

EXHIBIT 7
INSTRUCTION MANUAL

7.0 **Instruction Manual**

Hand Held Products, Inc.
Dolphin™ RF Terminal
User's Guide

Release 970808

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User's Guide

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This equipment has been tested and found to comply with the limits for a Class B 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:

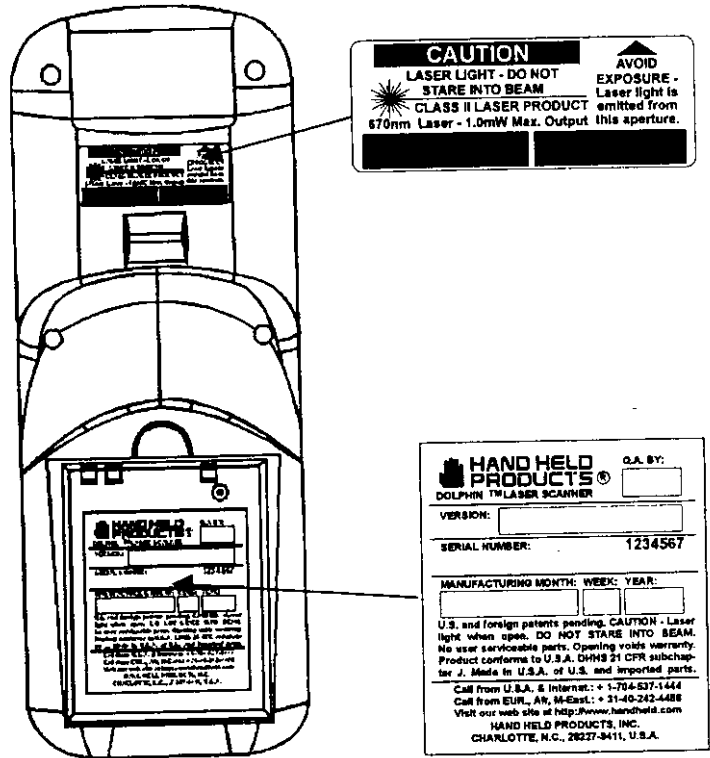
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canadian Equipment Identification Statement

This Class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique numérique de la classes A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

The Dolphin utilizes 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, the user should avoid direct eye exposure. The following are required safety labels as they should appear on the Dolphin.



CAUTION: Use of controls, adjustments, or performance of procedures other than those specified herein may result in hazardous light exposure.

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Chapter 1

Introduction

Congratulations! You have selected the first, pocket-sized laser scanner for true, single-handed operation. The Dolphin's unique patented shape sets it apart from the competition.

Overview

Dolphin™ RF incorporates the RANGELAN2 6330 Micro-ISA Module, a small, high-performance wireless LAN module that integrates sophisticated wireless LAN networking capabilities into the Dolphin™. With its high-performance 1.6 Mbps data rate and low power consumption, it is especially well suited for mobile data applications.

Dolphin RF includes a 2.4 GHz frequency hopping spread spectrum radio and network controller in a compact single-piece package optimized for mobility, performance and range.

Powerful Wireless Networking

Dolphin RF offers the best combination of performance, range and mobility.

Performance

With a data rate of 1.6 Mbps, expandable to 24 Mbps system-wide, Dolphin RF provides the fastest frequency hopping spread spectrum solution commercially available.

Range

Dolphin RF offers a range of up to 500 feet indoors and 1000 feet in open spaces.

Mobility

Dolphin RF's power management provides very low power consumption, thus reducing battery consumption, allowing users to stay on the move longer. Seamless roaming allows users to roam

transparently between access points, thus providing full building or campus coverage.

Compatibility and Interoperable Networks

Dolphin RF is compatible with all of Proxim's RANGELAN2 products and all WLIF-compliant products. OEMs can leverage Proxim's other network components to expand their network capabilities.

Chapter 2 Getting Started

This section will give you the basic information you need to operate the Dolphin Terminal.

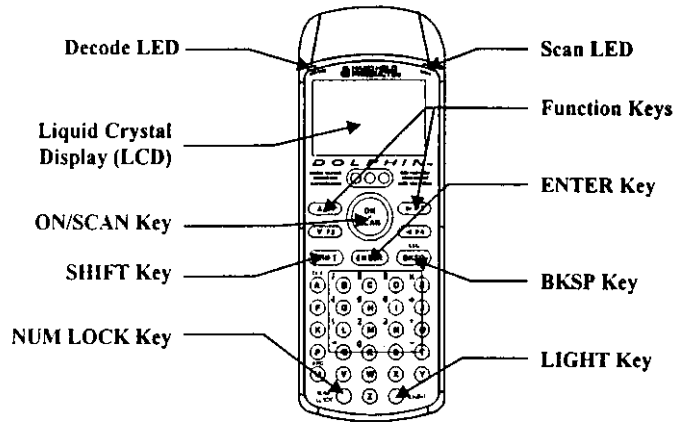


Figure 1: Dolphin Terminal (front view)

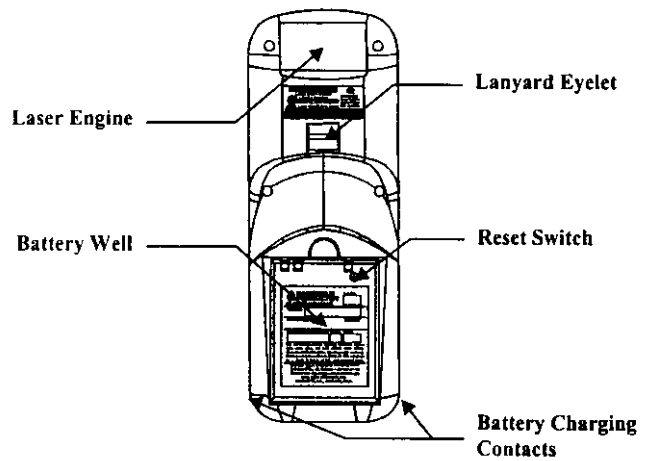


Figure 2: Dolphin Terminal (rear view)

Charging The Dolphin Batteries

Before using the Dolphin Terminal for the first time, you will need to charge the Dolphin Terminal's main and backup batteries for a minimum of four hours.

The Dolphins terminals main battery can be charged in either the Dolphin Terminal or in the Dolphin HomeBase's auxiliary battery well. The Dolphin Terminal's internal backup battery is charged, over time, by the Dolphin's main battery or via the HomeBase.

1. Setup and apply power to the Dolphin HomeBase. See the Dolphin HomeBase documentation for details.
2. Insert the battery pack into the Dolphin Terminal.
3. Place the Dolphin Terminal into the HomeBase. If the Dolphin Terminal is properly seated, the "CHARGING MAINBATT" LED will be illuminated. If the "CHARGING MAINBATT" LED is not illuminated, remove and reinsert the Dolphin Terminal into the HomeBase.

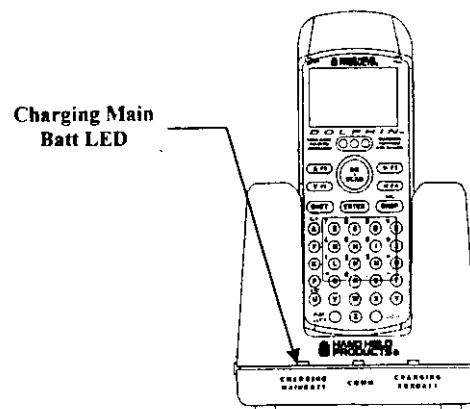


Figure 3: Charging Main Battery LED

Note: The "CHARGING MAINBATT" LED is used only to indicate that the Dolphin Terminal is properly seated and charging the main battery. The LED will not change colors to indicate when the charge is complete.

Inserting And Removing The Battery Pack

Removing the Battery Pack

Push the locking tab on the battery pack away from the laser engine end of the Dolphin Terminal and pull up.

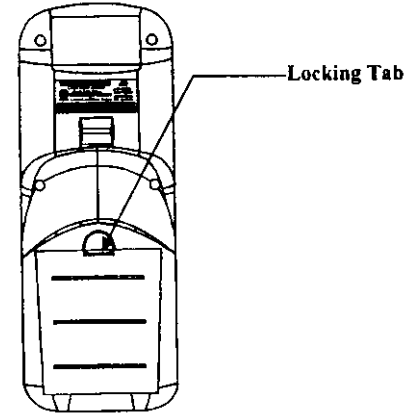


Figure 4: Removing The Battery Access Cover

Re-Inserting the Battery Pack

Place the end of the battery with the electrical contacts into the well first. Press down until the battery pack snaps into place.

Turning The Dolphin Terminal On

1. Hold the Dolphin Terminal in the palm of your hand so that you can press the ON/SCAN key easily with your thumb.
2. If the LCD is blank, press the ON/SCAN key to turn the unit on. You should see a message on the LCD similar to this:



Figure 5: Demo Program

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

Scanning A Bar Code

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

Hold the Dolphin Terminal 2 inches in front of the sample bar code. Press the ON/SCAN key to begin scanning. Pull the Dolphin Terminal back until the unit gets a good read. The Dolphin Terminal will "beep" and the laser will turn off when a good read is obtained.



Figure 6: Sample Bar Code

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

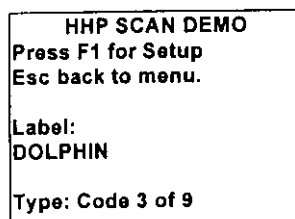


Figure 7: Demo Program after scan

Turning The Dolphin Terminal Off

The Dolphin Terminal is never really turned off. Instead the terminal is placed into a very low power mode. The Dolphin Terminal can be placed in sleep mode by an application or the Operating System.

Pressing ESC (accessed by pressing "SHIFT" then "BKSP") while in the HHP Scan Demo will place the Dolphin Terminal in Sleep mode.

Note: The Dolphin Terminal can not be turned off while it is the HomeBase. Power is required to monitor and manage battery charging.

Chapter 3

Dolphin Terminal Features

Dolphin's Internal Features

CPU

The Dolphin Terminal's system architecture is based on the AMD SC310 Elan. This single chip solution provides many of the features of a complete PC including, an Intel 386 compatible processor, memory controller, Built-in real time clock, two serial ports, standard counter timer, DMA, interrupt, and keyboard controller.

Memory

The Dolphin Terminal's memory is divided into three sections, System FLASH , Execution RAM, and FLASH Disk data storage.

- **System FLASH**
The System FLASH area is used for DOS, BIOS, bootstrap loader and other system specific functions. The System FLASH area is 256KB and is not upgradable. The System FLASH emulates a floppy disk or Drive A:.
- **FLASH Disk**
The FLASH Disk is a virtual hard drive used for program and data storage. The Dolphin includes 512K of base FLASH Disk data storage. Additional FLASH memory can be added via a FLASH expansion module. The base 512K FLASH Disk appears as Virtual Hard Drive C:. The expansion module appears as Virtual Hard Drive D:.
- **Execution RAM**
The Execution RAM is where terminal applications are executed. DOS utilizes a portion of this memory for drivers and other operating system overhead. The Dolphin includes 512K of base Execution RAM. The Dolphin can be

manufactured with up to 2MB of Execution RAM. This option is available only by a special order.

Backup Battery

The Dolphin Terminal has an internal backup battery. This allows the main battery pack to be replaced without loss of data. The backup battery allows RAM data to be retained, and the real-time clock to remain valid for up to 30 minutes when the battery pack is removed.

The Dolphin Terminal's internal battery is charged by the Dolphin Terminal's main battery or the Dolphin HomeBase. If the Dolphin Terminal is left without a main battery (or out of the HomeBase) for an extended period of time (over 30 minutes), the internal battery will need time to recharge. If the backup battery has been discharged allow the internal backup battery to charge by inserting the Dolphin Terminal into the HomeBase or by installing a fully charged battery for 4-8 hours.

Note: Your data and programs on the FLASH Disk (C: and D: drives) remain safe even if the backup battery drains completely. If the Backup Battery discharges you will need to reset the real time clock. Use the DOS Time and Date function to set the correct time and date.

Dolphin's Front Panel Features

Alphanumeric Dolphin

This section describes the external features on the front panel of the Alphanumeric Dolphin Terminal.

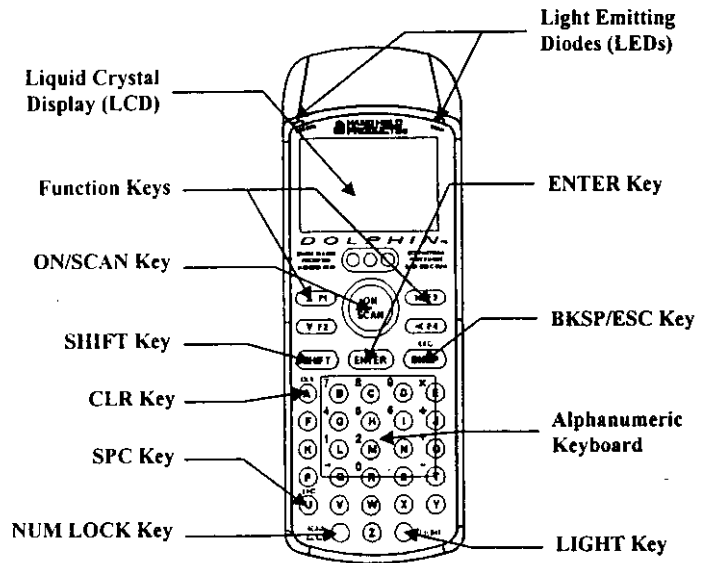


Figure 8: Alphanumeric Dolphin Front Panel

ON/SCAN Key

The ON/SCAN key is located on the front of the Dolphin Terminal. The ON/SCAN key is used to "wake up" the Dolphin Terminal from its "sleep mode", or to scan a bar code in an application. To conserve power, the Dolphin Terminal goes into a "sleep mode" when it has not been used for a programmed period of time as defined by your application.

Light Emitting Diodes (LEDs)

The green LED is located near the upper left corner of the LCD display and is labeled 'DECODE'. This LED is illuminated when the bar code software successfully decodes a bar code.

The red LED is located near the upper right corner of the LCD display and is labeled 'SCAN'. This LED is illuminated when the laser in the scan engine is on.

Alphanumeric Keyboard

The keyboard of the Alphanumeric Dolphin Terminal consists of 36 conductive rubber keys. The keyboard is splash-resistant. The yellow background on the keyboard marks the numeric keys and special characters. The numeric keys are activated by either pressing the SHIFT key, NUM LOCK key or through programming.

ENTER Key

The ENTER key performs the same function as the RETURN or ENTER key on a computer keyboard. When pressed, it signals the acceptance of key entered data. As with most other keys, the ENTER key function can be defined through software programming.

Liquid Crystal Display (LCD)

The LCD display consists of 8 rows with 20 character positions per row and Electroluminescence Backlight capability. The backlight and contrast are software controlled.

SHIFT Key

The SHIFT key is used to temporarily switch from alphabetic mode to numeric mode, and vice-versa. The SHIFT key only affects the key typed immediately after the SHIFT key is pressed. Therefore, when typing in alphabetic characters, simply press the SHIFT key to enter a number or special character. When typing in numeric mode, simply press the SHIFT key to enter an alphabetic characters.

The function of the SHIFT key can be defined through software programming. For example, the Dolphin Terminal can be

programmed to automatically activate the SHIFT key before a number is entered. This eliminates the extra step of pressing the SHIFT key before entering a number.

NUM LOCK Key

The NUM LOCK key is used to switch from alphabetic mode to numeric mode, and vice-versa. Therefore, when typing in alphabetic characters, simply press the NUM LOCK key to begin entering numbers or special characters. And, when typing in numeric mode, simply press the NUM LOCK key to begin entering alphabetic characters.

BKSP/ESC Key

While in alphabetic or numeric mode, the BKSP key causes the cursor to move backward each time the key is pressed. As the cursor moves across a character, it deletes that character. Pressing SHIFT BKSP while in alphabetic or numeric mode will perform an ESCAPE function (Note the abbreviation ESC above the BKSP key).

SPC

The SPC function is accessed by typing SHIFT U (Note the abbreviation SPC above the U key). The SPC function moves the cursor forward one character position at a time.

CLR

The CLEAR function is accessed by pressing SHIFT A (Note the abbreviation CLR above the A key). The CLR function will erase the line of data just entered, if the ENTER key has not yet been pressed.

Note: This function is application specific and is not available at the DOS prompt.

Function Keys

On either side of the ON/SCAN key, there are four keys marked F1, F2, F3, and F4. These are the function keys. These keys can be programmed for any application you choose. For example, the F1 key can be programmed to represent a "YES" response. Any time a "YES" response is required by the application that is

running, you would simply press the F1 key. In addition the function keys can be programmed to scroll through text or move the cursor between fields. The direction of movement is indicated by the arrows on the function keys.

LIGHT Key

The Light key toggles the LCD backlight on and off. The LCD backlight allows the display to be viewed in low light conditions. To conserve power, the backlight is automatically turned off after 30 seconds. The backlight can be turned on and off by the application software.

Special Characters

The following table outlines the shifted function of keys not defined on the Dolphin Terminal keypad silk screen.

Standard Function	Shifted Function	Standard Function	Shifted Function
f	#	x	!
k	@	y	\
p	&	z	:
v	\$	x (shift E)	*
W	%	+	/

Figure 9: Special Characters

Numeric Dolphin

This section describes the external features on the front panel of the Numeric Dolphin Terminal.

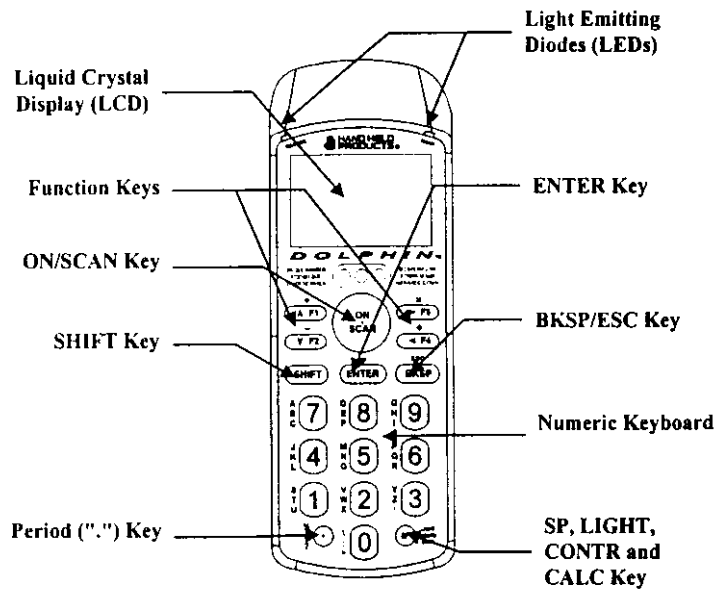


Figure 10: Numeric Dolphin Front Panel

ON/SCAN Key

The ON/SCAN key is located on the front of the Dolphin Terminal. The ON/SCAN key is used to "wake up" the Dolphin Terminal from its "sleep mode" or to scan a bar code in an application. To conserve power, the Dolphin Terminal goes into "sleep mode" when it has not been used for a programmed period of time as defined by your application.

Light Emitting Diodes (LEDs)

The green LED is located near the upper left corner of the LCD display and is labeled 'DECODE'. This LED is illuminated when the bar code software successfully decodes a bar code.

The red LED is located near the upper right corner of the LCD display and is labeled 'SCAN'. This LED is illuminated when the laser in the scan engine is on.

Numeric Keyboard

The keyboard of the Numeric Dolphin Terminal consists of 20 conductive rubber keys. The Alpha characters and symbols are accessed using the SHIFT key or through programming.

ENTER Key

The ENTER key performs the same function as the RETURN or ENTER key on a computer keyboard. When pressed, it signals the acceptance of key entered data. As with most other keys, the ENTER key function can be defined through software programming.

Liquid Crystal Display (LCD)

The LCD display consists of 8 rows with 20 character positions per row and Electroluminescence Backlight capability. The backlight and contrast are software controlled.

SHIFT Key

The SHIFT key is used to switch from Numeric mode to Alpha mode, and vice-versa. Each of the Numeric keys has three shifted letters, symbols or functions listed next to it. The shifted letters are accessed by placing the terminal in Alpha mode and then pressing the numeric key next to the desired letter. To display the first shifted letter, press the key once. To display the second shifted letter, press the key twice within one second. To display third shifted letter, press the key three times within one second. If you make a mistake or did not press the key quickly enough, just press the BKSP key and reenter the data.

BKSP/ESC Key

While in numeric mode, the BKSP key causes the cursor to move backward each time the key is pressed. As the cursor moves across a character, it deletes that character. Pressing SHIFT BKSP while perform an ESCAPE function (Note the abbreviation ESC above the BKSP key).

Function Keys

On either side of the ON/SCAN key, there are four keys marked F1, F2, F3, and F4. These are the function keys. These keys can be programmed for any application you choose. For example, the F1 key can be programmed to represent a "YES" response. Any time a "YES" response is required by the application that is running, you would simply press the F1 key. In addition the function keys can be programmed to scroll through text or move the cursor between fields. The direction of movement is indicated by the arrows on the function keys.

SP

The SP function moves the cursor forward one character position at a time. The SP key has three shifted functions, LIGHT, CONTR and CALC. See below for details on the shifted functions.

LIGHT Function

The LIGHT function is accessed by placing the terminal in Alpha mode and pressing the SP key one time. The Light key toggles the LCD backlight on and off. The LCD backlight allows the displayed to be viewed in low light conditions. To conserve power, the backlight is automatically turned off after 30 seconds. The backlight can be turned on and off by the application software.

CONTR Function

The Control Menu or CONTR function is accessed by placing the terminal in Alpha mode and pressing the SP key two times.

Currently, The CONTR function will load a utility to adjust the LCD contrast. Other function may be added at a latter date. To adjust the Contrast, Use the up and down cursor keys (F1 and F2) to adjust the contrast. Press the BKSP/ESC key when the contrast is adjusted properly.

CALC Function

The CALC function is undefined. The CALC function can be used by a custom application to load a calculator utility.

Dolphin's Back Panel Features

This section describes the external features on the back of the Dolphin Terminal. The Alphanumeric and Numeric Dolphin have identical Back Panel features.

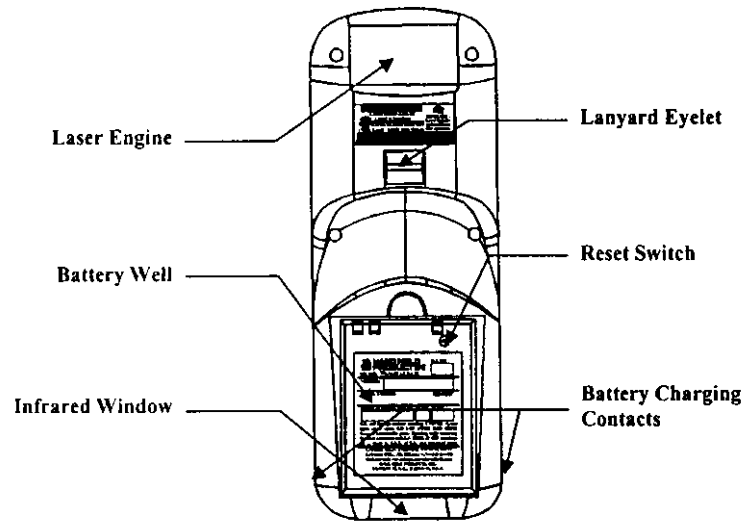


Figure 11: Dolphin Terminal Back Panel

Laser Engine

The Dolphin uses a laser to read bar codes. The laser engine converts reflected light into a digital pattern that represents the bar code data. An exit window is placed in front of the Laser engine in order to keep out dust and dirt.

Note: The Dolphin Terminal is also available in a version with Long Range, High Density and without the Laser engine. Call your HHP representative for details.

Battery Charging Contacts

When the Dolphin Terminal is placed inside the main well of the Dolphin HomeBase, the HomeBase charges the Dolphin Terminal battery pack through these contacts.

Lanyard Eyelet

On the back of the Dolphin Terminal is a lanyard eyelet. With a lanyard attached to the eyelet, the Dolphin Terminal can be secured around a wrist, hooked to a belt, secured to a specific location.

Battery Well

The battery well is the recessed area on the back of the Dolphin Terminal which holds the 3.6V Battery Pack.

Infrared Window

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

Reset Switch

Under normal circumstances, you will never need to reset your Dolphin Terminal. However, a reset switch has been provided in case you need to reset the Dolphin Terminal. The reset switch is located inside the Dolphin Terminal and is accessible through a small hole using a paper clip.

Note: The recess hole for the reset switch may be covered with a small plastic cover. This cover must be removed to allow access to the reset switch.

Chapter 4

Dolphin Accessories

The Dolphin Terminal is fully expandable. Hand Held Products offers a number of accessories to customize your data collection system.

Dolphin HomeBase

The Dolphin HomeBase offers the following features:

- RS-232 communications
- Intelligent charging for NiCad and NiMH batteries
- Spare battery well for charging a second battery
- Deep cycling feature for NiCad batteries
- Network capable versions

Extra 3.6V Battery Pack

The Dolphin Terminal uses one 3.6-Volt battery pack for power. The following types of battery packs are available for use with the Dolphin Terminal:

- 3.6 Volt industrial grade NiCad battery pack. This battery pack is rechargeable and gives approximately 600maH of service per charge (approximately 4,000 scans at 1 scan every 6 seconds).
- 3.6 Volt industrial grade NiMH battery pack. This battery pack is rechargeable and gives approximately 1200maH of service per charge (approximately 8,000 scans at 1 scan every 6 seconds).

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

Memory Expansion

The Dolphin Terminal comes with 512K or 2MB of execution RAM and 512K of FLASH Data Storage. FLASH Data Storage is upgradable to 8.5MB.

Chapter 5

Communications

The Dolphin Terminal and Dolphin HomeBase support RS-232 communications through the DB9 connector on the side of the HomeBase. The HomeBase translates the RS232 signals from the host computer into infrared signals to communicate with the Dolphin Terminal.

Dolphin HomeBase

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.

To communicate with the Dolphin Terminal via the HomeBase:

1. Set up the HomeBase by following the procedures described in the Dolphin HomeBase User's Guide.
2. Insert the Dolphin Terminal into the HomeBase.

If the Dolphin Terminal is properly seated in the HomeBase, the "CHARGING MAINBATT" LED on the HomeBase will be solid green. The status of the other LEDs on the HomeBase will vary depending on the charge status of the battery in the HomeBase.

3. Follow the sequence for data transfer as described by the software developer.

For more information on cables, see the chart in the following section. For more information on the HomeBase consult the Dolphin HomeBase User's Guide.

Cable Configuration

The Dolphin HomeBase is configured as a DCE device. If you are making your own serial cable, the following chart shows the cable configuration for communicating with several different RS-232 devices.

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
4 (DTR)	4	20	6
5 (SG)	5	7	7
6 (DSR)	6	6	20
7 (RTS)	7	4	5
8 (CTS)	8	5	4

Figure 12: Connections Between DCE Device And Other Devices

Protocols/Baud Rate

The Dolphin Terminal Boot Loader uses XMODEM protocol to load the ROM image into FLASH. Any communications protocol used by the application program is left up to the software developer. The Dolphin Terminal does support hardware flow control.

The following baud rates are supported, and can be selected through application programming:

1200, 2400, 4800, 9600, 19200, 38400, and 57600 baud.

Chapter 6

Troubleshooting

The Dolphin Terminal was designed to provide years of trouble-free use. In the event that something does go wrong with the Dolphin Terminal, take a look at the list of symptoms and solutions listed below. If the problem isn't listed in this chapter, contact your Reseller or Hand Held Products' Technical Support Department for additional information.

Troubleshooting Table

Problem/Symptom	Solutions
My display is blank, the Dolphin Terminal will not turn on.	<p>Is the battery is low? Recharge the battery or replace the battery with a known good battery.</p> <p>Reset the Dolphin Terminal, refer to Troubleshooting Section for direction on resetting the terminal.</p>
My Dolphin Terminal will not scan a bar code.	<p>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.</p> <p>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.</p> <p>Consult your software developer to ensure the correct bar code symbology is being used.</p>

<p>The battery keeps failing in my Dolphin Terminal.</p>	<p>If the battery has been stored for a long period of time, it may take 3 charge/discharge cycles before the battery reaches its full storage capacity.</p> <p>The capacity of NiCad or 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.</p> <p>To increase the run time of the Dolphin Terminal, try to limit the use of the speaker, scan engine and backlight.</p>
<p>My Dolphin Terminal is not communicating with my host computer.</p>	<p>Make sure the HomeBase is plugged in.</p> <p>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 re-insert it into the HomeBase.</p> <p>Ensure the communications baud rate is set correctly. Set communications for 9600, N, 8, 1. Make sure that Configuration Switch 2 on the back of the HomeBase is set to "Fixed BPS".</p> <p>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.</p>
<p>I can not enter an ":" to change to Drive B at the DOS prompt.</p>	<p>The ":" is a special character that can be entered by typing "SHIFT" "Z". See reference to special characters in Dolphin Terminal Features section for additional information.</p>

Resetting The Dolphin Terminal

Under normal circumstances, you will never need to reset your Dolphin Terminal. However, a reset switch has been provided in case you need to reset the Dolphin Terminal. You can reset the Dolphin Terminal using one of the following methods.

- Reset using the “Three Key Reset” sequence
- Reset using the reset switch
- Reset by removing the main battery

Three Key Reset Sequence

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.

Reset Switch

If the method listed above does not reset your Dolphin Terminal you can use the reset switch that is located in the battery compartment of the Dolphin Terminal.

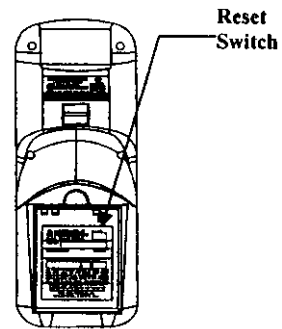


Figure 13: Reset Switch

Use the tip of an unfolded paper clip (or other similar object without a sharp point) 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 to access the reset switch.

Removing The Main Battery

If neither of the reset methods listed above work, the Dolphin Terminal can 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 drained. This process may take up to 5 hours.

Upgrading The Dolphin ROM Image

The Dolphin Terminal has a Boot Loader incorporated which allows the developer to upgrade or reload the ROM image.

1. Set up the Dolphin HomeBase for communication as described in the Dolphin HomeBase documentation. Verify terminal communications are working properly before proceeding.

Note: To ensure reliable communications, set up the communications application for 9600, N, 8, 1. Make sure that Configuration Switch 2, on the back of the HomeBase, is set to "Fixed BPS".

2. Hold down the '7' and '9' keys while resetting the Dolphin Terminal. The following prompt should appear on the screen:

```
SYS Utilities X.XX
1) Download
2) Launch Bios
3) Set Baud Rate

Baud: 9600
```

3. Press '3' to set the baud rate. Select 9600.

```
SYS Utilities X.XX
1) 9600
2) 19200
3) 38400
4) 57600

Baud: 9600
```

4. Press '1' to download the new ROM image. The following prompt should appear on the screen:

```
SYS Utilities X.XX
1) IR      (CRADLE)
2) RS232  (DB9)

Baud: 9600
```

5. Press '1' to select the IR communications port. This will start the communication process on the Dolphin. Option 2 is available for factory use only.

6. Initiate a Xmodem transfer of the appropriate ROM image file on the PC. The communication software should be configured for 9600, N, 8, 1.

Chapter 7

Dolphin Demo Application

Note: Review the Dolphin OS and Development System documentation for complete information on the software provided with you terminal.

Starting the HHP Demo Application

The HHP Demo Application 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, a HHP logo and Dolphin will be displayed, press any key to continue. The following prompt should appear on the display:

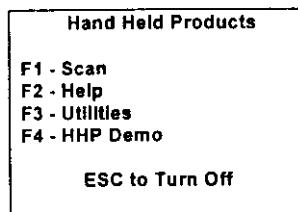


Figure 13: HHP Demo Application

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

F1- Scan

Pressing F1 from the Main Menu will load the Scan program. Documented source code for the Scan demo program is included on the Dolphin OS and Development System disk.

F2 - Help

Pressing F2 from the Main Menu will load the Help Menu. The Help Menu will provide the user with access to information regarding the Dolphin terminal, Specifications and contacting Hand Held Products.

F3 - Utilities

Pressing F3 from the Main Menu will load the Utility Menu. Utility Menu options include, Send File, Receive File and Toggle Status line.

F4 - HHP Demo

Pressing F4 from the Main Menu will load the HHP Inventory Control Sample. The sample application uses a lookup table to validate item number and display quantity and part description. The data entered is written to a file, and can be transferred via xmodem to a computer.

Appendix A: Warranty Information

Who Is Covered By The Warranty

The Dolphin Terminal and HomeBase offered by Hand Held Products, Inc. (HHP) come with a One-Year Limited Warranty. Hand Held Products, Inc. extends this Warranty only to the first end-user of the product. This Warranty is non-transferable.

What's Covered By The Warranty

This Warranty covers the Dolphin Terminal and HomeBase and warrants them to be free from defects in materials and workmanship, under normal use and service, for a period of one year from date of purchase by the first end-user.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND FREEDOM FROM INFRINGEMENT. Neither HHP nor its marketing agents shall be liable for any direct, indirect, consequential, or incidental damages resulting from the use, results of use, or inability to use this product.

No one is authorized to change, add to, or otherwise alter this Warranty without the express written permission of an officer of HHP.

What's Not Covered By The Warranty

This Warranty does not cover application software, or damage to the product caused by modification, alteration, misapplication, misuse of, or physical abuse to the product; or damage due to repair or service to the product by anyone other than an Authorized HHP Service Center. This Warranty also excludes any damage to the product caused by circumstances outside of HHP's control, such as, but not limited to, lightning or fluctuation in electrical power.

How Problems Should Be Handled

Should the Dolphin Terminal or HomeBase prove to be defective within one year of date of purchase, 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.

How To Get Warranty Service - Return Material Authorization (RMA) Procedures

If you purchased the product from an Authorized HHP Reseller, contact the Reseller with the unit's serial number. Your Reseller will contact HHP for you and arrange for the unit's service.

If you purchased the product directly from HHP, or have been instructed by your Reseller to contact HHP directly, call HHP's Customer Services Department at (704) 537-1444 and request an RMA number. You must have an RMA number to receive service on your product. Have the product's serial number and a brief problem description ready when you call; you will need it to get an RMA number. After receiving the number, place the product in its original packaging, include the RMA number on the address label as well as on the packing slip, and send the package, prepaid, to:

Hand Held Products, Inc.
Customer Services Department
RMA # _____
7510 East Independence Blvd., #100
Charlotte, North Carolina 28227-9411

After repair or replacement, HHP will ship the product, at our cost, to your location.

How To Extend Your Warranty

HHP offers a variety of extended service plans on our hardware products. These agreements offer continued coverage for your equipment after the one year Warranty expires. For more complete information, contact HHP or your Authorized HHP Reseller.

Appendix B: Dolphin Terminal Specifications

Mechanical

Size & Weight

- 6.9 x 2.6 x 1.9 inches (17 x 7 x 5 cm)
- 12 oz. (340 gm)

Power

- Uses one (1) battery pack approximately 2.2 x 1.8 x 0.8 inches. NiCad and NiMH battery packs can be recharged while resident in the Dolphin Terminal or in the spare battery well of the Dolphin HomeBase.
- Zero maintenance backup battery for memory retention and real-time clock.
- Low-battery detection and automatic shut-off with battery voltage levels readable through the application software.

Environmental

Recommended Operating Temperature

- -10 to 50 degrees C (32 to 122 degrees F)

Note: The unit can be operated to -20 degrees C for short periods of time. LCD quality will be reduced.

Recommended Storage Temperature

- -20 to 70 degrees C (-4 to 158 degrees F)

Humidity

- Operates in up to 95% non-condensing humidity

Case

Material

- Polycarbonate ABS Blend

Structural Integrity

- Multiple 5-foot drops to concrete

Fire Retardant Rating

- UL 94-VO

Architecture

CPU

- AMD ELAN SC310 386 microprocessor
- CMOS technology (low power)
- 20MHz

Memory

- 512KB or 2MB of DRAM for program execution
- 256KB Executable FLASH EEPROM for bootstrap loader, BIOS, common routines
- 512KB Data Storage FLASH EEPROM expandable to 8.5MB

Real Time Clock

- Accurate, crystal-controlled
- Clock and calendar operation
- Continuous time-keeping
- Application software controllable time/date stamping

User Interfaces

Standard Scan Engine

- Symbol SE SE 1200-I000A, scans from 2 to 36 inches

Optional Scan Engines

- Symbol SE1200LR, scans up to 15 feet with reflective labels
- Symbol SE 1200VHD-I000A, scans bar codes down to 2 mil
- No Scan Engine, the Dolphin Terminal is also available with no scan engine

Bar Code Symbologies Supported

- Code 3 of 9
- Interleaved 2 of 5
- EAN
- Codabar
- Code 11
- Code 128
- Plessey
- Universal
- Product Code (UPC)

Main Keyboard

Alphanumeric Keyboard

- 36 keys
- Alphanumeric
- Four (4) user-definable function keys
- CLR, SPC, BKSP, SHIFT, ENTER, LIGHT, NUMLOCK, ESC
- Splash-resistant, one-piece module
- Special Characters: * # / @ + & = . - \$ % ! \ :

Numeric Keyboard

- 20 keys
- Numeric, with shifted Alpha
- Four (4) user-definable function keys
- SP, BKSP, SHIFT, ENTER, LIGHT, CONTR, ESC
- Splash-resistant, one-piece module
- Special Characters: % \$? \ : > , + - / * =

Output

Liquid Crystal Display (LCD)

- 8 lines of 20 characters per line
- Alphanumeric, scrollable
- Application software controllable pixel graphics: 6 x 8 pixel matrix
- Auto-wrap-around of text, software controllable
- Electroluminescence backlight

Light Emitting Diodes (LEDs)

- Red LED for 'Laser Scanning Active' indication
- Green LED for 'Successful bar code decode' indication

Audible Horn

- Application software controllable speaker

Infrared transceiver

- IRDA compliant infrared transceiver which mates with the Dolphin HomeBase.
- EIA RS-232C/CCITT V28

Communications

- RS-232C format, with the Dolphin HomeBase functioning as a DCE device
- OS uses the XMODEM protocol to load the ROM image into FLASH memory through the IR Link. Other protocols may be implemented using custom applications.

Software

- DOS architecture programmable with standard x86 development tools, Borland and Microsoft C/C++ libraries are provided for non PC standard functions (i.e. scan engine support, communications and power management).

Dolphin RF Radio Specifications

General

- Data Rate: 1.6 Mbps per channel (high-speed mode) 800 Kbps (back-off mode)
- Modulation:.....4FSK (BFSK in back- off mode)
- Typical Range:..... Up to 500 feet in offices, up to 1000 feet in open spaces, unlimited with transparent roaming

Radio

- Frequency2.4 - 2.4835 GHz
- TechnologyFrequency hopping spread-spectrum
- Channels 15 independent
- Output Power 100 mW (+20 dBm)

Network Information

- Drivers Available:.....ODI supporting all major network operating systems
- Media Access Protocol:Proxim's optimized CSMA/CA
- StackStandard TCP/IP stack from FTP Software

*Range will vary depending on the application and physical environment.

Appendix C: Bar Code Symbolgies

In this section, we will briefly describe and discuss bar code symbolgies. We also list and discuss the symbolgies that the Dolphin Terminal supports.

Bar coding is rapidly replacing other methods of data entry, partly due to its accuracy rate (only 1 error in every 3-5 million scans 1:3-5M, vs. an OCR rate of 1:250 to 1:1 0,000). Scanning bar code is also faster and easier than typing entries on a computer keyboard, cash register, or other recording devices. Present day uses for bar code include (to name a few) package tracking, inventory control, VCR programming, self-checkout at grocery stores, security systems, and games and toys,

There are two types of bar codes: binary and modular. Binary codes have only two sizes of bars and spaces; modular codes have varied bar and space sizes.

Bar code symbolgies are also designed to be either discrete or continuous. Discrete codes are those whose individual characters can stand alone. In other words, the space between each character (the intercharacter gap) is not part of the code itself (e.g. Code 39). Continuous codes specify that the intercharacter gap be a part of the code itself (e.g. Interleaved 2 of 5).

There are many excellent reference books available on bar coding. Among them are:

- Reading Between the Lines - An Introduction to Bar Code Technology, by Craig K. Harmon and Russ Adams (Helmets Publishing, Inc., Peterborough, NH 03458. 1984).
- Getting Started With Bar Codes: A Systematic Guide, by Richard Bushnell, Jr., Cutter Information Corp., Arlington, MA 021734. The Black & White Solution, by Russ Adams and Joyce Lane (Helmets Publishing, Inc., Peterborough, NH 03458. 1987).

Another excellent reference, from which we quote here, is A Guide to Bar Coding, published by Bar Code Systems, Inc. (7000 Central Parkway, Suite 1210, Atlanta, GA 30328, 404/399-5921 or 800/343-0343).

In Chapter II - BAR CODE TYPES: THEIR STRUCTURE AND USES, pp. 56, Bar Code Systems states:

The basic principle of any symbology (the interpretation and structural characteristics of bar codes) is to represent a character with a pattern of black and white, wide and narrow lines. The black lines are generally called bars, while the white lines are called spaces. Although the lines have been referred to as black, and the spaces as white, you are not limited to strictly black against white. The key is ... having the correct amount of print contrast between the bars (which must appear dark or have the properties that absorb light from the bar code reading device) and spaces (which must be light or disperse the light from the reading device).

The common characteristics that bar codes have are as follows:

QUIETZONE

All symbols must have a clear space, containing no marks or conflicting artwork, preceding the beginning of the code and following the end of the code.

START AND STOP PATTERNS

Each symbol has distinct characters used at the beginning and end of the code which provide reading instructions, as well as scanning direction. The start character is normally at the left-hand end of a horizontally-oriented symbol, while the stop character would normally be at the right-hand end of the same symbol.

BARS AND SPACES

Each symbol has a defined pattern of bars and spaces that is machine readable by a bar code reader. It is the relative width of the bars and spaces that contains information; the height of the

bars has no such interpretive information. Published specifications for each bar code outline the exact bar and space dimensions, along with allowable plus and minus tolerances from these dimensions that are allowed. Character sets vary depending on the code type. Some codes are only numeric while some offer Alpha/numeric and special characters.

CHECK CHARACTERS

Check characters are mandatory with some code types, and optional with others. When used, this character allows a mathematical check to be performed which ensures the accuracy of the encoded information.

PRINT CONTRAST

The print contrast is a measurement of the reflectivness between the bars and spaces. Specifications state that a bar code symbol must meet a standard formula used to determine the contrast between a symbol's background and bars.

DENSITY

Bar code symbols can be printed in a variety of sizes. The basic element of the code is the width of the narrow element, which is called the ,XI dimension. The width of the wider elements in the code are typically measured in multiples of 'X'. Bar code symbologies can achieve different densities (number of characters per inch). The density of a bar code is determined by the minimum 'X' dimension, the wide-to-narrow element ratio (if applicable), and the number of elements required to represent a character of information. Considerations when choosing the code density are the size of the area on which a code must fit, specifications of the bar code reader, and the limitations of the bar code printer. (end of quote from A Guide to Bar Coding).

On the following pages, we will discuss each of the bar code symbologies that the Dolphin Terminal supports. We have also printed some examples of different bar codes (Appendix C). You can use these samples to test your Dolphin Terminal, if you are using a program that accepts that particular symbology.

CODE 39 (also called CODE 3 of 9)

The name CODE 39 describes the makeup of the code. It consists of nine elements- five bars and four spaces. Three of the elements are wide; the remaining six are narrow. It is a discrete, binary, self checking symbology.

Other features include:

1. It is bi-directional- can be scanned in either direction.
2. It provides a high level of data security.
3. It encodes the digits 0-9, the twenty six letters of the Alphabet, a space, and six special characters (asterisk (*), diagonal (/), plus sign (+), percent sign (%), period (.), and dash (-). The asterisk is most often used as the start and stop character.

It is the most widely used symbology in industrial environments, partly because it can be printed by a wide variety of equipment.

INTERLEAVED 2 OF 5 (I 2 OF 5)

Interleaved 2 of 5 is a continuous, binary symbology. It consists only of numeric characters. It received its name from the structure of the code- each character contains five elements (two wide, three narrow). It usually requires an even number of characters, because it works by pairing characters (but can include leading zeros). In I 2 of 5, the start character always consists of this sequence: narrow bar, narrow space, narrow bar, narrow space. The stop character is always: wide bar, narrow space, narrow bar.

Advantages of I 2 of 5 are:

1. It is compact (because of the interleaving of characters).
Maximum character density is 17.8 characters/inch at 2.25:1 ratio.
2. Provides a higher level of data security when using a bearer bar (a stripe above and below the code).

However, I 2 of 5 does not prevent short reads and therefore needs a check digit to ensure a proper read.

UPC (Universal Product Code)

Possibly the most popular bar code symbology is UPC- this is the code seen most often at grocery stores.

UPC is a modular code. The longer bars at the front, back, and middle of the bar code are called the "guard bars". The guard bar in the center divides the code into a right and left half. This allows the code to be read from either direction. Tags (code labels) are usually printed beneath the code.

The number to the left of the code is called the Number Systems Character, and denotes the type of item (e.g. 0=regular retail items, 2=variable-weight items, 3=health-related items, 4=in-store item marking, 5=coupons, 6 & 7=industrial, distributor products, 1 & 8=reserved for future use, 9=version D of UPC).

The first five digits of the bar code represent the UPC Manufacturer's ID number; the remainder of the digits can represent the product number.

EAN (European Article Number)

EAN is a variation of UPC and was designed for use in Europe. It has an eight and 13 digit version. Both versions are based on UPC, except that there is a symbol in EAN that represents the country of origin.

CODABAR

Libraries, package-delivery services, blood banks, air-freight and photo-developing companies are the primary industries that use CODABAR. It is a discrete, 16-character, numeric code. Each character is represented by four bars and three included spaces. There are four different start and stop characters, each having one wide bar and two wide spaces. It does not include check digits.

CODE 11

CODE 11 is a very dense, discrete, numeric code. It is primarily used in the telecommunications industry. The digits 0 - 9 and the dash can be represented with CODE 11. Each character is

represented by three bars and two included spaces. CODE 11 is not self-checking, but can include one or two check-digits.

CODE 128

128 different characters can be encoded with CODE 128. It is an extremely dense code, with a structure similar to UPC'S. CODE 128 is modular, and requires three bars and three spaces to represent each character. There are three different start characters and one stop character. CODE 128 is continuous and self-checking.

CODE93

This code is also very dense, and was designed to be similar to CODE 39. It codes Alphabetic and numeric characters. Each character is represented by three bars and three spaces. The termination bar after the stop character closes off the final space.

CODE 93 is continuous and not self-checking. It uses two check-digits, and has the highest density of any of the Alphanumeric bar codes.

PLESSEY

Plessey was designed in England, and is widely used in libraries. It is limited to a character set of ten digits and six additional characters. Each character is represented by four bars and the adjacent four spaces. It is a low-density code, continuous, and is not self-checking.

Appendix D: GS DOS Commands

The Dolphin Terminal ships with General Software DOS (GS DOS). GS DOS is compatible with Microsoft DOS (MS DOS), but 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 [ON|OFF]

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-yy]

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 wildcarded 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 [ON/OFF/string]

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, a 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 \$n\$. 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 copied into %1, %3 is copied 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 [ON|OFF]

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 E: Bar Code Samples

In this section, you'll find samples of some different types of bar code symbologies. The Dolphin Terminal is programmed (in the DEMO program) 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)

