options. These configurations include the standard range (LR), long range (LX), and high-density (HD) engines with 2MB RAM and 8MB non-volatile FLASH memory.

The 2D terminal has image lift capabilities for signature capture and proof of delivery applications. Images taken with the unit can be compressed and stored using industry-standard data compression technologies. The device provides the flexibility to store either images that contain grayscale information or black and white only information. Images can be downloaded via HomeBase™ or VehicleBase™ communication cradles and then transmitted via one of many wired or wireless options.

The terminal is also able to decode barcode symbologies and capture images in dim lighting conditions or complete darkness.

Supported Symbologies

1D linear codes:
Code 3 of 9, Interleaved 2 of 5, TLC Code 39, Code 11, MSI, UPC A, UPC EO, UPC EI, EAN/EAN13, Codabar, Code 128, Code 93, UPC
2D codes:
PDF417, microPDF, Maxicode, Datamatrix, Aztec, QR Code, Code 49
Composite codes:
RSS-14, CODABLOCK, AZTEC MESA
OCR codes (Optical Character Recognition):
OCR A and OCR B
Postal Codes:
Postnet and most international 4 state codes, PLANET CODE, BPO 4 STATE, CANADIAN 4 STATE, DUTCH POSTAL, AUSTRALIAN 4 STATE, JAPANESE POSTAL
For other supported symbologies, please see the IMAGETEAM ™ 4250 User's Guide.

Reading Barcodes

The omni-directional scanning capabilities of the Dolphin 7200 2D terminal greatly simplify operation and training and increase productivity. To read a bar code:

1. Press the ON/SCAN button to project the scanner's bright red aiming beam

2. Center the aiming beam over the barcode. The red SCAN LED illuminates when the user presses the ON/KEY key and the green DECODE LED illuminates when a bar code is successfully decoded. **The aiming beam can be positioned in any direction for a good read.**

Linear bar code **2D Matrix symbol**

The aiming beam is smaller when the terminal is held closer to the code and larger when it is farther from the code. Symbologies with smaller bars or elements (mil size) should be read closer to the unit. Symbologies with larger bars or elements (mil size) should be read farther from the unit.

Capturing Images

The image-capture process is a split-second operation for experienced users. By following the basic guidelines, new users can easily develop their own technique and, with practice, quickly learn to adapt it to different circumstances. The basic steps for acquiring images using the Dolphin 7200 2D terminal are:

1. To aim, hold the Dolphin terminal horizontally at a 45° angle approximately 2 to 9 inches (5 to 20 cm) away from the target. You may have to adjust the angle at which you hold the Dolphin if there is glare on the screen.

2. Press the **ON/SCAN** button to take an image. Use the live video image on the terminal screen as a guide for positioning and aiming the terminal at the target. You may find it helpful to start by moving the terminal further away and then in closer to the target. The active screen image will have a slightly degraded appearance compared to the captured image. This is normal.

3. Release the **ON/SCAN** button to capture the image when the desired image is displayed on the terminal screen. Hold the Dolphin terminal as still as possible when capturing the image.

The image quality and related file size is determined by the data compression method used by your software application. For highest quality, take grayscale images. When saved, the image will be saved in JPEG file format. The size of the file depends on the information content of the image and will be approximately 4-8 K.

Lighting Conditions

The Dolphin 7200 2D terminal is designed to read bar codes and take images in dim light conditions. It is suggested that you turn on the unit's electroluminescent display backlight when taking images in extreme low light conditions to help with aiming.

Dolphin 7200 2D Demo Software

The Dolphin 7200 2D terminal demonstration software allows you to show terminal's ability to do omni-directional decoding, image capture and I.Q. Imaging.

The Image Capture demo requires that you have a PC available with a program such as the Dolphin File Transfer utility that is capable of receiving files via Ymodem protocol, and a Dolphin home base connected to that PC.

For more information on using the Dolphin File Transfer Utility, see the section on Transferring Files To or From Dolphin in Chapter 9.

Installing the Dolphin 7200 Demo Applications

The Dolphin 7200 2D terminal is shipped loaded with the demonstration software.

If the demo software has been removed from your terminal, follow these steps to re-install it:

1. Download the demonstration installation programs from the HHP website. www.handheld.com. The program is called DEMOS.EXE.

2. Use the Dolphin File Transfer utility to load DEMOS.EXE onto the Dolphin unit.

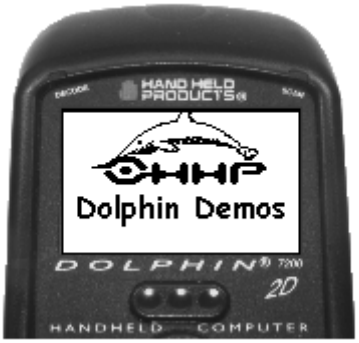
3. Run DEMOS.EXE once the program is loaded onto the Dolphin. It is a self-extracting Zip file that installs the demonstration applications. It will also offer to replace the Dolphin terminal's AUTOEXEC.BAT file.

4. Start the demo program by typing DEMOSTART at the C:> prompt and then pressing <ENTER>. If you chose to let DEMOS.EXE overwrite the AUTOEXEC.BAT, perform a three-key reset (pressing and releasing the "SHIFT", "ON/SCAN" and "BKSP" keys at the same time.) and the program will start.

Main Menu

Dolphin Demo Main Screen

When you start the program, this menu screen will be the first one you see. This screen allows you to access the demonstration programs listed or exit to DOS. All the Demo programs will return to this menu screen when exited.



If there is no keyboard activity over a short period of time, the leaping dolphin screen will appear. Press any key to go to the Dolphin Demo Main Screen.

F1 - Decoding Demo

Press F1 and the "Scan a Target" screen shown below will display:

Scan a Target Screen

For optimal scanning performance for your application, the 2D imager has three scanning modes: standard omni, reduced omni and ALD (Advanced Linear Decoding) To change the scan mode, see Appendix C and follow diagram for configuring the decode mode.

To scan a bar code:

1. Press and hold the ON/SCAN button. You will see the scanner alternate between a thin green aiming line, and a general red flash. The flash is when the imager is actually taking an image and attempting to decode any barcodes in the image.

2. After the Dolphin successfully decodes a barcode, the Decoded Message screen shown below will display.

Decoded Message Screen

The top of the screen tells the name of the symbology decoded, the bottom of the screen tells the length of the data decoded, and the middle section shows the message. If the message is long, you can scroll up and down using the F1 & F2 keys to read the data. To scan again, just press the ON/SCAN button again.

3. To exit demo, press F4 and you will return to the Dolphin Demo Screen.

F2 - Imaging Demo

Press F2 and the screen shown below will display:

Imaging Demo Screen

To setup the imager, press F3.

To take an image:

Press and hold the **ON/SCAN** button. Release the **ON/SCAN** button to capture the image when the desired image is displayed on the terminal screen. When you release the ON/SCAN button, the terminal will save the image taken. You will hear a confirming set of beeps and the screen shown below will display.

Place the unit in the Home Base, start the Dolphin File Transfer utility on your PC and set it to receive a file.

Press <ENTER> on the Dolphin terminal to transfer the image to your PC. Go to the directory to the file was transferred and you should see a file titled Gray.jpg.

Double click on the file to launch the viewer to see the image. Browsers like Netscape or Internet Explorer are good tools for looking at jpg images. (Note: If you changed any file format settings in the setup window for the program, the name of the file will be different).

You can skip sending the file by pressing enter, then pressing esc when the Dolphin attempts to transmit the file. F4 on the "Press ON/SCAN" screen will allow you to exit the application.

F3 - I.Q. Imaging Demo

Press F3 and the screen shown below will display:

"Scan the Test Target" Screen

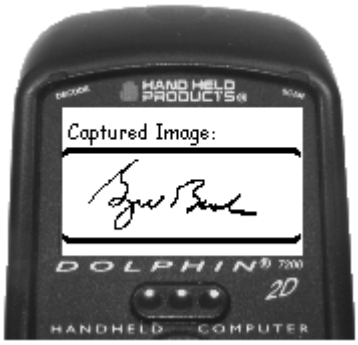
For this demo, you must use the test target shown below. See Appendix E for a copy of the test target to make copies for multiple uses in the future.

To use the demo:

Enter a signature in the box below.

Press and hold the ON/SCAN button and aim at the barcode. When the engine successfully decodes, you will hear a short beep. The image engine will then take an image of the signature. When the signature is captured, the terminal will beep and the screen shown below will appear on the screen.

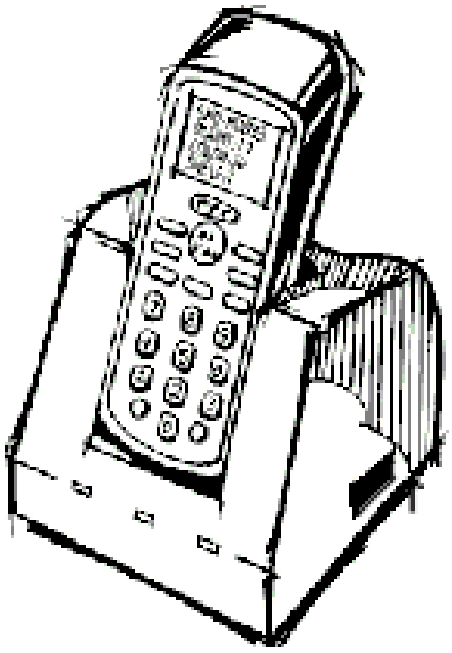
The data shown is information contained in the barcode. Press the <ENTER> key and the signature captured screen will be displayed as shown below:



Press <ENTER> to return to the "Scan the Test Target" screen. Press F4 to exit the demo and return to the demo main menu.

Chapter 7 Using the Dolphin® 7200 HomeBase

Summarizes the features of the Dolphin 7200 HomeBase and explains how to use it.



Hub of the System

As the hub of your Dolphin system, the Dolphin 7200 HomeBase performs three important functions – battery management, communications and storage.

Battery Management

The Dolphin 7200 HomeBase uses a charging method that senses when the battery pack is fully charged and then drops to a trickle charge to keep the battery pack at full capacity. The battery pack does not need to be discharged before recharging because this method protects the battery from damage caused by overcharging.

IrDA Optical Communications

The IR communications port on the HomeBase connects with the IrDA port on the Dolphin. Reliable data communications at speeds of up to 115 baud can be transmitted by the HomeBase. With no pins or contacts to break, IrDA will work reliably for years.

The Dolphin 7200 HomeBase can be networked together for mass programming and charging. Units are individually addressable, allowing each HomeBase to be automatically loaded with the right information and files for its user.

Convenient Storage

The Dolphin 7200 HomeBase is a safe and convenient storage receptacle for the Dolphin terminal. The HomeBase also holds a spare charged battery pack.

Dolphin 7200 HomeBase Parts and Functions

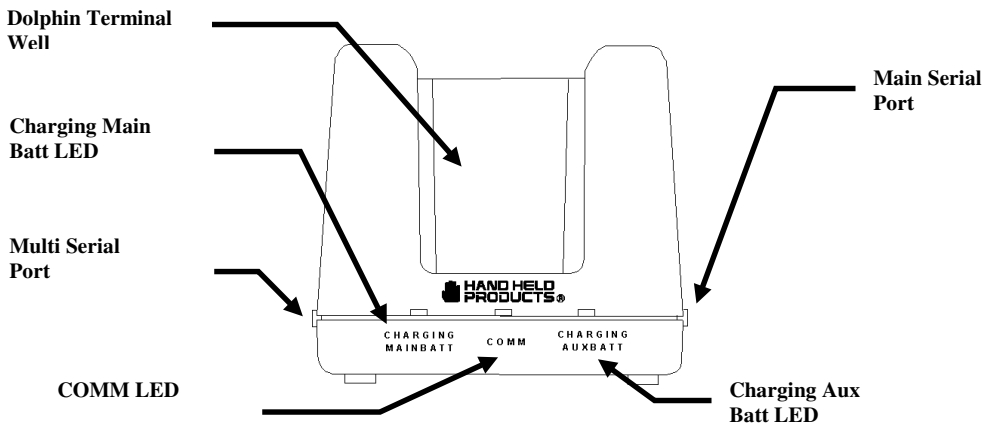


Figure 8 HomeBase Front Panel

NOTE

The Charging Main Batt LED does not indicate the battery status of the Dolphin terminal.

Front Panel

The Dolphin's front panel has one slot:

Dolphin Terminal Well You put the Dolphin in this well to communicate with a host device and to charge the Dolphin's batteries.

LEDs There are three LEDs that you can use to monitor the status of battery charging and communications status:

1. **Charging Main Batt LED** Turns solid green when the Dolphin Terminal is properly seated into the Dolphin HomeBase.

2. **COMM LED** Indicates the status of data transfer between the Host Device and the Dolphin Terminal as described below:

Comm LED	Description
Red LED	Data is being sent from the Host Device to the Dolphin HomeBase.
Green LED	Data is being sent from the Dolphin HomeBase to the Host Device.
Orange LED	Data is being sent at high data rates.

Figure 9 Data Transfer States

3. **Charging Aux Batt LED** Indicates the status of the auxiliary battery pack in the Dolphin HomeBase as described in the table below:

Charging Aux Batt LED	Description
OFF	Battery pack not properly inserted into the auxiliary battery well, or the HomeBase has no power
Red	Battery discharging
Blinking red LED	Charge cycle initializing
Blinking orange LED	Battery charging at the maximum rate
Solid green LED	Trickle charging; battery pack is ready for use

Figure 10 Battery Charging States

Back Panel

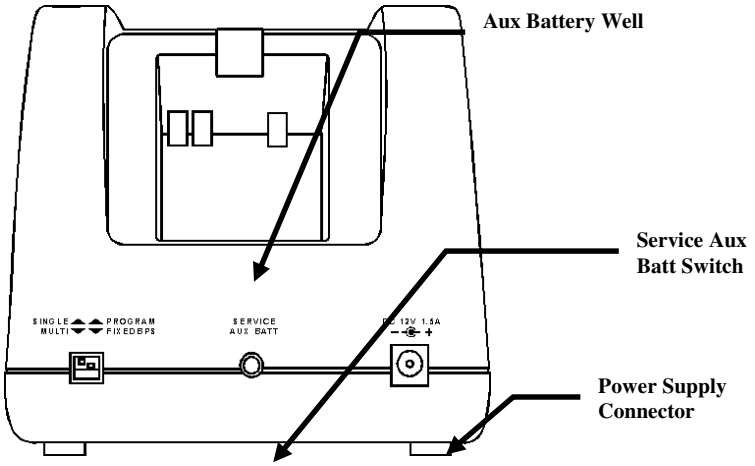


Figure 11 Back Panel of HomeBase

Configuration Switches

NOTE

The configuration switches are checked at power up. Changes in the switch settings will not be recognized until power is turned off and then back on.

There is an auxiliary battery well, two configuration switches, a discharge button, and a power supply connector:

Auxiliary battery well Insert a battery into the well to charge a second battery and you will always have a spare. The auxiliary battery well can also service your battery pack.

Configuration switches Use these switches to select the network and communications modes for your Dolphin. See Chapter 8 for more on the configuration switch settings.

Service Aux Batt switch Press and hold this button for four seconds to service the battery in the auxiliary battery well. For maximum battery life, the battery should be serviced, or calibrated once a month. The Charging AUX BATT LED is red while the battery is discharging and changes to blinking red when the charging cycle begins. The battery is ready to use when the light turns green.

Power supply connector Use this connector to attach a power supply to the HomeBase. The power supply provides 12V DC input for communications and battery charging.

Side Panels

There is a main communications port on one side and a multi-HomeBase-port on the other side:

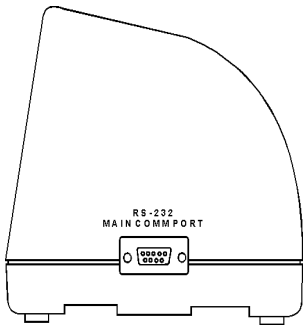


Figure 12 HomeBase Side Panel Main Communications Port

Main Communications Port Use a standard serial cable to connect this port to a host RS-232 device if the Dolphin HomeBase is the first unit of HomeBase network. Otherwise, the main communications port connects to another Dolphin HomeBase Multi-HomeBase Port to form a daisy-chained network. See pinout definitions in the section on *Setting Up the Dolphin HomeBase* later in this chapter.

Multi-HomeBase Port Use this port to form a Dolphin HomeBase Network. This port mates with the next HomeBase's main communications port to form an addressable network. *Note: The Multi-HomeBase Port cannot be used for communications to standard serial devices.*

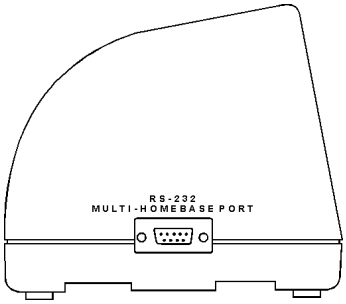


Figure 13 HomeBase Side Panel Multi-HomeBase Port

Charging Batteries In The Dolphin 7200 HomeBase

CAUTION: Use only the 3.6V battery packs provided by Hand Held Products. The use of any other battery pack in the Dolphin Terminal will void your warranty and may result in damage to the Dolphin Terminal or battery.

NOTE

For maximum battery life, Hand Held Products recommends that you deep-cycle (service) the battery ***twice*** *before initial use and then, once a month thereafter.*

With the Dolphin HomeBase, you can charge a Dolphin terminal and a spare NiMH battery pack simultaneously. The HomeBase charges the terminal and the spare battery pack independently.

When you insert a battery into the Dolphin HomeBase, it charges the battery at the highest rate possible. The HomeBase uses a charging method that senses when the battery pack is fully charged and then drops to a trickle charge to keep the battery pack at full capacity. You do not need to discharge the battery pack before recharging because this method protects the battery from damage caused by overcharging. A dead battery will charge to full capacity in approximately three hours.

The Dolphin Terminal can be stored indefinitely in the HomeBase without damage to the terminal, battery packs, or the HomeBase. Keep the HomeBase plugged in so that the Dolphin Terminal's battery pack stays fully charged.

Charging A Dolphin Terminal

1. Insert a battery pack into the Dolphin Terminal.
2. Place the terminal, laser engine window up and the LCD visible, in the Dolphin Terminal Well of the Dolphin HomeBase.
3. Let it glide down into the well until it stops.
4. Once the Dolphin Terminal is properly seated, the Charging Main Batt LED on the HomeBase will be solid GREEN.

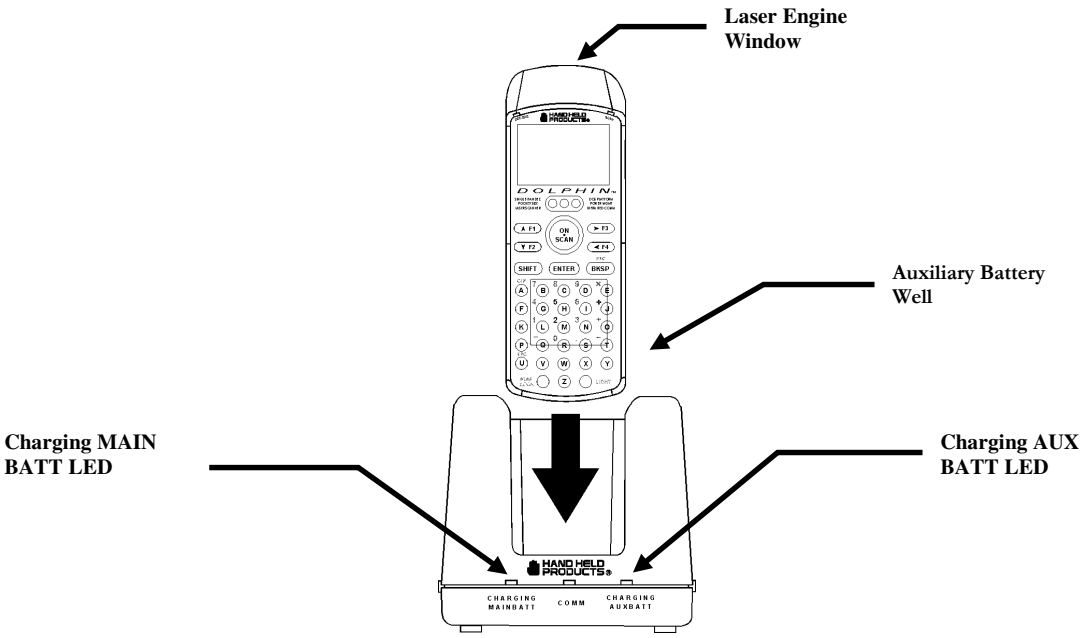


Figure 14 Inserting the Dolphin terminal into the HomeBase

Charging an Additional NiMH Battery Pack

1. Insert an NiMH battery pack with the battery contacts pointing upward into the Dolphin HomeBase auxiliary battery well.

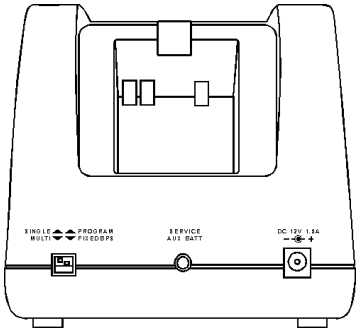


Figure 15 Rear View Dolphin HomeBase

Once the battery is inserted into the Dolphin HomeBase you can use the CHARGING AUXBATT LED to monitor the charging progress. See Figure 10 for a summary of each charging state.

Deep-cycling the Battery

For maximum battery life, Hand Held Products recommends that you deep- cycle (service) the battery **twice** before initial use and then, once a month thereafter. To deep-cycle, insert the battery into the HomeBase auxiliary battery well. Then, push and hold the **Service Aux Batt** button for at least 4 seconds. The deep-cycling process takes approximately 6.5 hours.

The CHARGING AUXBATT LED is red while the battery is discharging and changes to blinking red when the charging cycle begins and orange when charging at the maximum rate. The battery is ready to use when the light turns green. See Figure 10 for more on the LED status.

Setting Up For Communications

The Dolphin Terminal and Dolphin HomeBase support RS-232 communications through the RS-232 Main Communications Port located on the side of the Dolphin 7200 HomeBase. The HomeBase translates the RS-232 signals from the host computer into infrared signals to communicate with the Dolphin Terminal.

The HomeBase RS-232 interface allows the Dolphin Terminal to communicate to a personal computer, modem, or any standard RS-232 device using a standard serial cable and communications software.

Follow these steps to set up the Dolphin HomeBase and Dolphin Terminal for communications:

1. Set-up the Dolphin HomeBase.
2. Set-up the Dolphin Terminal.
3. Follow the data transfer sequence as described by your application.

Setting up the Dolphin HomeBase

Set the Dolphin HomeBase on any dry, stable surface such as a desktop. Before mounting the Dolphin HomeBase, check to ensure that all AC wall transformers have a nearby electrical outlet. Be sure to provide enough workspace with good lighting for the user to view and operate the Dolphin Terminal while it is in the HomeBase. Setting up the HomeBase involves three steps:

1. Connecting the cables
2. Setting the configuration switches
3. Setting the baud rate

Connecting the Cables

Connect the HomeBase to the host computer or other device by plugging an RS-232 serial cable into the RS-232 Communications Port on the rear of the HomeBase. The

wiring of your cable depends on whether the other device is set up as a DCE (Data Communications Equipment) or DTE (Data Terminal Equipment) device.

The HomeBase RS-232 Port is configured as a DCE device. To communicate with a DTE device such as a computer, use a standard (or straight-through) RS-232 cable. To communicate with a DCE device, use either a null modem adapter in line with a standard RS-232 cable, or a null-modem serial cable.

You can make your own cables by following the pin configuration in the chart below. To do so, you must determine if your host RS-232 device is 9-pin or 25-pin, and whether it is configured as a DCE or DTE device.

HomeBase /Host Port (DCE)	IBM AT DB9 (DTE)	IBM XT DB25 (DTE)	Modem DB25 (DCE)
2 (RD)	2	3	2
3 (TD)	3	2	3
5 (SG)	5	7	7
4 (DTR)	4	20	6
6 (DSR)	6	6	20
7 (RTS)	7	4	5
8 (CTS)	8	5	4

Figure 16 Pin Configuration

With the Dolphin 7200 HomeBase, use the appropriate cable to connect each device to the Main Comm Port for a single Dolphin HomeBase or to the Multi-HomeBase Port if you are creating a Dolphin HomeBase network.

Connect the power supply to the Dolphin HomeBase. Plug the AC transformer into the Dolphin HomeBase 12 Volt DC power supply connector. The AC wall transformer provided can power only one Dolphin HomeBase.

Hand Held Products recommends that you leave the Dolphin HomeBase connected to its power source at all times, so that it is always ready to use.

Setting the Configuration Switches

Use these switches to select the network and communications modes for your Dolphin HomeBase. If you are configuring the HomeBase for a single Dolphin Terminal, the switch must be in the 'Single' position for proper basic operation. The switch must be set to 'Multi' for proper network operation if you are creating a HomeBase network. The configuration switch must be in the program position to change the baud rate.

Setting the Baud Rate

You may use the HomeBase Configuration utility program to select the baud rate. The program can also be used to change the host system's COM port and will run a diagnostic check for optimal communications. After changing the baud rate, you must power the HomeBase off and then on again. The program is one of the utility programs that come with the Dolphin OS and Development System. For more on HomeBase Configuration, see the chapter 9.

Modes of Operation

Through the Command Mode, the host application software provides command instructions for configuring a single Dolphin HomeBase or a network of HomeBases for communications. Once configured, the HomeBase(s) is in Transparent Mode and ready for communications.

Command Mode

You can configure a single Dolphin HomeBase or a whole network and select units for communications via the host application by entering the Command Mode. Data transmission is not possible while the Dolphin HomeBase network is in this mode. Go into Command Mode by entering an escape sequence that informs the HomeBase network that it will be receiving commands from the host device or application. The escape string is:

<ESC>HHP [>100ms<1s] Next Command

where **<ESC>** is an ASCII 27 character. The escape string should be followed by a >100ms<1second period of line silence. When sending commands, the escape string must precede the command string. The HomeBase automatically exits Command Mode after receiving each command.

Programming commands used for configuring single Dolphin HomeBases include Version Number and Baud Rate Selection. You configure HomeBase networks using the Baud Rate Selection, Address Assignment and Device Selection programming commands. See the sections on *Configuring A Single Dolphin HomeBase* and *Creating a HomeBase Network* for details.

Transparent Mode

When the Dolphin HomeBase is selected by the host application and ready for communications, it is in Transparent Mode. In this mode, the HomeBase facilitates point-to-point communication between the host device and the Dolphin Terminal. Data sent through the RS-232 link is passed directly to and from the Dolphin Terminal via the Infrared Link between the terminal and the HomeBase.

Configuring a Single Dolphin 7200 HomeBase

NOTE

The configuration switches are checked at power up. Changes in the switch settings will not be recognized until power is turned off and then back on.

To prepare a single Dolphin HomeBase for communications, you must enter the Command Mode to configure the version number and select the baud rate.

Version Number

To retrieve the version number for the Dolphin HomeBase:

1. Enter or send the escape and command strings:

   <ESC>HHP >100ms< 1s V

This command will return the version number but is not needed for communications.

Baud Rate Selection

NOTE

The baud rate is stored in Non-Volatile Memory and is retained even if the power is removed from the network.

The Dolphin HomeBase baud rate is set to 57600 at the factory. Use the configuration switches on the HomeBase's back panel to select the network and communications modes for your Dolphin. The following table outlines the configuration switch settings:

Switch	Setting	Function
1	SINGLE (UP)	Single HomeBase only
2	FIXED BPS (DOWN)	Baud rate fixed at 9600
2	PROGRAM (UP)	Baud rate can be programmed

Figure 17 Configuration Switch Settings on HomeBase for Single HomeBase

To ensure communications, leave Switch 2 in the 'FIXED BPS' position and configure your communications software for 9600 baud. When Switch 2 is in the 'PROGRAM' position, the baud rate can be changed using the following procedure or you may use the HomeBase Configuration Utility program.

1. Enter or send the escape and command strings:

   <ESC>HHP >100ms< 1s B*n*

   where ***n*** is the ASCII number corresponding to the baud rate shown in the table below. For example, the string <ESC>HHPB6 (which consists of the escape string and the command B6) would set the baud rate for the network to 19200. No response will be transmitted back to the host after executing this function.

ASCII Value of "n"	Selected Baud Rate	ASCII Value of "n"	Selected Baud Rate
0	38400	6	19200
1	38400	7	38400
2	1200	8	57600
3	2400	9	115200
5	9600		

Figure 18 Baud Rate per Value of n

Creating a Dolphin 7200 HomeBase Network

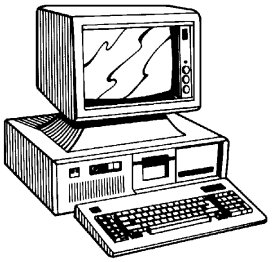
This information applies only to the Dolphin 7200 HomeBase. The Dolphin 7200 Compact HomeBase **is not** networkable. Each HomeBase must have its own AC power adapter connected to a standard AC electrical socket. The group can be placed on a table or desk, or rail-mounted using the mounting holes on the two outside Dolphin HomeBase units.

How to Daisy Chain the Dolphin HomeBases

To form a HomeBase network, daisy chain the HomeBases together using one of the following methods:

- Align adjacent units so that the MULTI-HOMEBASE PORT of one unit will mate with the MAIN COMM PORT of the next unit until all HomeBases in the network are connected.

OR



- Use a RS-232 cable to connect the Multi-HomeBase Port on one terminal to the MAIN COMM PORT on the next terminal. Repeat this step to include each additional terminal in the chain. Connect the last terminal to the host computer and leave the last MULTI-HOMEBASE PORT open if it is not needed.

Programming Commands

To configure a Dolphin HomeBase network, these attributes must be programmed: Address Assignment, Baud Rate Selection and Device Selection.

Address Assignment

Use the Address Assignment command to establish unit IDs for each Dolphin HomeBase in your network. This must be done before a unit can be selected for communications. To establish an Address Assignment:

1. Type or send the escape and command strings to set-up the configuration mode and establish the beginning unit ID number:

   <ESC>HHP >100 ms< C >100 ms< 1s I*n*

   n is the number representing the first unit in the network

   For example, the string <ESC>HHPCI0 would instruct the network to set up ID numbers for all the units in the network beginning at zero (0).

NOTE

The configuration switches are checked at power up. Changes in the switch settings will not be recognized until power is turned off and back on.

2. The first Dolphin HomeBase in the network receiving the command responds to the host with:

   <SYN>

   <SYN> indicates that the command was accepted

3. In sequence, each Dolphin HomeBase will determine its own ID number by adding one to the previous ID number.

4. When ID numbers are established for all HomeBases, the last HomeBase will return this response to the host:

   <ACK>n

   <ACK> indicates completion of ID configuration; ***n*** represents the ID number for the last unit in the network.

Programmer's Note: *When sending ID numbers to the Dolphin HomeBase, remember that numbers typed on the keyboard are ASCII numbers which will be converted to Hex when sent to the Dolphin HomeBase. For example, typing the command from the keyboard:*

<ESC>HHP >100ms< C >100ms< 1s I1

would instruct the network to set up ID numbers for each Dolphin HomeBase starting with the ASCII number 1. The first unit in the network would actually receive the number 31 Hex (since ASCII 1 is equal to 31 Hex) as the starting ID number. Each unit in the network would sequentially add one to this starting ID number to establish its own ID. So, for a network of 15 units, the final ID number would be set up as 3F Hex. When the final unit sends back an <ACK>3F, the host computer (which converts Hex data back to ASCII) will then display the ID number as "?" instead of 15 as you might expect.

Baud Rate Selection

The Dolphin HomeBase baud rate is preset to 57600 at the factory. Use the configuration switches on the back panel of the HomeBase to select the network and communications modes for your Dolphin. The following table outlines the configuration switch settings:

Switch	Setting	Function
2	FIXED BPS (DOWN)	Baud rate fixed at 9600
2	PROGRAM (UP)	Baud rate can be programmed

Figure 19 Configuration Switch Settings for a HomeBase Network

When Switch 2 is in the 'PROGRAM' position, the baud rate can be changed using the following procedure or by using the HomeBase Configuration Utility.

Enter or send the escape and command strings:

<ESC>HHP >100ms< 1s B*n*

n is the ASCII number corresponding to the baud rate shown in the table below. For example, the string <ESC>HHPB6 (which consists of the escape string and the command B6) would set the baud rate for the network to 19200. No response will be transmitted back to the host after executing this function.

ASCII Value of "n"	Selected Baud Rate	ASCII Value of "n"	Selected Baud Rate
0	38400	6	19200
1	38400	7	38400
2	1200	8	57600
3	2400	9	115200
5	9600		

Figure 20 Baud Rate per Value of n

NOTE

The baud rate is stored in Non-Volatile Memory and is retained even if the power is removed from the network.

Device Selection

Use this command to enable the host device to select a specific Dolphin HomeBase in the network for communication.

1. Enter or send the escape and command strings:

   <ESC>HHP >100ms< 1s S*n*

   where ***n*** is the unit ID of the Dolphin HomeBase being selected

2. The Dolphin HomeBase with the unit ID corresponding to the ID number in the Device Selection command string will respond with:

   <ACK>n

   to indicate to the host that it is present. ***n*** is the unit ID.

When data transfer begins, the COMM LED on the Dolphin HomeBase will blink red and green. A unit remains selected until another unit in the network is selected. For example, the string <ESC>HHPS3 would select the unit with ID number 3 for communications. That unit would then send back an <ACK>3.

A selected unit in the Dolphin HomeBase network will assert the DSR signal of the HomeBase when a Dolphin terminal is present. The DSR signal can be used by the host application to determine if a Dolphin terminal is present and selected.

Communicating with the Dolphin Terminal

To communicate with the Dolphin and any other devices connected to the HomeBase:

1. Insert the Dolphin into the terminal well of the HomeBase. If the Dolphin is in sleep mode, it will awaken into active state.

2. The CHARGING MAINBATT LED on the HomeBase will turn on. If the Dolphin does not turn on, or the LED does not light up, make sure that it is properly seated in the terminal well and that the power supply is properly connected to the HomeBase and plugged into a functioning AC outlet.

3. Start your application on the Dolphin terminal or the host computer. Data can then begin transmitting between the terminal and the devices connected to the Dolphin HomeBase.

When data transfer begins, the COMM LED on the Dolphin HomeBase will blink red and green. If the HomeBase will not communicate with the Dolphin, check the port connections to ensure that the HomeBase is correctly configured. See *Chapter 10, Troubleshooting*, for more information.

Chapter 8 Using the Dolphin® 7200 Compact HomeBase

Summarizes the features of the Dolphin 7200 Compact HomeBase and explains how to use it.

Hub of the System

As the hub of your Dolphin system, the Dolphin 7200 Compact HomeBase performs three important functions – battery management, communications and storage.

Battery Management

The Dolphin 7200 Compact HomeBase uses a charging method that senses when the battery pack is fully charged and then drops to a trickle charge to keep the battery pack at full capacity. The battery pack does not need to be discharged before recharging because this method protects the battery from damage caused by overcharging.

The Dolphin 7200 Compact HomeBase provides power to the Dolphin terminal to enable the terminal to charge its battery.

IrDA Optical Communications

The IR communications port on the Compact HomeBase connects with the IrDA port on the Dolphin. Reliable data communications at speeds of up to 115 baud can be transmitted by the HomeBase. With no pins or contacts to break, IrDA will work reliably for years.

The Dolphin 7200 Compact HomeBase **is not** networkable.

Convenient Storage

The Dolphin 7200 Compact HomeBase is a safe and convenient storage receptacle for the Dolphin terminal.

Dolphin 7200 Compact HomeBase Parts and Functions

Front Panel

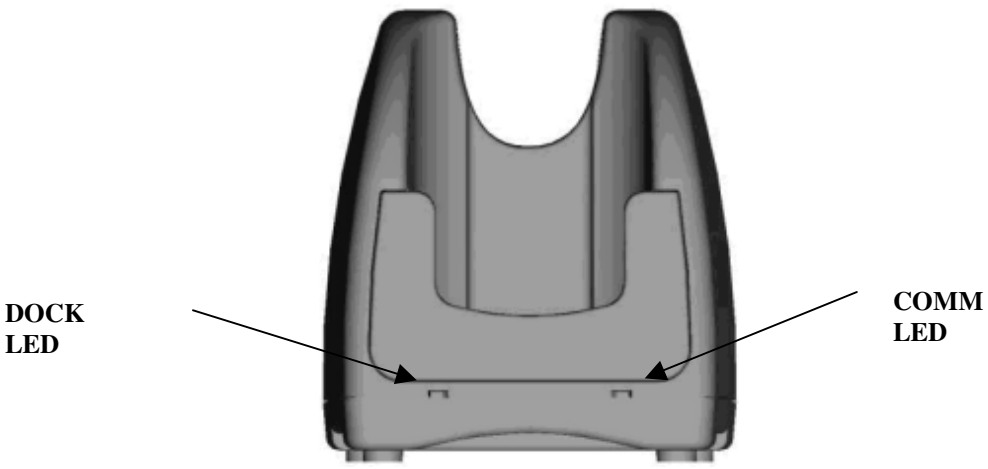


Figure 16 Front View of HomeBase

The Compact HomeBase's front panel has one slot:

Dolphin Terminal Well You put the Dolphin in this well to communicate with a host device and to charge the Dolphin's batteries.

LEDs There are two LEDs on the front panel of the HomeBase

1. **DOCK LED** Turns solid green when the Dolphin Terminal is properly seated into the Dolphin HomeBase.

2. **COMM LED** Indicates the status of data transfer between the Host Device and the Dolphin Terminal as described below:

Comm LED	Description
Red LED	Data is being sent from the Host Device to the Dolphin HomeBase.
Green LED	Data is being sent from the Dolphin HomeBase to the Host Device.
Orange LED	Data is being sent at high data rates.

Back Panel

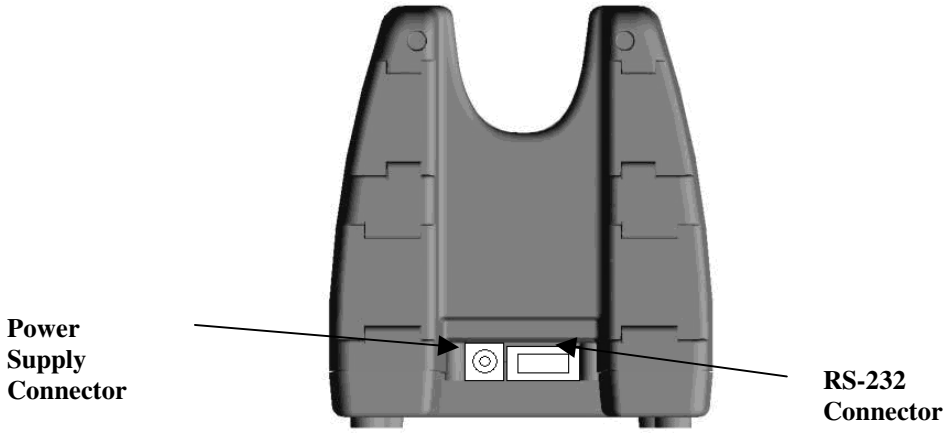


Figure 17 HomeBase Back Panel

There is a power supply connector and an RS232 connector:

Power supply connector Use this connector to attach a power supply to the HomeBase. The power supply provides 12V DC input for communications and battery charging.

RS-232 Communications Port Use a standard serial cable to connect this port to a host RS-232 device.

Bottom Panel

A Baud Rate DIP switch is located on the bottom of the HomeBase. The three-position DIP switch is used to select the communication baud rate. Switch position and the corresponding baud rates are shown in the chart below.

NOTE

*The HomeBase Configuration program **cannot** be used to select the baud rate on the Compact HomeBase.*

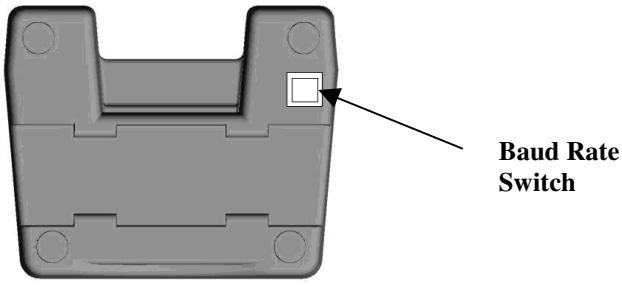


Figure 18 HomeBase Bottom Panel

Baud Rate	Switch 1	Switch 2	Switch 3
115200	0	0	0
57600	1	0	0
19200	0	1	0
9600	1	1	0
38400	0	0	1
4800	1	0	1
2400	0	1	1

*Note: The HomeBase Configuration program **cannot** be used to select the baud rate on the Compact HomeBase.*

Powering the Dolphin Terminal

When seated in the HomeBase, the Dolphin terminal receives the power it needs to charge the battery and to run its internal circuitry.

The Dolphin terminal can be stored indefinitely in the HomeBase without damage to the terminal or the HomeBase. Keep the HomeBase plugged in so that the Dolphin terminal's battery pack stays fully charged.

Charging A Dolphin Terminal

The HomeBase supplies charging power to the Dolphin terminal so that the terminal can monitor the charging of its battery pack. This charging method protects the battery from being damaged by overcharging. Therefore, the Dolphin terminal may be stored indefinitely in the HomeBase without damage to the terminal, the battery pack, or the HomeBase.

To charge a Dolphin terminal, follow these steps:

1. Insert a battery pack into the Dolphin terminal.

2. Place the terminal, laser engine window up and the LCD visible, in the Dolphin Terminal Well of the Dolphin HomeBase.

3. Let it glide down into the well until it stops.

4. Once the Dolphin terminal is properly seated, the Dock LED on the HomeBase will be solid GREEN.

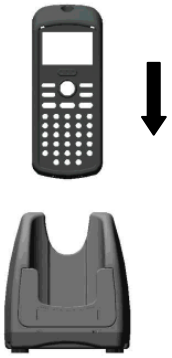


Figure 19 Inserting the Dolphin terminal into the HomeBase

Figure 20 Dolphin Seated in HomeBase

Deep-Cycling Batteries

For maximum battery life, Hand Held Products recommends that you deep- cycle (service) the battery **twice** before initial use and then, once a month thereafter. Since the Dolphin 7200 Compact HomeBase ***does not*** have deep-cycling capabilities, it is recommended that you use the Dolphin 7200 Multicharger or the Dolphin 7200 HomeBase.

The deep-cycling process using the Multicharger takes approximately 9.5 hours. For more information, see the Dolphin 7200 Multicharger User's Guide.

Mounting the Dolphin 7200 Compact HomeBase

The Dolphin 7200 Compact HomeBase may be desk or wall-mounted for convenience and storage.

Desk Mounting:

The Compact HomeBase has a DIN rail (7.5 X 35 mm) slot on the bottom to allow for secure desk attachment of the unit if desired (see figure 21).

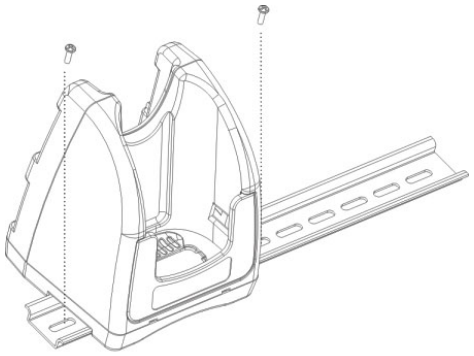


Figure 21

Wall Mounting:

The Compact HomeBase also has two DIN rail (7.5 X 35mm) slots on the back to allow for secure wall mounting of the unit if desired (see figure 22).

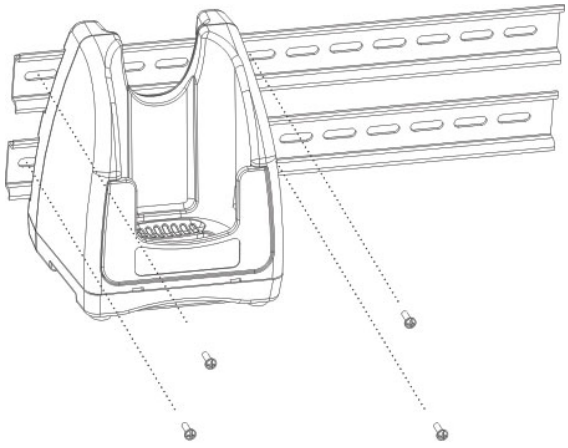
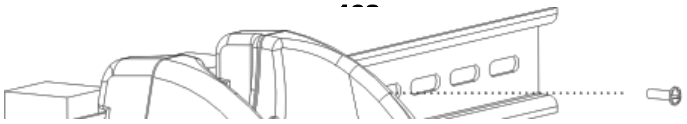


Figure 22

When using right-angle style RS232 connector cable, the DIN rails may be mounted directly to the wall. When using standard RS232 connector cables, it is recommended



that the rails be mounted to the wall using a 25mm (1 in.) spacer to allow for appropriate strain relief of the cables (see figure 23).

In either case, **after wall mounting,** it is **recommended** that the cables be secured to the DIN rail through use of a wire tie to prevent damage to the Compact HomeBase unit in case accidental or excessive force is applied to the cables. (see figure 24)

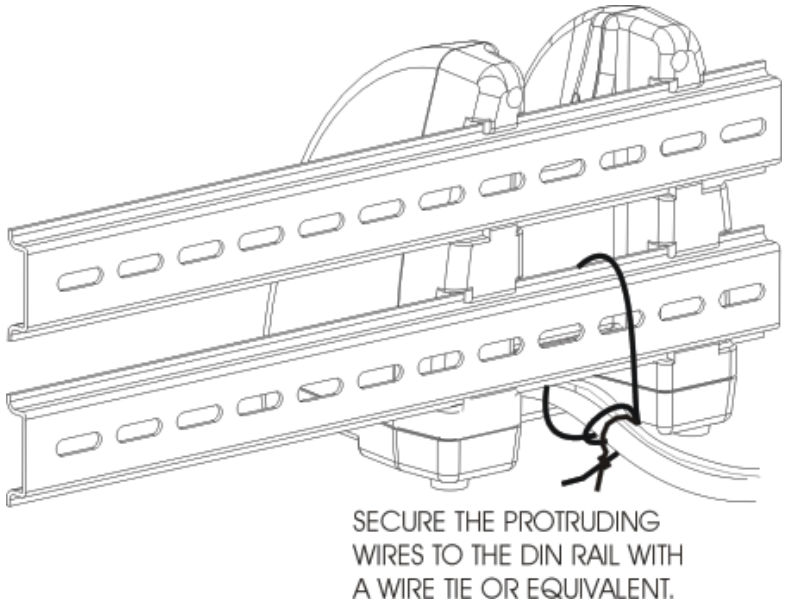


Figure 24

Setting Up For Communications

The Dolphin terminal and Dolphin Compact HomeBase support RS-232 communications through the RS-232 Main Communications Port on the back of the Dolphin 7200 Compact HomeBase. The HomeBase translates the RS-232 signals from the host computer into infrared signals to communicate with the Dolphin Terminal.

The HomeBase RS-232 interface allows the Dolphin terminal to communicate to a personal computer, modem, or any standard RS-232 device using a standard serial cable and communications software.

Follow these steps to set up the Dolphin HomeBase and Dolphin Terminal for communications:

1. Set up the Dolphin Compact HomeBase.
2. Set-up the Dolphin Terminal.
3. Follow the data transfer sequence as described by your application.

Setting up the Dolphin Compact HomeBase

Set the Dolphin Compact HomeBase on any dry, stable surface such as a desktop. Before mounting the Compact HomeBase, check to ensure that all AC wall transformers have a nearby electrical outlet. Be sure to provide enough workspace with good lighting for the user to view and operate the Dolphin Terminal while it is in the HomeBase.

Connecting the Cables

Connect the Compact HomeBase to the host computer or other device by plugging an RS-232 serial cable into the RS-232 Communications Port on the rear of the HomeBase. The wiring of your cable depends on whether the other device is set up as a DCE (Data Communications Equipment) or DTE (Data Terminal Equipment) device.

The HomeBase RS-232 Port is configured as a DCE device. To communicate with a DTE device such as a computer, use a standard (or straight-through) RS-232 cable. To communicate with a DCE device, use either a null modem adapter in line with a standard RS-232 cable, or a null-modem serial cable.

You can make your own cables by following the pin configuration in the chart below. To do so, you must determine if your host RS-232 device is 9-pin or 25-pin, and whether it is configured as a DCE or DTE device.

HomeBase /Host Port (DCE)	IBM AT DB9 (DTE)	IBM XT DB25 (DTE)	Modem DB25 (DCE)
2 (RD)	2	3	2
3 (TD)	3	2	3
5 (SG)	5	7	7
4 (DTR)	4	20	6
6 (DSR)	6	6	20
7 (RTS)	7	4	5
8 (CTS)	8	5	4

Figure 16 Pin Configuration

With the Dolphin 7200 Compact HomeBase, connect each device to the RS-232 Communications Port on the back of the HomeBase. The Compact HomeBase **cannot** be networked.

Connect the power supply to the Compact HomeBase. Plug the AC transformer into the Dolphin HomeBase 12 Volt DC power supply connector. The AC wall transformer provided can power only one Dolphin Compact HomeBase.

Hand Held Products recommends that you leave the Dolphin Compact HomeBase connected to its power source at all times, so that it is always ready to use.

Communicating with the Dolphin Terminal

To communicate with the Dolphin and any other devices connected to the Compact HomeBase:

1. Insert the Dolphin into the terminal well of the HomeBase. If the Dolphin is in sleep mode, it will awaken into active state.

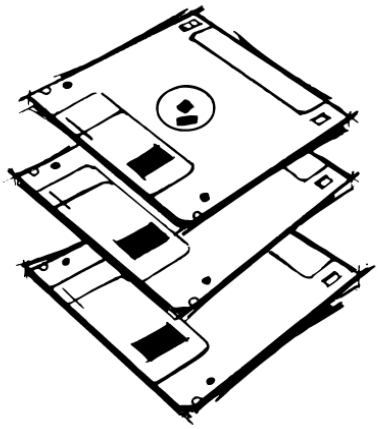
2. The CHARGING MAINBATT LED on the HomeBase will turn on. If the Dolphin does not turn on , or the LED does not light up, make sure that it is properly seated in the terminal well and that the power supply is properly connected to the HomeBase and plugged into a functioning AC outlet.

3. Start your application on the Dolphin terminal or the host computer. Data can then begin transmitting between the terminal and the devices connected to the Dolphin HomeBase.

When data transfer begins, the COMM LED on the Dolphin HomeBase will blink red and green. If the HomeBase will not communicate with the Dolphin, check the port connections to ensure that the HomeBase is correctly configured. See *Chapter 10, Troubleshooting*, for more information.

Chapter 9 Learning About the Dolphin OS and Development System Software

Explains how to use and manage the software accompanying the Dolphin 7200 terminal.



Dolphin OS and Development System

***Important Notice**: Before installing the Dolphin OS and Development System it is important that you remove all previous installations. To remove the previous installations, delete the* c:\dolphin *directory and all files contained within. You should also delete the Dolphin Group or Folder. Only install the most recent release of the Dolphin ROM IMAGE and Boot Loader, loading an old version of the ROM IMAGE or Boot loader can result in Dolphin becoming unstable or inoperable, and requiring the unit to be returned to HHP for repair.*

The Dolphin OS and Development System is available from the Partners Area of the Hand Held Products website, www.handheld.com. The self-extracting file contains:

- Dolphin Development Tools and Libraries (API)
- Sample Programs with source code
- Dolphin Utilities including Communication and Upgrade Wizard
- Electronic Help
- Boot Loader & ROM Image

Installation

Once the file is downloaded on your PC, double click the Dolphin OS and Development System icon and follow the instructions on the screen to complete the installation and set-up procedure.

The setup program will create the following directories on your system:

Directory	Contents
c:\dolphin	Default installation directory, containing HHP Help and Read Me First Files.
c:\dolphin\bootldr	Backup of Dolphin Boot Loader (BURN.EXE and BOOTLDR.BIN)

Directory	Contents
c:\dolphin\devtools	Dolphin Development Libraries, Samples and API Help file.
c:\dolphin\wizard	Dolphin Upgrade Wizard
c:\dolphin\hhpdemo	HHP Dolphin Batch Demo Program
c:\dolphin\romimage	Backup of Dolphin ROM Image
c:\dolphin\utils	Dolphin Utilities (YX.EXE, DCOMM2.EXE, BMP2LCD.EXE)
c:\dolphin\devtools\samples\rfdemo\server	Host/Server application
c:\dolphin\devtools\samples\rfdemo\client	Client application for Dolphin RF

*Note: All future references to directories assume that the user has accepted the installation default directory. The default installation directory is "*c:\dolphin*".*

Figure 21 Directories Created by Dolphin OS & Development System Set-up Program

Help File, Document and Utility Icons

The Dolphin OS and Development System set up program will set up a Dolphin group or folder and install the following Help, Document and Utility icons.

The Read Me First Icon provides important information not available at the time the manual was printed.

The Contacting HHP Icon provides information on contacting HHP by Phone, Fax, Email, WWW and BBS.

The OS and Development System Icon provides additional information on the Dolphin OS and Development System.

The Development Library Help file provides information on the Dolphin API and Sample applications.

Electronic Users Guide for the Dolphin terminal.

A Windows drag-and-drop communication utility, supporting Xmodem and Ymodem file transfer protocols

A Windows utility that steps you through the process of upgrading Dolphin's Boot Loader, ROM image and Demo application.

A Windows utility for configuring the HomeBase baud rate.

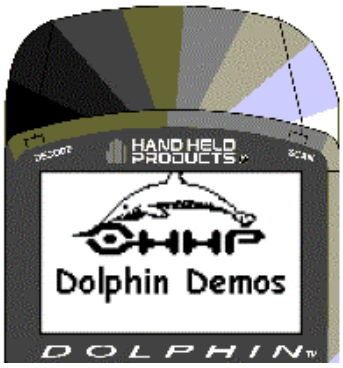
Dolphin HHP Demo Program

A simple demonstration program is included with the Dolphin OS and Development System that shows how the Dolphin 7200 terminal works. The Dolphin OS and Development system setup program installs the demonstration programs in the **c:\dolphin\hhpdemo** directory on your PC.

The HHP demo has also been pre-installed on your Dolphin terminal. If you need to re-install the HHP demo, copy all the files located in the **c:\dolphin\hhpdemo** directory to your Dolphin terminal's C: drive or run the Dolphin Upgrade Wizard.

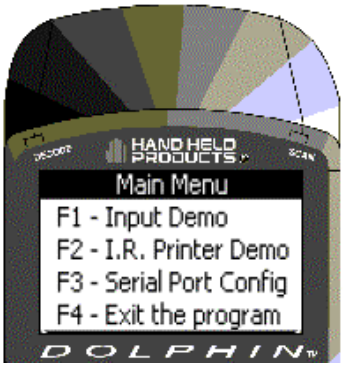
Main Menu

The HHP Demo Program is loaded automatically when the Dolphin terminal is turned on. To turn the Dolphin terminal on, press the ON/SCAN key. When you first turn the Dolphin terminal on, the following screen will display on the screen:



Note: If the screen illustrated above does not appear on your Dolphin terminal, the HHP Demo Application has been removed from your terminal.

Press any key and the following screen will appear on the display:

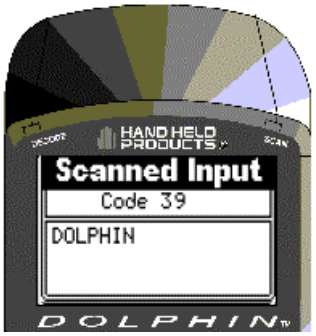


F1 – Input Demo

Press F1 to load the Input demo and the following screen will appear.

If you enter information from the keyboard, the following screen will appear and display the information you entered:

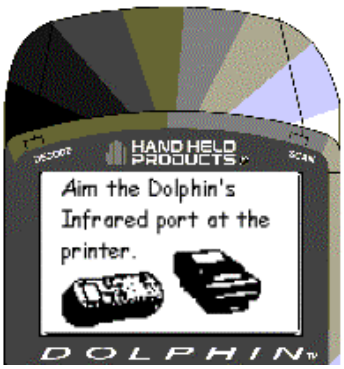
If you press the ON/SCAN button to scan a bar code, the following screen will appear and display the results of the scanned input:



Press ESC to return to the main menu.

F2 – I.R. Printer Demo

Press F2 to access the I.R.Printer Demo and the screen shown below will appear:

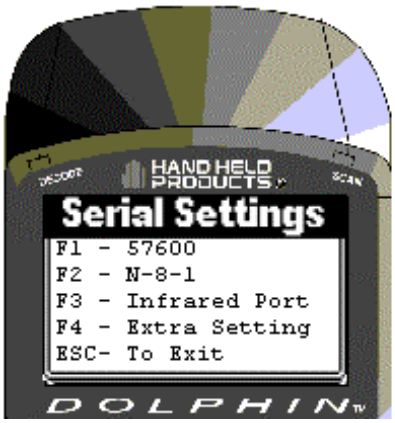


Follow the instructions shown on the previous screen and the screen shown below will display indicating that information is being sent to the printer:

If the connection with the printer is not found, the message below will display:

F3 –Serial Port Config

To configure the Dolphin 7200 terminal's serial port, press F3 and the screen below will display.



F1 – 57600

Each press of the F1 key changes the baud rate value. To set the baud rate, press the F1 key until the desired baud rate is displayed. The default is 57600.

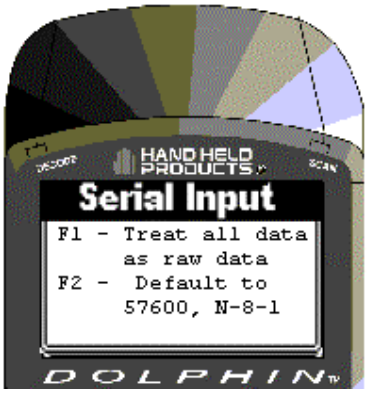
F2– N-8-1

Press F2 to select the parity settings. Each press of the key changes the parity setting; press the F2 until the desired parity setting is displayed. The default is N-8-1.

F3– Infrared Port

Toggles between Infrared port or DB-9. This depends on how your Dolphin terminal is equipped.

F4- Extra Setting
Press F4 and the screen shown below will display.



F1 - Treat all data as raw data
Toggles between Treat all data as raw data and Look for a symbology ID to lead the data.

F2 - Default to 57600, N-8-1
Select this option to set the baud rate and parity settings to the default values.

ESC – To Exit

Press ESC to return to the main menu.

Scanning A Barcode

The Dolphin Terminal comes with demonstration software that allows you to scan barcodes immediately. A sample barcode is illustrated below for you to use for practice.

Hold the Dolphin terminal approximately 2 inches away from the sample barcode. Press the ON/SCAN key to begin scanning. Move the Dolphin terminal back and forward until the unit gets a good read. The Dolphin terminal will "beep," and the laser will turn off when a good read is obtained. The decode LED will turn green

The Dolphin terminal will show a translation of the sample barcode on the LCD window, which should appear similar to the following illustration.

Dolphin Utilities

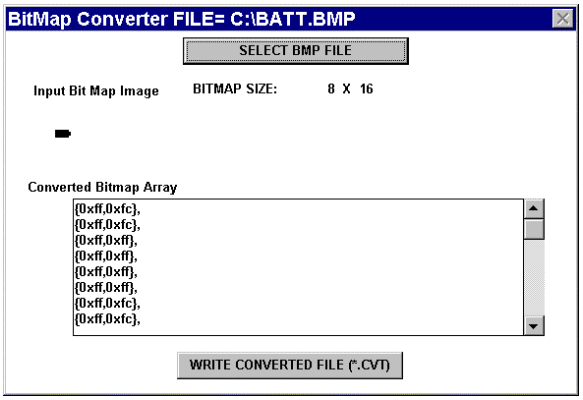
A number of utilities are provided with your Dolphin terminal. The Utility programs are installed in the **c:\dolphin\utils** directory on your computer.

NOTE

See the Development API electronic Help file (dolphapi.hlp) for additional information regarding the Dolphin Development Libraries, samples and compiling instructions.

BMP2LCD.EXE

BMP2LCD.EXE is a Windows tool that allows developers to create a bitmap data structure from a standard Windows™ bitmap. The bitmap can then be displayed using a Dolphin Developers API function such as evDrawUserBitMap().



BURN.EXE

WARNING

Only install the most recent release of the Dolphin Boot Loader, loading an old version of the Boot loader can result in Dolphin becoming inoperable, and requiring the unit to be returned to HHP for repair.

BURN.EXE is a Dolphin utility, which will load or reload the Dolphin's Boot Loader. The Boot Loader is an Xmodem communications utility used by the Dolphin OS to load or update the BIOS and Operating System (ROM image). To load or reload the Dolphin's Boot Loader:

1. Transfer BURN.EXE and BOOTLDR.BIN to the Dolphin's FLASH Drive C:.
2. Execute BURN.EXE. The OS Boot Loader is updated and the files BURN.EXE and BOOTLDR.BIN are deleted.

DCOMM2.EXE (Dolphin File Transfer Utility)

DCOMM2.EXE is a Windows communication utility. It supports drag-and-drop file transfer using both Ymodem and Xmodem.

Usage :

dcomm2 [/c#] [/b#] [/y] [/x] [filename1…n]

Where:

/c#	*Specifies COM port, where #=1-4*
/b#	*Specifies Baud Rate, where #=9600, 19200, 38400 or 57600*
/x	*Specifies Xmodem protocol*
/y	*Specifies Ymodem protocol*
/a	*Automatic mode, waits and receives all files that are sent*
filename	*Filename to transfer, supports multiple file names and wildcards (*.dat).*

Example:

Dcomm2 /c1 /b57600 /y filename.dat

If you do not specify command line arguments, DCOMM2.EXE will open a dialog that allows you to receive files or configure the default serial communications port, baud rate, communications protocol and download path.

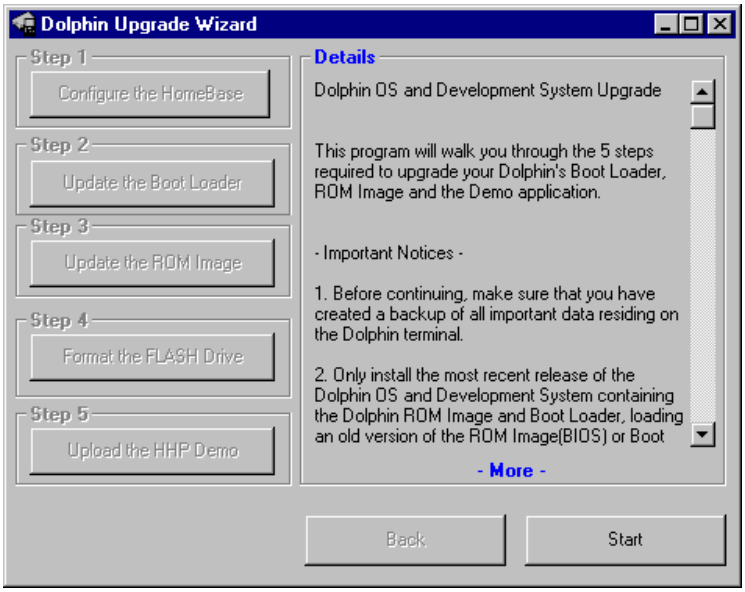
An 'Auto Execute' command line can also be specified in the configuration screen. The specified command line will be executed when a file is received.

DWIZARD.EXE (Dolphin Upgrade Wizard)

DWIZARD.EXE is a Windows utility that steps you through the process of upgrading Dolphin's Boot Loader, ROM image and Demo application. Simply run DWIZARD and follow the instructions provided to:

- Upgrade the terminal Boot Loader
- Upgrade the terminal ROM Image (BIOS, A Drive Image)

- Reinstall/Upgrade the HHP Demo



HBCFG.EXE (HomeBase Configuration Utility)

HBCFG.EXE is a Windows utility that allows the user to change the baud rate setting for the Dolphin HomeBase. HBCFG.EXE supports the following command line arguments:

Usage:

hbcfg [/c#] [/I] [/b#]

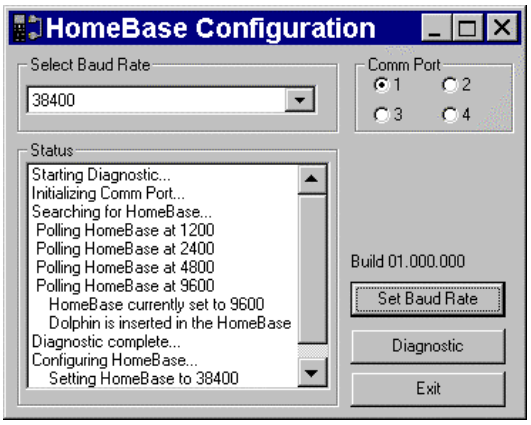
Where:

/c#: Specifies COM port, where #=1-4
/b#: Specifies Baud Rate, where #=9600, 19200, 38400 or 57600
/I: Forces HBCFG.EXE to display 'Please wait Dialog'

Example:

hbcfg /c1 /b57600 /I

If no command line arguments are specified or an error is detected, HBCFG.EXE will open a dialog that allows the user to select the serial communications port, baud rate, or run a diagnostic.



***Note**: Dip Switch 2 located on the back of the HomeBase must be set in the Up (PROGRAM) position for the baud rate to be programmed. The HomeBase power must be cycled (turned off and on) for the new dip switch settings to be recognized.*

STL.EXE

STL.EXE is a DOS command line utility for Dolphin that turns the 9th line status indicators on or off.

Usage:

STL *[1] [0]*

Where:

1:	*Turns the status line on*
0:	*turns the status line off*

Example:

STL *1*

If no command line is specified, STL.EXE will toggle the status line off, if it was on, and on if it was off.

YX.EXE

YX.EXE is a DOS command line Ymodem communication tool for the Dolphin terminal or a PC. YX.EXE supports the following options:

NOTE

When using YX on the Dolphin 7200 terminal, only COM1 is available.

Usage:

yx {/c#] [/b#] [/m] [filename]

Where:

filename:	*refers to file name to send, if not specified YX will receive a file*
/c#:	*Specifies COM ports 1-4 (1=Ir Port, 2=Micro DB-9)*
/b#:	*Specifies new BAUD rate, 300-57600*
/m:	*Run YX in menu driven mode*

Examples:

yx /b57600 autoexec.bat
yx
yx /m
yx /c2

The default baud rate for the YX.EXE utility is 57600. For your convenience, batch files are included on the Dolphin terminal to make sending data at a higher baud rate easier.

To send at 38400, enter <YF> instead of YX/b38400.

To send at 57600, enter <YFF> instead of YX/b57600.

ZZZ.EXE

ZZZ.EXE is a DOS command line utility for Dolphin that places the terminal into sleep mode.

Note – The terminal can not be placed in sleep mode while it is in the HomeBase. While in a HomeBase, the terminal must be on so it can monitor the battery status.

The following Utilities are included in the Dolphin ROM image and are automatically loaded when the terminal boots. They are NOT included on the Dolphin OS and Development System Disk.

Utility	Description
EVS.EXE	Enhanced Video System (EVS) is a TSR that traps standard video BIOS (INT 10H) calls, and overlays hardware-specific support for the Dolphin's LCD. In addition, EVS provides application and system level Status line support.
POWERMON.EXE	POWERMON.EXE is a TSR that monitors battery status and power usage. POWERMON.EXE is automatically loaded when the terminal boots.

Dolphin Application Development

Compiling Applications for the Dolphin

Dolphin application development is straightforward. Since Dolphin is DOS-compatible, most of the application can be tested on a desktop computer.

Although Dolphin is DOS-compatible, it provides many unique features that are not built into most PCs. For example, it has an integrated bar code scanner. The Dolphin libraries provide an API that allows an application to use these features. There are four libraries provided for linking into applications:

- **dolphins.lib** for small memory models
- **dolphinm.lib** for medium memory models
- **dolphinc.lib** for compact memory models
- **dolphinl.lib** for large memory models

The header file, **dolphin.h**, in the **c:\dolphin\devtools** directory contains useful declarations for using these libraries.

Sample Applications

A number of sample programs with source code have been provided with your Dolphin terminal. The sample programs are installed in the **c:\dolphin\devtools\samples** directory on your desktop computer.

Application	Description
GRAPH	Draws various patterns on the Dolphin's LCD display.
KBSTATUS	Displays keystrokes. If the keystroke is non-printable, the hex value of the keystroke is displayed.
LED	Allows the red and green LEDs to be toggled
ONBHIT	Displays status of the ON key.
SCAN	Allows bar code scanning.
SIO	Performs serial I/O. Displays characters received and sends key strokes.
SOUND	Runs through the frequency range of the Dolphin's speaker.
NI	Sample programs for the Numeric Dolphin. This sample is located in the C:\DOLPHIN\DEVTOOLS\NUMERIC\BORLAND or C:\DOLPHIN\DEVTOOLS\NUMERIC\MSVC.
EVSDEMO	Demonstrates graphics, changing fonts, turning the status line on and off, adding new icons to the status line, and changing the system cursor.
INV5	Sample inventory application with source code.

Building the Samples

There is one Microsoft Visual C\C++ version 1.52 project file, **.mak**, for each sample application. There is also a Borland C++ version 5.0 project file, **samples.ide**. This project file will rebuild all sample applications. Consult the documentation for your compiler for information on the use of project files.

Compiling the Sample Programs

Note: *See the Development API Help file (DAPI.HLP) for complete information regarding the Dolphin Development Libraries, Samples and Compiling instructions.*

Microsoft

In order for an application to use Dolphin's unique features, you must add a Dolphin library to the *application's* project. There are four libraries located in **c:\dolphin\lib\msvc** named **dolphinx.lib** where **x** is **s**, **m**, **c**, or **l**, corresponding to the memory model.

To add **dolphinx.lib** to an application's project:

- Select the menus Project|Edit.
- Change List Files of Type: to Library (*.lib). Browse into **c:\dolphin\devtools\lib\msvc**. Select **dolphinx.lib** corresponding to the memory model. Click the Add button.
- The Include Files Path must be modified, so the compiler will search for include files in **c:\dolphin\devtools\include.**

Borland

For an application to use Dolphin's unique features, you must add a Dolphin library must be added to the application's project. There are five libraries are located in **c:\dolphin\devtools\lib\ orland** directory. They are named **dolphinx.lib** where **x** is **t**, **s**, **m**, **c**, or **l**, corresponding to the memory model.

To add **dolphinx.lib** to an application's project:

- Right click on the .exe file in the Project Window.
- Select Add node from the pop-up menu.
- When the Add to Project List dialog box is displayed, change Files to Type: to Libraries (*.lib).
- Browse to **c:\dolphin\devtools\lib\borland**.
- Select the **dolphinx.lib** library corresponding to the memory model. Click the Open button.
- The Include Files Path must be modified, so the compiler will search for include files in **c:\dolphin\devtools\include**.

Transferring Files to or from Dolphin

Transferring files between your Dolphin terminal and a desktop PC is easy with the YX.EXE utility or the Dolphin File Transfer program.

Using the YX.EXE Utility

The YX.EXE utility, installed in the directory **c:\dolphin\utils**, performs RS-232 file transfers using Ymodem batch protocol. In addition, YX.EXE is preloaded on the Dolphin's A drive. This program can be run by entering commands at the DOS prompt or by accessing a menu.

NOTE

When using YX on the Dolphin 7200 with Ir Only terminal, only COM1 is available.

YX.EXE supports the following options:

Usage :

yx [/b#] [/m] [filename] [com port]

Where:

filename:	*refers to file name to send, if not specified YX will receive a file*
/b#:	*Specifies new BAUD rate, 300-57600*
/m:	*Run YX in menu driven mode*
/c#:	*Specifies COM ports 1-9 (1=Ir Port, 2=Micro DB-9)*

Examples:

yx /b57600 autoexec.bat
yx
yx /m
yx/c2

The default baud rate for the YX.EXE utility is 57600. For your convenience, batch files are included on the Dolphin terminal to make sending data at a higher baud rate easier.

To send at 38400, enter <YF> instead of YX /b38400.

To send at 57600, enter <YFF> instead of YX /b57600.

Using the Dolphin File Transfer Program


Dolphin File Transfer

Open the Dolphin program group in Windows Explorer and copy the Dolphin File Transfer shortcut to your PC's desktop. Putting the shortcut on your desktop simplifies the file transfer process.

Sending a File to the Dolphin

NOTE

The configuration switches are checked at power up. Changes in the switch settings will not be recognized until power is cycled.

1. Open the Dolphin File Transfer Program Configuration dialog box. Check to make sure the baud rate is set at 57600. This is the default for YX.EXE. Close the Configuration dialog box and exit the Dolphin File Transfer program. To change the baud rate, see the section on *"Sending Files at a Higher Rate"* on the next page.

2. Open Windows Explorer. Resize and move the window so that you can see both Explorer and the Dolphin File Transfer shortcut on your desktop.

3. In Windows Explorer, select the file to be transferred and, while holding down the left mouse button, drag and drop the file on the Dolphin File Transfer shortcut on the desktop. This opens the Dolphin File Transfer program.

4. At the Dolphin's C: prompt, enter <YX>.

5. Press <ENTER> on the Dolphin terminal to begin the file transfer. The COMM LED on the Dolphin HomeBase will blink red and green during the transfer. You can also view the progress of the file transfer on the Dolphin screen and Dolphin File Transfer program window.

Sending a File From Dolphin to Your PC

1. Double-click on the Dolphin File Transfer shortcut to open the program.

2. Open the Configuration dialog box. Check to make ensure the baud rate is set at 57600.

3. At the Dolphin's C: prompt, enter <YX> [Filename].

4. Click on the Receive File button.

5. Press <ENTER> on the Dolphin terminal to begin the file transfer. The COMM LED on the Dolphin HomeBase will blink red and green during the transfer. You can also view the progress of the file transfer on the Dolphin screen and in the Dolphin File Transfer program window.

Sending Files At A Higher Rate

A batch file containing command lines for sending and receiving files at higher baud rates is also loaded on the Dolphin terminal. To send at a higher rate, the Dolphin HomeBase must be programmed at the higher baud rate. Configuration Switch 2 should be in the down position. Refer to the section on *Baud Rate Selection* in *Configuring a Single Dolphin HomeBase* or *Creating a HomeBase Network* later in this chapter.

- To send at 38400 baud rate, enter <YF> at the DOS prompt instead of <YX>.

- To send at 57600 baud rate, enter <YFF> at the DOS prompt.

Using the Dolphin File Transfer Program and YX in Menu Mode

You can also use YX in menu mode to send and receive files from the Dolphin to your PC and vice versa with the Dolphin File Transfer program and YX.EXE on the PC.

Sending Files to the Dolphin

To use a menu for sending files to the Dolphin, follow these steps:

1. Open the Configuration dialog box. Check to make sure the baud rate is set at 57600. This is the default for YX.EXE.

2. Enter <YX /M> at the Dolphin terminal's DOS prompt.

3. Press <ENTER> and the menu below will appear on your Dolphin terminal's screen:

4. In Windows Explorer, select the file to be transferred and, while holding down the left mouse button, drag and drop the file on the Dolphin File Transfer shortcut on the desktop. This opens the Dolphin File Transfer program.

5. Press <F2> to begin the file transfer. If you are using a HomeBase to transfer files, the COMM LED will blink red and green during the transfer. You can also view the progress of the file transfer on the Dolphin screen and status bar in the Dolphin File Transfer program window.

NOTE

When using the menu, press <F3> to change to a higher baud rate. If you are using a HomeBase to transfer files, be sure to set Configuration Switch 2 on the HomeBase in the up position.

Sending Files From the Dolphin To Your PC

1. Double-click on the Dolphin File Transfer shortcut to open the program.

2. Open the Configuration dialog box. Check to make sure the baud rate is set at 57600.

3. Enter <YX /M> at the Dolphin terminal's DOS prompt.

4. Press <ENTER> and the menu below will appear on your Dolphin terminal's screen:

5. Click on the Receive File button.

6. Press <F1> on your Dolphin terminal and then enter the name of the file. Press <ENTER>. If you are using a HomeBase to transfer files, the COMM LED on the Dolphin HomeBase will blink red and green during the transfer. You can also view the progress of the file transfer on the Dolphin screen and status bar in the Dolphin File Transfer program window.

Dolphin EVS Engine

The EVS engine provides bit-mapped graphics support for the Dolphin LCD. EVS is the primary interface between an application and BIOS graphics functions. The EVS engine consists of three basic parts:

1. A TSR (EVS.EXE) that traps standard video BIOS (INT 10H) calls, and overlays hardware specific support for the Dolphin LCD.

2. A set of API routines that allow easy access to the EVS specific routines. These functions have been merged into the standard Dolphin Development API and are documented in the Dolphin API Help file (DAPI.HLP).

3. Application and system level Status line support.

The EVS engine eliminates the need for an application to directly access the hardware layer. The EVS engine maintains an image of the display in memory (118 pixels wide by 73 pixels tall). All application screen access (read/write) is filtered so as to write to the display image rather to the hardware. The EVS engine then updates the hardware (e.g. writes to the display) as necessary. This process allows for support of a single display plane that combines graphics and text.

For more on the Dolphin EVS Engine, see the Dolphin OS and Development System electronic help file.

Dolphin ROM Image and Boot Loader

Upgrading the Dolphin ROM Image

Important Notice: Before installing the Dolphin OS and Development System, you must remove all previous installations. To do this, delete the C:\DOLPHIN directory and all files contained within as well as the Dolphin Group or Folder. Only install the most recent release of the Dolphin ROM IMAGE and Boot Loader. Loading an old version of the ROM IMAGE or Boot Loader can make the Dolphin unstable or inoperable, and requiring you to return the unit to HHP for repair.

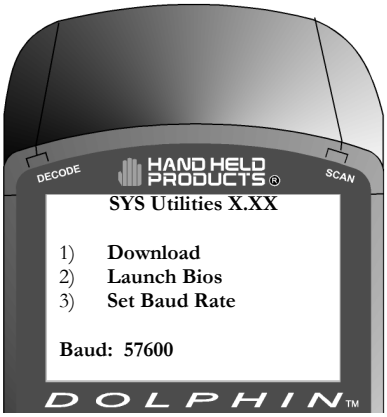
The Dolphin terminal has a Boot Loader incorporated that allows the developer to upgrade or reload the ROM IMAGE.

Follow these steps to manually reload the ROM IMAGE and Operating System from DOS:

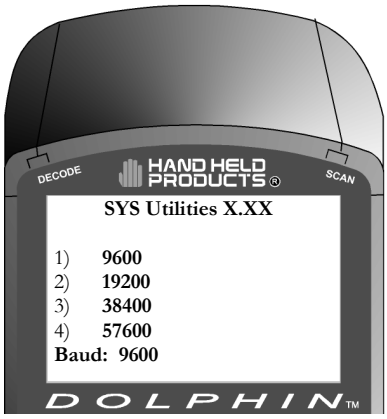
1. Verify that Configuration Switch 2 on the back of the Dolphin HomeBase is set to "Fixed BPS" and Switch 1 is set to "Single". Power must be turned off and then on to accept the new dip switch settings.

2. Make sure the serial cable is properly installed and power is properly connected to the HomeBase. Make sure no other communications programs are running on the PC.

3. Start the Dolphin Boot Loader. Hold down the "7" and "9" keys with one hand. With your other hand, press and release the "ON/SCAN", "SHIFT" and "BKSP" keys. Release the "7" and "9" keys. You should see the screen below. If not, repeat step three.



4. Press "3" to select Baud rate. Press "1" to set baud rate to 57600.



5. Press 1 to download.

Upgrading the Dolphin Boot Loader

Note: *We recommend that you use the Dolphin Upgrade WIZARD to update the Dolphin Boot Loader, ROM image and Demo application. Simply run DWIZARD and follow the instructions provided.*

WARNING

Only install the most recent release of the Dolphin ROM IMAGE and Boot Loader. ***DO NOT*** *load an old version of the ROM IMAGE or Bootloader. The Dolphin may become unstable or inoperable requiring you to return the unit to HHP for repair.*

While it is unlikely that you will ever need to reload the Dolphin Boot Loader, an image of the Dolphin Boot Loader is included with the Dolphin OS and Development System just in case. The Boot Loader image is installed in the **c:\dolphin\BOOTLDR** directory on your PC.

To load or reload Dolphin's Boot Loader:

1. Transfer BURN.EXE and BOOTLDR.BIN to Dolphin's FLASH Drive C:.

2. Execute BURN.EXE. The OS Boot Loader is updated and the files BURN.EXE and BOOTLDR.BIN are deleted.

Chapter 10 Troubleshooting and Warranty Information Dolphin® 7200 Terminal

Describes troubleshooting tips, solutions for problems you may encounter with the Dolphin 7200 terminal or HomeBase and warranty information.

Just In Case

The Dolphin 7200 terminal and Dolphin HomeBase are both designed to provide years of trouble-free use. Both products are covered by a one-year limited warranty. This chapter includes troubleshooting tips, warranty information, describes how to obtain technical support.

Before Calling For Application Support

If you have problems with either the Dolphin terminal or HomeBase, review the list of symptoms and solutions included in this chapter. If the problem isn't listed in this chapter, contact your Reseller or Hand Held Products' Application Support Department for assistance.

Troubleshooting the Dolphin Terminal and HomeBase

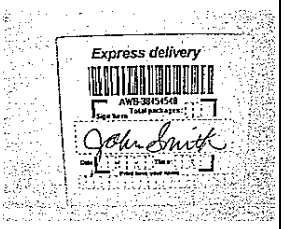
This table describes some of the common problems/symptoms and solutions that you could encounter while using your Dolphin terminal or Dolphin HomeBase. If you need further assistance with troubleshooting your terminal, contact your HHP Authorized Reseller.

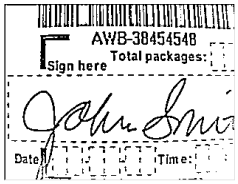
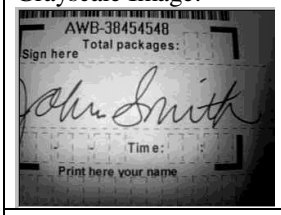
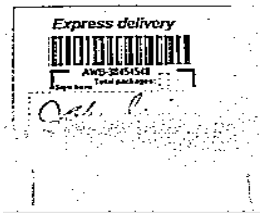
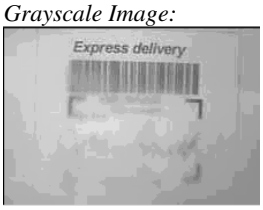
If You Have This Problem/Symptom	Try This:
The display is blank, the Dolphin terminal will not turn on.	Is the battery is low? Recharge or replace it with a known good battery. Reset the Dolphin terminal.
When booting up the Dolphin, I see the message 'CMOS MEM size wrong' for a second or two and the unit continues to boot. Is there something wrong with my unit?	When the Dolphin's internal NiMH battery is not charged or run down, this message will display and the terminal's settings are reset to their default values. This includes the date and time which is reset to January 1, 1980 and 12:00 AM. The terminal is fine. You simply need to recharge the internal battery and reset the Dolphin's date and time. To do this, insert a fully charged battery in the Dolphin and then use the DOS Date and Time function to set the correct date and time. The internal back-up battery requires a minimum of 5 hours of charging time in order to perform and maintain the system as described in Chapter 2 of this manual.

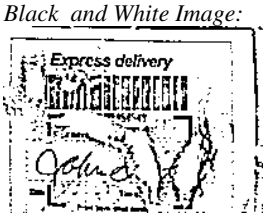
If You Have This Problem/Symptom	Try This:
The Dolphin terminal will not scan a bar code.	The bar code may be out of spec. Try reading some of the bar code examples in Appendix C, or locate a bar code sample that you know can be read by another Dolphin terminal. Is the exit window dirty? Clean it with a soft dry cloth. If the exit window is badly scratched, the Dolphin terminal should be returned to HHP for repair. Consult your software developer to ensure the correct bar code symbology is being used.
The battery in the Dolphin terminal keeps failing.	If the battery has been stored for a long period of time, it may take three charge/discharge cycles before the battery reaches its full storage capacity. The capacity of NiMH batteries decreases as the number of charge/discharge cycles increases. So, if you are experiencing low run times, a new battery may be required. To increase the run time of the Dolphin terminal, try to limit the use of the speaker, scan engine and backlight.
The Dolphin terminal is not communicating with the host computer.	Make sure the HomeBase is connected to a power source. Make sure the Dolphin terminal is inserted properly into the HomeBase. The CHARGING MAINBATT LED should be solid green. If not, remove the Dolphin terminal and reinsert it into the HomeBase. Ensure the communications baud rate is set correctly. Set communications for 57600, N, 8, 1. Make sure that Configuration Switch 2 on the back of the HomeBase is set to "Fixed BPS". Make sure the RS-232 cable is properly attached to the HomeBase and host computer. Also, check to ensure that the cable is configured properly.
I can not enter a ":" to change to Drive B: at the DOS prompt.	The ":" is a special character that can be entered by typing "SHIFT" "Z". See reference to special characters in "Using the Alphanumeric Keypad" or "Using the Numeric Keypad" section for additional information.
The 'CHARGING AUXBATT' LED does not come on when I insert a battery pack into the Dolphin HomeBase.	Check the power connections on the Dolphin HomeBase. Also check to ensure the battery pack is properly seated.

If You Have This Problem/Symptom	Try This:
The 'CHARGING AUXBATT' LED constantly changes from RED to ORANGE to GREEN.	The NiMH battery pack may need to be replaced. Insert a new battery pack into the Dolphin HomeBase's auxiliary battery well.
The 'CHARGING MAIN BATT' LED is on, but the Dolphin terminal will not communicate.	Check the cable connections to other devices. If you are connecting to another DCE device, be sure you're using a null modem cable. Try a previously tested cable if you suspect a bad cable. Check your communications program in both the Dolphin terminal and the RS-232 device with which you are communicating. Verify that the baud rates are set properly.

Troubleshooting with Dolphin 7200-2D

If You Have This Problem/Symptom	Try This:
Image not readable or too dark *Black & White Image:*  *Grayscale Image:* 	Move to an area with more light to take image.
Image not readable, distorted *Black & White Image:*  *Grayscale Image:* 	Hold Dolphin with Image-Capture terminal at 90 degree angle.

If You Have This Problem/Symptom	Try This:
Image not readable, cut off Black and White Image:  Grayscale Image:  	You are holding terminal too close to subject. Hold the terminal at a 90 degree angle and move it further away from the subject.
Image not readable, dirty lens *Black and White Image:*  *Grayscale Image:*  	Wipe lens with clean, lint free cloth.

If You Have This Problem/Symptom	Try This:
Image not readable; too small. *Black and White Image:*  *Grayscale Image:* 	You are holding the terminal too far away from the subject. Hold the terminal at a 90 degree angle and move it closer to the subject.
Image not readable due to reflection *Black and White Image:*  *Grayscale Image:* 	Adjust the angle at which you are holding the Dolphin terminal to avoid a reflection.

Resetting The Dolphin Terminal

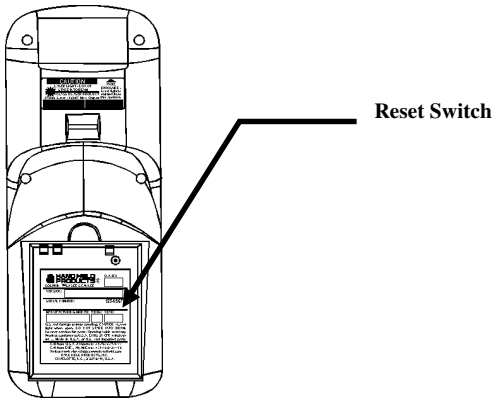
Under normal circumstances, you should not need to reset the Dolphin terminal. However, if required, you can reset the terminal with one of the following methods:

1. Perform the "Three Key Reset."

The Dolphin terminal can be reset by pressing and releasing the "SHIFT", "ON/SCAN" and "BKSP" keys. All three keys must be held down and released at the same time.

2. Press the Reset Switch.

The reset switch is located in the battery compartment of the Dolphin terminal.



Use the tip of an unfolded paper clip (or other similar blunt object) to gently press the reset switch.

Note: The recess hole for the reset switch may be covered with a small plastic cover. This cover must be removed and placed back in position after accessing the reset switch.

3. Remove the Main Battery.

If the methods described above are not successful, the Dolphin terminal may be reset by removing the main battery for an extended period of time. The terminal will reset when the Dolphin's internal backup battery is completely drained of power. This process may take up to 5 hours.

Warranty Information

Who Is Covered By The Warranty

Limited Warranty

Welch Allyn Data Collection, Inc., d/b/a Hand Held Products ("HHP") warrants its products to be free from defects in materials and workmanship and to conform to HHP's published specifications applicable to the products purchased at the time of shipment. This warranty does not cover any HHP product which is (i) improperly installed or used; (ii) damaged by accident or negligence, including failure to follow the proper maintenance, service, and cleaning schedule; or (iii) damaged as a result of (A) modification or alteration by the purchaser or other party, (B) excessive voltage or current supplied to or drawn from the interface connections, (C) static electricity or electro-static discharge, (D) operation under conditions beyond the specified operating parameters, or (E) repair or service of the product by anyone other than HHP or its authorized representatives.

This warranty shall extend from the time of shipment for the duration published by HHP for the product at the time of purchase ("Warranty Period"). Any defective product must be returned (at purchaser's expense) during the Warranty Period to HHP's factory or authorized service center for inspection. No product will be accepted by HHP without a Return Materials Authorization, which may be obtained by contacting HHP. In the event that the product is returned to HHP or its authorized service center within the Warranty Period and HHP determines to its satisfaction that the product is defective due to defects in materials or workmanship, HHP, at its sole option, will either repair or replace the product without charge, except for return shipping to HHP.

EXCEPT AS MAY BE OTHERWISE PROVIDED BY APPLICABLE LAW, THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER COVENANTS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, ORAL OR WRITTEN, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

HHP'S RESPONSIBILITY AND PURCHASER'S EXCLUSIVE REMEDY UNDER THIS WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT. IN NO EVENT SHALL HHP BE LIABLE FOR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, AND, IN NO EVENT, SHALL ANY LIABILITY OF HHP ARISING IN CONNECTION WITH ANY PRODUCT SOLD HEREUNDER

(WHETHER SUCH LIABILITY ARISES FROM A CLAIM BASED ON CONTRACT, WARRANTY, TORT, OR OTHERWISE) EXCEED THE ACTUAL AMOUNT PAID TO HHP FOR THE PRODUCT. THESE LIMITATIONS ON LIABILITY SHALL REMAIN IN FULL FORCE AND EFFECT EVEN WHEN HHP MAY HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH INJURIES, LOSSES, OR DAMAGES. SOME STATES, PROVINCES, OR COUNTRIES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

All provisions of this Limited Warranty are separate and severable, which means that if any provision is held invalid and unenforceable, such determination shall not affect the validity of enforceability of the other provisions hereof.

See table below for the limited duration of the warranty for the configuration of Dolphin 7200 or peripheral you have purchased.

Product	**Standard Factory Warranty**
Dolphin 7200 Batch Laser	1 year
Dolphin 7200 RF Laser	1 year
Dolphin 7200 Batch iButton	1 year
Dolphin 7200 Batch RS-232	1 year
Dolphin 7200-2D Batch	2 years
Standard HomeBase	1 year
Compact HomeBase	1 year

The limited duration of the warranty for batteries is one year. The battery life will be greatly increased when following the specific battery instructions in the user guide. Rechargeable batteries are highly susceptible to "battery memory" and if instructions are not followed, the amount of hours of usage and the life of the battery are greatly reduced.

Batteries returned to Hand Held Products in this reduced state may or may not be replaced under this warranty.

Hand Held Products, Inc. extends these warranties only to the first end-users of the products. These warranties are non-transferable.

How Problems Should Be Handled

Should the Dolphin terminal or HomeBase prove to be defective within the warranty period, return the product, as described in the RMA procedures below, and we will, at our option, repair or replace the product, to whatever extent HHP deems necessary to restore the product to proper operating condition, without any charge to you.

NOTE

You must have an RMA number to receive service on your product at the repair facility for North and South, Asia and the Pacific Rim.

Return Information

If you purchased the product from an Authorized Hand Held Products Reseller, contact the Reseller with the unit's serial number. Your Reseller will contact Hand Held, on your behalf, to arrange for the unit to be serviced.

If you purchased the product directly from Hand Held, or have been instructed by your Reseller to contact Hand Held directly, call the Customer Services Department in your area to request a Repair Maintenance Authorization (RMA) number. *Note: An RMA number is not needed for service at the Europe, the Middle East, Africa or United Kingdom repair facilities.*

North America:

(TEL) 1-(800)-782-4263

(FAX)+1-(704)-566-9904

Latin America

(TEL)+1-(941)-263-7600

(FAX)+1-(941)-263-9689

Europe, Middle East and Africa:

(TEL)+31-40 24 24 486

(FAX)+31-40 24 25 672

The United Kingdom:

(TEL)+44 (0) 1925 240 055

(FAX)+44 (0) 1925 245 225

Asia Pacific

(TEL) +852 2511 3050

(FAX) +852 2511 3557

You must have an RMA number to receive service from the repair facility for North and South America, Asia and the Pacific Rim. Failure to obtain an RMA number before shipping your product to this repair facility may result in the product being returned without being serviced. RMA numbers are valid for 30 days within the United States and 60 days Internationally.

When calling for service at any of our repair facilities, please be prepared to give the following information:

- Product's type and serial number
- Brief description of problem
- Dated Proof-of-Purchase

Place the product in its original packaging with a copy of your original invoice and ship the product prepaid to the appropriate address below:

North and South America, Asia, Pacific Rim

Hand Held Products
Product Service Department
7510 East Independence Blvd., #100
Charlotte, NC 28227-9411
RMA Number:_____

Europe, Middle East and Africa :

HHP Product Service Department
Hondsruglaan 87D
5628 DB Eindhoven
The Netherlands

The United Kingdom :

HHP Product Service Department
1st Floor
Dallam Court
Dallam Lane
Warrington, Cheshire WA2 7LT
United Kingdom

If your equipment is still covered under the initial end-user's product warranty, please notify the Customer Services Representative when you call. Please include a copy of

the original invoice in the package to avoid possible service delays. For your protection, we recommend you insure any equipment being sent to HHP.

After repair or replacement of the equipment, Hand Held Products will ship the product, at our cost, to your location. Non-warranty repairs will be returned, at the customer's expense, unless otherwise requested. Units currently under a service agreement will be shipped per the service agreement.

Please make note of the RMA number (if required) before shipping and the product's serial number for future reference.

How To Extend Your Warranty

Hand Held Products offers a variety of service plans on our hardware products. These agreements offer continued coverage for your equipment after the initial warranty expires. For more information, contact your Hand Held sales representative, customer account representative or the Product Service Marketing Manager or your Authorized Reseller.

Application Support

If you have a question or problem with your Dolphin terminal or Dolphin HomeBase, you can get technical assistance from Hand Held's Application Support department.

Application Support – North and South America, Asia and Pacific Rim:

(TEL) 1-(800) 782-4263
(FAX) 1-(704) 532-4191
8:30 a.m. and 5:30 p.m., Eastern Time, Monday through Friday

Application Support – Europe, Middle East and Africa :

(TEL)+31-40 24 24 486
(FAX)+31-40 24 25 672
9 a.m. – 5 p.m., Central European Time, Monday through Friday

Application Support – The United Kingdom :
(TEL) : INT+ 44 1925 240055
(FAX) : INT+ 44 1925 631280

9 a.m. – 5:30 p.m., UK Time, Monday through Friday

Appendix A Dolphin 7200 Terminal Specifications

Product	Dolphin 7200 Batch	Dolphin 7200 RF	Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200-2D
Terminal Specifications					
Case Material	Polycarbonate ABS Blend, Splash-resistant, one-piece module	Same	Same	Same	Same
Dimensions	Length: 6.85 in. (17 cm) Width: 2.63 in. (7 cm) Depth at handle: 1.62 in. (4 cm) Depth at front: 1.83 in. (5 cm)	Length: 6.85 in. (without antenna) (17 cm) Width: 2.63 in. (7 cm) Depth at handle: 1.62 in. (4 cm) Depth at front: 2.25 in. (5 cm)	Length: 6.85 in. (174 mm) Width: 2.63 in. (7 cm) Depth at handle: 1.62 in. (4 cm) Depth at front: 2.25 in. (5 cm)	Length: 7.1 in. Width: 2.63 in. (7 cm) Depth at handle: 1.62 in. (4 cm) Depth at front: 1.83 in. (5 cm)	Length: 6.85 in. (17 cm) Width: 2.63 in. (7 cm) Depth at handle: 1.62 in. (4 cm) Depth at front: 2.25 in. (5 cm)
Ergonomics	Patented shape one-handed operation; fits either hand comfortably	Same	Same	Same	Same

Product Family	Dolphin 7200 Batch	Dolphin 7200 RF	Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200-2D
Terminal Specifications (con't.)					
Weight (including battery)	12 oz (340 gm)	14.5 oz (411 gm)	12 oz (340 gm)	14 oz (397 gm)	14.3 oz. (406 gm)
Display	8 lines of 20 characters per line, 119 x 73 graphics pixels, Alpha-Numeric, scrollable, Application software controllable pixel graphics, 6 x 8 pixel matrix, Electroluminescent Backlight	Same	Same	Same	Same
Keypad	Alphanumeric keypad—36 keys; Numeric keyboard-20 keys with shifted alpha keys	Alphanumeric keypad—36 keys; Numeric keyboard-20 keys with shifted alpha keys; Terminal emulation keypad overlays for IBM 3270, IBM 5250 & DEC VT220	Same as Dolphin 7200 Batch	Same as Dolphin 7200 Batch	Same as Dolphin 7200 Batch
Communication Interface	Optical IRDA optical, max 115kbs	Same	Same	Same	Same

Product	Dolphin 7200 Batch	Dolphin 7200 RF	Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200-2D
Terminal Specifications (con't.)					
Visual Indicators	Red light is on during "Laser Scanning," Green light blinks when "Successful decode"	Same	Same	Same	Same
Audio Indicators	Internal application software controllable speaker, emits sound level of 80 dB at 10 cm.	External application software controllable speaker, emits sound level of 90 dB at 10 cm.	Same as Dolphin 7200 RF	Same as Dolphin 7200 Batch	Same as Dolphin 7200 RF
Power Specifications					
Primary	Rechargeable 3.6V 3 cell battery pack @ 1,500 mAh Length: 2.2 in. (5.6 cm) Width: 1.8 in. (4.6 cm) Depth: .0.8 (2 cm)	Same	Same	Same	Same
Backup	Internal NiHM Back-up battery retains memory & clock for up to 30 minutes	Same	Same	Same	Same
Power Management	Low-battery detection & automatic shut-off with battery voltage levels.	Same	Same	Same	Same

Product	Dolphin 7200 Batch	Dolphin 7200 RF	Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200-2D
Processing Specifications					
CPU	AMD ELAN SC310 386SX microprocessor	Same	Same	Same	Same
Memory	2 MB RAM with 8 MB non-volatile FLASH memory expandable to 16 MB	2 MB RAM with 8 MB non-volatile FLASH memory No expansion FLASH	2 MB RAM with 8 MB non-volatile FLASH memory No expansion FLASH	2 MB RAM with 8 MB non-volatile FLASH memory	2 MB RAM with 8 MB non-volatile FLASH memory No expansion FLASH

Product	Dolphin 7200 Batch	Dolphin 7200 RF	Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200-2D
Processing Specifications (con't.)					
Real Time Clock	Accurate, crystal-controlled real time clock/calendar Application software controllable time/date stamping	Same	Same	Same	Same
Operating System	GS-DOS architecture programmable with standard x86 development tools; Microsoft C/C++ libraries provided for non-PC standard functions (scan engine support, communication & power management)	Same	Same	Same	GS-DOS architecture programmable with standard x86 development tools; Microsoft C/C++ libraries provided for non-PC standard functions (image engine support, communication & power management)
Environmental Specifications					
Operating Temperature	-10 to 50°C (14 to 122°F); Operates at –20° for a short time with little loss of LCD quality	Same	Same	Same	Same
Storage Temperature	-20 to 70°C (-4 to 158°F)	Same	Same	Same	Same
Humidity	Operates in up to 95% non-condensing humidity	Same	Same	Same	Same

Product	Dolphin 7200 Batch	Dolphin 7200 RF		Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200-2D
Environmental Specifications						
Structural Integrity	Survives multiple 5 ft (1.5 m) drops to concrete Independently certified to meet IP-64 standards for moisture & particle resistance	Same		Independently certified to meet IP-54 standards for moisture & particle resistance	Same	Same
Electrical Static Discharge	15KV	Same		Same	Same	Same
Fire Retardant Rating	UL 94-VO	Same		Same	Same	Same
2.4 GHz Specifications		**WLIF**	**802.11b**			
Radio	----	Integrated WLIF/ OpenAIR	Integrated Cisco 802.11b	----	----	----
Frequency	----	2.4 to 2.4835 GHz	2.4 to 2.4835 GHz	----	----	----
Output Power	----	100mW	30mW	----	----	----

Product	Dolphin 7200 Batch	Dolphin 7200 RF		Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200-2D
2.4 Ghz Specifications (con't.)		WLIF	802.11b			
Data Rate	----	1.6 Mbps per channel in high-speed mode; 800 Kbps in back-off mode	1, 2, 5.5 and 11 Mbps	----	----	----
Modulation	----	4FSK (BFSK in back off mode)	DBPSK at 1 Mbps; DQPSK at 2Mbps; CCK at 5.5 and 11 Mbps	----	----	----
Typical Range	----	<500 ft (150 m) in offices, <1000 ft (300 m) in open spaces	1500 ft (460 m) open environment; 300 ft (90 m) office	----	----	----

Product	Dolphin 7200	Dolphin 7200 RF		Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200-2D
2.4 Ghz Specifications (con't.)		**WLIF**	**802.11b**			
Technology	----	Frequency Hopping Spread-Spectrum	Direct Sequence Spread Spectrum	----	----	----
Channels	----	15 independent	3 non-overlapping	----	----	----
Network Information		**WLIF**	**802.11b**			
Drivers	----	ODI supports major network operating systems	NDIS2, NDIS3, NDIS4, NDIS5 ODI, and Packet	----	----	----
Media Access Protocol	----	Optimized CSMA/CA	Same	----	----	----
Software	----	Standard TCP/IP Stack	Same	----	----	----

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
Bar Code Specifications					
Standard scan engine	Standard HP, scans 2 - 36" (5 - 91cm); scans in high ambient light	Same	Same	Same	-------
Optional scan engines	Long-Range (LR) Scans up to 15 ft. (4.6 ft.) with reflective labels High-Density (HD) Scans small bar codes >2 mil No Scan Engine	Same	Same	Same	--------

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
Bar code symbol types	Code 3 of 9, Interleaved 2 of 5, EAN, Codabar, Code 128, Plessey MSI, Code 11, Code 93, UPC	Same	Same	Same	**1D linear codes:** Code 3 of 9, Interleaved 2 of 5, Code 11, TLC Code 39, IATA 2 of 5, MSI, UPC A, UPC EO, UPC EI, EAN/EAN13, Codabar, Code 128, Code 93 **2D codes:** PDF417, microPDF, Maxicode, Datamatrix, Aztec, QR Code, Code 49 **Composite codes:** RSS-14, CODABLOCK, AZTEC MESA OCR codes (Optical Character Recognition): OCR A and OCR B **Postal Codes:** Postnet and most international 4 state codes, PLANET CODE, BPO 4 STATE, CANADIAN 4 STATE, DUTCH POSTAL, AUSTRALIAN 4 STATE, JAPANESE POSTAL

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200-2D
iButton Reader					
Communication Speed	----	----	----	115.2kbps	

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200-2D
Digital Camera					
CMOS Camera	----	----	-----	----	CMOS Sensor: 640 x 480 Pixel 2 to 9 in. (5 to 23 cm) operating range 256 level gray scale image Operates in range of light from outdoors to total darkness

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200 2D
4250 Image Engine					
Image Engine Options	----	----	----		Standard: (LR) scans 2 to 9 in. (5 to 23cm) High-Density (HD): scans 2 to 4 in. (5 to 12cm) Long-Range (LX): Bar code and Auto-ID symbol types **1D linear codes:** Code 3 of 9, Interleaved 2 of 5, Code 11, TLC Code 39, IATA 2 of 5, MSI, UPC A, UPC EO, UPC EI, EAN/EAN13, Codabar, Code 128, Code 93 **2D codes:** PDF417, microPDF, Maxicode, Datamatrix, Aztec, QR Code, Code 49

Product	Dolphin 7200	Dolphin 7200 RF	Dolphin 7200 RS-232	Dolphin 7200 with iButton Reader	Dolphin 7200-2D
4250 Image Engine					
Image Engine Options continued	-----	----	----	----	**Composite codes:** RSS-14, CODABLOCK, AZTEC MESA OCR codes (Optical Character Recognition): OCR A and OCR B **Postal Codes:** Postnet and most international 4 state codes, PLANET CODE, BPO 4 STATE, CANADIAN 4 STATE, DUTCH POSTAL, AUSTRALIAN 4 STATE, JAPANESE POSTAL

Appendix B Bar Code Samples

With the HHP Demo program, the Dolphin terminal is programmed to read these codes. Practice scanning each of the bar codes, and notice the LCD window after you scan each code.

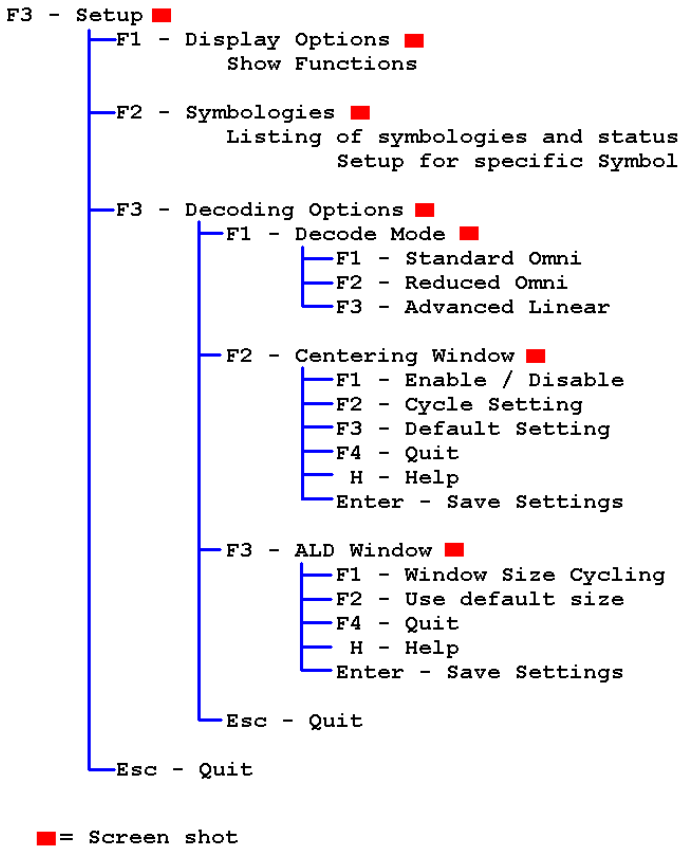
Code 39 (Code 3 of 9)

EAN (UPC variation)

UPC

Interleave 2 of 5 (I2of5)

Appendix C Dolphin 7200 2D Decoding Demo Menu Layout



The flow diagram above shows the layout of the menus available in the 2D Decoding Demo. Shown below are screen shots of the different menus listed above.

Example: Selecting ALD decoding mode.

Press F3 to get main menu screen

Press F3 to set a decoding option

Press F1 to select the desired decoding mode

Press F3 to select ALD Mode

Setup Menu

Display Options Menu

Display Options Menu

Symbologies

Configure the Dolphin 7200 for reading specific bar code symbologies as well as enabling, disabling, or defaulting all available symbologies.

Decoding Options

Decode Mode

The top of the screen will show the decode mode currently active on the Dolphin 7200 terminal. To set the mode, press:

F1 for Standard Omni – HHP's traditional search and decode routine. Gives full omni-directional decoding over the whole image area.

F2 for Reduced Omni – Uses the same search and decode method but only applies it to the center portion of the image. This makes for shorter and faster search times.

F3 for Advanced Linear Decoding – This decoding mode applies a linear search routine across the center of the image. This menu is for setting the size of the search area. ALD is the quickest search and decode routine, but only works on linear bar codes positioned horizontally in the image.

The terminal will return to the main screen after the mode is selected.

Centering Window

Press F2 for the Centering Window and the screen below will display. This is the default setting for the Centering Window function.

The Centering Window is used to keep the image engine from decoding the wrong symbol when you have several bar codes located close together. The following key presses configure this feature:

F1 – Enables or disables centering window function

F2 – Cycles the window setting through several predetermined sizes

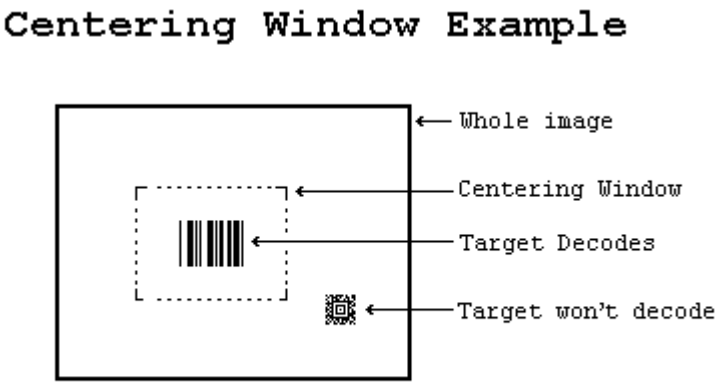
F3 -- Sets to default settings

F4 -- Quit without saving

H -- Help

ENTER -- Save settings

The decoder will only decode a target if it is inside the area defined by the Centering Window.



ALD (Advanced Linear Decoding) Window

Press F3 and the ALD window shown below will display:

ALD mode searches for linear bar codes across the middle of the image. How much of the image is searched is controlled by the window size. This mode only works on linear symbologies and only decodes them horizontally. The following key presses configure this feature:

F1 – Cycles through window sizes

F2 – Use default sizes

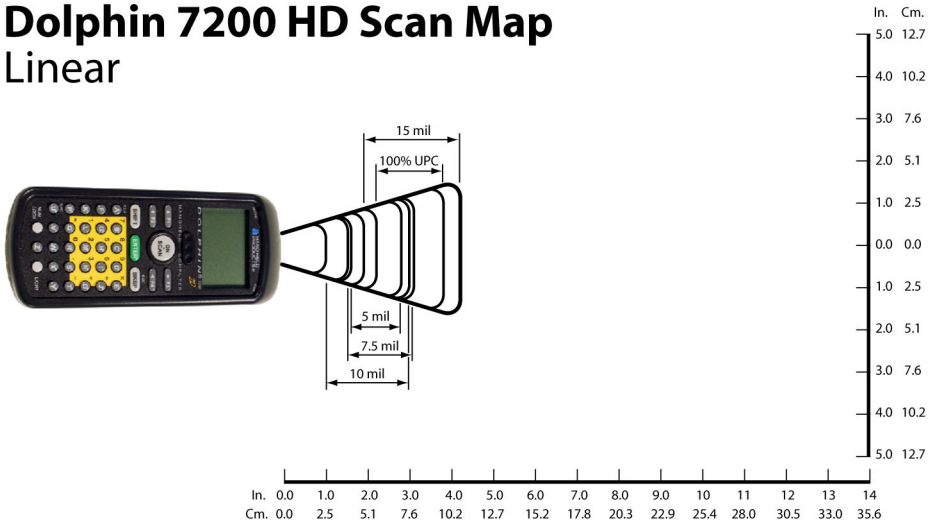
F4 – Quit without saving

H -- Help

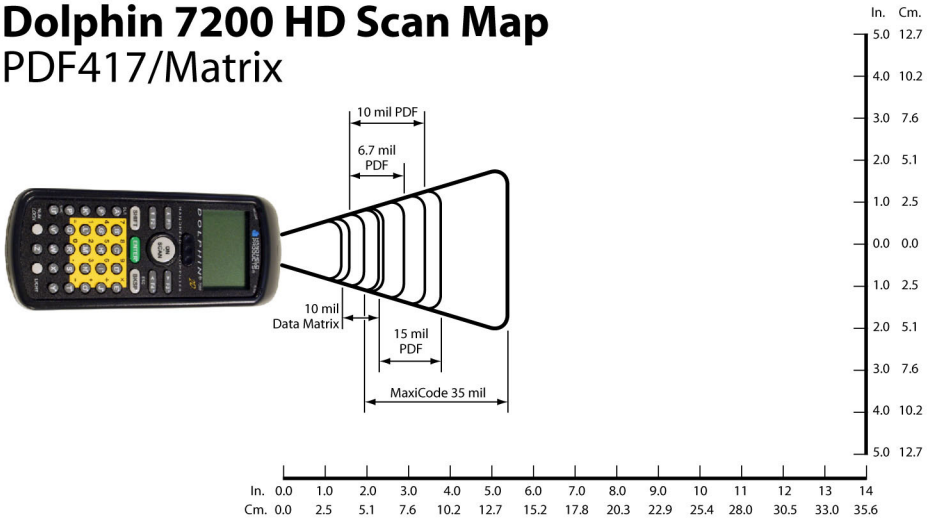
ENTER – Save settings

Appendix D Dolphin 7200 Scan Maps

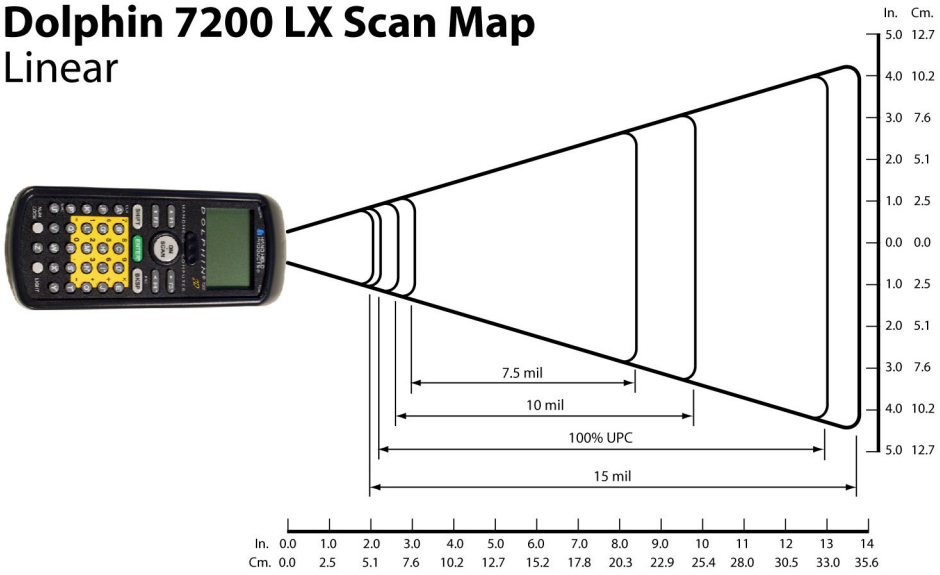
Dolphin 7200 HD Scan Map
Linear



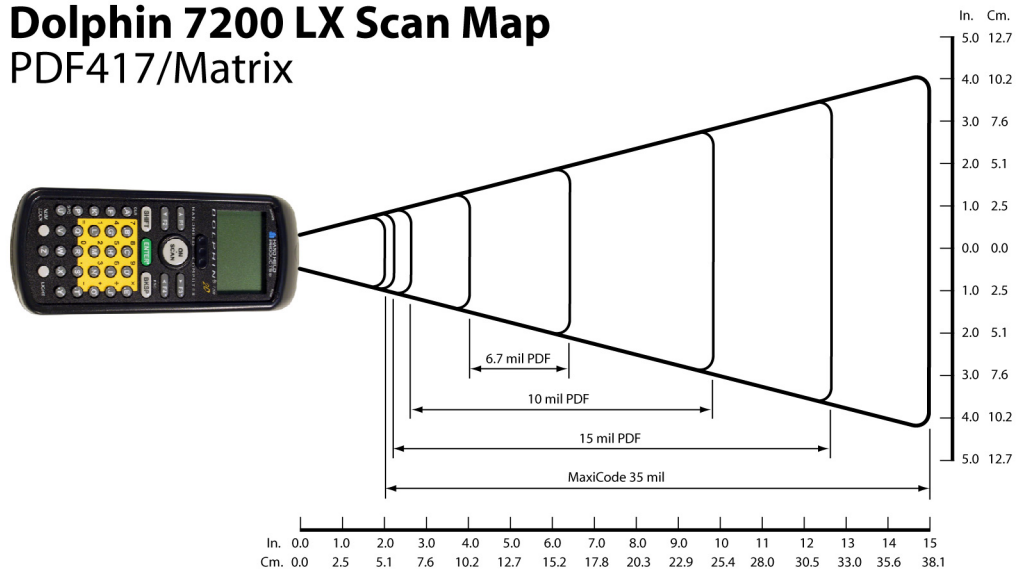
Dolphin 7200 HD Scan Map
PDF417/Matrix



Dolphin 7200 LX Scan Map
Linear



Dolphin 7200 LX Scan Map
PDF417/Matrix



Appendix E IQ Imaging Test Target

Make copies of this page to use with the Dolphin 7200-2D terminal IQ Imaging demo as described Chapter 6.

Appendix F GS-DOS Commands

The Dolphin terminal ships with General Software DOS (GS-DOS). GS-DOS is compatible with Microsoft DOS (MS-DOS) and is optimized to run in a very small amount of memory.

The following is a list of internal commands supported by GS-DOS:

HELP	BREAK	CALL
CD (CHDIR)	CLS	COPY
CTTY	DATE	DEL (ERASE)
DELAY	DIR	ECHO
EXIT	FOR	GOTO
IFMD (MKDIR)	PATH	PAUSE
PROMPT	RD (RMDIR)	REM
REBOOT	REN	SHIFT
SET	SWITCH	SYNC
TIME	TRUENAME	TYPE
VER	VERIFY	VOL

The following section describe the internal GS DOS commands in detail.

Warning: The command line functions are intended for developers only. Some commands may produce undesirable results or may not function at all. In addition, the LCD may not display the command results properly.

HELP

The **HELP** command displays a list of the commands that are supported by the command interpreter.

Syntax: ***HELP***

BREAK

The **BREAK** command changes or displays how GS DOS handles break-ins by the user with ^C and CTL-BRK key sequences. If BREAK is ON, then GS DOS will break out of a running program or batch file when the ^C or CTL-BRK keys are pressed. If BREAK is OFF, then GS DOS will not break out, but will instead pass the keys pressed to the program.

Syntax: ***BREAK [ONlOFF]***

CALL

The **CALL** command executes a pre-recorded list of commands as a subroutine.

Syntax: ***Call [d:] [pathname] [parameter1] [parameter2] [...]***

CD (CHDIR)

The **CD** command displays the current directory of the specified drive, or can change the current directory of the specified drive. If no drive is specified, then the default drive is used.

Syntax: ***CD [drive:][pathname]***

CLS

The **CLS** command clears the terminal's screen and resets the cursor position to the upper-left hand corner of the screen. The next prompt is issued on the top line of the screen.

Syntax: ***CLS***

COPY

The **COPY** command copies one or more files to a new destination. If the destination path names a file, then all of the source files are written to the target file, concatenated together.

Syntax: ***COPY [drive:]pathname [drive:]pathname***

CTTY

The **CTTY** command changes the default console device

Syntax: ***CTTY device***

Note: This command is not supported the Dolphin Terminal.

DATE

The **DATE** command displays the current date (month, day, date, and year) on the screen. If a user specifies a new date on the command line, then DATE will change the date to the one specified. This command updates the battery-maintained clock so that the new date will be remembered across power-downs.

Syntax: ***DATE [mon-dd-yyyy]***

DEL (ERASE or ERA)

The **DEL** command deletes one or more files from a file system on a specific drive. If the specified path is a directory, all files in that directory will be deleted. If the path contains wildcards, then all files that match the wildcard specification will be deleted.

Syntax: ***DEL [drive:]pathname***

DELAY

The **DELAY** command delays a batch file for a specified amount of time.

Syntax: ***DELAY seconds***

DIR

The **DIR** command displays the files and sub-directories in a directory on the specified drive. If the drive is not specified, then the default drive is assumed. DIR uses the path operand to determine which files to list. If the path is not specified, then the current directory is assumed. If the specified path is a directory name, then all files in that directory are listed. If the specified path is a wildcard filename, then all files matching the path specification are listed.

Syntax: ***DIR [drive:][path] [wildcard-filename]***

ECHO

The **ECHO** command has two functions; namely, control of the ECHO flag, and displaying messages in batch files. ECHO mode controls the command processor's echoing of commands in batch files. If ECHO mode is on, then commands read from batch files are automatically echoed to the screen before they are executed. If ECHO mode is off, then commands are not echoed as they are executed. To display the current ECHO flag status, use the ECHO command without any parameters. To display a message from a batch file, use the ECHO command with a non-empty string to be displayed. The special form of the ECHO command with a period (".") immediately following the word ECHO (no intervening space) causes a blank line to be echoed.

*Syntax: **ECHO [ONlOFFlstring]***

EXIT

The **EXIT** command terminates the current command shell and reverts control to the previous shell, provided that the current command shell is not the first one loaded in the system. The very first shell cannot be terminated with EXIT. If executed from a batch file, EXIT will terminate the batch file in a controlled manner causing control to be transferred to the keyboard user.

*Syntax: **EXIT***

GOTO

The **GOTO** command causes the command processor to start executing commands that follow the specified label, in the current batch file. Labels can be inserted anywhere in batch files, and take the following form: ": label".

Syntax: **GOTO label**

IF

The **IF** command causes a command to be executed if (or if NOT) a condition is TRUE.

*Syntax: **IF [NOT] ERRORLEVEL n statement***

IF [NOT] EXIST filename statement

MD (MKDIR)

The **MD** command creates a subdirectory in the root directory or a subdirectory. By using the MKDIR command, tree-structured file systems can be created. If a drive is specified, then the directory is created on the specified drive. Otherwise, it is created on the default drive.

Syntax: ***MD [drive:]path***

PATH

The **PATH** command displays or changes the current search path that is used by the command processor, COMMAND.COM, to locate user programs and batch files. If no pathlist parameter is specified, then the current path is displayed. If a pathlist parameter is specified, then the path will be changed to the one specified.

Syntax: ***PATH [path1[;path2][;path3][;...]***

PAUSE

The **PAUSE** command is typically used in batch files to suspend execution of the batch file, print a message on the screen, and wait for the user to press a key after some action has been performed. PAUSE displays the following message on the screen before accepting a keypress from the user, "Strike any key when ready".

Syntax: ***PAUSE***

PROMPT

The **PROMPT** command maintains the PROMPT environment variable that is used by COMMAND.COM to display something before the user is asked to type-in a command.

The default PROMPT variable is ng. This has the effect of showing the current drive letter followed by a "greater-than" sign:

Syntax: ***PROMPT string***

RD (RMDIR)

The **RD** command removes a subdirectory from a root directory or of a subdirectory. This command can only be used to delete directories, and cannot be used to delete files, even if they are inside the directory to be removed. Conversely, the DEL command cannot delete directories; only the files they contain. If a drive is specified, then the directory on the specified drive is removed. Otherwise, the default drive is assumed.

Syntax: ***RD [drive:]path***

REM

The **REM** command provides a simple way of entering a free-form comment in a batch file. The line starting with REM has no effect on the execution of the batch file.

Syntax: ***REM any comment***

REBOOT

The **REBOOT** command will reset the terminal.

Syntax: ***REBOOT***

REN

The **REN** command renames a file or group of files. Files cannot be moved in the directory structure with this command; instead, only their filenames are altered within the directory in which they reside. Wildcards may be used in the second pathname to indicate that the characters in that component of the first filename are to be kept as-is.

Syntax: ***REN [drive:][path]filespec filespec***

SHIFT

The **SHIFT** command allows access to multiple batch file arguments. The command shifts the contents of the 9 batch file arguments so that %2 is copies into %1, %3 is copies into %2 and so on.

Syntax: ***SHIFT***

SET

The **SET** command displays the entire environment space (one variable per line), or changes the assignment of one variable in the environment space. If no operands are specified, then the SET command simply displays all of the environment variables in the environment space. If a variable name and an equal sign is given, but no string is specified, then the variable name is removed from the environment space. If the string is specified, then the previous definition of the variable is deleted, and the new one is installed in the environment.

Syntax: ***SET [keyword=[string]]***

SHIFT

Displays or changes the optional switch character.

Syntax: ***SWITCH [character]***

SYNC

The **SYNC** command provides a synchronization checkpoint feature that enables a batch file to flush the file system's buffers to disk before doing something that might otherwise cause a disorderly shutdown

Syntax: ***SYNC***

TIME

The **TIME** command displays or changes the system time. If no parameter is specified, then the current system time is displayed, and the user is queried for the new system time. If the user just presses the ENTER key, the system time is not changed. If the user enters a new time, then the system's real-time-clock is updated.

Syntax: ***TIME [hh:mm:ss[.hh]]***

TRUENAME

The **TRUENAME** command displays the true name and path of a file.

Syntax: ***TRUENAME file***

TYPE

The **TYPE** command copies the contents of the specified file to standard output (usually, the screen). If the drive letter is not specified, then the default drive is assumed.

Syntax: ***TYPE [drive:][path]filespec***

VER

The **VER** command displays the MS-DOS emulation version number, as well as the version of the Embedded DOS-ROM operating system that is running.

Syntax: ***VER***

VERIFY

The **VERIFY** command changes or displays how GS DOS handles I/O to disk files and directory structures. If VERIFY is ON, then Embedded DOS-ROM verifies immediately that disk I/O is completed successfully before telling the user that it was. This is accomplished by writing data directly to disk, without temporarily storing it in a file system or disk driver cache. If VERIFY is OFF, then GS DOS caches writes to files and defers the actual writing to disk, enabling multiple writes to the same sectors to be served much faster. The cache is automatically written to disk in the background during "dead time", when the disk is not busy. This is accomplished with the multitasking threads and semaphores that the GS DOS kernel supports.

Syntax: ***VERIFY [ONIOFF]***

VOL

The **VOL** command displays the volume label of a diskette or a hard disk. VOL does not allow the user to change the volume label. If the drive letter is not specified, then the default drive is assumed.

Syntax: ***VOL [drive:]***

Appendix G Declarations of Conformity

Declaration of Conformity

EC declaration of conformity for the following:
89/336/EEC EMC Directive
73/23/EEC Low Voltage Directive as amended by 93/68/EEC

1. Product Identification

Product name	: Dolphin 1 Terminal and Homebase
Line of business	: Auto ID
Model/type	: N/A
Version	: N/A
Additional information	: This Product was tested with the following: Dolphin 1 Terminal Bar Code Scanner Dolphin 1 Homebase

2. Manufacturer

Name	: Hand Held Products, Inc.
Address	: 7510 E. Independence Blvd. #100 Charlotte, North Carolina 28227-9411
Country	: United States Of America
Authorized by manufacturer	: Corporate Body: Trading as: Fleuri Kets V B.V. Hand Held Products Europe Kaatsheuvel Hondsruglaan 87d The Netherlands 5628 DB Eindhoven The Netherlands

3. Test lab

Name	: Instrument Specialties
Address	: Delaware Water Gap, Pennsylvania 18327-0136
Country	: United States of America

4. Applied standards

Name/numbers	:ITE Emissions	EN 55022
	:Generic Immunity for Res./Comm./Lt. Ind.	EN 50082-1
	:Electrostatic Discharge Immunity	IEC 1000-4-2
	:Radiated EMI Field Immunity (IEC 801-3)	IEC 1000-4-3
	:Fast Transient / Burst Immunity	IEC 1000-4-4

5. Test report

Name/number	:ITE Emissions	45889
	:Generic Immunity for Res./Comm./Lt. Industrial	45889
	:Electrostatic Discharge Immunity 45889	
	:Radiated EMI Field Immunity (IEC 801-3)	45889
	:Fast Transient / Burst Immunity 45889	

6. Declaration

We, mentioned at point 2, declare on our own full responsibility that the product mentioned at point 1 complies with the directive 89/336/EEC. This is based upon testing of a sample of the product mentioned at point 1, performed by the test lab mentioned at point 3, according to the harmonized standards corresponding to article 10 (1) of the directive 89/336/EEC. These standards are mentioned at point 4. The results of the tests are given in the report mentioned at point 5.

7. Authentication

Signature in behalf of authorized company mentioned at point 2 :

Signature On File

J.H. Cottrell Jr., Managing Director, Hand Held Products Europe

Date : _____ Place : _____

Declaration of Conformity
EC declaration of conformity for the following:
89/336/EEC EMC Directive
73/23/EEC Low Voltage Directive as amended by 93/68/EEC

1. Product Identification

Product Name	: Dolphin RF 2.4 GHz Portable Data Collection Terminal
Line of Business	: Auto ID
Model/Type	: N/A
Version	: N/A
Additional Information	: This product was tested with the following: Dolphin I Homebase.

2. Manufacturer

Name	: Hand Held Products. Inc.
Address	: 7510 East Independence Blvd. Charlotte, North Carolina 28227-9411
Country	: United States of America

Authorized by Manufacturer : Corporate Body: Trading As:

Fleuri Kets V B.V.	Hand Held Products Europe
Kaatsheuvel	Hondsruglaan 87d
The Netherlands	5628 DB Eindhoven
	The Netherlands

3. Test Labs

Name	: Teleficaton BV
Address	: Utrechtseweg 310
Country	: The Netherlands

Name	: SGS US Testing Company Inc
Address	: 291 Fairfield Avenue
Country	: Fairfield, NJ 07004 USA

4. Applied Standards

Name/Numbers

: ITE Emissions	EN 55022:1995
: Electromagnetic Immunity for Res,/Comm./Lt. Industrial Including:	ETS 300 826:1997
: Electrostatic Discharge Immunity	EN 61000-4-2:1995
: Radiated EMI Field Immunity	EN 61000-4-3:1996
: Fast Transient / Burst Immunity	EN 61000-4-4:1995
: Conducted RF Immunity	EN 61000-4-6:1996
: Safety of Information Technology Equipment, Including Electrical Business Equipment (LVD)	EN 60950:1992

Declaration of Conformity
EC declaration of conformity for the following:
89/336/EEC EMC Directive
73/23/EEC Low Voltage Directive as amended by 93/68/EEC

5. Test Report

Name/Number : Telefication
: ITE Emissions 98302120
: Electromagnetic Immunity for Res./
Comm,/Lt. Ind. (as listed above): 98302120

: SGS
: LVD Compliance U0212

6. Type Approval Certifications

Country/Approval Number

: FCC/USA	: HD5RFDolphin-1
: Canada	: 16931021078A
: Netherlands, UK, Austria	: NL98062970
: Germany	: D800372K
: Switzerland	: 98.0517.L.P
: Denmark	: CEPT/RLAN/DK/9817
: Norway	: CEPT/RLAN N NO98000529-R
: Sweden	: Ue980117
: Belgium	: RTT/RL/X070
: Italy	: DGPGF/4/2/334473/2590/061098
: Hungary	: 1705-2/99
: Greece	: CEPT-RLAN-GR.YME TA 164
: Ireland	: IRL TRA 24/5/242/1
: Spain	: E/D.G.Tel./08/99/0221
: France	: 980321PPO

7. Declaration

We, mentioned at point 2, declare on our own full responsibility that the product mentioned at point 1 complies with the directive 89/336/EEC and 73/23/EEC as amended by 93/68/EEC. This based upon testing of a sample of the product mentioned at point 1, performed by the test labs mentioned at point 3, according to the harmonized standards corresponding to article 10 (1) of the directive 89/336/EEC and to 73/23/EEC as amended by 93/68/EEC. These standards are mentioned at point 4. The results of the tests are given in the reports mentioned at point 5.

8. Authentication

Signature on behalf of authorized
Company mentioned at point 2:

Signature on file

J.H. Cottrell Jr., Managing Director, Hand Held Products, Europe

Date : October 27th , 1998 Place: North Carolina, USA