



FALCON[®]

DOS Portable Data Terminals



Advanced User's Guide

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Preface: About this Guide

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Overview

This manual is a supplement to the *Falcon[®] DOS Portable Terminals User's Guide*. It contains the following technical information on Falcon portables:

- System configuration
- Disk drives
- Using PC cards
- Resetting the Falcon
- Using the 4-Slot Dock
- DOS commands
- Utilities
- Connector configurations
- Programming parameters
- Bar codes for setting parameters

This book is provided as a reference guide for System administrators, Developers, and Programmers who want to create end-user solutions for Falcon DOS portable terminals. It is not intended for use by first-time Falcon users.

Falcon[®] Model Numbers

Falcon DOS portable data terminals are handheld computers designed for data collection. The product title, “**Falcon**” refers to any or all of the DOS portable models identified in the table below of [Falcon[®] Portable Models](#).

Where information in this manual applies only to specific models, those models are clearly identified by the model icon as shown in the first column.

The Falcon DOS portable line includes 8-line and 16-line models. Both the 8-line and the 16-line Falcon models are available in batch and wireless (radio frequency, or RF) configurations. Wireless models provide instant communication of data between the unit and a host computer.

Table 1: Falcon® Portable Models

Model	Model Number	8-Line Display	16-Line Display	Batch Portable	RF Portable
31X	310	◆		◆	
	315	◆			◆
32X	320		◆	◆	
	325		◆		◆
33X	330		◆	◆	
	335		◆		◆
34X	340		◆	◆	
	345		◆		◆

31X The **31X** icon refers to both the Falcon **310** and the Falcon **315**. As the table on [page xi](#) notes, the Falcon **310** is a batch portable model and the Falcon **315** is an RF portable model. On the cover of this manual, the Falcon **31X** is represented by the Falcon **315**, in the lower left corner, with an 8-line display screen.

32X The **32X** icon refers to both the Falcon **320** and the Falcon **325**. As the table on [page xi](#) notes, the Falcon **320** is a batch portable model and the Falcon **325** is an RF portable model. The Falcon **32X** has many features in common with the Falcon **31X**. These models are often grouped together throughout this manual. On the cover of this manual, the Falcon **32X** is represented by the Falcon **325**, second from the upper left, with a 16-line display screen.

33X The **33X** icon refers to both the Falcon **330** and the Falcon **335**. As the table on [page xi](#) notes, the Falcon **330** is a batch portable model and the Falcon **335** is an RF portable model. The Falcon **33X** model has many features in common with the Falcon **32X** model. On the cover of this manual, the Falcon **330** portable is the smaller, ergonomic model shown in the upper right corner of the grouping.

34X

The **34X** icon refers to both the Falcon **340** and the Falcon **345**. As the table on [page xi](#) notes, the Falcon **340** is a batch portable model and the Falcon **345** is an RF portable model. The Falcon **34X** introduces the pistol grip. This model operates in every other way identically to the Falcon **33X**. On the cover of this manual, the Falcon **340** portable is the one with the pistol grip, shown in the lower right corner of the grouping.

Radio Frequency Interference

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

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 these 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 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 which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Style Conventions

Document Conventions

Formatting conventions are used throughout this guide as a method of providing consistency for notes, cautions, and warnings.

Notes



Notes appear throughout the manual to provide additional information on a topic, including technical details, exceptions to instructions and other pertinent information. These notes are identified by the notepad symbol to the right and ***bold italics text***.

Cautions



Cautions appear when there is information for the user that is strongly recommended. They are identified by the exclamation mark in a triangle and ***bold italics text***. This text appears in ***gold bold italics text*** if the user is viewing the manual in electronic PDF form on their computer.

Warnings



Warnings appear when there is something of extreme importance for the user to be know prior to proceeding. They are identified by the exclamation mark in a triangle and ***bold italics text***. This text appears in ***red bold italics text*** if the user is viewing the manual in electronic PDF form on their computer.

Keys and Keystroke Conventions

Portable keys and keystroke conventions are used throughout this manual to identify the difference between a key on the portable and keystrokes input by the user. Brackets such as: “<Scan>” indicate a key on the Falcon Portable. Data or keystrokes entered by the user are printed in a **monospaced typeface**.

Technical Support

PSC Website Technical Support

The most comprehensive source for technical support and information for PSC products is the PSC website: www.pscnet.com. Select **Support** from the sidebar for technical support. The site offers product registration, warranty information, answers to frequently asked questions (product FAQs), product manuals, product tech notes, software updates, patches, demos, and instructions for returning products for repair.

Reseller Technical support

Another excellent source for technical assistance and information is an authorized PSC reseller. A reseller is directly acquainted with specific types of businesses, application software, and computer systems and, therefore, is in the best position to provide individualized assistance.

E-Mail Technical Support

If the solution to a technical support question is not available through the PSC website or a local reseller, contact PSC technical support directly via E-mail at TechSupport@pscnet.com.

Telephone Technical Support

For those without E-mail access, please call (541) 984-3092.

PSC Solutions Group

For advanced, cost-effective services, contact the PSC Solutions Group (PSG) at (888) 583-3008 or psg@pscnet.com. Or go to the PSG webpage at www.pscnet.com/html/psc_solutions_group_psg.htm.

1

Using Falcon DOS Portable Terminals

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Overview

This chapter provides information about advanced features of Falcon DOS portable terminals. It does not cover Falcon basics, such as use of the keypad and viewport. For basic information about the Falcon, refer to the *Falcon DOS Portable Terminals User's Guide*.

Programming the Laser Triggers

31X
32X

Normally, the left trigger operates the Falcon laser or another bar code reader attached to the Falcon, and the right trigger toggles the Falcon in and out of Alpha mode (models **31x**) or Function mode (models **32x**). One or both of the laser triggers can be reprogrammed to act as equivalents of keypad keys.


To turn a trigger into an alias for a keypad key:

31X

1. Hold down the **<FN 1>** and **<FN 2>** keys.
2. Press the **<SWAP>** key and the program-trigger cursor (**P**) appears in the viewport.
3. Press the trigger to be changed.
4. Press the key to be assigned to the trigger. The following keys are valid selections:

<Alpha>	<CAPS>	<FN 1>
<ALT>	<CTRL>	<FN 2>
<Backlight>	<Enter>	<Laser Trigger>
<BKSP>	<ESC>	

32X

1. First, hold down the **<FN>** and **<Alt>** keys and press the **<FLAG>** key. The program-trigger icon () should appear in the viewport.
2. Press the trigger that is to be changed.
3. Press the new key assigned to the trigger. The following keys are valid selections:

<ALT>	<CAPS>	<FN>
<Backlight>	<CTRL>	<INTL>
<BKSP>	<Enter>	<Laser Trigger>
	<ESC>	

32X

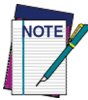
For example, to turn the right trigger on a model **32x** into an alias for the **<Enter>** key:

1. Hold down the **<FN>** and **<Alt>** keys and press the **<FLAG>** key to enter program-trigger mode.
2. Then press and release the right trigger.
3. Press the **<Enter>** key.

The right trigger now works as a second **<Enter>** key.

To change a reassigned trigger back to a laser trigger:

1. Put the Falcon into program-trigger mode.
2. Press the trigger twice.

33X
34X

Falcon 33x and 34x models do not have programmable laser triggers. The **<Scan>** key is only key for operating the laser.

Programming the Enter Keys

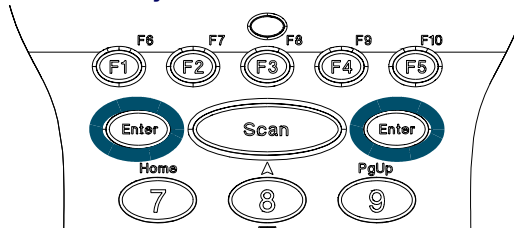
33X
34X

Falcon 33x and 34x models allow reprogramming of one of the **<Enter>** keys. One **<Enter>** key may be reprogrammed from a list of available keys. There is no option for swapping the function of the **<Enter>** keys. However, if one key is reprogrammed, the other key automatically becomes the **<Enter>** key.



This features only is only available on a 38-key keypad.

Figure 1-1: Location of the Enter keys on the Falcon 33X and 34X



To program an **<Enter>** key:

1. Hold down the key sequence **<Alt>-<Fn>** and press the desired **<Enter>** key to re-program.



Press the **<Alt>** key then the **<Fn>** key, not the **<Fn>** key then **<Alt>** (or **<Intl>**) key.

2. The Program Trigger Icon (▶● or ●◀) appears on the right of the LCD, indicating which **<Enter>** key is to be reprogrammed.
3. Select the key sequence to reprogram the **<Enter>** key. The following keys are valid sections:

<Backspace> **<Enter>** **<Tab>**
<Caps> **<Intl>**



All of these functions, except the **<Enter>** character are the **<Fn>** shifted state of another key. When selecting the key, do not enter **<Fn>** mode first. To assign the left **<Enter>** key to **<Caps>**, press **<Alt>-<Fn>-<Left Enter>-<Ctrl>**. Falcons 33x and 34x automatically translate the **<Ctrl>** keypress into the **<Caps>** key.

Using PC Cards

31X
32X

The Falcon has a slot for plugging in PC cards, and each unit is factory-equipped with PhoenixCARD Manager Plus PC card drivers. PC cards provide such features as network connectivity, modem connectivity, and wireless capability. Their primary purpose in the Falcon is to provide additional memory storage by functioning as a disk drive. (See page [page 1-9](#) for information about the Falcon's drives.)

33X
34X

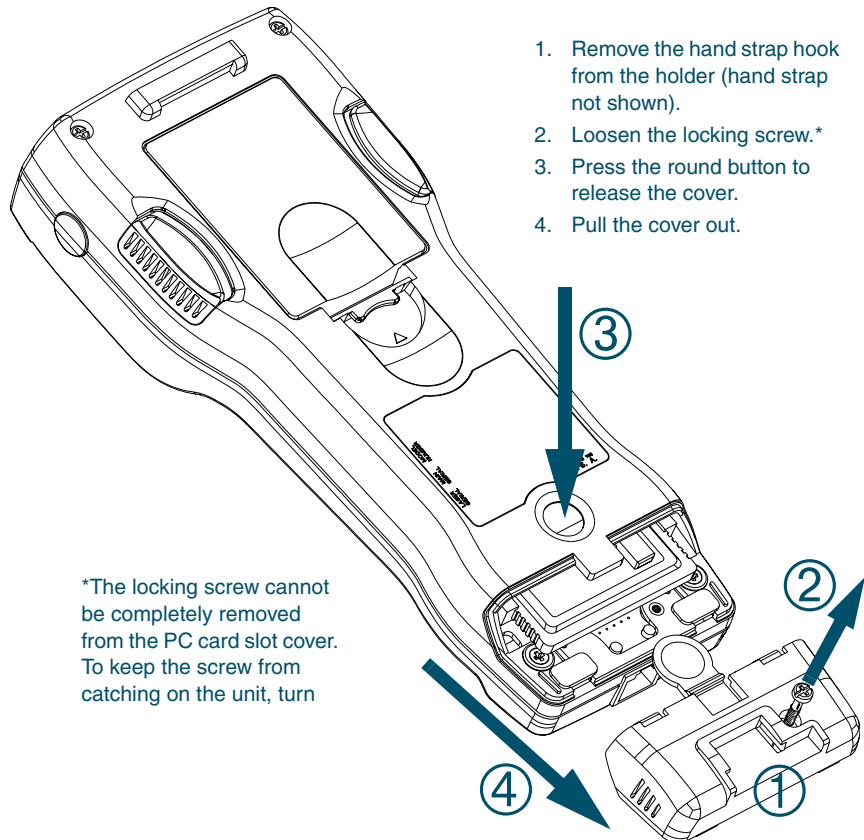


The PC card slots of the Falcon 33x and 34x are not user accessible, but function in the same manner as the Falcon 32x for software installation, use and general features.

Opening the PC Card Slot Cover

31X
32X The PC card slot is located near the bottom on the back of the Falcon (refer to [Figure 1-2](#)). The slot is protected by a cover. Detach the elastic hand strap on the back of the Falcon by pulling its hook out of the holder near the base. If the slot cover is secured by a screw, loosen the screw. Then, while pressing the round button above the slot cover, slide the cover out and away from the Falcon.

Figure 1-2: Removing the PC Card Slot Cover on a Falcon 310



Inserting a PC Card

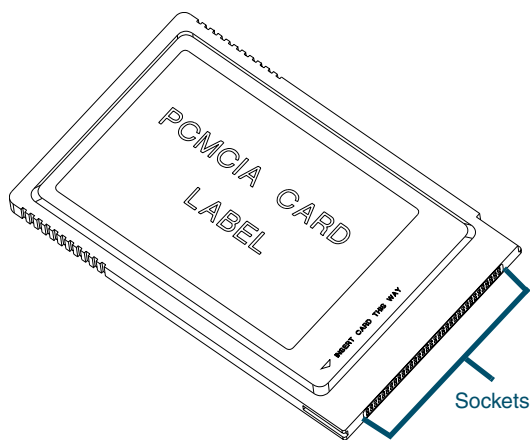
31X
32X

All PC cards have two rows of small sockets on one end (refer to [Figure 1-3](#)). The cards also have face-up and face-down sides. The card manufacturer's label is usually on the face-up side.



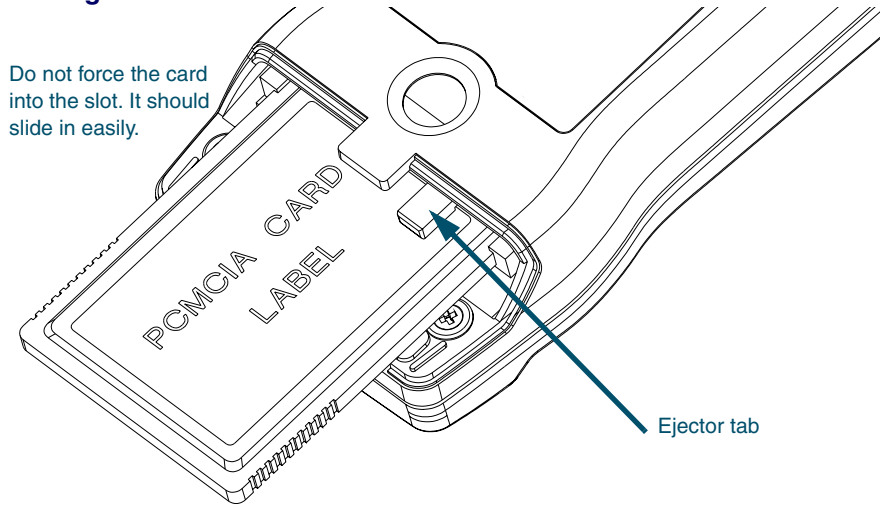
Turn the Falcon off before inserting or removing a PC card.

Figure 1-3: A Typical PC Card



To insert a PC card into a Falcon complete the following steps:

1. Start with the Falcon face down and the PC card face up.
2. Insert the end of the card with the sockets into the card slot (refer to [Figure 1-4](#)).
3. Use the tracks inside the slot to help guide the card.
4. Push the card firmly into the slot until the ejector tab slides out.
5. Replace the PC card slot cover.

Figure 1-4: Inserting a PC Card into the Slot

The PC card slot on the Falcon is designed so a card cannot be inserted upside down or backward. If the card does not push into the slot easily, make sure the card is positioned properly. Put the end with the sockets into the slot first. Then flip the card upside down and try to insert it again.

Card Recognition and Configuration

Once the card is inserted into the slot complete the following steps:

1. Turn the Falcon on. The Falcon will attempt to recognize and configure the card.
2. If the Falcon responds with one beep, the PhoenixCARD Manager Plus drivers successfully recognized and configured the card.
3. If the Falcon does not beep, the drivers might not be loaded in the Falcon, or the beeper may be disabled.



In some cases, drivers provided by a specific card's vendor are responsible for configuring the card. If one of these cards is being used, there may be no audio signals for card configuration. See the configuration instructions that came with the card.

Removing a PC Card

A tab inside the PC card slot ejects the installed card (refer to [Figure 1-4](#)). Push the end of the ejector tab into the Falcon. The PC card should slide partway out of the slot. Hold the card by the edges and pull it the rest of the way out.

The Serial Port

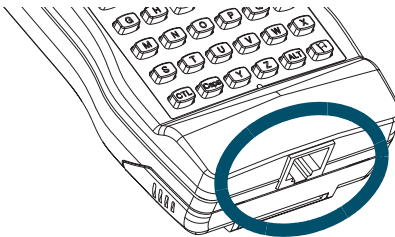
31X
32X

Falcon models **31x** and **32x** have a port for serial communications with a PC. The serial port is located at the base of the Falcon **31x** and **32x** (refer to [Figure 1-5](#)). Designated as **COM1**, it is a 10-pin telephone-style jack providing a standard RS-232 connection.

With a serial cable connected to it, the port allows communications with a host computer or any serial device, such as a printer or modem. The serial port also provides a connection for communications and battery recharging in the Falcon Dock and Falcon 4-Slot Dock.

Figure 1-5: The Serial Port on a Falcon 320

31X
32X



For the wiring configuration of the serial port, refer to [Appendix A, on page A-1](#).

The IR Serial Port

33X
34X

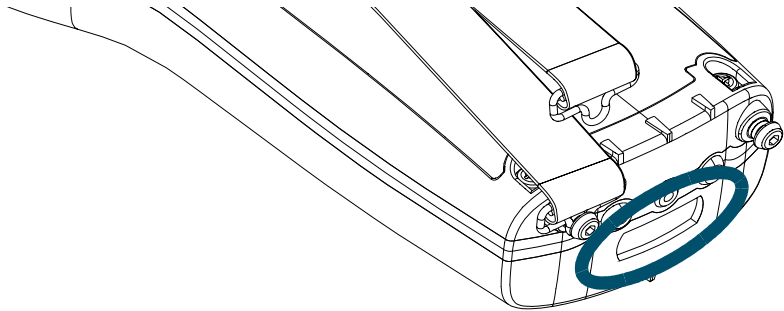
The serial port of the Falcon **33x** and **34x** is a half duplex IR port. Refer to [Figure 1-6](#). Through software commands, the port may be setup for IR or a modified RS-232 serial communication.

- In IR mode, all physical communications meet the IrDA physical layer specification.
- In the modified RS-232 serial mode, the IR port is used to transmit RS-232 level data out the IR port. The third pin along the bottom of the Falcon **33x** and **34x** is used to receive RS-232 level data.
- In general, the IR mode is used when communicating to other IR devices (printers, computers, etc.) and the modified RS-232 mode is used to communicate with the dock for host communications.
- The Falcon **33x** and **34x** do not propagate the RS-232 hardware signals such as RTS, CTS, DTR, DSR, RI, and DCD.



When using Zmodem, flow control must be the same on both sides of the transmission. Normally, XFER defaults to RTS/CTS flow control. On the Falcon 33x and 34x, it defaults to Xon/Xoff. When transferring files between a 33x or 34x and the host PC, make sure the PC is also using Xon/Xoff. See the /F option on [page 3-18](#) for more details.

Figure 1-6: The IR Serial Port on the Falcon 33x and 34x



The Disk Drives

The Falcon contains four logical disk drives that provide storage for system files, applications, and data.

Drive A Drive **A** is a read-only drive. Its contents cannot be changed.

Drive B Drive **B** is a read-only drive used to store system utilities and to initialize the boot process. Its contents cannot be changed.

Drive C Drive **C** is a flash disk drive that allows full read and write access. This drive contains DOS command files, PC card drivers, Falcon utilities, and executable files and associated files for applications. It may also contain additional **config.sys** and **autoexec.bat** files to configure the Falcon to run applications.

Drive D Drive **D** is a **RAM** disk drive. The **RAM** disk is used primarily for data storage. Programs that need to be loaded into memory and then quickly removed from memory can also be placed here. Drive **D** can also be used for scratch disk space or temporary files.

Additional Drives Additional RAM disk drives may be configured using **VDISK.SYS**. This can be done using the configuration utility (refer to [page 2-12](#)) or directly in **CONFIG.SYS** (refer to [page 6-13](#).)

32X

33X

34X

The Falcon may also be configured to use PC ATA flash cards. The PC Card is identified as a hard disk drive by the operating system. This drive may be used for safe and permanent storage of data.

The Falcon may have other additional logical drives that are network drives accessed via wireless access points.

The drive letters for the additional **RAM**, **ATA**, and network drives will be assigned at loading. The drive letters will begin at Drive **E**.

Configuring the Falcon

If the Falcon is not already configured, use the Falcon Configuration Utility to install applications and set options for bar code scanning. The Falcon Configuration Utility operates under Windows® **95**, Windows® **98**, Windows® **2000**, Windows® ME, and Windows® NT. For instructions on using the utility, refer to [Chapter 2](#).

Bar codes can also be used to change settings in the Falcon. [Appendix D](#) contains the bar codes for most common settings.

Transferring Files

To transfer data or program files, connect the Falcon unit to the host computer with any of the following accessories:

- Falcon serial cable
- Falcon Dock
- Falcon 4-Slot Dock (Only available for Falcon models **31x** and **32x**.)

The Falcon application may have simple file-transfer options, or use the Falcon XFER utility.

When using the Falcon Configuration Utility to transfer files (refer to [Chapter 2](#)), the configuration utility runs XFER automatically. If the configuration utility is not used, XFER requires entering commands at the DOS command line on both the Falcon and the PC.

Falcon and the PC.

The XFER utility is loaded into the Falcon at the factory and placed on drive **B**. If the PATH statement has not been changed, XFER can be run from any drive on the Falcon. However, before running XFER32 on a PC, install the Falcon Configuration Utility onto the hard drive. By default, XFER32`xfer32` is placed in the directory: `\PDTFiles`

The command line syntax for XFER is as follows:

```
XFER [/option1 [/option2] . . .] filename
```

Use a slash (/) or a hyphen (-) to denote options, and use uppercase or lowercase letters. Options can be placed before or after the filename on the command line. A sample command line appears at the end of this section.

Transfer a single file by using XFER with the Xmodem protocol (the default protocol) or transfer multiple files with the Xmodem or Zmodem protocol.

Basic options for Xmodem protocol are listed and described in [Table 1-1 on page 1-12](#). The “Default” column indicates whether the option is used (“On”) or ignored (“Off”) if not included in the command line. For options that have two or more possible values, the default value is given.

Table 1-1: XFER Options (Xmodem Protocol)

Option	What It Does	Default
filename	Identifies the file to be transferred or received.	None
#	Specifies the communication port to use. Replace the # symbol with the desired setting: 1 = COM1 2 = COM2	1
B#	Specifies the baud rate. Replace the # symbol with the desired setting: 2400 4800 9600 19200 38400 57600 115200	19200
D#	Specifies the number of seconds for XFER to wait for activity before cancelling the transfer. Replace the # symbol with the desired number of seconds for the timeout delay. Acceptable values are 0 (no timeout) through 65,535.	60
H or ?	Displays help for the XFER command.	Off
O	Overwrites an existing file with a new file having the same name.	Off
R	Receives the specified file.	Off
T	Transmits the specified file.	On

An Example

To transfer a file named **foo** from a PC to a Falcon using Xmodem protocol, use the following command lines.

On the PC: `xfer foo`. This command causes the computer to send the specified file using XFER's default settings.

On the Falcon: `xfer /r foo`. This command causes the Falcon to receive the specified file transmitted from the PC.



For more information about XFER, including Zmodem options, refer to [Chapter 3](#).

2

The Falcon Configuration Utility

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Overview

The **Falcon Configuration** utility provides a simple way to change the Falcon's settings for bar code symbologies and serial communications. It can also be used to load programs and files into the Falcon. The utility runs under Windows® 95, Windows® 98, Windows® 2000, Windows® Me, and Windows® NT. This chapter describes how to install the utility and use it to configure the Falcon.

Installing the Falcon Configuration Utility

To install the **Falcon Configuration** utility complete the following steps:

1. Insert the CD labeled **Falcon Utility Software and Manuals** into the PC's CD drive.
2. Wait for the autoplay to open. If the autoplay does not come up, access the CD using Windows Explorer. Go to the install directory and run **setup.exe**.
3. At the autoplay menu, select the **Falcon Configuration** utility.
4. Copy the file to your desktop or run it from the CD.
5. In the **Installation Options** window, select the radio components to be installed, if any.
6. Click on the **Next** button to continue.
7. In the **RF Installation Options** window, uncheck the check boxes for any components not to be installed.
8. Click on the **Next** button to continue to the next dialog box.
9. In the **Select a Group Name** window, select a program group in which to place the **Falcon Configuration** utility icons.
10. Click on the **Next** button to continue.
11. Specify the directory in which to place the **Falcon Configuration** utility files in the next window.
12. Click on the **Next** button to continue.

13. Continue following the instructions in the dialog boxes, replacing the first disk with the second, and then the third disk.
14. When the installation is complete, click on the **Finish** button in the final window.

Using the Falcon Configuration Utility



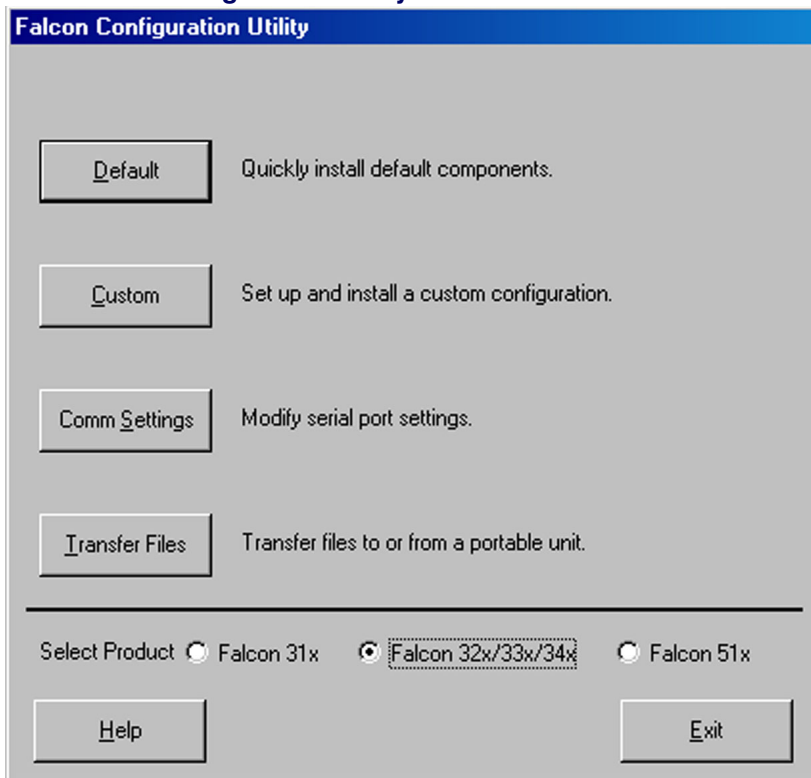
To start the **Falcon Configuration** utility, double-click on the **FALCON** icon in the program group. The first screen that appears is the main menu.

Main Menu

This menu provides access to all the configuration settings for the Falcon ([Figure 2-1 on page 2-4](#)).

- Default**
1. Select this option to load the original factory configuration into the Falcon unit. The Configuration utility prepares files to be transferred to the Falcon and opens the **Important** dialog box ([Figure 2-2](#)).
 2. Check the file lists in both sections of the dialog box to see if they are correct and complete.
 3. To add, delete, or rename files, select **Cancel** from the dialog box.
 4. Use the **Custom** selection in the main menu to build custom lists. (Refer to [page 2-5](#) through [page 2-8](#) for instructions to create custom configurations.)
 5. If the file lists in the dialog box are correct, make sure the Falcon unit is properly connected to the serial port specified in the **Comm Settings** dialog box (refer to [page 2-20](#)).
 6. Run the **ld.bat** file on the Falcon.

Figure 2-1: The Falcon Configuration Utility Main Menu

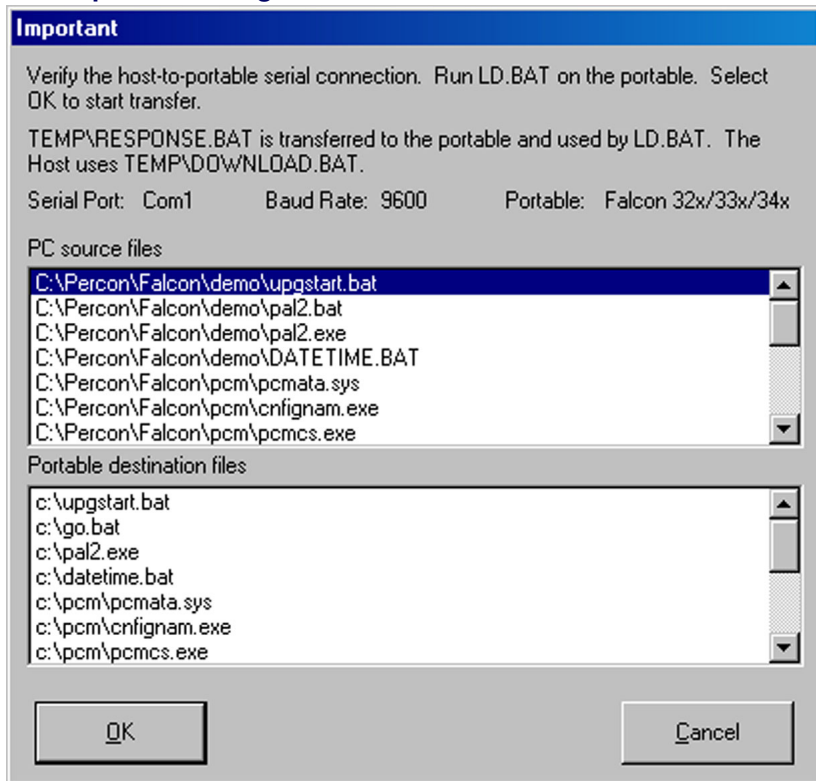


7. Click on the **OK** button in the **Important** dialog box ([Figure 2-2 on page 2-5](#)).

Custom Select this option to choose or modify configuration files or program files to be loaded into the Falcon unit. See the next section for information on the **Custom Configuration** menu.

Comm Settings Select this option to modify settings for the computer's serial port. Refer to [page 2-20](#) for information on the **Comm Settings** dialog box.

Transfer Files Select this option to transfer data files between the Falcon and the host computer. Refer to [page 2-21](#) through [page 2-24](#) for information on the **File Transfer** window.

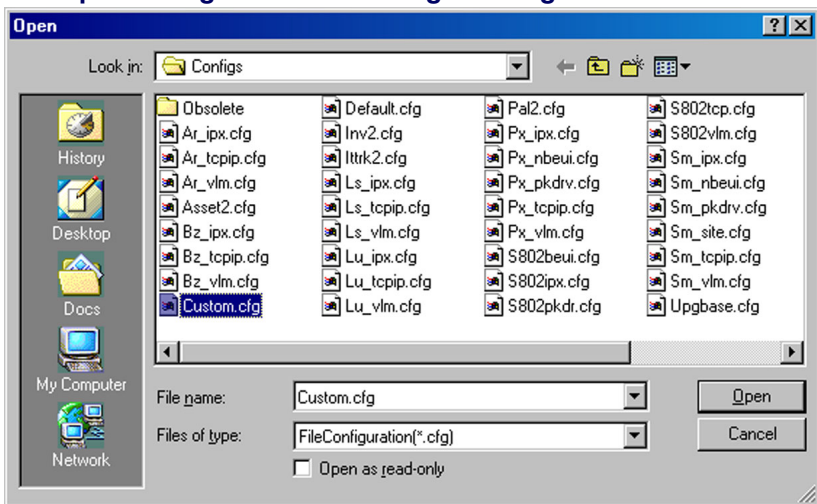
Figure 2-2: The Important Dialog Box

Select Product: Select the appropriate radio-button for type the Falcon model being configured: **31x**, **32x/33x/34x**, or **51x**.

The Custom Configuration Menu

1. Select **Custom** from the main menu.
2. An **Open** dialog box appears (refer to [Figure 2-3 on page 2-6](#)).
3. Use this dialog box to select a configuration file from the **Configs** folder.
 - The configuration file contains the information presented when selecting the **File Configuration** button on the **Custom Configuration** menu.

Figure 2-3: The Open Dialog Box for Selecting a Configuration File



If the **Open as read-only** check box is selected and changes are made to the configuration settings, use a new file name to save the changes.

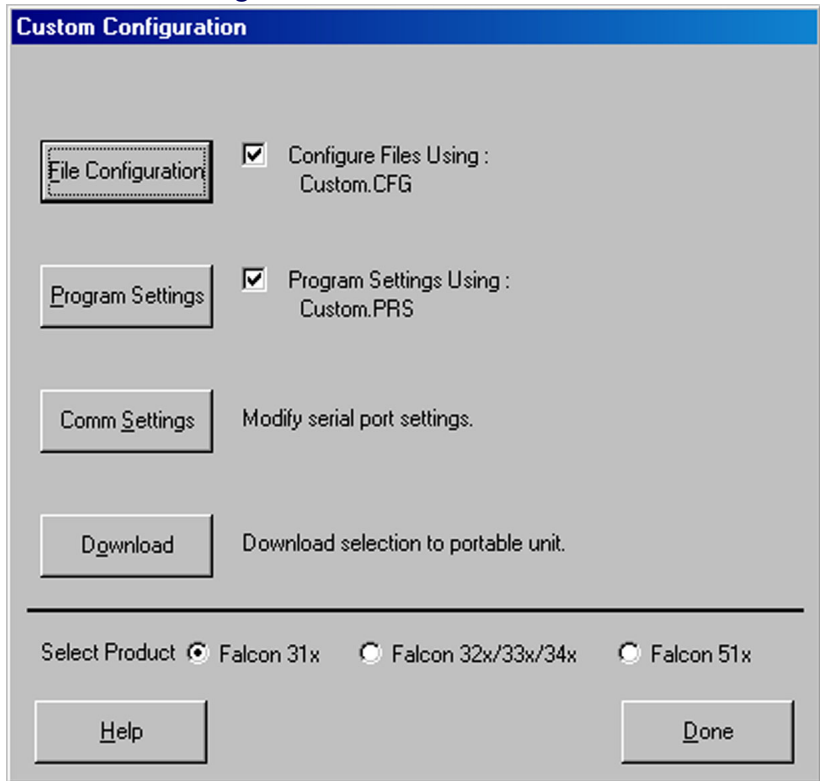
4. When the configuration file is finished loading, a second **Open** dialog box appears.
5. Use this dialog box to select a program-settings file from the **Progsets** folder.
6. The program-settings file contains the information that will be presented when selecting the **Program Settings** button on the **Custom Configuration** menu.
7. After the program-settings file is loaded, the **Custom Configuration** menu appears ([Figure 2-4 on page 2-7](#)).

File Configuration

Select this option to choose application files to be loaded into the Falcon. Refer to [page 2-9](#) through [page 2-16](#) for information about the **File Configuration** windows.

Configure Files Using: This field shows the configuration file that will be used to specify the files that will be loaded into the Falcon. Select the check box to load the files. Deselect it to turn this option off.

Figure 2-4: The Custom Configuration Menu



Program Settings Select this option to view or change settings for bar code symbologies and other programmable Falcon options. Refer to [page 2-16](#) through [page 2-20](#) for information about the **Program Settings** windows.

Program Settings Using: This field shows the program-settings file that will be used. Select the check box to load the program settings. Deselect it to turn this option off.

Comm Settings Select this option to view or change serial communications settings for the Falcon. See [page 2-20](#) for information about the **Comm Settings** dialog box.

Download When finished customizing the Falcon configuration, select this option to load the custom configuration into the Falcon.

1. When selected, the configuration utility prepares files to be transferred to the Falcon and opens the **Important** dialog box (refer to [Figure 2-2](#)).

2. Make sure the Falcon unit is properly connected to the serial port specified in the **Comm Settings** dialog box (refer to [page 2-20](#)).
3. Then run the **ld.bat** file on the Falcon, and select **OK** in the **Important** dialog box.

Select Product: Select the appropriate radio-button for type the Falcon model being configured: **31x**, **32x/33x/34x**, or **51x**.

Done Select this option to return to the main menu. If changes were made to the file configuration or program settings, one or both of the following prompts appear:

Figure 2-5: The Prompt for Saving Changes to the Current File Configuration

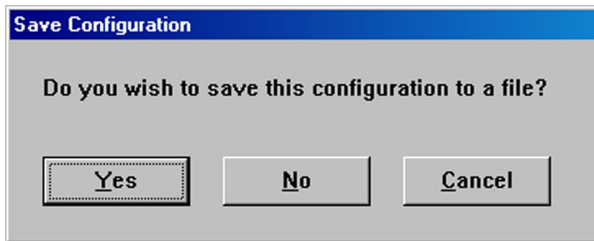
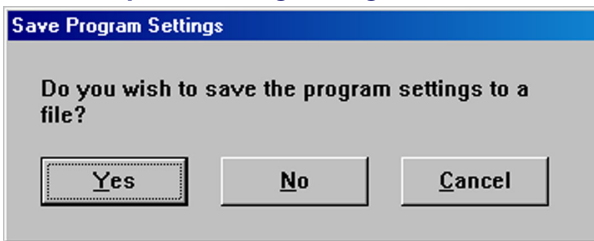


Figure 2-6: The Prompt for Saving Changes to the Current Program Settings



Yes Select this option to save the changes. A **Save As** dialog box will open. Use the dialog box to specify the location and name of the new configuration or program-settings file.

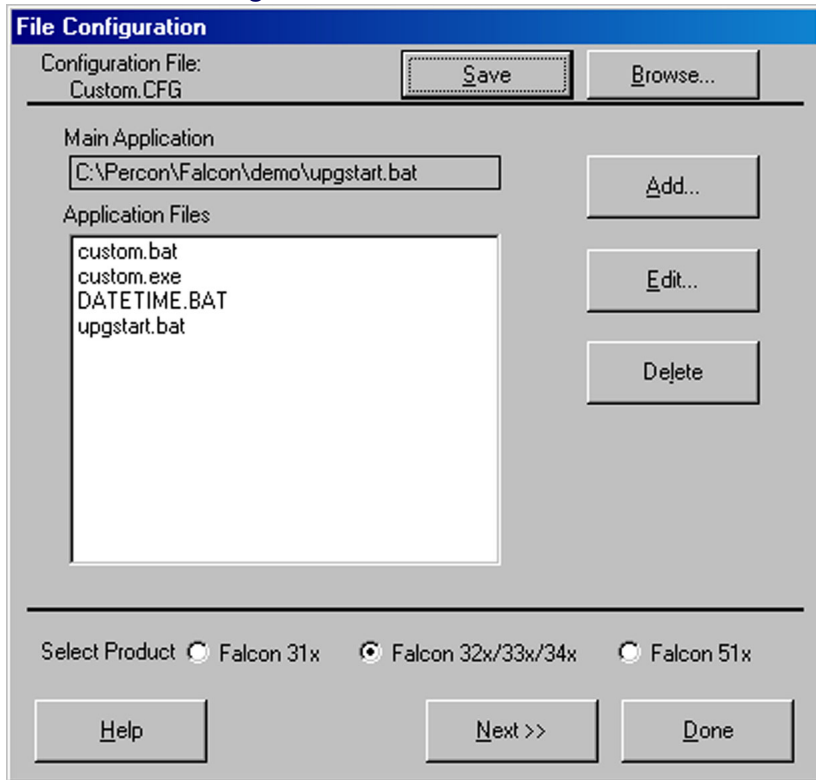
No Select this option to discard the changes.

Cancel Select this option to return to the **Custom Configuration** menu without saving or discarding the changes.

The File Configuration Windows

1. Select **File Configuration** from the **Custom Configuration** Menu
2. The first of three **File Configuration windows** appears. (Figure 2-7)

Figure 2-7: The First File Configuration Window



3. Use these windows to choose application files to be loaded into the Falcon.

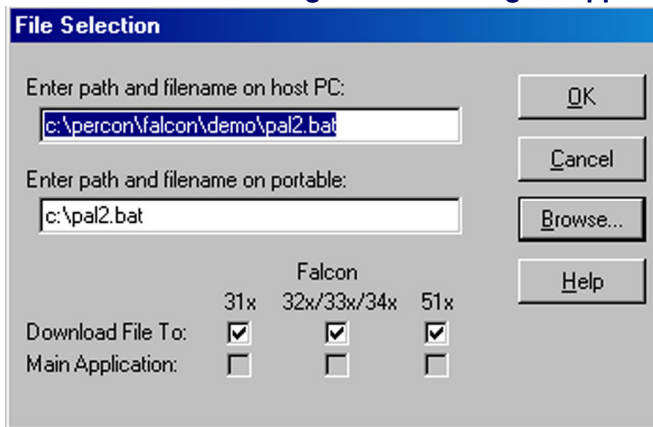
Configuration File: This field shows the configuration file used to specify the files that will be loaded into the Falcon.

Save After adding, editing, or deleting files in the **Application Files** list, select **Save** to save the revised list in the current configuration file or in a new one.

- Browse**
1. Select **Browse** to use a different configuration file.
 2. An **Open** dialog box appears.

3. Use the **Open** dialog box to choose a configuration file from the **Configs** folder.
4. If **Browse** is selected after making changes in this or any other **File Configuration** window and the changes are not saved, the prompt shown in [Figure 2-8](#) appears.

Figure 2-8: The File Selection Dialog Box for Adding an Application File



Main Application: This field identifies the default application that will run on the Falcon after completing the installation.

Application Files: This field lists the files associated with the main application.

Add Select this option to include other files to be installed on the Falcon unit. The **File Selection** dialog box opens.

Enter path and filename on host PC: Use this field to specify the file to be transferred to the Falcon.

Enter path and filename on portable: Use this field to specify the location and name of the file to be transferred to the Falcon. The name can be the same as the original file or it can be given a new name.

Download File To: Select this check box to have the specified file downloaded to the specified Falcon models.

Main Application: Select this check box to have the specified file be the main application on the specified Falcon models.



Only one file can be selected as the main application for a Falcon model family. To select another file as the main application, highlight the current one in the **Application Files** list in the **File Configuration** window, select **Edit**, and turn off the **Main Application** switch for that file.

OK Select **OK** to return to the **File Configuration** window. The specified source file will appear in the **Application Files** list.

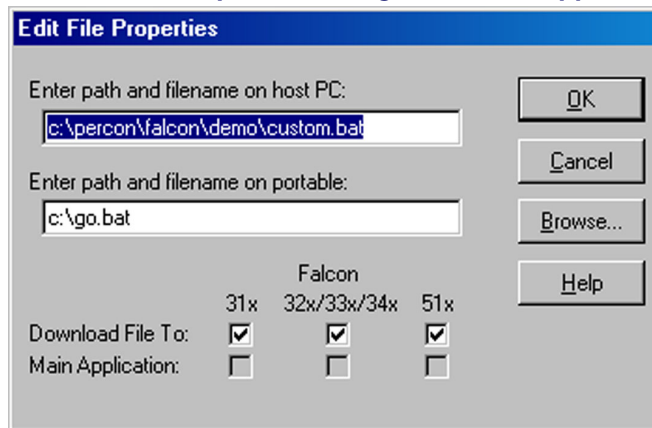
Cancel Select **Cancel** to return to the **File Configuration** window without adding a file to the **Application Files** list.

Browse

1. Select **Browse** to use a different configuration file.
2. An **Open** dialog box appears.
3. Use the **Open** dialog box to choose a source file to be included in the custom configuration.

Edit Select a file in the **Application Files** list and then select **Edit** to change the source path or destination path for the file. The **Edit File Properties** dialog box opens.

Figure 2-9: The Edit File Properties Dialog Box for an Application File



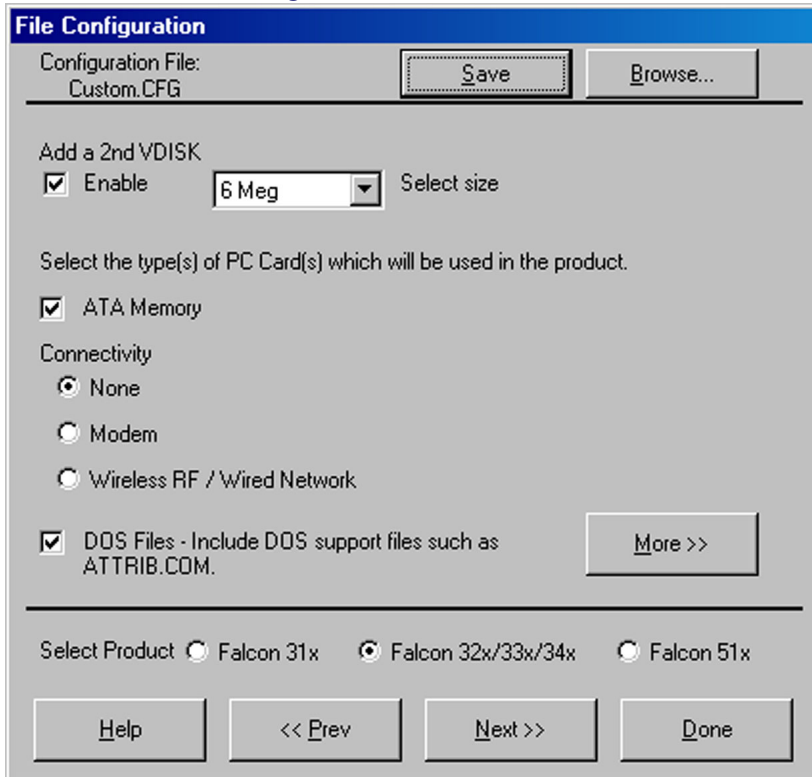
Delete To delete a file from the **Application Files** list, select the file in the list and then select **Delete**.

Select Product: Select the appropriate radio-button for type the Falcon model being configured: **31x**, **32x/33x/34x**, or **51x**.

Next Select **Next** to view or change additional file-configuration options for the custom installation.

- Done**
1. Select **Done** when finished setting file-configuration options for the custom installation.
 2. The second **File Configuration** window (Figure 2-10) appears if **Next** is selected in the first window.

Figure 2-10: The Second File Configuration Window



Configuration File This field shows the configuration file used to specify the files that will be loaded into the Falcon.

Save After changing selections in this window, select **Save** to save the revisions in the current configuration file or in a new one.

- Browse**
1. Select **Browse** to use a different configuration file.

2. An **Open** dialog box appears.
3. Use the **Open** dialog box to choose a configuration file from the **Configs** folder.
4. If **Browse** is selected after making changes in this or any other **File Configuration** window and the changes are not saved, the prompt shown in [Figure 2-5 on page 2-8](#) appears.

Add a 2nd VDISK: Select to add a 2nd VDISK in the extended memory area on the Falcon. (Refer to [page 1-10](#).)

Select Size: Use this drop down list box to select the size of the 2nd disk.

ATA Memory Cards: Turn this switch on to transfer drivers for ATA memory cards to the Falcon.

I/O Cards: Turn this switch on to transfer drivers for fax/modem cards to the Falcon.

Vendor Specific: Turn this switch on to transfer drivers for other types of PC cards.

This option loads PC Card drivers for Card and Socket Services only. Generic client drivers such as ATA or I/O Card drivers are not loaded if this is the only card switch turned on.

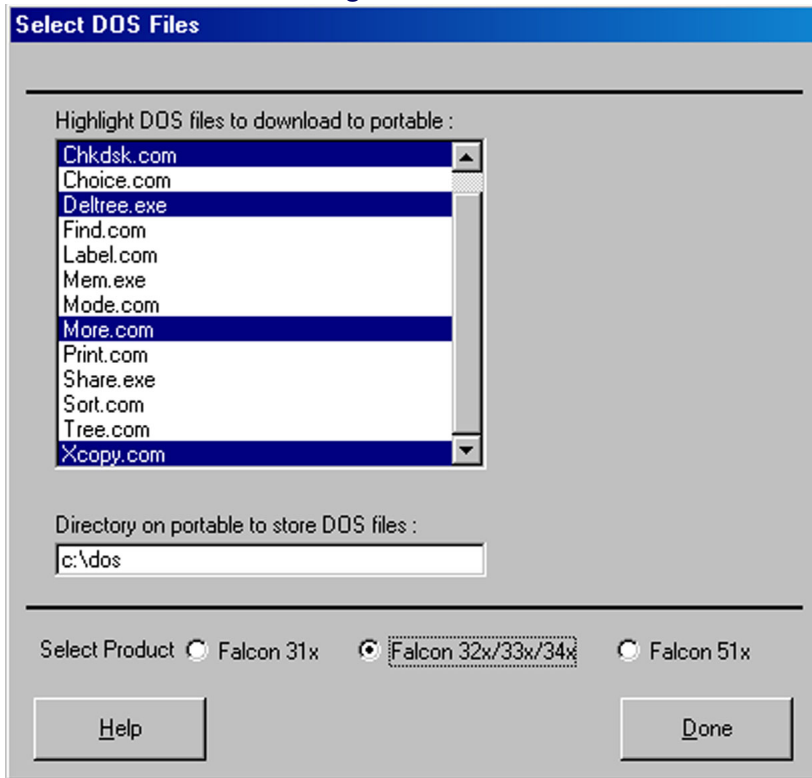
Use this for RF cards that have their own specific client drivers that will be loaded using application files in the first file configuration window. (refer to [page 2-9](#))

DOS Files: Turn this switch on to transfer files for DOS commands and utilities to the Falcon.

More Select **More** to add or remove DOS files from the custom installation. The **Select DOS Files** dialog box appears ([Figure 2-11 on page 2-14](#)).

Highlight DOS files to download to portable: This field lists DOS files that are available. Files that are highlighted are currently selected to be included in the custom installation. Click on a file to select it or deselect it.

Figure 2-11: The Select DOS Files Dialog Box



Directory on portable to store DOS files: Use this field to specify where the DOS files should be placed in the Falcon unit.

Done Select **Done** to return to the **File Configuration** window.

Select Product: Select the appropriate radio-button for type the Falcon model being configured: **31x**, **32x/33x/34x**, or **51x**.

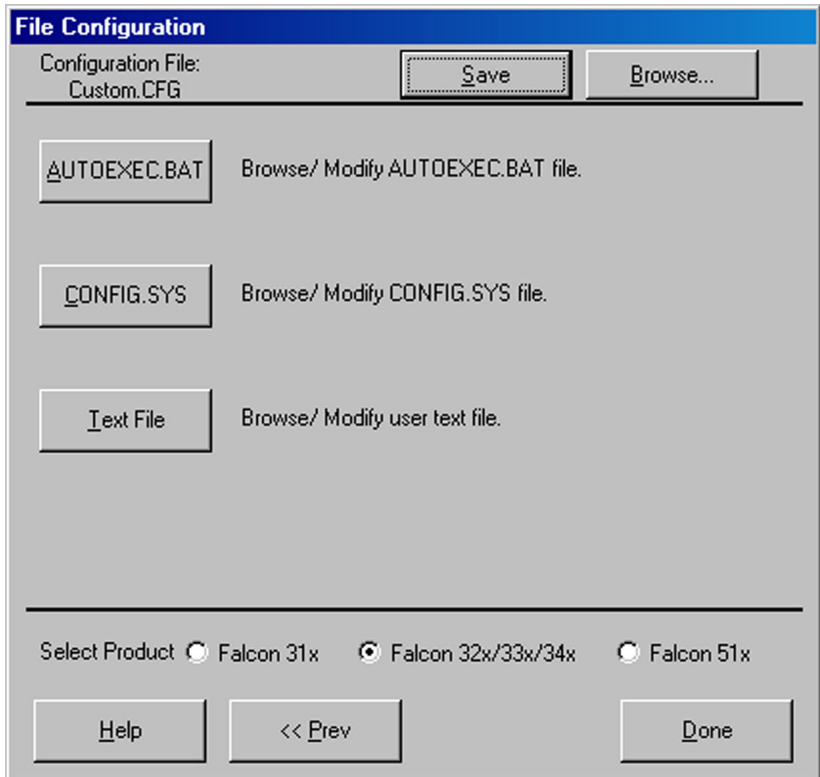
Prev Select **Prev** to return to the previous file-configuration window.

Next Select **Next** to move on to the next file-configuration window.

The third **File Configuration** window ([Figure 2-12](#)) appears if **Next** is selected in the second window.

Done Select **Done** when finished setting file-configuration options for the custom installation.

Figure 2-12: The Third File Configuration Window



Configuration File: This field shows the configuration file used to specify the files that will be loaded into the Falcon.

Save After selecting options in this window, select **Save** to save the revisions in the current configuration file or in a new one.

- Browse**
1. Select **Browse** to use a different configuration file.
 2. An **Open** dialog box appears.
 3. Use the **Open** dialog box to choose a configuration file from the **Configs** folder.

4. If **Browse** is selected after making changes in this or any other **File Configuration** window and the changes are not saved, the prompt shown in [Figure 2-5 on page 2-8](#) appears.

AUTOEXEC.BAT: Select this option to insert new commands into the `autoexec.bat` file that will be transferred to the Falcon.

CONFIG.SYS: Select this option to insert new commands into the `config.sys` file that will be transferred to the Falcon.

Text File: Select this option to view or modify any text file that will be transferred to the Falcon.

Select Product: Select the appropriate radio-button for type the Falcon model being configured: **31x**, **32x/33x/34x**, or **51x**.

Prev Select **Prev** to return to the previous file-configuration window.

Done Select **Done** when finished setting file-configuration options for the custom installation.

The Program Settings Windows

1. Select the **Program Settings** from the **Custom Configuration** Menu and the first of six **Program Settings** windows appears.
2. Use these windows to view or change settings for bar code symbologies and other programmable options.
 - The first window is shown in [Figure 2-13 on page 2-17](#).
 - The next four windows are similar, and so are not shown.

Program Settings File: This field shows the program-settings file that will be loaded into the Falcon.

Save After selecting options in this window, select **Save** to save the revisions in the current program-settings file or in a new one.

- Browse**
1. Select **Browse** to use a different program settings file.
 2. The **Open** dialog box appears.

- Use the dialog box to choose a configuration file from the **Progs** folder.

Figure 2-13: The First Program Settings Window

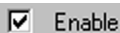
Program Settings

Program Settings File: Custom.PRS

<p>Code 39</p> <p><input checked="" type="checkbox"/> Enable</p> <p><input type="text" value="0"/> Minimum Length</p> <p><input type="text" value="20"/> Maximum Length</p> <p><input type="checkbox"/> Enable Checksum</p> <p><input type="checkbox"/> Send Checksum</p> <p><input checked="" type="checkbox"/> Full ASCII Mode</p>	<p>Codabar</p> <p><input checked="" type="checkbox"/> Enable <input type="checkbox"/> Enable</p> <p><input type="text" value="4"/> Minimum Length</p> <p><input type="text" value="20"/> Maximum Length</p> <p><input type="checkbox"/> Send Start/Stop</p> <p><input type="checkbox"/> Codabar to CLSI Conversion</p> <p><input checked="" type="checkbox"/> Allow Wide Inter-Character Gaps</p>
<p>Code 128</p> <p><input checked="" type="checkbox"/> Enable</p> <p><input type="text" value="2"/> Minimum Length</p> <p><input type="text" value="20"/> Maximum Length</p> <p><input type="checkbox"/> UCC/EAN 128 Enable</p>	<p>Code 11</p> <p><input type="checkbox"/> Enable</p> <p><input type="text" value="4"/> Minimum Length</p> <p><input type="text" value="10"/> Maximum Length</p> <p><input type="checkbox"/> Require 2 Check Digits</p> <p><input type="checkbox"/> Send Check Digit(s)</p>

Select Product Falcon 31x Falcon 32x/33x/34x Falcon 51x

- If **Browse** is selected after making changes in this or any other **Program Settings** window and the changes are not saved, the prompt shown in [Figure 2-6 on page 2-8](#) appears.



On/Off Switches: The smaller white boxes are on/off switches. Click in the box to toggle a switch.



Input Fields: Enter specific settings for parameters in the larger white boxes. (Refer to [Appendix C](#) for a table of parameters and settings.)

Select Product: Select the appropriate radio-button for type the Falcon model being configured: **31x**, **32x/33x/34x**, or **51x**.

Prev Select **Prev** to return to the previous program-settings window.

Next Select **Next** to move on to the next program-settings window.

- Done**
1. Select **Done** when finished making program settings for the custom installation.
 2. The sixth **Program Settings** window (Figure 2-14) appears if **Next** is selected in the fifth window.

Figure 2-14: The Sixth Program Settings Window

The screenshot shows a window titled "Program Settings" with a blue header bar. Below the header, there is a text field for "Program Settings File:" containing "Custom.PRS", with "Save" and "Browse..." buttons to its right. The main area contains several settings: "Laser Program Enable" (checked), "Symbology Identifiers" (unchecked), "Auto-Terminator Character" (dropdown menu set to "Carriage Return"), "Long Range Laser Mode" (dropdown menu set to "Spot Beam Timeout"), "Spot Beam Timeout" (dropdown menu set to ".5 second"), "System Auto-Off Timer" (text field set to "300"), "Backlight Auto-Off Timer" (text field set to "15"), "Release Scan Beam Timeout" (text field set to "2"), and "Spotting Beam Enable" (checked). At the bottom, there is a "Select Product" section with radio buttons for "Falcon 31x", "Falcon 32x/33x/34x" (selected), and "Falcon 51x". Below this are four buttons: "Help", "<< Prev", "Next >>", and "Done".

Program Settings File: This field shows the program-settings file that will be loaded into the Falcon.

Save After selecting options in this window, select **Save** to save the revisions in the current program-settings file or in a new one.

- Browse**
1. Select **Browse** to use a different program settings file.

- The **Open** dialog box appears.

Figure 2-15: The Last Program Settings Window

Program Settings

Program Settings File: Custom.PRS

Enable Ctrl-Alt-Del
 Enable Trigger Programmability

Falcon 33x/34x Double Action Key Mode
 Double Strike
 Press and Wait

Falcon 33x/34x Double Action Key Delay
 330 milliseconds

Keyboard Sound: Click

Good Read Tone: Low (2393 Hz)

Good Read Tone Duration: Short

Error Tone: Low (2568 Hz)

Beeper Volume: Loud

Number of Good Read Tones:
 1
 2
 3
 4

Select Product: Falcon 31x Falcon 32x/33x/34x Falcon 51x

- Use the **Open** dialog box to choose a configuration file from the **Progscts** folder.
- If **Browse** is selected after making changes in this or any other **File Configuration** window and the changes are not saved, the prompt shown in [Figure 2-6 on page 2-8](#) appears.

Spotting Beam Enable

Spotting Beam Enable: Select to enable the Spotting Beam. This feature is reviewed in the *Falcon DOS Portable Data Terminal User's Guide* on page 58.

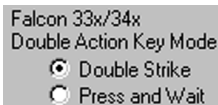
Laser Program Enable

On/Off Switches: The smaller white boxes are on/off switches. Click in the box to toggle a switch.



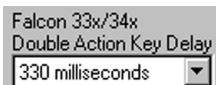
300 System Auto-Off Timer

Input Fields: Enter specific settings for parameters in the larger white boxes. (Refer to [page C-3](#) for a table of parameters and settings.)



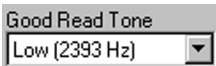
Falcon 33x/34x
Double Action Key Mode
 Double Strike
 Press and Wait

Double Action Key Mode: Select **Double Strike** or **Press and Wait** as the Double Action Key Mode. Both selections in the *Falcon DOS Portable Terminals User's Guide* on page 38.



Falcon 33x/34x
Double Action Key Delay
330 milliseconds

Double Action Key Delay: Select **Double Action Key** delay. This feature is reviewed in the *Falcon DOS Portable Terminals User's Guide* on page 38.



Good Read Tone
Low (2393 Hz)

Drop-Down Lists: Click on the list to view the options, and select the desired option.



Number of
Good Read
Tones
 1
 2
 3
 4

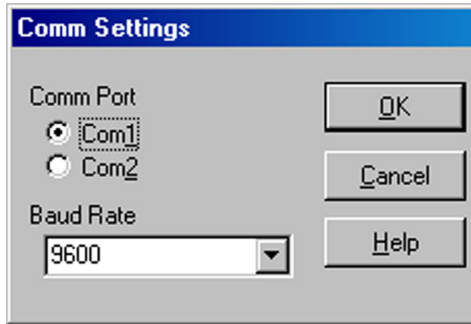
Radio Buttons: Select the desired setting by clicking on it.

Prev Select **Prev** to return to the previous program-settings window.

Done Select **Done** when finished making program settings for the custom installation.

The Comm Settings Dialog Box

1. Select **Comm Settings** from the main menu or the **Custom Configuration** menu.
2. The **Comm Settings** dialog box ([Figure 2-16 on page 2-21](#)) appears.
3. Use this dialog box to view or change settings for serial communications with the Falcon.

Figure 2-16: The Comm Settings Dialog Box

Comm Port: Select the desired serial port for the PC to communicate with the Falcon. The default port is **COM1**.

Baud Rate: Select the **baud rate** for serial communications between the PC and the Falcon. The default is **9600**.

The File Transfer Window

1. When selecting **Transfer Files** from the main menu, the **File Transfer** window appears ([Figure 2-18 on page 2-22](#)).
2. Use this window to select data files for transfer between the Falcon and the computer.

List File: This field shows the name of the file-list file, when selected.

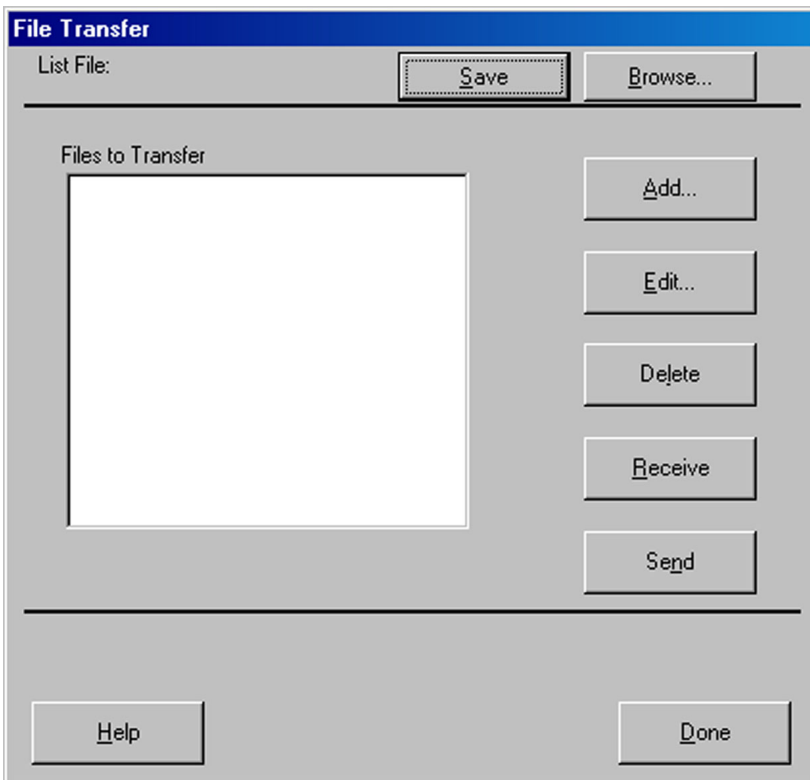


Transfer files can be selected without using or creating a list file.

Save After making changes in the **Files to Transfer** list, select **Save** to save the revisions in the current file-list file (if any), in another existing file, or in a new file.

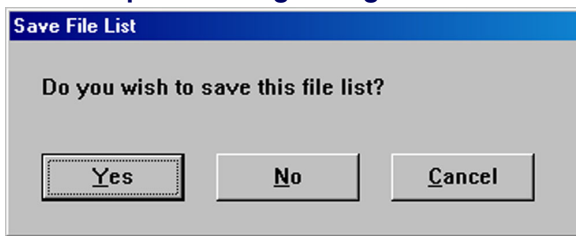
- Browse**
1. Select **Browse** to use a different file-list file.
 2. An **Open** dialog box appears.

Figure 2-17: The File Transfer Window



3. Use the dialog box to choose a configuration file from the **Filelist** folder.
4. If **Browse** is selected after making changes in this or any other **File Transfer** window and the changes are not saved, the following prompt appears:

Figure 2-18: The Prompt for Saving Changes to the Current File List



- Yes**
1. Select this option to save the changes.

2. A **Save As** dialog box will open.
3. Use the dialog box to specify the location and name of the new file-list file.

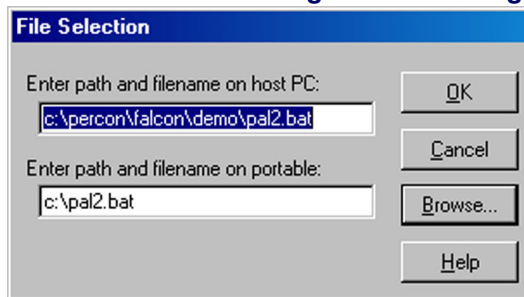
No Select this option to discard the changes.

Cancel Select this option to return to the **File Transfer** window without saving or discarding the changes.

Files to Transfer: This field shows the files that will be included in the transfer between the Falcon and the PC.

Add Select **Add** to include additional data files in the transfer. The **File Selection** dialog box open ([Figure 2-19 on page 2-23.](#))

Figure 2-19: The File Selection Dialog Box for Adding a Data File



Enter path and filename on host PC: Use this field to specify the location of the file on the PC.

Enter path and filename on portable: Use this field to specify the location and name for the transferred file on the Falcon.

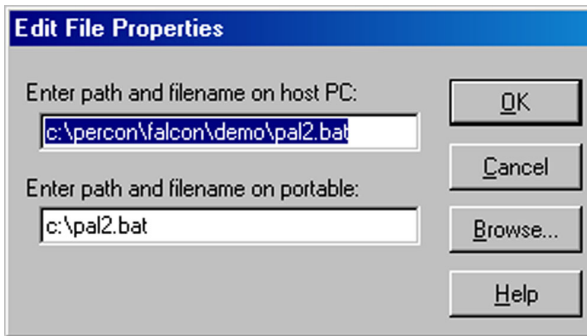
OK Select **OK** to return to the **File Transfer** window. The specified data file will appear in the **Files to Transfer** list.

Cancel Select **Cancel** to return to the **File Transfer** window without adding a file to the **Files to Transfer** list.

- Browse**
1. Select **Browse** to view the files on the computer.
 2. The **Open** dialog box appears.
 3. Use the dialog box to choose a data file to be included in the transfer.

- Edit**
1. Select a file in the file list and then select **Edit** to change the source path or destination path for the file.
 2. The **Edit File Properties** dialog box opens ([Figure 2-20](#)).

Figure 2-20: The Edit File Properties Dialog Box



- The fields and buttons in this dialog box are the same as in the **File Selection** dialog box above.

Delete To delete a file from the list, select the file and then select **Delete**.

- Receive** Select **Receive** to begin a file transfer from the Falcon to the PC
1. When selected, the configuration utility prepares files to be transferred to the PC and opens the **Important** dialog box ([Figure 2-2 on page 2-5](#)).
 2. Make certain the Falcon unit is properly connected to the serial port specified in the Comm Settings dialog box (refer to [page 2-20](#)).
 3. Then run the **ld.bat** file on the Falcon, and select **OK** in the **Important** dialog box on the computer.
 - 4.

- Send** Select **Send** to begin a file transfer from the PC to the Falcon.
1. The configuration utility prepares files to be transferred to the Falcon and opens the **Important** dialog box (refer to [Figure 2-2 on page 2-5](#)).
 2. Make certain the Falcon unit is properly connected to the serial port specified in the **Comm Settings** dialog box (refer to [page 2-20](#)).
 3. Then run the **ld.bat** file on the Falcon, and select **OK** in the **Important** dialog box.

Done Select **Done** when finished selecting and transferring files.

3

Using File Transfer Programs

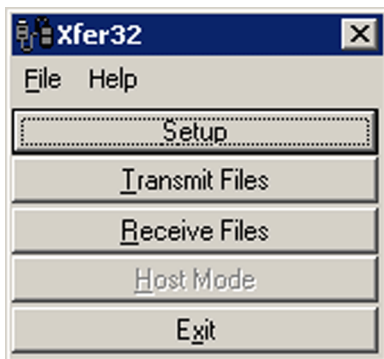
CHAPTER CONTENTS

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XFER32 Using XFER32

When you start **XFER32**, the **XFER32** interface, opens ().

Figure 3-1: . XFER32 User Interface



XFER32 XFER32 Setup

To prepare for data transfer between the PC and the PT40, click on the **Setup** button to open the **Setup** dialog box, which contains three tabbed sections. The settings in these dialogs can be modified or customized to meet your communications requirements.

General Tab

Figure 3-2: File Transfer Setup Definition Form: General Tab

The screenshot shows a 'Setup' dialog box with three tabs: 'General', 'Transfer', and 'Logging'. The 'General' tab is selected. The settings are as follows:

- Connection:** A dropdown menu showing 'COM1'.
- Baud Rate:** A dropdown menu showing '19200'.
- Flow Control:** A dropdown menu showing 'None'.
- Protocol:** A dropdown menu showing 'XModem'.
- Maximum Errors:** A text input field containing '0'.
- Window Size:** A dropdown menu showing 'Streaming'.
- Crash Recovery:** A dropdown menu showing 'Never'.

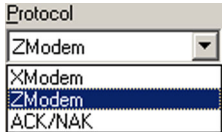
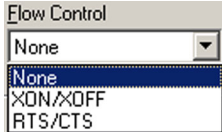


At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Help'.

Connection Enter the **Connection** port for file transfers. Select from the list of detected serial ports or modems.

This close-up shows the 'Connection' dropdown menu. The text 'COM1' is visible in the dropdown box. The list of options is: 'COM1', 'COM1', and 'COM2'. The first 'COM1' is highlighted with a blue background.

Baud Rate Select a **Baud Rate** for serial communications from the pull-down list. The default value is **19200**.

This close-up shows the 'Baud Rate' dropdown menu. The text '19200' is visible in the dropdown box. The list of options is: '19200', '9600', '19200', '38400', '57600', and '115200'. The first '19200' is highlighted with a blue background.

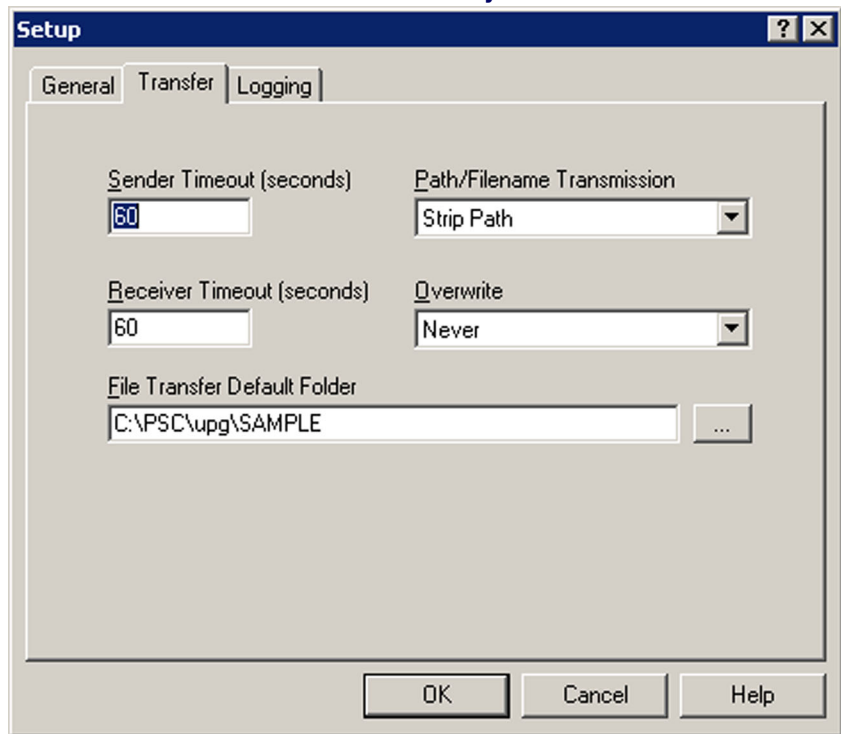
Protocol	<p>Select the file transfer Protocol to use for sending and receiving files. The Protocol depends upon what the Host system requires. The default value is ZModem.</p> <p>Refer to <cross-ref>“XModem vs. ZModem” on page -267 to select the correct protocol for your application.</p>	
XModem	XModem does not allow multiple file transfers.	
ZModem	ZModem allows multiple file transfers.	
ACK/NAK	ACK/NAK does not allow multiple file transfers. Do not use ACK/NAK with PSC Falcon DOS units.	
Maximum Errors	Enter the maximum number of Errors permitted before a file transfer is aborted. Range: 1 to 50 . 0 specifies no limit to the number of file transfer errors.	
Flow Control	Select the mechanism used to control the flow of data. Sender and receiver must agree on the flow control method.	
None	No flow control used.	
XON/XOFF	Software flow control using XON and XOFF characters to communicate when to suspend and resume data transfer. Only available with Z-Modem protocol.	
RTS/CTS	Hardware flow control that uses Ready to Send (RTS) , and Clear to Send (CTS) serial port lines to communicate when to suspend and resume data transfer.	
Window Size	Specifies the amount of data transmitted before receiving a response from the receiver.	
Streaming	Sender does not wait for a response before sending all the data.	
1024-4096	Causes the sender to wait for a response after sending the specified amount of data.	
Crash Recovery	Specifies whether or not an attempt is made to complete a file transfer at the point of failure.	

Never	Never attempts to recover from a file transfer.
Follow Sender	Follows the sender's Crash Recovery and Overwrite options.
Always	Forces an attempt to recover from a file transfer.

Transfer Tab

This tab establishes file transfer settings. Select the **Transfer** tab.

Figure 3-3: Transfer Tab of the File Transfer Utility



Sender Timeout (Seconds)	Enter the maximum number of seconds to wait for a connection when sending files. A value of 0 waits indefinitely.
Receiver Timeout	Enter the maximum number of seconds to wait for a connection when receiving files. A value of 0 waits indefinitely.

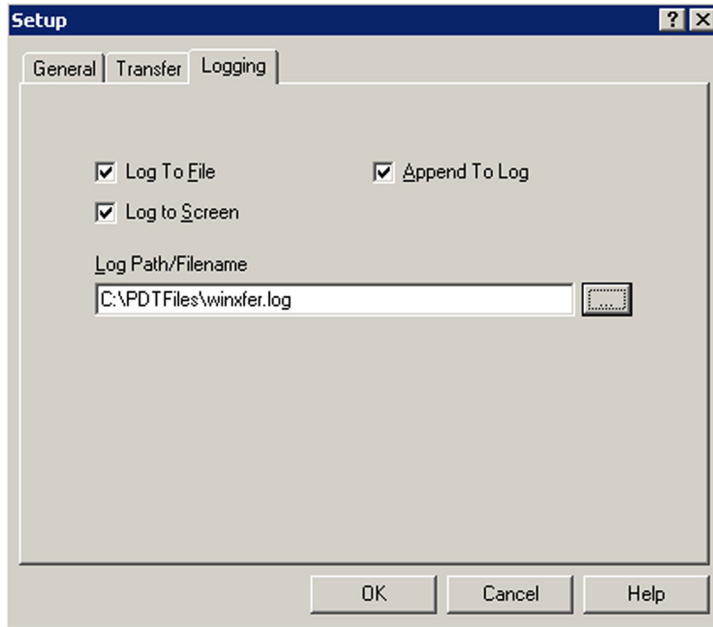
Path/Filename Transmission	Enter a Path/Filename Transmission to control how the sender processes the paths and filenames of files to be sent. Only applies to Z-Modem.
Strip Path	Sends only the filename (no path) to the receiver.
Send Path	Sends the filename with path to the receiver.
Specify Receiver's File Path/Name	Allows both the filename and path for each file to be altered prior to being sent to the receiver.
Overwrite	Select to determine the action the receiver takes when a received file already exists.
Source Longer or Newer	Overwrites the existing file if the received file is longer or newer.
CRCs Don't Match	Overwrites the existing file if the CRCs of both files don't match.
Append	Appends the received file to the existing one.
Always	Overwrites the existing file with the one received.
Source Newer	Overwrites the existing file if the received file is newer.
Date/Length Don't Match	Overwrites the existing file if the dates or lengths of both files don't match.
Never	Skips the transfer if the received file already exists.
File Transfer Default	Enter the File Transfer Default folder for storing received files. Use the Browse button to locate a new location.



Logging Tab

This tab establishes settings for the communications log. Click the **Logging** tab.

Figure 3-4: Logging Tab of the File Transfer Utility

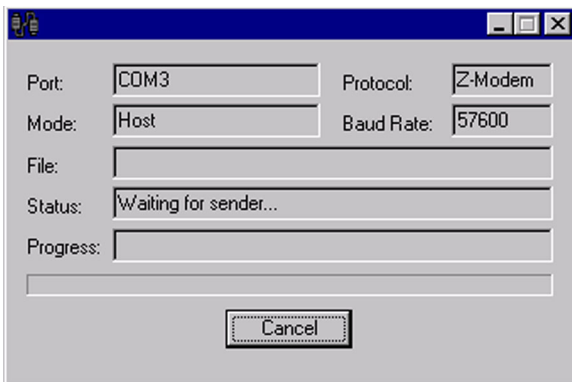


- | | |
|-------------------------------|--|
| Log To File | Specifies that the log is to be written to a text file. |
| Log To Screen | Specifies that the log is displayed on screen. |
| Append to Log | This option becomes available when you select Log to File . When enabled, Append to Log adds log information to the end of the log file. If not enabled, new log information replaces the previous log file. |
| Log Path/
Filename | Specify the location for storing the communications log. If a path is not given, the file is stored in the Default File Transfer folder. |
| Browse | Use the Browse button to locate a new log file. |

Host Mode

Host Mode is a method of receiving files using the Z-Modem protocol. It continuously waits for files and receives them using the filenames specified by the sender. Once files have been received, it goes back to waiting for additional files. Select **Transfer Files > Host Mode** from the menu bar.

Figure 3-5: Host Mode Window



Sending and Receiving Data



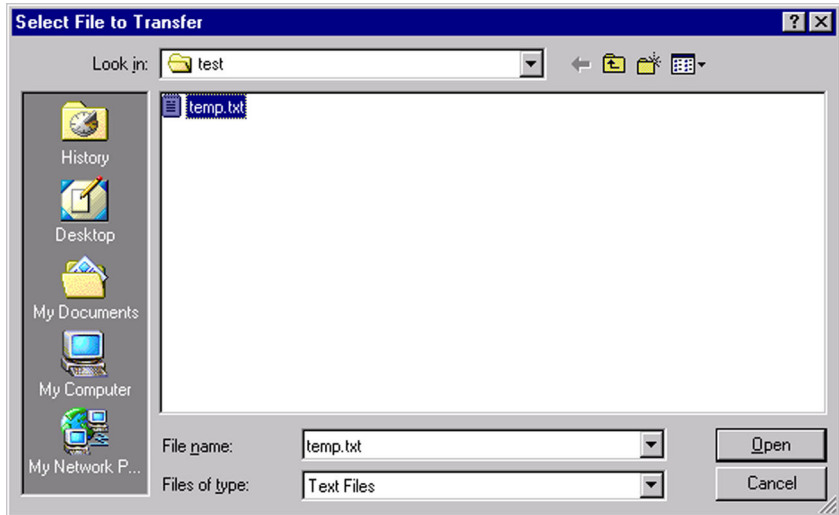
UPG uses the **File Transfer Manager** to transfer data (collection, validation, and INI files) between a portable data collection unit and the host PC. It is possible to send and receive files with the **File Transfer Manager** without switching between utilities. Send and receive files only works with direct connections between a host PC and portable data collection unit. To receive data from a portable via modem, use a communications utility that supports a modem (XFER32 or UPG Runtime or commercially available communications programs). Use the same protocol as selected in the Communication Settings window to receive a file via modem using the external communications package; see the documentation for the communication package for more information.

Verify that the portable is properly attached to the host PC. If the portable uses a dock, make sure that the dock is properly attached to the PC. Many docks require the use of a null-modem with a serial cable and power supply. Check the portable/dock documentation for more information.

Send File (to Portable)

1. Select **Transfer Files > Send File** from the menubar.

Figure 3-6: Send File to Portable Window



2. Select the file(s) to send.
 - You can select multiple files if you are using the **ZModem** protocol.
3. Click **Open** to send the file to the data collection terminal
 - Press **Cancel** to not send any files

If the **Path/Filename Transmission** is set to **Specify Receiver's File/Pathname**, the file names may be altered prior to being sent to the receiver. A **Send File As...** dialog is displayed to permit the changing of the path/name of each file. The dialog contains a list of each file to be sent. The left column displays the path/name of each file as it exists on this computer. The right column displays the same file as seen by the receiver. To change the path/name assigned to a file, select the filename to change, and then click **Edit**. Or, double-click the filename from the list.

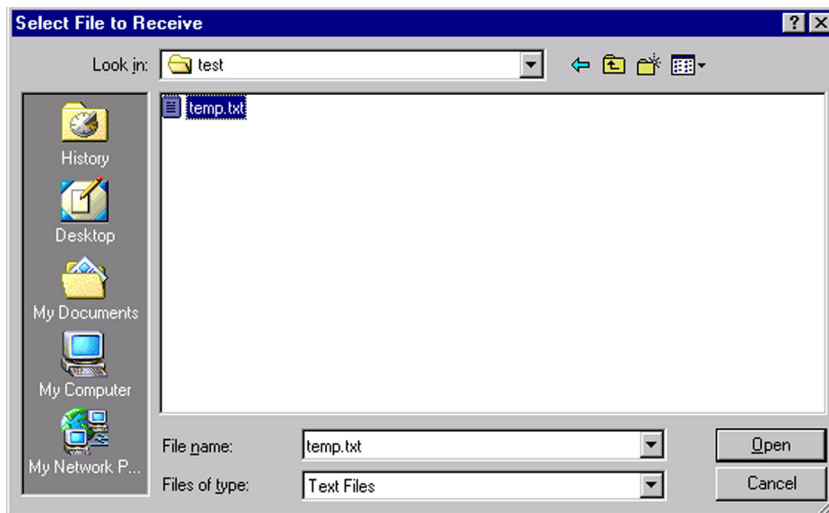


Receive File (from Portable)

When receiving files from a data collection terminal, a prompt appears. Enter the name of the incoming file.

1. Select **Transfer Files > Receive** from the menubar.

Receive File from Portable Window



2. Select (or enter) a filename for the file.
 - You can select multiple files if you are using the **ZModem** protocol.
 - Filenames are assigned to files in the order listed in the **File Name** field.
 - You can also use the filename(s) supplied by the sender. Press **Cancel** to select this option.
3. Click **Open** to begin receiving the file.
 - Press **Cancel** to not receive any files.

Using XFER

XFER (**xfer.exe**) is a DOS utility that directs the serial transfer of ASCII and binary data between two computers. This chapter provides information for advanced users and system administrators who want to use XFER to transfer files between a Falcon and a PC. For basic information about XFER, refer to [page 1-11](#).



XFER runs on Falcon portables using DOS. Use XFER32XFER32 on the Host PC with Win32. Use the native on-help with XFER32.

When using Z-modem, flow control must be the same on both sides of the transmission. Normally, XFER defaults to RTS/CTS flow control. On the Falcon 33x and 34x, it defaults to Xon/Xoff. When transferring files between a 33x or 34x and the host PC, make sure the PC is also using Xon/Xoff. See the /F option on [page 3-18](#) for more details.

XFER supports Xmodem and Zmodem transfers at speeds up to 115200 baud. Modem support is provided via an initialization file that specifies option settings for the modem. Option settings can be specified on the command line or with an environment variable called **XFER_ARGS**.

XFER supports RTS/CTS handshaking for Xmodem protocol and both XON/XOFF and RTS/CTS handshaking for Zmodem protocol.

Syntax and Parameters

The command line syntax for XFER is as follows:

```
XFER [/option1 [/option2] . . .] filename(s)
```

Use a slash (/) or a hyphen (-) to denote options, and use uppercase or lowercase letters for them. Options can be placed before or after filenames on the command line.

Basic options and their defaults are listed and described in [Table 3-1](#). The **Default** column indicates whether the option is used (**On**) or ignored (**Off**) if it is not included in the command line. For options that have two or more possible values, the default value is given.

A page number for each option indicates where a full explanation can be located in this manual.

Table 3-1: XFER Parameters

Option	Description	Default	
		Xmodem	Zmodem
filename(s) (page 3-14)	Identifies the file to be transferred or received.	None	None
@file (page 3-15)	(Zmodem only) Specifies a response file consisting of two or more names of files to be transferred. Replace file with the name of the response file to use.	N/A	None
# (page 3-16)	Specifies the communications port to use. Replace the # symbol with the desired setting: 1 = COM1 2 = COM2	1	1
B# (page 3-16)	Specifies the baud rate. Replace the # symbol with the desired setting: 2400 4800 9600 19200 38400 57600 115200	19200	19200
C# (page 3-16)	(Zmodem only) Specifies how the retransmission of a file should be handled if a previous transfer was interrupted. Replace the # symbol with the desired setting: 1 = Never recover (start transmission from the beginning of the file) 2 = Follow sender (use the sender's crash-recovery options; ignore the receiver's) 3 = Always recover (send data from the point where transmission was interrupted)	N/A	1
D# (page 3-17)	Specifies the number of seconds for XFER to wait for activity before cancelling the transfer. Replace the # symbol with the desired number of seconds for the timeout delay. Acceptable values are 0 (no timeout) through 65 , 535 .	60	60
E# (page 3-18)	Specifies the maximum number of times XFER should attempt retransmission of a packet after an error occurs. If the final attempt fails, XFER aborts the transfer. Replace the # symbol with the desired maximum number of attempts. A setting of 0 allows for unlimited attempts.	0	0
F# (page 3-18)	Specifies the type of flow control to use for data transfer. Replace the # symbol with the desired setting: 0 = No flow control 1 = XON/ XOFF (Zmodem only) 2 = RTS/ CTS	0	1 = Falcon 33x or 34x 2 = all other Falcon models
H or ? (page 3-19)	Displays help for the XFER command.	None	None

Option	Description	Default	
		Xmodem	Zmodem
Ifile (page 3-19)	Specifies the modem-initialization file. Replace file with the name of the file to use.	modem.ini	modem.ini
Mcommand (page 3-19)	Sends a command to the modem before beginning the data transfer. Replace command with one of the following: A = Auto answer ATstr = Send AT <i>str</i> commands D#x = Dial memory #x (0–9) Dstr = Dial phone number <i>str</i>	None	None
N (page 3-20)	Forces XFER to ignore all previously specified option settings, including filenames and options specified in the XFER_ARGS environment variable. All XFER options are set to their default state.	Off	Off
O# (page 3-20)	Overwrites an existing file with a new file having the same name. Replace the # symbol with the desired setting: 1 = Overwrite if source is longer or newer (<i>Zmodem only</i>) 2 = Overwrite if CRCs don't match (<i>Zmodem only</i>) 3 = Append to existing file (<i>Zmodem only</i>) 4 = Always overwrite 5 = Overwrite if source is newer (<i>Zmodem only</i>) 6 = Overwrite if dates or lengths don't match (<i>Zmodem only</i>) 7 = Never overwrite	7	7
Q (page 3-22)	Toggles quiet mode on and off. In quiet mode, only the filename and a " Transmitting... " or " Receiving... " message is displayed. When quiet mode is off, additional information is displayed. Each use of this option reverses the quiet-mode state.	Off	Off
R (page 3-22)	Receives the specified file or files.	Off	On if no file is specified
S# (page 3-23)	(<i>Zmodem only</i>) Specifies how paths and names should be handled when sending files. Replace the # symbol with the desired setting: 0 = Strip paths 1 = Send paths 2 = Send new paths/filenames	N/A	0
T (page 3-24)	Transmits the specified file or files.	On	On if file is specified

Option	Description	Default	
		Xmodem	Zmodem
W# (page 3-25)	Window size (<i>Zmodem only</i>): x = Packet size, in bytes 0 = Streaming	N/A	0
X (page 3-26)	Uses Xmodem protocol for the transfer.		
Z (page 3-26)	Uses Zmodem protocol for the transfer.		

filename(s) Name(s) of the File(s) to Send or Receive:

Xmodem Only one file can be transferred at a time. The entire path can be specified, including the drive letter. If the path is not specified, the file is sent from or received into the current directory. If the directory or file doesn't exist on a send, or the directory doesn't exist on a receive, the transfer will fail, with a file-open error.

The filename must be included on the command line when receiving a file. If multiple files are specified for Xmodem, only the first file will be transferred. All other file names will be ignored.

Zmodem Zmodem allows up to 256 files to be transferred in one session. The entire path for each file can be specified, including the drive letter. If a path is not specified, the file is sent from or received into the current directory. If the directory or the file doesn't exist on a send, or the directory doesn't exist on a receive, the transfer will fail, with a file-open error. DOS accepts only 128 characters on the command line, but a response file can be used to get around this limitation. (Refer to the **@file** option on [page 3-15](#).)

When receiving, the filename does not need to be specified for Zmodem. Zmodem transfers the name of the file to be sent before sending the file. (See the **S** option on [page 3-23](#) for information on controlling how Zmodem sends the filename.) Any filename specified on the receiving end will override the default name that is sent by the sender.

When multiple files are sent, a one-to-one correspondence is established. For example, if ten filenames are specified on the sender's side and five filenames are specified on the receiver's side, the first five files transferred will be received with the names specified on the receiver's command line, while the last five files

will be received with the names specified on the sender's command line (assuming all the files exist). Each filename on the command line can include its own path.

XFER also recognizes the wildcard characters `?` and `*`. Normal DOS pattern-matching rules for these characters apply. Be careful about using wildcards when receiving: XFER expands the wildcards of the specified filenames and then searches for any matching patterns in the specified directory. If no matching files are found (in an empty directory, for instance), then no filenames will be sent to the Zmodem receive procedures. This may or may not be what was intended. Also, DOS does not store files in alphabetical order, and so using `*.*` to both send and receive files may result in files being renamed because they are loaded in a different order. This can occur even if the file lists on both sides of the transfer are the same.

@file Response File (Zmodem only): The `@file` option allows use of a “response file” for specifying filenames when conducting Zmodem transfers. This option allows circumvention of the DOS limitation of 128 characters on the command line when sending many files in a single transfer session.

When using a response file, fill the file with the filenames to be sent or received. The filenames may include drives and paths. One filename should appear on each line of the response file. Up to 256 files can be specified in this way.

The following is a sample response file, named **response.txt**:

```
autoexec.bat
c:\programs\theprog.exe
c:\data\file1.dat
c:\data\file2.dat
c:\data\file3.dat
```

Not all the filenames need to be specified in the response file. For example, the following command would send seven files, including the five in **response.txt** above.

```
xfer /z c:\default\config.sys /@response.txt c:\data\file4.dat
```

In this case, each filename is read in as it appears on the command line. The file **c:\default\config.sys** would be the first one sent, the **autoexec.bat** file specified in the **response.txt** file would be the second file sent, and the **c:\data\file4.dat** file specified on the command line would be the seventh file sent.

Multiple response files can be specified. Regardless of the number of response files used, the 256-file limitation for a single transfer session is always in effect.

If a response file is included in the **XFER_ARGS** environment variable (refer to [page 3-26](#)), the **N** option can be used to ignore the response file and start from a default condition (refer to [page 3-20](#)).

Response files can be used with the **S2** option (refer to [page 3-23](#)). In this case, the format for the response file would be:

```
autoexec.bat c:\autoexec.bat
c:\programs\theprog.exe c:\prog.exe
c:\data\file1.dat d:\data1
c:\data\file2.dat d:\data2
c:\data\file3.dat d:\data3
```

In this case, the first filename on a line specifies the file on the sender's side. The second filename on the line specifies the filename the sender will pass to the receiver.

The receiver's filename is separated from the sender's filename by a single space. If more than one space is used, the additional spaces will be included as part of the receiver's filename. Because a space character is used as a delimiter, Windows 95 and Windows NT filenames with spaces as part of the filename will not be parsed correctly and should not be used. Placing quotes around the filename will not help in this situation.



The **@file** option can be used only in Zmodem transfers. The **Z** option must be specified before the **@file** option. If a response file is used with the **S2** option, the **S2** option must be specified before the **@file** option.

All other rules governing filenames apply to response files.

COM Port: This option specifies the communications port to use for the file transfer. Replace the **#** symbol with the desired setting:

1 = COM1 2 = COM2

B# Baud Rate: This option specifies the baud rate to be used for the file transfer. Replace the **#** symbol with the desired setting:

2400 4800 9600 19200 38400 57600 115200

C# Crash Recovery (Zmodem only): Crash recovery refers to the ability of Zmodem protocol to detect that a file transfer was not completed and to attempt to recover at the point of failure (instead of recopying the entire file). For instance, if the communications link is severed during the transfer of a 10K file, with only 5K of data successfully transferred, crash recovery can be used to send the remaining 5K without resending the entire 10K file.



This option is supported by Zmodem protocol only. Xmodem will never attempt to recover a file after a crash.

Crash recovery uses the CRC of the sender's and receiver's files to ensure that the portion of the file that was successfully received in the first transfer is identical to that portion of the sender's copy of the file. If this is true, then the receiver instructs the sender to begin sending data beginning at the point in the file that corresponds to the end of the file on the receiver's side.

By default, crash recovery is turned off. To use the **C** option, replace the **#** symbol with the desired setting:

- 1** - No crash recovery
- 2** - Follow sender
- 3** - Always use crash recovery

If the **C** option is used without including a number, then the **1** setting is assumed. An invalid setting will result in an error on the command line.

The **C** option can be used in conjunction with the **O** option. If **C2** (follow sender) is specified on the command line, the receiver will use the sender's crash and overwrite options. Any overwrite options local to the receiver will be ignored. This is useful if a default crash-recovery command is specified in the **XFER_ARGS** environment variable (refer to [page 3-26](#)) and crash recovery for the current transfer is temporarily disabled.

D# Delay Before Terminating Transmission: This option allows specifying a timeout. If the specified number of seconds elapse with no characters received by either the sender or the receiver, the program aborts the transfer session.



This option is supported by Zmodem protocol only. Xmodem will never attempt to recover a file after a crash.

To use the **D** option, replace the **#** symbol with the desired number of seconds for the timeout delay. Acceptable values are **0** (no timeout) through **65,535**; the default is **60**. A value of **0** disables the timeout feature, meaning that the transfer session will never be aborted because of inactivity. If the **D** option is used without specifying a number, an error will occur.

E# Maximum Number of Errors Before Aborting Transfer: The **E** option is used to specify the maximum number of times the receiver will request a retransmission of a packet before aborting the transfer session.



For multiple file transfers in Zmodem, the entire session is aborted, not just the transfer of the current file.

The default is **0**, meaning the transfer will never be aborted because of errors. If the **E** option is used without specifying a number, an error will occur.

F# Flow Control: This option is used to specify what type of flow control to use for the file transfer.

Flow control is the ability of the receiver to detect that data is coming in faster than it can receive and to issue a command to the sender instructing it to stop sending data. When the receiver is again able to handle new data, it issues another command instructing the sender to resume the transfer of data.

XFER supports two types of flow control: software (XON/XOFF) and hardware (RTS/CTS). Only one type can be used at a time. The sender and receiver should have this option enabled similarly.

To use the **F** option, replace the **#** symbol with the desired setting:

- 0** - No flow control
- 1** - XON/ XOFF (*Zmodem only*)
- 2** - RTS/ CTS

If the **F** option is used without specifying a number, it is assumed to mean **F0**, or no flow control. This is useful in the case where flow control is specified in the **XFER_ARGS** environment variable (refer to [page 3-26](#)) but flow control is turned off for the current transfer session. An invalid setting will result in an error on the command line.



The RTS/CTS flow control option is only available when using XFER with the Falcon 31x and 32x.

Flow control defaults and capabilities differ depending upon the protocol (Xmodem or Zmodem) being used.

Xmodem: If the **F** option is not included in the command line, no flow control is used. XON/XOFF cannot be used with Xmodem protocol, because Xmodem protocol sends raw binary data and cannot distinguish between the XON/XOFF characters and file data. Attempting to specify XON/XOFF with Xmodem protocol will result in an error.

Zmodem: On the Falcon **33x** and **34x**, the default flow control for Zmodem is Xon/Xoff. For all other portables and host PCs, the default is RTS/CTS. On a Falcon portable, flow control should be used when transferring with Zmodem, especially if Zmodem is in streaming mode. In streaming mode, the Zmodem sender does not wait for acknowledgements to packets but continuously sends a stream of data. Often this can overwhelm the receiver especially if it is receiving at high data rates or receiving to the **C** drive or to a PCMCIA ATA card, which writes data to disk much slower than the **D** drive.

H or ? Help: This option displays a brief description of the XFER syntax, options, and settings.

Ifile Modem-Initialization File: This option specifies the file that contains modem setup and control commands. Refer to [The Modem-Initialization File](#) on [page 3-29](#) for complete information about *Ifile*.

Mcommand Modem Command: This option allows commands to be sent to the modem before the start of the file transfer. To use the **M** option, replace **command** with one of the following commands:

A = Auto answer

ATstr = Send *ATstr* commands

D#x = Dial memory #*x* (0–9)

Dstr = Dial phone number *str*

Specifying **XFER /MA** instructs the modem to go into auto-answer mode. In this mode the modem will wait for the timeout period specified in the modem-initialization file for another modem to dial into it. On detection of a ring-in signal, XFER will answer the line and attempt to start a file transfer.

Specifying **XFER /MATstr** allows a string of AT commands to be sent to the modem. These commands will be sent to the modem after the initialization string from the modem-initialization file and can be used to specify a different configuration. Since only one modem command can be specified on the

command line, any commands to auto-answer or dial must be included in the AT string.

There are two methods for dialing numbers. The first method uses the format **XFER /MD#x**, where **x** is a number from 0 through 9. This number corresponds to a directory number from the modem-initialization file, which identifies a number that should be dialed for this transfer (see the **NUMBER#** keyword on [page 3-31](#)). If a number is not specified, directory number **0** is used.

The second dialing method is to use the **XFER /MDstr** format, where **str** is a dialing command to be sent directly to the modem. This string can be any recognizable phone number text, such as **(555) 444-3333** or **5554443333**.

The last **M** option on the command line or in the environment variable is the one used for controlling the modem. All earlier modem-command settings are ignored.

If the **M** option is used without specifying a command, the modem will be disabled for that transfer session. This is useful in the case where modem commands are specified in the **XFER_ARGS** environment variable (refer to [page 3-26](#)) but are transferring files without a modem for the current transfer session.

N Ignore Previous Option Settings: This option causes XFER to ignore previously specified options and return to a default state. All options specified in the **XFER_ARGS** parameter and on the command line preceding the **N** are ignored. All options that XFER supports are returned to the default state, and all filenames, response files, modem-initialization files, and modem commands that are specified before the **N** (including the **XFER_ARGS** environment variable) are discarded.

The **N** option is useful when the **XFER_ARGS** environment variable is used to redefine defaults for XFER. It isn't always obvious that the **XFER_ARGS** parameter is controlling the behavior of XFER, and it is often the case that several parameters have been redefined. Instead of having to set each option back to its default, use the **N** option to return XFER to a known state.

O# Overwrite Existing File(s): The **O** option specifies what action the receiver should take if the file being transferred already exists on the receiver's side. When using this option, replace the **#** symbol with the desired setting:

- 1 - Overwrite if source is longer or newer
- 2 - Overwrite if CRCs don't match
- 3 - Append to existing file
- 4 - Always overwrite
- 5 - Overwrite if source is newer
- 6 - Overwrite if dates or lengths don't match
- 7 - Never overwrite

By default, XFER operates in **O7** mode—existing files are never overwritten. For Xmodem, the only valid options are **O4** and **O7**; all other settings resolve to **O7** (never overwrite). All settings for the **O** option are available with Zmodem protocol.

To remain compatible with previous versions of XFER, the **O** option used without a setting resolves to the **O4** setting (always overwrite). This differs from most other XFER options, where specifying the option without a setting usually resolves to the default condition for that option. To use the default condition for the **O** option, specify the **O7** setting.

An invalid setting will result in an error on the command line.



XFER does not prompt to specify whether a file should be overwritten in the default mode. If no overwrite option is specified, the file will never be overwritten. Under Xmodem, the session will abort. Under Zmodem, the file will be skipped and the next file will be transferred.

For the **O6** setting under Zmodem, XFER does not set the date or time of a received file to match the original date or time of the sender's version of the file. Instead, the date and time are taken from the receiver's operating system when the file is received and created. Because of this, it is highly unlikely that a file transferred with XFER will have the exact date of the original file. Since the resolution of times for files under DOS is in two-second increments, it is unlikely the timestamps will be the same, even if the times on the receiver and sender are calibrated frequently. Also, DOS doesn't report the seconds field when displaying the modification time of a file during a file listing. So, two files may appear to have the same timestamp when in fact they don't. The tendency with the **O6** option is for files to be overwritten, because times usually do not match exactly.

The **O3** setting is unique in that it causes the transferred file (binary or ASCII) to be appended to the end of the old file rather than overwriting it.

With Zmodem, the **O** option can be used with the **C** option setting for crash recovery (refer to [page 3-16](#)). If **C2** (follow sender) is specified on the command line, then the receiver will use the sender's crash and overwrite options. Any options local to the receiver will be ignored.

Q Quiet Mode: This option toggles quiet mode. When quiet mode is enabled, minimal information is displayed about the file transfer in progress. Generally, only the name of the file being transmitted is displayed. When not in quiet mode, XFER will display a copyright message, the filename, and file statistics, including a running count of bytes transferred.

Running XFER in quiet mode on the Falcon can significantly improve serial-transfer performance, especially at high speeds. At 115200 baud, transfers are four times faster if quiet mode is enabled on the Falcon than if it is disabled, owing to the delay inherent to writing a running byte count to the screen.

Since the **Q** option is a toggle switch, each occurrence of it in the command line inverts the quiet-mode state. By default, XFER has quiet mode off. The first occurrence of the **Q** option turns quiet mode on, the next turns it back off, and so on. This is most useful if the option is specified in the **XFER_ARGS** environment variable (refer to [page 3-26](#)) to activate quiet mode by default but in the current transfer session quiet mode will be deactivated.

R Receive File(s): This option specifies that files are to be received. With Xmodem protocol, the option must be specified whenever receiving a file. The option can be included in the **XFER_ARGS** environment variable (refer to [page 3-26](#)), forcing Xmodem protocol to default to receiving instead of sending files.

With Zmodem, receive is the default if *no* file is specified on the command line (for example, **XFER /z**). The name of the file is sent by the transmitting side before the file is transferred, and the file is received with that path and name. To receive a file under Zmodem with a different name from the sender's, use the **R** option to force Zmodem into receive mode. Specify the new filename after the **R** option on the receiver's command line (See the **filename(s)** option on [page 3-14](#) for information on specifying file-names.) When Zmodem has been specified, using the **R** option without a filename is the same as not using the option at all—the sender's filename (and path) is used.



The last transfer option, **R** or **T**, on the command line controls whether to transmit or receive for the session.

S Specify Sender's Path-and-File Handling (Zmodem only): The **S** option controls how the sender handles the paths and filenames of the files that it sends. This option is available only with Zmodem protocol. The **Z** option must be specified before using the **S** option. Use one of the following settings described individually below:

- 0** - Strip paths
- 1** - Send paths
- 2** - Send new paths/filenames

If the **S** option is not included in the command line, the default setting (**0**) is used. If the **S** option is used without specifying a setting (for example, **XFER / S**), it is assumed to mean **S0**. This is useful in the case where another option is specified in the **XFER_ARGS** environment variable (refer to [page 3-26](#)) but during the current transfer session, the paths will be stripped.

An invalid setting will result in an error on the command line.

0 Strip Paths: In this mode (the default), the sender will remove any paths that are specified with a filename before sending the filename to the receiver. The new filename will be transmitted to the receiver without any path information. The file will be stored by the receiver in the current directory.

1 Send Paths: This option performs no processing on the filenames specified on the sender's side. Any drive and path information that is specified is transmitted to the receiver. If a path is specified and it does not exist on the receiver's side, the transfer will abort with a failure.

2 Send New Paths/Filenames: When the **S2** setting is used, all filenames are treated as filename pairs. This provides the ability to specify dual filenames during a transfer. The first filename (optionally including a drive and path) is the one that the sender uses to open the file. The second filename is used by the sender when it transmits the filename to the receiver. This provides the ability to transfer a file and have it renamed on the receiver's side. It also allows

transfer of a file from one directory on the sender's side to another directory on the receiver's side.

Multiple filename pairs may be specified, which may be separated by other XFER options.

The following conventions must be observed when using the **S2** option. Failure to conform may result in errors.

- The **S2** command must be specified ahead of any filenames.
- When specifying dual filenames, the filenames must be separated by a single space. The first filename in the pair is what the sender uses, and the second filename is what the sender will transmit to the receiver. If more than one space is used, all spaces after the first will be included as part of the receiver's filename.
- The drive and path may be specified for components for either filename in a pair. The actual name of the file must be included in both filenames along with the drive and the path.

Correct examples:

```
C:\> xfer /zs2 file1 file2
C:\> xfer /zs2 c:\data\file1 d:\file2
C:\> xfer /zs2 c:\data\file1 d:\file1 c:\yourfile myfile
C:\> xfer /zs2 file1 data1 /b115200 file2 data2
```

Incorrect examples:

```
C:\> xfer /zs2 file1 /b115200 file2
C:\> xfer /zs2 file1      file2
C:\> xfer /zs2 file1[TAB]file2
C:\> xfer /z file1file2 /s2
C:\> xfer /zs2 file1d:\
```

In the second incorrect example, the additional spaces would be included in the receiver's filename. This is generally wrong, but it may be correct if that is the intended result. The third incorrect example is invalid because the filenames must be separated by a single space; no other white-space character can be used. This mistake most often occurs when using response files (refer to [page 3-15](#)).



If a filename is specified on the receiver's side, that filename will override whatever filename the sender transmits to the receiver.

- T Transmit File(s):** This option specifies that files are to be sent. For Xmodem protocol, this is the default; that is, typing **XFER foo** on the command line would send the file **foo**.

For Zmodem protocol, transmit is the default when specifying a file on the command line. So, for example, the command **XFER /Z foo** is equivalent to the command **XFER /Z /T foo**.

The **T** option is most useful if the **XFER_ARGS** environment variable (refer to [page 3-26](#)) includes the **R** command and a file is also being sent.



The last transfer option, R or T, on the command line controls whether to transmit or receive for the session.

W Window Size (Zmodem only): This option controls the use of windowing with Zmodem protocol. By default, Zmodem is a streaming protocol, and windowing is disabled. “Streaming” refers to the method by which Zmodem transfers data. In streaming mode, the sender forms 1K data packets and sends one packet after another in a continuous stream. The sender does not wait, and does not expect, to get acknowledgments from the receiver for any of the packets it sends. Instead, the sender assumes the file transfer is going normally unless it gets an error indication from the receiver.

This works fine in robust, error-free environments. But the receiver can get lost or disconnected without the sender realizing it. Windowing provides a way in noisy environments to give some level of packet acknowledgment to Zmodem protocol. With windowing, the sender will send up to the number of bytes specified by the size of the window and then stop transmitting data until the receiver acknowledges that it has received all of the packets that have been sent. The sender then sends more packets, up to the size of the window, and so on.

Waiting for acknowledgments slows down transfer speeds, but XFER allows a dynamic compromise between speed and robustness. XFER allows specifying the window size with any value from **0** to **65535**. Use **W0** for streaming mode. For a 1K window, use **W1024**. Values below **1024** are used exactly as specified and should be the size of the transmitted packets. Values above **1024** should be multiples of **1024** (**1024**, **2048**, **4096**, etc.). Values above **1024** that are not multiples of **1024** are rounded up to the nearest multiple of **1024**.

If the **W** option is not included on the command line, streaming is used. If the option is used without specifying a setting, **W0** (streaming) is used by default. This is useful in the case where a window size is specified in the **XFER_ARGS** environment variable refer to [page 3-26](#)) but streaming will be used for the current transfer session.



Always place the **w** option after the **z** option, or a parsing error will occur. See the information about the **z** option on [page 3-26](#) for more details.

- X Xmodem Transfer:** The **x** option instructs XFER to transfer all files in that session using Xmodem protocol. Because this is the default file-transfer protocol, it does not normally need to be specified.
- Z Zmodem Transfer:** The **z** option instructs XFER to transfer all files in that session using Zmodem protocol. The **z** option should come before all other options that are valid for Zmodem only (such as the **C** option). This is required because Xmodem is the default protocol for XFER, and option parsing will fail if an illegal setting is specified under Xmodem.

In addition, specifying the **z** option resets the Zmodem window size for that session, making it necessary for the **z** option to come before any use of the **w** option.



The last protocol option in the command line specifies the protocol that will be used for the file transfer; that is, Xmodem would be used for the transfer ordered by **XFER /z /X f00**, and Zmodem would be used for the transfer ordered by **XFER /x /z f00**.

The XFER_ARGS Environment Variable

XFER recognizes the environment variable **XFER_ARGS**. This variable can be used to set option settings for most transfer sessions. Even files can be specified in the **XFER_ARGS** environment variable. Parsing of the XFER command line starts with the **XFER_ARGS** variable and then continues through any other specified options or filenames.

A slash or hyphen can be used for each option or the options can be merged into one block following a single slash or hyphen:‘

```
C:\> set XFER_ARGS = /ZROB57600
C:\> set XFER_ARGS = /z /R /O /B57600
```

For each command line in the example, files will be received (option **R**) using Zmodem protocol (**Z**) and a baud rate (**B**) of **57600** baud, and existing files will always be overwritten (**O**).



Up to ten slashes or hyphens can be used for options in the environment variable. Refer to section, [Multiple-Option Blocks](#), on [page 3-27](#) for more information.

Any of the parameters used in the example could be overwritten on the command line. For example, with following command:

```
C:\> xfer /x foo
```

XFER would use Xmodem for the file transfer instead of Zmodem, while still using the other option settings specified in the **XFER_ARGS** variable.

There are two precautions for mixing options in the environment variable with options on the command line. The first is about options that are supported by Zmodem protocol only. In the following example:

```
C:\> set XFER_ARGS = /z /w4096 /c3
C:\> xfer /x foo
```

the environment variable is set up to use Zmodem with a 4K window and crash recovery turned on. In the XFER command line, Xmodem protocol is specified. Since Xmodem doesn't support windows or crash recovery, both those options are ignored. Another, more troublesome scenario is the following:

```
C:\> set XFER_ARGS = /z /o5
C:\> xfer /x foo
```

Here, XFER is set to Zmodem in the environment variable, with an overwrite setting of **5** (overwrite if source is newer). However, in the XFER command line, Xmodem protocol is specified. The only overwrite settings that Xmodem supports are **O4** (always overwrite) and **O7** (never overwrite); all other **O** options resolve to **O7** for Xmodem. If the file **foo** exists, the transfer will abort. In this case, specify **O4** on the command line or do not use the **X** option.



If a filename is included in the **XFER_ARGS** environment variable, that file will always be the first file sent or received. Negate it only by specifying the **N** option on the command line (refer to [page 3-20](#)). For this reason, exercise extreme caution when including filenames in the environment variable.

Multiple-Option Blocks

XFER supports multiple options after a single slash (/) or hyphen (-) on the command line and in the **XFER_ARGS** environment variable. Each of the following examples is a valid command line:

```
C:\> xfer /zrob115200 foo
C:\> xfer /zro /d30 /b115200 foo
C:\> xfer /zrw2 /o5c3f2 foo
```

Any option can immediately follow another without a separate delimiter (/ or -) unless the preceding option has a multicharacter setting. The following options have multicharacter settings:

- **B** (baud rate)
- **D** (timeout)
- **E** (error count)
- **I** (modem-initialization file)
- **M** (modem command)

The setting for each of these options *must* be followed by a space. Except for the **I** and **M** options, the option is ignored during parsing if there is no space following its setting. For the **I** option, any extra characters directly following the initialization-file filename will be treated as part of the filename. Any extra characters following the **M** option will be treated as part of the modem command; this may produce modem-command syntax errors.

Correct examples:

```
C:\> xfer /zrob115200 foo
C:\> xfer /zo5c3f2b115200 foo
C:\> xfer /z /mA foo
```

The first two command lines above are valid because the **/b115200** setting is always at the end of the multiple-option block. Also in the second example, the **O**, **C**, and **F** options all have single-digit settings.

Incorrect examples:

```
C:\> xfer /zb115200ro foo
C:\> xfer /z /mAro6 foo
```

In the first command line above, XFER would load and run. However, the **R** and **O** options would not be detected, because the **b115200** setting is not followed by a space. Therefore, XFER would try to send the file **foo**, not receive it. The second example is wrong because the **R** and **O6** parameters would be included as part of the modem command **A**.

Be careful when specifying the COM port in a multiple-option block. For example, the following command:

```
C:\> xfer /zo2 foo
```


sets the overwrite option to **2** (overwrite if CRCs don't match) but doesn't cause XFER to use COM port 2. The following commands could be used to do this:

```
C:\> xfer /z2o foo
C:\> xfer /z2o2 foo
C:\> xfer /zo22 foo
```

In the last example, the first **2** is treated as the setting for the **O**, and the second **2** is parsed as the COM port to use for the transfer.

The Modem-Initialization File

Format The modem-initialization file (*modem.ini*) contains keyword-and-value pairs, with each pair on a separate line. Each keyword is separated from its value by one or more spaces; tabs and other white-space characters are not valid. Keywords can be in any order within the file.

Lines beginning with a **#** character or with a space character are treated as comment lines and are ignored. The **#** character can also be used to embed comments within a line. Any characters after a **#** character in a line are ignored for that line.



Individual lines cannot exceed 128 characters in length, including comments, or errors in parsing may occur.

Keywords **ACCESS_DELAY:** This keyword specifies the number of milliseconds for XFER to wait for a response from the local modem when sending a command to the local modem. The default is **2000** ms (2 seconds).

CARRIER_TIMEOUT: This keyword specifies the number of seconds for XFER to wait for a carrier signal from the remote end before timing out. The default is **60** seconds.

COMPRESSION_STRINGS: This keyword specifies a list of response strings (expected responses from the modem) that indicate that a connection was made using data compression. Because modems often support various types of data compression, they may have more than one string indicating that compression is taking place. Use the **COMPRESSION_STRING** keyword as many times as necessary to create the desired list. However, the combined

length of all the values assigned to **COMPRESSION_STRING** cannot exceed 115 characters.

DIAL_METHOD: This keyword specifies how the modem attempts to dial phone numbers. This can be **T** for tone dial or **P** for pulse dial.

ECHO: This keyword indicates whether responses received from the modem should be displayed to the screen. Enable the keyword by setting the value string to **T** (for true); clear it by setting the value string to **F** (for false).

FAIL_STRINGS: This keyword is a list of response strings (expected responses from the modem) that indicate that the connection to the remote end failed. These strings contain text (such as **NO CARRIER** and **BUSY**) that the modem might return on an error. Using a configurable list of errors allows the serial-in/out modem run-time library to compensate for differences in messages between individual modems. Use the **FAIL_STRING** keyword as many times as necessary to create the desired list. However, the combined length of all the values assigned to **FAIL_STRING** cannot exceed 115 characters.

HANDSHAKING: This keyword controls the type of handshaking the Falcon will perform with the modem. Generally, RTS/ CTS handshaking is necessary to support the advanced functions of modems, such as compression and error-correcting protocols.

Set this keyword to **N** for no handshaking, **X** for Xon/Xoff software flow control, or **R** for RTS/CTS hardware handshaking.



The **HANDSHAKING** keyword in the modem-initialization file takes precedence over any flow-control options selected on the command line in **XFER**.

INIT_STRING: This keyword specifies the string to use to initialize the modem. The initialization-string value should begin with the AT sequence for Hayes-compatible modems, as the serial in/out modem routines do not attach these characters to the beginning of the initialization string before sending it to the modem.

LOCKED_BAUDRATE: When enabled, this keyword indicates that the local modem is configured to communicate with the PC at a fixed baud rate, regardless of the speed of the connection between the modem and the remote

end. This is the normal state of affairs for any modem that supports either data compression or error-correcting protocols. Having this keyword enabled implies that the modem is using hardware handshaking.

The baud rate used for a file transfer will be the baud rate set for XFER by the **B** option (the default is **19200** baud). If the **B** option is not set, the baud rate used is whatever the modem indicates it is using in the **CONNECT** message after connecting to the remote end.

Enable this keyword by setting the value string to **T** (for true). Clear it by setting the value string to **F** (for false).

NUMBER#: The **NUMBER#** keyword specifies a user-defined phone number. The value string can be any sequence of characters that defines a valid number for the modem to dial. Up to ten phone numbers may be specified, with each one assigned a keyword **NUMBER0** through **NUMBER9**. Any number may be assigned to a keyword (unless the number has already been assigned). It is not necessary to define all ten **NUMBER#** keywords, and they do not need to be defined in numerical order.

See the **Mcommand** section on [page 3-19](#) for information on how to access the **NUMBER#** strings to dial when using XFER.

PROTOCOL_STRINGS: This keyword is a list of response strings (expected responses from the modem) that indicate that a connection was made using an error-correcting protocol. Since modems often support various error-correcting protocols, they may have more than one string indicating that such a protocol is being used. Use the **PROTOCOL_STRING** keyword as many times as necessary to create the desired list. However, the combined length of all the values assigned to **PROTOCOL_STRING** cannot exceed 115 characters.

Sample Modem- Initialization File

```

INIT_STRING      ATE1Q0V1X4&C1&D2S7=10s9=6s10=20S11=55S0=2
FAIL_STRING      NO CARRIER
FAIL_STRING      ERROR
FAIL_STRING      NO DIALTONE
FAIL_STRING      BUSY
FAIL_STRING      NO ANSWER

# This is a comment.
  So is this.
COMPRESSION_STRING CLASS 5
COMPRESSION_STRING V.42BIS
PROTOCOL_STRIN   LAPM
PROTOCOL_STRIN   ALT
DIAL_METHOD      T # (T)ONE or (P)ULSE dialing
CARRIER_TIMEOUT 60
ACCESS_DELAY     2000
LOCKED_BAUDRATE  T # (T)RUE or (F)ALSE
ECHO              T # (T)RUE or (F)ALSE
HANDSHAKING      R # (R)TSCTS, (X)ONXOFF, or (N)ONE
NUMBER0          9 555-1234
NUMBER9          (111) 555-9999
NUMBER5          (111) 555-7777
NUMBER1          9 555-4321

```

The keywords are all case-sensitive and must be capitalized. For the **FAIL_STRINGS**, **COMPRESSION_STRINGS**, and **PROTOCOL_STRINGS** settings, the value string should also be capitalized. Any responses from the modem are converted to capital letters before being compared with the various substrings.



Performance

This section describes issues relating to serial performance on the Falcon. Although these issues are described in the context of XFER, they apply to serial transfers in general.

File-transfer speed is severely reduced when byte counts are displayed on the Falcon screen. Use the **Q** option in XFER to enable quiet mode and speed up transfers (refer to [page 3-22](#)).

Performance also is diminished when data is transferred to the **C** drive or to a PCMCIA ATA card. Both of these devices write data to the disk very slowly. Problems may arise as the disks become full and loading algorithms are executed to clean up space for new data. This can become particularly severe with Zmodem in streaming protocol, because the sender never waits for the receiver to write data to the disk. To avoid this problem, use Zmodem with either windowing (refer to [page 3-25](#)) or flow control (refer to [page 3-18](#)).

enabled. Flow control is generally faster and permits the receiver to operate at its peak capacity.

Another factor in performance is the presence of other software running in the background. Card and Socket Services, for instance, use the timer interrupt for certain functions. Because Card and Socket Services chain into this interrupt and execute some code with interrupts disabled, the system may become overburdened when running serial interrupts at high speed (greater than 19200 baud). In this case, overrun, parity, and framing errors become more common, sometimes resulting in an inability to send a file efficiently. If this occurs, select a lower baud rate (refer to [page 3-16](#)) and enable flow control (refer to [page 3-18](#)).

Error Codes

[Table 3-2:](#) lists error codes returned by XFER.

Table 3-2: XFER Error Codes

XFER Error Codes		
Value	Mnemonic	Description
0	OK	All files transferred OK.
1	ABORT_FILESSKIPPED	One or more files were skipped during a multifile download.
2	ABORT_TIMEOUT	The transfer was aborted because of a timeout.
3	ABORT_KEYPRESS	The abort key (<ESC>) was pressed.
4	ABORT_LINEERROR	A communications line error (e.g., OVERRUN) occurred.
5	ABORT_FILEERROR	A read, write, open, close, or access error occurred on a file.
6	ABORT_FTPERROR	An invalid file-transfer protocol option was selected.
7	ABORT_CHECKERROR	A checksum or CRC error occurred.
8	ABORT_MEMORYERROR	An error occurred while trying to allocate memory from the heap.
9	ABORT_RECEIVERERROR	The receiver encountered a problem and requested to skip the file.
10	ABORT_COMERROR	An error occurred while opening the COM port.
11	ABORT_ARGERROR	An error in an argument (option setting) occurred on the command line.
20	ABORT_UNKNOWN	An unknown error occurred.
31	MODEM_ABORT_CONNECTION	XFER could not establish a connection with the remote end.
32	MODEM_ABORT_NORESPONSE	The modem did not respond.
33	MODEM_ABORT_INIFILE	The specified modem-initialization file could not be found.

4

The Falcon 4-Slot Dock

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Overview

31X
32X

This chapter provides advanced information about using the Falcon 4-Slot Dock. It is intended for use by system administrators and advanced users who need to modify the Falcon 4-Slot Dock's factory-configuration settings.

For basic information about the Falcon 4-Slot Dock, see the *Falcon DOS Portable Data Terminals User's Guide*. For information about programming the Falcon 4-Slot Dock, see the *Falcon DOS Portable Data Terminals Developer's Toolkit*.

Operating Modes

The Falcon 4-Slot Dock network can operate in either of two modes:

- In *terminal-demand mode* (the default), the Falcon 4-Slot Dock network grants access to the communications line to individual portables on a priority basis.
- In *host-controlled mode*, the host controls which portable gets access to the communications line at any time.

For information about setting and using these modes, see the *Falcon DOS Portable Data Terminals Developer's Toolkit*.

XFER, the serial file-transfer utility that comes with Falcon, can access the 4-Slot Dock network in terminal-demand mode without any further action from the user. Use XFER to send and receive files from one or more portables to the host (refer to [page 4-4](#)). If two or more portables attempt to communicate with the host at the same time, the 4-Slot Dock network arbitrates between them so that each portable gets a chance at the line.

The 4SLOT.SYS Device Driver

To use terminal-demand mode within a custom application or to use host-controlled mode, the **4slot.sys** DOS device driver should be installed on the portable. The **4slot.sys** driver extends the capabilities of the DOS COM driver and provides a programming interface so that custom programs can request, detect, and drop access to the 4-Slot Dock communications line.

For host-controlled mode, the **4slot.sys** driver allows the user to assign a unique name to the portable that the host can use to control that portable's ability to access the 4-Slot Dock communications line.



The 4slot.sys driver is included in the Falcon Developer's Toolkit. For information about purchasing the toolkit, contact a PSC representative.

The **xfer.exe** program has limited ability to access the Falcon 4-Slot Dock network when the **4slot.sys** driver is not loaded. This allows use of the Falcon 4-Slot Dock network to download the Falcon 4-Slot Dock device driver to any portable that doesn't already have it.

The Falcon Configuration Utility can transfer the **4slot.sys** driver to the portable and modify the **config.sys** file. Complete the following steps:

1. Install the Developer's Toolkit software on the computer. (Follow the installation instructions provided with the Developer's Toolkit.) Be sure to include the 4-Slot Dock software during the installation process. (Install the Falcon Configuration Utility at this point, if not already installed.)
2. Start the Falcon Configuration Utility, and select the **Transfer Files** button on the main menu. Find the **4slot.sys** file (in the **percon\falcon\dos** directory if the default installation was used) and transfer it to the **c:\dos** directory on the Falcon unit.
3. Transfer the Falcon's **c:\config.sys** file to a temporary location on the PC. Using a text editor (for example, Notepad), add the following line to the end of the file: **device=c:\dos\4slot.sys**
4. Save the file, and transfer it back to the **c:** directory on the Falcon.
5. Reboot the Falcon.



Save the file list or create a new `.cfg` file to transfer the 4-Slot Dock driver and modified `config.sys` file to multiple Falcons units. For complete information about the Falcon Custom Configuration Utility, refer to [Chapter 2](#).

Transferring Files with XFER

Files can be transferred with the XFER utility on the portable. XFER has the ability to automatically request access to the communications line from the Falcon 4-Slot Dock, whether the Falcon 4-Slot Dock device driver is loaded or not.

To use XFER to transfer a file to the portable, place the portable in a slot on the Falcon 4-Slot Dock. On the portable, type in the command to receive a file, which is typically the following: `C:\> xfer /r filename.txt`

On the host, type the following at a DOS prompt: `C:\> xfer filename.txt`

Once the XFER command is executed on the portable, the portable requests access to the communications line from the Falcon 4-Slot Dock. When access is given to the portable, the COM LED for that slot will come on with a green light. When the XFER command is executed on the host, XFER will transfer the file from the host to the portable. When XFER exits on the portable, the COM LED goes out, indicating that the portable has relinquished access to the communications line.



Xmodem uses no flow control, by default. For Zmodem, the default flow control is RTS/CTS. To use XFER with Zmodem with the 4-Slot Dock, hardware flow control must be turned off using the appropriate XFER command line switch (refer to [page 3-18](#)), and XON/XOFF flow control should be used instead. This holds true for any communications software on a Falcon using the 4-Slot Dock.

For complete information about the XFER utility, refer to [Chapter 3](#).

Setting the Baud Rate

The Falcon 4-Slot Dock is capable of operating at the following baud rates:

- 9600
- 19200
- 38400
- 115200

It is configured for 19200 baud at the factory.

When running in host-controlled mode, the Falcon 4-Slot Dock network must be informed of the baud rate the host and portables will be using so that it can set itself accordingly.

To enable the 4-Slot Dock network to detect and set the baud rate, follow the procedure below. A host-communications software package, such as ProCOMM or HyperTerminal is required. It does not matter if the portables have the **4slot.sys** driver loaded. However, each portable must have the **4slot.sys** driver loaded if the host is to control that portable.

Complete the following steps.

1. Set the host-communications package or program to 2400 baud. Send a single space to the dock network. There will not be any feedback from any of the Falcon 4-Slot Docks in the dock network.



This step isn't always necessary, but it ensures that the Falcon 4-Slot Docks will detect a baud rate error as quickly as possible. It also eliminates concern about what baud rates the various docks are already in.

2. Now set the host communications package or program to the desired baud rate and send a plus character (+) to the dock network. This is a synchronization character that the docks use to verify that they are correctly getting data from the host on a baud rate change.
3. To verify that the docks are correctly configured, send the **Request Unit IDs** command **DCRI** to the dock network.



It is possible to type in the command at a terminal communications program, sending it out the COM port from an application, or copying it to the COM port device driver under DOS. For complete information about sending commands to a Falcon 4-Slot Dock, see the Falcon DOS Portable Data Terminals Programmer's Reference.

The unit IDs are received in brackets (i.e., [Unit ID]) from any portables in dock slots. For each empty slot in the dock network, the Falcon 4-Slot Dock receives a blank Unit ID ([]). A slot returns the reserved Unit ID [UNKNOWN] if the Falcon in the slot is powered off (models 31x only), the Falcon does not have the 4-Slot Dock driver (4slot.sys) loaded, or the baud rate of the Falcon is not set to the same baud rate as the 4-Slot Dock network and host computer.

If any problems occur with a dock, or correct dock configuration cannot be verified, attach that dock directly to the host computer with an RS-232 cable. Then repeat the above steps with only the one dock attached to the host. The dock should send back four unit IDs, with unit IDs of [] for empty slots and [UNKNOWN] for slots that have portables without the Falcon 4-Slot Dock device driver loaded.

5

Disk Drives, Organization, Software, & Configurations

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Overview

This chapter details the default contents of the disk drives and the organization of system software on the Falcon. It also includes descriptions of two standard software configurations.

Disk Drives and Files

Structure

The Falcon DOS portable terminal has the following drive structure:

Drive **A** is a read-only flash drive. The contents of this drive cannot be changed.

Drive **B** is a read-only flash drive that can be updated by using the core-update program, **corexfer.exe**, from a host machine. (Normal operation will not require updating of this drive.)

Drive **C** is a resident flash disk drive that is accessed with the **flashdisk.sys** device driver. Use this drive to store applications and data.

Drive **D** is a RAM disk accessed with the **vdisk.sys** device driver. This drive can be used to store applications as well as data. Take great care in selecting files for this drive. As with any RAM drive, its contents will be lost if power is removed.

Additional drives are mapped to ATA flash PC cards or to network drives via radio frequency (RF).

This organization provides an easy-to-use, extensible system that allows a high degree of performance, usability, and customization. The following sections more fully describe the contents and intended uses of each of the Falcon's drives.

Drive A

Drive **A** is a disk image that is located in flash along with the BIOS and ROM-DOS. A read-only drive, it is intended to remain secure throughout the life of the unit. Drive **A** contains the following files:

- **autoexec.bat**, the first file in the startup sequence
- **command.com**, the DOS shell
- **config.saf**, the first file in the safe-boot sequence
- **config.sys**, the first file in the boot sequence
- **rev.com**, the utility that reports the firmware revision

The **config.sys** and **autoexec.bat** files contain only basic commands that the unit needs to run correctly (refer to [Figure 5-1](#) and [Figure 5-2](#)). Both files chain to their respective counterparts on the **B** drive, as described in the next section.

Figure 5-1: Config.sys File on Drive A

```
REM *****
REM Initial CONFIG.SYS file for starting the system.
REM *****
NEWFILE = B:\CONFIG.SYS
```

Figure 5-2: Autoexec.bat File on Drive A

```
@echo off
REM *****
REM Initial AUTOEXEC.BAT file for starting the system.
REM *****
VER
PATH=A:\
B:\AUTOEXEC.BAT
```

The **config.saf** file (refer to [Figure 5-3](#)) is used in the safe-boot sequence. (For more information about the **config.saf** file, refer to [page 5-5](#). For information about the safe boot, refer to [page 7-4](#).)

Figure 5-3: Config.saf File on Drive A

```
REM *****
REM Initial CONFIG.SYS for safe boot.
REM *****
NEWFILE = B:\CONFIG.SAF
```

Drive B

Drive **B** is a disk image that is located in flash. A read-only drive, it is intended to be used to store mandatory utilities and initialize the boot process. During normal use this drive will not be updated.

Drive **B** includes the following files. Where applicable, page numbers tell where to find more information about specific files.

- **autoexec.bat**, the second file in the startup sequence.
- **cfgdev.sys**, the system-parameter-configuration device driver ([page 6-3](#)).
- **comio.com**, the utility for redirecting input and output to the serial port (models **32x**, **33x**, and **34x** only; ([page 6-5](#)).
- **config.saf**, the second file in the safe-boot sequence.
- **config.sys**, the second file in the boot sequence.
- **coreupd.com**, the utility that updates the firmware image.
- **decode.sys**, the bar-code-decoding device driver ([page 6-6](#)).
- **flashdsk.sys**, the resident flash disk device driver ([page 6-7](#)).
- **format.com**, the disk-reformatting utility ([page 6-8](#)).
- **functest.com**, the functional test for system components.
- **himem.sys**, the device driver for accessing extended memory (models **32x**, **33x**, and **34x** only).
- **ld.bat**, the batch file for **response.bat** processing.
- **lock.com**, the utility for locking or unlocking the resident flash disk and RAM disk ([page 6-9](#)).
- **organize.com**, the utility for reorganizing flash disk data ([page 6-10](#)).
- **pm.com**, the power-management utility ([page 6-11](#)).
- **umblink.exe**, the device driver for accessing upper memory blocks (models **32x**, **33x**, and **34x** only).
- **vdisk.sys**, the RAM-disk device driver ([page 6-13](#)).
- **xfer.exe**, the serial-transfer utility ([page 6-14](#)).

32X
33X
34X

32X
33X
34X

32X
33X
34X

The **config.sys** file (refer to [Figure 5-4](#)) will load the **flashdisk.sys** driver to create the **C** drive and the **vdisk.sys** driver to create the **D** drive. It will then load **decode.sys** and **cfgdev.sys** before chaining to its counterpart on drive **C**. The **autoexec.bat** file (refer to [Figure 5-5](#)) will chain to its counterpart on drive **C**, except during a safe boot.

Figure 5-4: Config.sys File on Drive B

```
REM *****
REM Standard CONFIG.SYS for building system.
REM *****

REM *****
REM Create flash and RAM drives
REM *****
DEVICE = B:\FLASHDSK.SYS 4096
DEVICE = B:=VDISK.SYS 4096 /e

REM *****
REM Load decode/configuration drivers
REM *****
DEVICE = B:\DECODE.SYS
DEVICE = B:\CFGDEV.SYS
NEWFILE = C:\CONFIG.SYS
```

Figure 5-5: Autoexec.bat File on Drive B

```
@echo off
REM *****
REM Standard AUTOEXEC.BAT for starting system.
REM *****
PATH=%PATH%;B:\
C:
IF EXIST A:\CONFIG.SAF IF EXIST C:\AUTOEXEC.BAT C:\AUTOEXEC.B
```

The purpose of the **config.saf** file (refer to [Figure 5-6](#)) is to provide a minimal boot configuration that preserves the flash and RAM drives. When the safe-boot sequence is initiated (refer to [page 7-4](#)), the **config.saf** file is processed instead of the **config.sys** file. This prevents chaining into the drive-**C** initialization files by omitting the **NEWFILE = C:\CONFIG.SYS** command. It also eliminates the loading of the **decode.sys** and **cfgdev.sys** drivers.

Figure 5-6: Config.saf File on Drive B

```
REM *****  
REM Standard CONFIG.SYS for safe boot.  
REM *****  
  
REM *****  
REM Recover flash and RAM drives  
REM *****  
DEVICE = B:\FLASHDSK.SYS 4096  
DEVICE = B:\VDISK.SYS 4096 /e
```

Drive C

Drive **C** is a resident flash disk drive that is accessed via the **flashdsk.sys** device driver. By default, this drive is configured to have full read and write access. The default **config.sys** and **autoexec.bat** files reside here. These files can be modified to customize the system for an application. They will be called after the **config.sys** and **autoexec.bat** files on drives **A** and **B** are processed.

The Falcon Configuration Utility provides the ability to customize what software tools and utilities are placed on the unit. By default, the utility installs this software to the **C** drive. If the unit is intended to be used with PC cards, then the Phoenix PC card drivers are installed in the PCM subdirectory on the **C** drive, and the proper entries will be transferred into the **config.sys** and **autoexec.bat** files. The exact configuration of files and the contents of the **config.sys** and **autoexec.bat** files will change according to the configuration of the unit.

For RF capability, additional files for network connectivity would be required. These might include a Telnet program or peer-to-peer networking tools, depending on what is installed.

If something happens to a unit and data integrity becomes questionable, use the CHKDSK utility to detect and correct errors on drive **C**. (**Chkdsk.com** does not come installed on the Falcon. Download it using XFER or the Falcon Configuration Utility.)

Drive D

Drive **D** is a RAM disk drive. This drive resides in extended memory and is 1MB in size (3 MB for models **31x** with 4 MB of RAM).

Drive **D** can be used for short-term data storage. Programs that need to be loaded into memory and then removed from memory quickly can also be located there. The drive can also be used for scratch disk space or temporary files.

The Falcon preserves the data on drive **D** between warm or cold boots by checking for an existing RAM disk. However, only minimal checking is performed on any disk that is found; if something happens to a unit and data integrity becomes questionable, use the CHKDSK utility to detect and correct errors on drive **D**. (**Chkdsk.com** does not come installed on the Falcon. Download it using XFER or the Falcon Configuration Utility.)

Additional Drives

On Falcon models **32x**, **33x**, and **34x**, additional RAM disks may be created. If the Falcon Configuration Utility is used for this, it will appear as Drive **E**.

The Falcon can be configured to use an ATA flash card. The PC card looks like a hard disk drive to the operating system and the user. More flexible than flash disk drive **C**, it can be used for safer and more permanent bulk storage of batch data than the RAM disk (drive **D**).

Additional drives could also be a peer-to-peer or client-server network drive that is accessed through an RF or Ethernet network card link. This option allows the developer to make many network drives (drives **E**, **F**, etc.) available to applications.

Other System Software

BIOS and DOS

The Falcon uses a modified version of General Software's BIOS with Datalight's ROM-DOS. Both products are burned into system flash in a single 256K image. The **A** drive is included in the image, physically addressed just below the BIOS image.

ROM-DOS uses the Datalight **command.com** processor. This processor is fully Microsoft 6.2 compatible, except that it occupies about half the space in

memory. In addition, drive **C** contains Datalight DOS files in a DOS subdirectory.

PC Card and RF Networking Software

PC card device drivers and utilities as well as RF networking solutions can be installed to drive **C** (the flash drive) or drive **D** (the RAM drive). Use the Falcon Configuration Utility to download the necessary files to the Falcon.

System Configurations

Several configurations are possible for the system software on the unit, depending upon the type of hardware that is to be supported. Two standard configurations are described below, along with directory structures and default **config.sys** and **autoexec.bat** file descriptions.

Default Configuration

The configuration created by **default.cfg** in the Falcon Configuration Utility will create a **C** drive that contains **pal2.exe**, part of the Percon Portable Applications Library (PAL). The data files will be stored on drive **D**. PC card drivers able to support ATA cards will be loaded.

Figure 5-7: Config.sys File on Drive C for Default Configuration

```
FILES = 30

REM -----
REM --- Phoenix Card and Socket services for accessing PC Cards
REM -----
device = c:\pcm\cnfignam.exe /NORMAL
device = c:\pcm\pcmssit.exe
device = c:\pcm\pcmcs.exe
device = c:\pcm\pcmata.sys
```

Figure 5-8: Autoexec.bat File on Drive C for Default Configuration

```

REM -----
REM --- The following lines set up default parameters for some
REM --- environment variables. These lines may be modified or
REM --- overridden in the USER section below.
REM -----
set prompt=$p$g
set dircmd=/ogn /p

REM -----
REM --- The following section is for customized user entries.
REM -----
REM --- Insert user-specific options and commands here.
REM -----

REM -----
REM --- The following lines add system components to the PATH
REM --- and run the main application executable, if one was
REM --- specified.
REM -----
IF EXIST c:\bparams.ini copy c:\bparams.ini PARAMS
set path=c:\;c:\dos;%path%
c:
cd\
upgstart

```

I/O PC Card Support Configuration

The Falcon Configuration Utility has an option for support of I/O cards. This option will download the Phoenix Super Client Driver (**pcmscd.exe**) to the C:\PCM subdirectory on the Falcon. It will also add the command for loading of this driver to the **config.sys** file. The **config.sys** and **autoexec.bat** files below were created by eliminating ATA card support and adding I/O card support to **default.cfg**.

Figure 5-9: Config.sys File on Drive C for I/O PC Card Support

```

FILES = 30

REM -----
REM --- Phoenix Card and Socket services for accessing PC Cards
REM -----
device = c:\pcm\cnfignam.exe /NORMAL
device = c:\pcm\pcmsit.exe
device = c:\pcm\pcmcsc.exe
device = c:\pcm\pcmscd.exe

```

Figure 5-10: Autoexec.bat File on Drive C for I/O Card Support

```
REM -----
REM --- The following lines set up default parameters for some
REM --- environment variables. These lines may be modified or
REM --- overridden in the USER section below.
REM -----
set prompt=$p$g
set dircmd=/ogn /p

REM -----
REM --- The following section is for customized user entries.
REM -----
REM --- Insert user-specific options and commands here.
REM -----

REM -----
REM --- The following lines adds system components to the PATH
REM --- and runs the main application executable, if one was
REM --- specified.
REM -----
IF EXIST c:\bparams.ini copy c:\bparams.ini PARAMS
set path=c:\;c:\dos;%path%
c:
cd\
upgstart
```

6

System Utilities

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Chapter Conventions

This chapter describes some of the device drivers and utilities that are designed to be run on a Falcon unit. Where applicable, command syntax and parameters are given. Parameters may be supplied using either uppercase or lowercase letters, and the hyphen (-) may be substituted for the forward slash (/).

CFGDEV.SYS

The `cfgdev.sys` file is located on drive **B** of the Falcon unit. When `cfgdev.sys` is loaded by the `config.sys` file on that drive, a logical character-based device called PARAMS is created. This device receives programming strings that modify the configuration parameters that control the behavior of several system components. There are three ways programming strings can be sent to the PARAMS device:

- **Bar Code** Special bar code labels beginning with `$$$-` and ending with `EE` can be scanned using any bar code scanning device. [Appendix D](#) contains many useful labels.
- **File Copy** Files containing the bar code programming strings can be created and copied to the PARAMS device. The Falcon Configuration Utility creates a file called `bparams.ini` that contains all of the configuration settings. The `autoexec.bat` file on the Falcon's drive **C** contains the following command:

```
IF EXIST c:\bparams.ini copy c:\bparams.ini PARAMS
```

which copies the `bparams.ini` file to PARAMS. A new file may also be created which contains the configuration settings.

Example: To use the D2 defaults with the **CTL-ALT-DEL** key sequence disabled, complete the following steps:

1. Create a `myparams.ini` file with the following text: `$$$-D2E00EE`
`D2` sets the D2 defaults, and `E00` disables the **CTL-ALT-DEL** key combination.
2. Copy `myparams.ini` to the PARAMS device using the following DOS command: `COPY MYPARAMS.INI PARAMS`

- **Run-Time Library API** The API in the Falcon run-time library contains two function calls that allows configuration strings to be sent to the PARAMS driver from within a C application. See `CFG_Write()` and `CFG_Read()` in the *Falcon DOS Portable Terminals Programmer's Reference*.



Attempts to create, delete, or modify a file called `params` will conflict with the PARAMS device. The loading of `cfgdev.sys` cannot be eliminated except through the safe-boot process (refer to [page 7-4](#)).

CFGIO.EXE

The `cfgio.exe` utility changes the current font set or the current keypad mapping to be used by the system (or both). This is primarily to be used for loading support of alternate keypad overlays and fonts for international use. The new settings will take place only if the font set and keypad mapping are compatible.

Syntax `CFGIO [fontfile] [keymap]`

Options *fontfile*

Specifies the name of the file containing the new font set to be loaded into the system. Font files have the extension `fnt`.

keymap

Specifies the name of the file containing the new keypad map to be loaded into the system. Keypad map files have the extension `kbd`.

COMIO.COM

32X
33X
34X This utility provides an easy means for developers to interact with the portable by allowing video and keyboard interaction to be done at a host PC. It does this by controlling redirection of video and keyboard I/O through the portable's serial port COM1. When keyboard redirection is disabled, input is received from the portable's keypad; when it is enabled, input is taken from the

portable's serial port. The same mode of operation applies to video output, which is sent to either the Falcon viewport or out the serial port.

When redirecting video output, keypad input, or both, Falcon's serial port must be connected to a host computer. The host computer should be running a basic terminal emulator that provides a direct connection to the host communications port. The host communications port settings should be: no parity, 8 data bits, 1 stop bit, and the baud rate specified in the **comio.com** command line. By default, both video and keyboard I/O are redirected, but either one may be changed independently.

Syntax **COMIO** [/b#] [/h] [/k] [/v]

/b#

Specifies the baud rate to use. If not specified, the current baud rate is used.

/h

Displays a help file for the utility.

/k

Changes keyboard redirection only.

/v

Changes video redirection only.

DECODE.SYS

This driver controls bar code scanning devices and decodes bar code labels into text. If special programming bar codes are read, the decoded information will be sent to the PARAMS device (refer to CFGDEV.SYS, on [page 6-3](#)).

Otherwise, the resulting text is placed in the keyboard buffer for use by the application. **Decode.sys** is located on drive **B** of the Falcon unit and is loaded by the **config.sys** file located on that drive. The loading of **decode.sys** cannot be eliminated except through the safe-boot process (refer to [page 7-4](#)).

FLASHDSK . SYS

This driver configures all of the unit's available flash memory as a read-write disk, called a flash disk. Reading from a flash disk is fast, but writing can be somewhat slower. This driver is located on the Falcon's **B** drive and is loaded by the **config.sys** file located on that drive. The loading of **flashdisk.sys** cannot be eliminated.

FORMAT . COM

This utility formats a read-write disk drive. Only the flash and RAM drives may be formatted using this command. **Format.com** uses the existing drive parameters to recreate the drive, but without any files stored on it. This provides a quick method for cleaning out an existing drive.

Syntax **FORMAT** [*drive:*] [*/y*]

Options **drive**

Specifies the letter of the drive to be formatted. If a drive letter is not specified, the current drive is used.

/y

Suppresses output from being sent to the display, and bypasses the usual prompt to proceed with formatting.

LOCK . COM

Use this utility to enable or disable write protection on flash or RAM drives. (This is the software equivalent of the write-protect tab on a floppy disk.) Use **lock.com** to protect against accidental erasure of all files stored on a disk.

Whenever the Falcon is rebooted, write protection on a drive will be disabled, by default. To lock the drive upon bootup, include a **lock** command in the **autoexec.bat** file on drive **C**.

Syntax `LOCK [drive:] [/l] [/u] [/y]`

Options **drive**

Specifies the drive letter of the drive which is to be locked or unlocked. If a drive letter is not specified, the current drive is used.

/l (*the letter L*)

Lock the drive to prevent further disk writes.

/u

Unlocks the drive, allowing further disk writes.

/y

Suppresses output from being sent to the display.



If both the **/l** and **/u** options are given, the last option specified will take effect.

ORGANIZE . COM

This utility reorganizes sectors on a flash drive to improve flash disk access. Data is relocated so that all free sectors are grouped together, reducing the overhead of freeing space for new data. **Organize . com** has a greater effect on a flash disk as the disk gets closer to being full.



The flash disk created with the `flashdisk . sys` driver is the only Falcon drive that can be organized with this utility (refer to [page 6-7](#)). ATA flash drives will not respond properly to this utility.

Syntax `ORGANIZE [drive:] [/y]`

Options **drive**

Specifies the drive letter of the flash drive that is to be reorganized. If a drive letter is not given, the current drive will be used.

/y

Suppresses output from being sent to the display.

PM . COM

Use this utility to control various power-management features of the Falcon. Use it at the command line or in a batch file (including **autoexec.bat**) to set or read power-management settings.

Syntax `PM [/b#] [/E#] [/h] [/i] [/r] [/t#]`

Options `/b#`

Sets the automatic timeout for the backlight. Replace the **#** symbol with the number of seconds to wait after a keypress before automatically turning off the backlight. Each keypress restarts the timeout countdown. The range of acceptable values for **#** is **0** (off) to **255**; the default is **15** seconds.

`/E#`

Sets the time interval for audio indication when the batteries are low. Replace the **#** symbol with the number of minutes between soundings of the tone. The tone will not sound until the battery has been in the low state for the same number of minutes. The range of acceptable values for **#** is **0** (off) to **255**; this option is off by default.



The audio warning uses extra current, causing the batteries to drain faster. This interval should be set for as long as possible or should not be used at all.

`/h`

Displays a help file for the utility.

`/i`

Displays timer settings for auto-off, backlight timeout, and low-battery audio indication.

`/r`

Resets power management to the cold-boot defaults.

`/t#`

Sets the auto-off timeout. Replace the **#** with the number of seconds of nonuse before the unit should move to its lowest power state. The range of acceptable values for **#** is **16** to **1032**, or **0** for off; the default is **300** seconds (5 minutes).

VDISK.SYS

This driver configures some of the unit's available random access memory (RAM) as a read/write disk, called a RAM disk. This driver is located on Drive **B** of the Falcon unit and is loaded using the **config.sys** file located on that drive. On **31x** models, all of the Extended Memory on the unit (either 1 or 3 MB) is used to create a single disk (Drive **D**). On all other models, only the first 1MB of Extended Memory is used to create Drive **D**. The remaining available Extended Memory may be used to create additional RAM disks.

Syntax `DEVICE =
VDISK.SYS [disk_size [sector_size [root_entries]]]`

Options `disk_size`

Specifies the size of the RAM disk in kilobytes. The default disk size is 64 KB. If the amount of available Extended Memory is less than the disk size specified here, the size of the disk will be adjusted to the largest size available.

`sector_size`

Specifies the disk sector size in bytes. The default sector size is 512 bytes. Possible values are 128, 256, or 512.

`root_entries`

Specifies the number of root directory entries. The default value is 64 directory entries. This number may be set to any value between 2 and 1024.

XFER.EXE

The XFER utility provides the ability to transfer files to and from a PC through the Falcon's serial port. For basic information about XFER, refer to [page 1-11](#) through [page 1-12](#). For complete information, refer to [Chapter 3](#).

7

Resetting the Falcon

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Overview

One of the critical features of any portable data-collection device is its ability to protect against accidental data loss. In the event a Falcon unit becomes “locked up” or otherwise in a state in which data can no longer be processed, use any of the four methods described in this chapter to reset the unit.

Warm Boot

The warm boot is one of two software methods for resetting a Falcon unit. It is similar to the **CTL+ALT+DEL** key sequence for rebooting a PC. This method of resetting a unit should be used first to attempt to bring it back to a usable state.

Table 7-1: Falcon Warm Boot Key Sequences

Falcon Model	Keypad Type	Key Sequence
31x	-	<CTRL><ALT>
32x	-	<CTRL><ALT><BKSP>
33x/34x	25-key	<LAMP><FN><BKSP>
33x/34x	38-key	<CTRL><ALT><ESC>
34x	48-key	<CTRL><ALT><BKSP>

Since a warm boot can be attempted only from a unit that has been turned on, certain assumptions are made. For example, the rigorous hardware tests that are performed as part of the cold boot sequence are not all necessary. This means the unit restarts faster with a warm boot than with a cold boot.

During a warm boot, data written to the RAM drive (**D**), the flash drive (**C**), or an ATA flash card will remain intact. However, if an application is running on a unit before a warm boot, its state cannot be restored.



To prevent end users from resetting the unit, use the bar code on page [page D-13](#) to disable the <CTL>+<ALT>+ reboot.

Cold Boot

The second software method for resetting a Falcon unit is the cold boot. A cold boot should be used only if a warm boot is unsuccessful. Performing a cold boot is analogous to pressing the reset button on a PC or to turning the PC's power off and then back on.

To perform a cold boot on a Falcon unit, first turn it off. Then press the appropriate combination of keys for the Falcon model being used, holding the first two keys down while pressing the third.

Table 7-2: Falcon Cold Boot Key Sequences

Falcon Model	Keypad Type	Key Sequence
31x	-	<ALT><FN2><POWER>
32x	-	<ALT><FN><POWER>
33x/34x	25-key	<FN><LAMP><POWER>
33x/34x	38-key	<ALT><FN><POWER>
34x	48-key	<ALT><FN><POWER>

Release all three keys simultaneously, and the unit will reset.



Repeat this procedure prior to attempting a Hardware reset.

Simply removing and inserting the battery pack will not force a cold boot, because the backup battery can provide minimal power to sustain the Falcon's operating state. The exception to this is when the backup battery is drained of all power, a condition that should never be allowed to happen.

When a cold boot is performed, all transient data is lost, along with the state of any application that was running on the unit. Data written to the RAM drive (D), the flash drive (C), or an ATA flash card will remain intact. If a cold boot happens because of a dead backup battery, data written to a RAM drive may not be maintained.

A cold boot begins with a retesting of the hardware and then follows with the DOS boot sequence. The unit reboots DOS under the same conditions as a desktop PC: Device drivers included in the **config.sys** file and applications included in the **autoexec.bat** file are automatically loaded as

part of the boot process; any other programs that were loaded before the cold boot will not be reloaded automatically.

Safe Boot

During the DOS boot sequence, control is passed sequentially to the **config.sys** files on drives **A**, **B**, and **C**. A similar process is followed for the **autoexec.bat** files on each drive. (See chapter 5 for information about the Falcon's drives and system files.)

It is possible for a driver or application loading from the **config.sys** or **autoexec.bat** file on drive **C** to hang the system. A cold or warm boot of the unit will not directly correct the problem, because the troublesome program will be started again as part of the boot sequence. What is required is a method by which the **config.sys** or **autoexec.bat** file on drive **C** and the loading of the **cfgdev.sys** and **decode.sys** drivers can be taken out of the normal boot sequence. DOS can help some, with the **<CTL>+<C>**, and **<F8>** escape sequences.

Table 7-3: Falcon Safe Boot Key Sequences

Falcon Model	Keypad Type	Key Sequence
31x/32x	-	Alternative method less accessible to the end user: bypasses the config.sys & autoexec.bat files on drive C . Reboot the unit (with either a cold or warm boot), and when the message Wait... appears on the display, immediately press <ESC> simultaneously. Alternative config.sys and autoexec.bat processing takes place on drives A and B without chaining into the files on drive C .
33x/34x	25-key	<ESC><TAB>
33x/34x	38-key	<ESC><SPACE>
34x	48-key	<ESC><SPACE>

The unit indicates safe-boot mode by emitting a low tone followed by a higher-pitched tone. The flash drive (**C**) and the RAM drive (**D**) will be preserved, and the boot sequence will place the unit at the **C:\>** prompt.



If the two tones indicating the safe-boot sequence are not heard, the **<ESC>** and **** keys were probably not pressed quickly enough. Reboot the Falcon and press the two keys simultaneously, immediately upon seeing the “**W.a.i.t...**” message on the display.

Hardware Reset



Attempt at least two cold boots before going into Hardware reset. Refer to [page 7-3](#) for instructions on performing a cold boot.

In the extremely rare situation where none of the rebooting methods are successful, all Falcon models have a reset switch or hole.

Table 7-4: Falcon Hardware Reset Method

Falcon Model	Keypad Type	Key Sequence
31x/32x	-	The Reset switch is located under the PC card slot cover (refer to Figure on page 5) can be used. Touch a metal device (such as a paper clip) to the two contacts on the reset switch.
33x/34x	25-key 38-key	The Reset hole is located below the <Lamp> key.
34x	48-key	The Reset hole is located below the Contrast Down key.

Access the hardware reset for the Falcon models 33x or 34x through the small hole at the bottom of the keypad. Insert a paper clip or like device and press gently into the hole to perform a hardware activated cold boot.



Do not use a sharp instrument in the Falcon 33x or 34x Reset hole. If you puncture the keypad rubber matrix, the industrial specifications of the Falcon 33x or 34x could be compromised.

Hardware Reset Mechanism on Falcon 31x and 32x

31X
32X

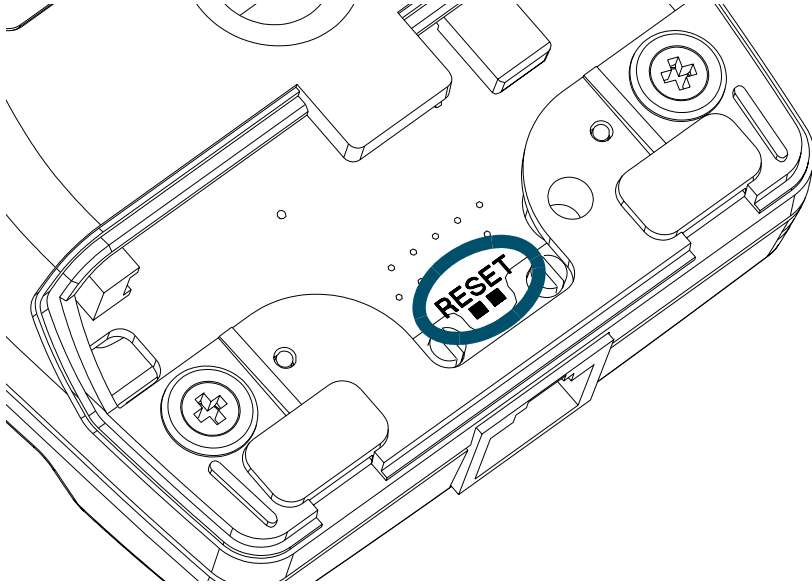
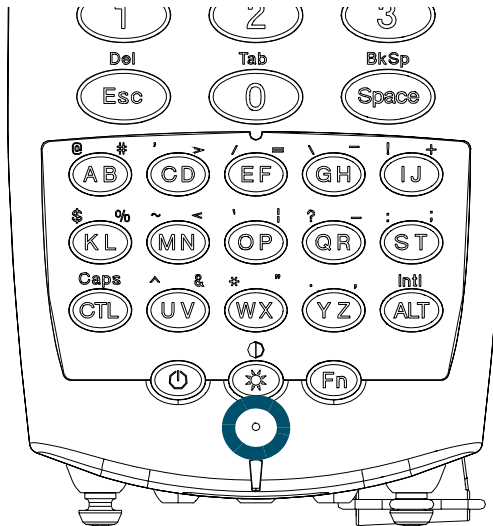


Figure 7-1: Hardware Reset Mechanism for the Falcon 33x/34x (38-key keypad)

33X
34X



8

Using PC Cards

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Overview

PC card support expands the feature set of the Falcon to include:

- Supplemental storage capacity through ATA flash cards
- Modem support
- LAN connectivity
- Radio frequency (RF) communications

Falcon supports Type 1 and Type 2 PC cards. Only one card can be installed in the unit at any one time.

This chapter describes the use of PC cards with the unit. It does not provide details about specific cards, such as communications protocols for fax/modem cards. This type of information should be available from the PC card vendor.

For information about opening the PC card slot cover, inserting and removing PC cards, and card recognition, see the **Falcon DOS Portable Terminals User's Guide**.

Uses of PC Cards

The primary intended uses for PC cards with the Falcon are expanded storage space and radio frequency (RF) communications. ATA flash memory cards can be added to increase memory. The card appears as a hard drive to the user. RF communications cards allow connection of the portable Falcon unit to a traditional network and to access shared network resources in a transparent fashion. The Falcon can also use network and fax/modem cards.

Use the Falcon Configuration Utility to download the appropriate drivers for ATA and generic I/O cards.

ATA Cards ATA cards are flash memory cards that utilize the IDE interface. This allows the flash to appear as a hard drive. Any ATA PC card should work on the Falcon unit with the appropriate drivers installed. The following ATA cards are approved for use on the Falcon:

- 2.6MB SunDisk Seagate FlashCard, Model ST72P5
- 4MB SanDisk PCMCIA PC CARD ATA
- 8MB SanDisk PCMCIA PC CARD ATA

Additional cards may be approved. Contact a PSC representative for information.

Fax/Modem Cards The Falcon should recognize any generic fax/modem PC card. Fax/modem PC cards are configured to use COM2, I/O address 2F8h, and IRQ 3. Be aware that many of these cards tend to use a large amount of power and can quickly drain the batteries. The following fax/modem card is approved for use on the Falcon:

Viking Components 36.6K PC Card Modem.



The Falcon does not support fax/modem cards with XJack connectors.

LAN Cards LAN cards require assignment of an I/O window, a memory window, and an IRQ. If the LAN card will be configured by the superclient driver (**pcmscd.exe**), additional entries to the **pcm.ini** file will be necessary. Many LAN cards come with their own resource-management system and do not require the **pcmscd.exe** driver.



Because of the Falcon's memory-handling properties, some LAN cards may not work. Please contact PSC prior to purchasing a LAN card.

RF Cards Because of the special requirements of RF environments, PSC is distributing Falcon RF units to qualified customers only. Please contact a PSC representative to see if a specific location is qualified.

PC Card Drivers

To attain compatibility with as many PC cards as possible, the Falcon utilizes card and socket services supplied by Phoenix Technologies. These card and socket services are implemented as installable device drivers and are loaded using the **DEVICE=** command in the **config.sys** file.

identifies the PhoenixCARD Manager Plus (PCM+) drivers needed for each type of card. Information about these drivers follows the table. Additional drivers or application programs may be required for some cards, particularly RF, LAN, and fax/modem cards.

Table 8-1: PCM+ Drivers Required for PC Cards

PCM+ Driver	ATA	Fax/Modem	LAN	RF
cnfignam.exe	X	X	X	X
pcm.ini	X	X	X	X
pcmata.sys	X			
pcmcs.exe	X	X	X	X
pcmscd.exe		X	See below	
pcmss.exe	X	X	X	X

- **cnfignam.exe** identifies the section in the PCM+ configuration file (**pcm.ini**) that should be loaded as the default.
- **pcm.ini** is the configuration file for the PC cards.
- **pcmata.sys** is an ATA-IDE device driver. It communicates with the **pcmcs.exe** driver to allow the system to access ATA-configured PC cards.
- **pcmcs.exe** is the card-services driver. Required for all PC cards, it provides an interface between applications and the socket services. It also manages resource allocations for the PC cards.
- **pcmscd.exe** is referred to as the superclient driver. It uses the **pcm.ini** file to configure and request system resources for generic PC cards as well as specific cards that have been included in the **pcm.ini** file. Some PC cards will have specific client drivers to handle configuration; **pcmscd.exe** should not be used with those cards.
- **pcmss.exe** is the socket-services driver. Required for all PC cards, it provides an interface to the PC card hardware.

A

Connector Configurations

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Overview

Cables for all Falcon products are available from PSC and its resellers. As custom cables may be required for custom uses this appendix provides information about Falcon cables, including diagrams and tables describing the connector configurations for:

- Falcon DOS portable terminals
- The Falcon Dock
- The Falcon 4-Slot Dock

Falcon Portable Terminals

31X
32X

Some Falcon models **31x** and **32x** have a standard 9-pin connector for scanner input at the top and a 10-pin telephone-style jack in the serial port at the bottom.



Falcon Units with integrated lasers do not have a 9-pin connector at the top of the unit as the integrated laser is located there.

Laser-Scanner Connector

Figure A-1: 9-Pin Connector on the Falcon 31x and 32x

31X
32X

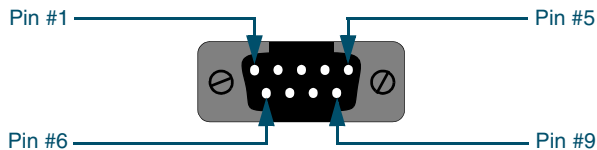


Table A-1: Pinouts for the 9-Pin Connector

Pin #	Signal	Notes
1	Laser sync in	
2	Bar code data in	

Pin #	Signal	Notes
3	Good-read out	
4	Scan-enable out	Not normally used
5	Laser trigger in	
6	Laser-scan-enable out	
7	GND	
8	GND	
9	5V out	300mA max

Serial Port Jack

Figure A-2: Serial Port Jack in the Falcon 31x and 32x

31X
32X

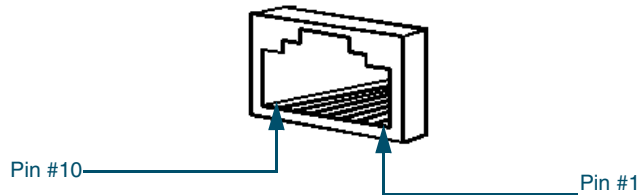


Table A-2: Pinouts for the Serial Port Jack in Falcon 31x/32x

Pin #	Signal	Notes
1	DCD in	RS-232
2	5V out	300mA max
3	RXD	RS-232
4	HS out	RS-232
5	TXD	RS-232
6	Battery	Charging input from dock
7	Ring in	RS-232
8	GND	
9	HS in	RS-232
10	GND	

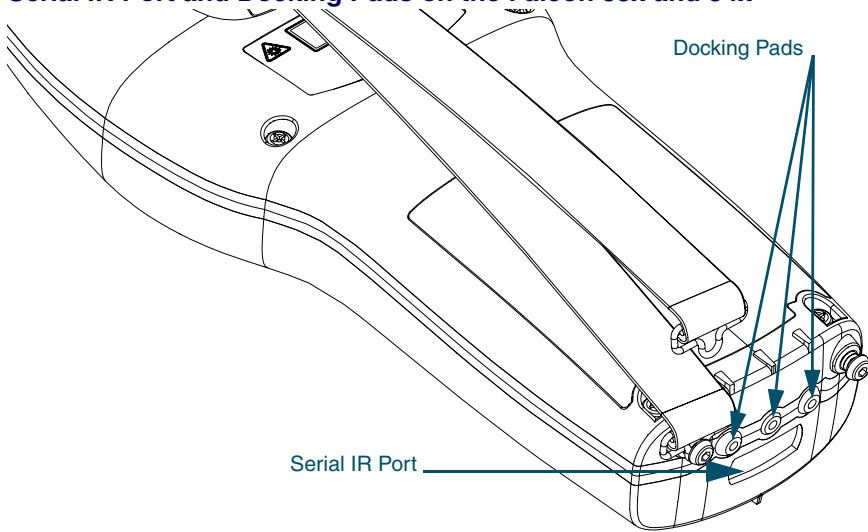
Serial IR Port

31X
32X

The IR port provides an IR transceiver for sending and receiving half-duplex IR data that meets the IrDA physical layer specifications.

Figure A-3: Serial IR Port and Docking Pads on the Falcon 33x and 34x

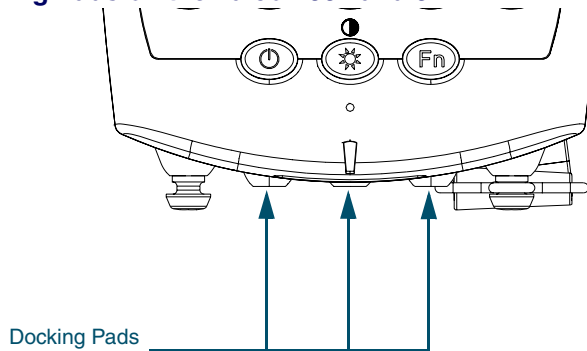
33X
34X



In addition, there are three pads along the bottom of the unit. These three pads are used when the Falcon is in the dock. Hold the Falcon oriented with its keypad facing up:

Figure A-4: Docking Pads on the Falcon 33x and 34x

33X
34X



- The **right-most** pad is the positive lead and is used for recharging the batteries.

- The **center** pad is the negative lead and is used for recharging the batteries.
- The **left-most** pad is used for modified RS-232 input into the Falcon 33x and 34x. This pin serves as RXD while the Falcon is in the dock.

Falcon Dock

25-Pin Connector

Figure A-5 shows the a 25-pin dock-to-host cable connector on the back of the Falcon dock.

Figure A-5: 25-Pin Cable Connector on the Falcon Dock

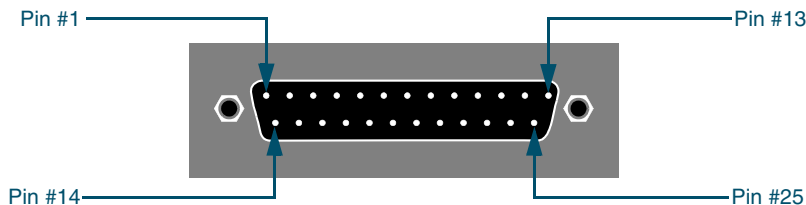


Table A-3: Pinouts for Falcon 31x/32x Dock Cable Connector

Pin #	Signal
1	Frame GND
2	TXD
3	RXD
4	RTS
5	CTS
6	DSR ←
7	GND
8	DCD
9-19	Unconnected
20	DTR ←
21	Unconnected
22	Ring in
23-25	Unconnected

Table A-4: Pinouts for Falcon 33x/34x Dock Cable Connector

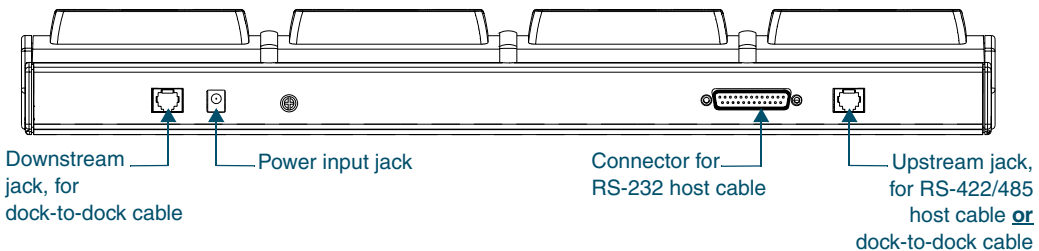
Pin #	Signal
1	Frame GND
2	Portable TXD
3	Portable RXD
4	RTS
5	CTS
6	DSR
7	GND
8	DCD
9–19	Unconnected
20	DTR
21	Unconnected
22	Ring in
23–25	Unconnected

Falcon 4-Slot Dock

31X
32X

The back panel of the Falcon 4-Slot Dock has a 25-pin dock-to-host cable connector and two telephone-style cable jacks: one for “upstream” communications and one for “downstream” communications. The upstream side is the side closer to the host; the downstream side is farther from the host.

Figure A-6: Back Panel of the Falcon 4-Slot Dock



In a dock network, the first 4-Slot Dock (the one closest to the host) has a cable running from its upstream jack to the host. The second 4-Slot Dock has a cable connecting its upstream jack to the downstream jack on the first 4-Slot Dock. Each additional 4-Slot Dock is connected similarly. The last 4-Slot Dock in the network has nothing plugged into its downstream jack.

Host-Interface Cable

The wiring for the Falcon 4-Slot Dock RS-232 host-interface cable is shown in [Table A-5](#). The standard cable is 6 feet (2 meters) long.

Table A-5: Wiring for the Falcon 4-Slot Dock Host-Interface Cable

Host Pin #		Host Signal	45D Pin # (25-pin)	Notes
(9-pin)	(25-pin)			
shell	1/shell	Chassis GND	1/shell	
3	2	HostTxD#	3	Dock to host
2	3	HostRxD#	2	Host to dock
7	4	HostRTS	5	Pins 4, 5, and 8 tied together inside 4-Slot Dock
8	5	HostCTS	4	
6	6	HostDSR	20	Pins 6 and 20 tied together inside 4-Slot Dock; must be active to select RS-232 interface
4	20	Host DTR	6	

Dock-Network Cable Jacks

The wiring for the dock network cable jacks are shown in [Table A-6](#). The network signals are differential type and are routed on twisted-pair wiring. The pinouts are assigned so as to accommodate certain off-the-shelf cables (e.g., L-COM #TRD855-* EIA568 Flex patch cables).

In the signal names, “in” and “out” refer to the logical direction of the signal with respect to the 4-Slot Dock.

Table A-6: Wiring for the Falcon 4-Slot-Dock Network Cable Jacks

Pin #	Signal	
	Upstream Connector	Downstream Connector
1	Vcc	Not used
2	HostXmtIn+	HostXmtOut+
3	HostXmtIn-	HostXmtOut-
4	ReqOut+	ReqIn+
5	HostRcvOut+	HostRcvIn+
6	HostRcvOut-	HostRcvIn-
7	ReqOut-	ReqIn-
8	InhIn+	InhOut+
9	InhIn-	InhOut-
10	GND	Not used



Vcc and GND connectors are present only on the upstream connector; they are reserved for future use.

B

ROM-DOS Commands

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Command Overview

This chapter lists the Datalight ROM-DOS commands that are available in the Falcon. ROM-DOS commands that differ from their MS-DOS equivalents are identified and described.

The information in this chapter is taken from Datalight's *ROM-DOS 6.22 User's Guide* and is used by permission.

[Table B-1](#) lists the Datalight ROM-DOS commands that are provided with the Falcon and gives a brief description of each command.

Table B-1: DOS Commands Used with the Falcon

Command	Description
?	A <code>config.sys</code> command. Directs ROM-DOS to pause for confirmation before processing a command.
@	Suppresses the display of a single batch file command line.
;	Same as <code>REM</code> . Identifies nonexecuting lines.
ATTRIB	Displays or modifies the attributes associated with a file.
BREAK	A <code>config.sys</code> command. Enables or disables the ability to stop program execution at a non-I/O point.
BUFFERS	A <code>config.sys</code> command. Sets the number of internal data buffers.
CALL	Batch subcommand. Invokes execution of a secondary batch file.
CHDIR	<code>CHange DIRectory</code> (also <code>CD</code>). Changes the default directory.
CHKDSK	<code>CHecK DiSK</code> . Checks integrity of data on a disk. Displays information.
CLS	<code>CLear screen</code> . Clears all information from the viewport.
COMMAND	Spawns a second DOS command processor.
COPY	Copies files from one storage location to another.
CTTY	<code>change teLeTYpe</code> . Changes the default terminal interacting with ROM-DOS.
DATE	Displays the date from the system's internal calendar and allows revision.
DEL	<code>DELeTe</code> . Deletes specified files.
DELTREE	Deletes files and subdirectories including empty subdirectories.
DEVICE	A <code>config.sys</code> command. Installs a device driver into ROM-DOS.
DIR	Displays a list of files in a directory.
DOS	A <code>config.sys</code> command. Installs ROM-DOS into high-memory area (HMA).
ECHO	Batch subcommand. Turns on the display of batch execution on the viewport.

Command	Description
ERASE	Same as DEL . Erases specified files.
EXIT	Exits “nested” running of ROM-DOS within another program.
FCBS	A config.sys command. Specifies the number of file control blocks (FCBS) open at one time.
FILES	A config.sys command. Sets the maximum number of files that can be open at one time on the system.
FIND	Works as a filter to display only lines that contain a specified string.
FOR	Batch subcommand. Performs one DOS command on a set of files.
GOTO	Batch subcommand. Moves control to a specified line in the batch file.
HELP	Lists all available ROM-DOS commands along with brief descriptions.
IF	Batch subcommand. Performs a command based on a specified condition.
INCLUDE	A config.sys command. Allows instructions in one configuration block to be included with instructions in another configuration block.
INSTALL	Loads terminate-and-stay resident (TSR) programs during config.sys processing.
LASTDRIVE	Sets the maximum number of drives.
MENUDEFAULT	Sets the default menu item choice and time-out value for making a selection.
MENUITEM	Specifies an item to be placed in the startup menu displayed during system boot.
MKDIR	MAKE DIRECTORY (also MD). Creates a new subdirectory.
NEWFILE	Allows continuation of config.sys processing from a new file.
PATH	Displays current command search path(s). A new path line can be specified.
PAUSE	Batch subcommand. Causes execution to halt until a key is pressed.
PRINT	Prints a list of files, up to ten files.
PROMPT	Resets the appearance of the system prompt line.
REM	REMARK . A batch subcommand for identifying nonexecuting lines.
REN	RENAME . Renames files.
RMDIR	REMOVE DIRECTORY (also RM). Deletes a specified subdirectory.
SET	Sets environment variables and command processor strings.
SHARE	Installs the capabilities for file sharing and file locking on the hard disk.
SHELL	Allows selections of an alternate boot program other than the default command.com command processor.
SHIFT	Batch subcommand. Shifts replaceable parameters one position “to the left.”

Command	Description
Sort	Sorts a text file and displays the output to the standard device.
Stacks	Allows for the use of dynamic data stacks to handle interrupts. Note: ROM-DOS does not utilize this command.
Submenu	Defines a menu item that represents a secondary menu.
Switches	Allows special <code>config.sys</code> file options.
Time	Displays the current time from the system's internal clock. Allows revision.
Tree	Displays the path of each directory on a specified drive.
Type	Displays the contents of a text file on the viewport.
Ver	Displays current version of ROM-DOS on the viewport.
Verify	Displays the current VERIFY state or sets the VERIFY state to on or off.
Vol	Displays the volume label on a disk.
Xcopy	Copies multiple files and, optionally, subdirectories.

ROM-DOS vs. MS-DOS

[Table B-2](#) identifies differences between ROM-DOS commands and their MS-DOS equivalents. For more information, see the individual command descriptions in the next section.

Table B-2: Difference Between ROM-DOS and MS-DOS Commands

Command	Features Exclusive to ROM-DOS	Features Exclusive to MS-DOS
ATTRIB	<code>-c</code> : Clears all file attributes	<code>/s</code> : Processes files in all subdirectories
BUFFERS		Allows designation of secondary buffer cache BUFFERS <i>n,m</i> where <i>m</i> is secondary buffer cache
CHKDSK	<code>/c</code> : Corrects errors without user confirmation	
COMMAND	Internal command help only	<code>/Y</code> : Steps through batch file specified by <code>/c</code> or <code>/K</code> switch <code>help.hlp</code> in MS-DOS includes all commands (external and internal), installable drivers, etc.

Command	Features Exclusive to ROM-DOS	Features Exclusive to MS-DOS
DIR	/A X: Shows attributes	/O:C and /O:-C: Sorts by compression ratio /C[H]: Displays compression ratio of files compressed using Drivespace or Doublespace
FCBS	, [minimum number]	
FIND		/I: Not case-sensitive
HELP	Requires <code>command.hlp</code>	MS-DOS requires external file, <code>help.com</code> , but provides more help text
NEWFILE	ALL	Not available with MS-DOS
PRINT	/F: Sets maximum number of files	/D: LPTx (Falcon has no parallel port.) /U /M /S /Q
SHARE	/U: Unloads <code>share.exe</code>	/F:space: Allocates space to record
SWITCHES		/W
TREE		/A: Indicates no graphics characters for tree symbols
VER	/R: Shows full version and release number Allows revision of the version number	
XCOPY		/Y /-Y: Turns confirmation prompts on or off

Command Descriptions

This section provides descriptions of the ROM-DOS commands listed in [Table](#). Each entry includes an explanation of the command's purpose, the command entry syntax, remarks, and examples.

Each command also has a label to designate whether it is an internal or external command. Internal commands are part of the command processor program, `command.com`. These functions are available only while `command.com` is running. External commands are actually stand-alone utility programs. They

are independent from **command.com**. Internal commands that are unique to **config.sys** processing are also identified. These commands can be used only in a **config.sys** file.

ATTRIB

Type External

Purpose The **ATTRIB** command either displays or modifies the attribute of a file.

Syntax **ATTRIB** [+ | -][*option*][*filespec*]

Remarks The file attributes define the characteristics of a file. They determine if a file may be deleted or modified, or if it is archived. The **ATTRIB** command is used to manage these file attributes.

Wildcard characters may be used in the **ATTRIB filespec**.

The **ATTRIB** command will modify file attributes if modify commands are given to **ATTRIB**. The modify commands are:

Command	Description
+/-	Add(+) or remove(-) attribute
A	Archive attribute
C	Clear all attributes
H	Hidden file attribute
R	Read only attribute
S	System file attribute

If no modify commands are found by **ATTRIB**, then the files are displayed along with the file names and their current attributes.

Examples **ATTRIB** will add the read-only attribute to the file **myfile.dat**.

```
ATTRIB +r myfile.dat
```

ATTRIB will remove the read-only attribute and the archive attribute of all files with the DAT extension.

```
ATTRIB -a -r *.dat
```

ATTRIB will display the attributes of all files with the DAT extension.

```
ATTRIB *.dat
```

BUFFERS

Type `config.sys`

Purpose ROM-DOS has internal buffers to temporarily hold data read from the disk. Increasing the number of internal buffers will speed system performance.

Syntax `BUFFERS = number`

Remarks Each buffer used by ROM-DOS requires 512 bytes of RAM. The **BUFFERS** command will increase or decrease the amount of RAM used by the operating system.

The minimum number of buffers is 2 and the maximum number is 40. If a number less than 2 is given then the number of **BUFFERS** is set to 2. If a number larger than 40 is given then **BUFFERS** is set to 40.

Example The following example causes ROM-DOS to have 10 buffers. These 10 buffers will use 5120 bytes of RAM.

```
BUFFERS = 10
```

CHKDSK

Type `External`

Purpose The **CHKDSK** command checks the disk directories and File Allocation Table (FAT) and displays a disk and memory report.

Syntax `CHKDSK [filespec] [/C] [/F] [/V]`

Remarks **CHKDSK** examines a disk and determines if the disk has any errors in the File Allocation Table (FAT) and will optionally fix errors.

Options The **/F** option causes **CHKDSK** to fix errors on the disk if any were found. The errors that can be found are directory or FAT errors. If the **/F** is not specified then **CHKDSK** acts as if it will fix the disk, but the corrections will not be written out to the disk.

If errors are detected, a prompt will appear with a message similar to the following:

```
15 lost allocation units found in 5 chains.  
Convert lost chains to files?
```

Type Y for Yes, and each lost chain will be written to a file in the root directory of the current default drive. Each file will have the name **filennnn.chk**. **nnnn** will be a sequential number. The first chain will be in **file000.chk**. These files can be verified to see if they contain valuable information, and then deleted if desired. Answering N for No to the above prompt, **CHKDSK** will still make the corrections however the lost chains will not be saved to the disk.

The **/C** option allows **CHKDSK** to correct errors without user confirmation. This option must be used along with the **/F** option for corrections to be made.

The **/V** option causes **CHKDSK** to display each path and file as it is processed.

If a file specification is specified, then **CHKDSK** displays all files matching the specification that have noncontiguous data areas on the disk. Files that are stored in noncontiguous areas, especially **.exe** files, have slower disk access times. If **CHKDSK** reports a large number of files with this problem, a utility program that optimizes the files and free space on the disk should be used.

After checking the disk, **CHKDSK** displays any error messages followed by a report on the state of the disk that was checked. An example of the report is shown below.

```
Volume ROM-DOS created June 1,1990 1:00a  
Volume Serial Number is 190E-4AA2  
362496 bytes total disk space  
0 bytes in 1 hidden files  
6144 bytes in 2 user files  
356352 bytes available on disk  
655360 bytes total memory  
595360 bytes free
```


CHKDSK does not wait for a disk to be inserted before the checking is initiated nor does it repair any errors.

Examples **CHKDSK** will check the integrity of drive **A**. The report will be printed to the console.

```
CHKDSK a:
```

CHKDSK will check the integrity of RAM disk **D**. The report will be saved in a file called **drive_d.rpt**.

```
CHKDSK d: >drive_d.rpt
```

COMMAND

Type External

Purpose Start a new command processor.

Syntax **COMMAND** [*device*] [/E:*number*] [/K:*filename*] [/P] [/C
string] [/MSG]

Remarks This command starts a new copy of the ROM-DOS command processor. The command processor is the program that has all the internal DOS commands in it.

Starting a new command processor will also produce a new environment. The size of the environment is 128 bytes by default, but it can be changed using the **/E** switch.

Command and its arguments can also be used in a **SHELL=** statement in the **config.sys** file. See the full description of **SHELL** for more details.

Options The *device* option specifies that **command.com** should use a different device, such as **AUX**, for input and output.

The **/E: *number*** switch sets the environment size. **Number** represents the size of the environment in bytes. **Number** must be in the range from 160 to 32768. All other values will be ignored and the default value of 256 will be used. ROM-DOS will round the value entered up to the nearest multiple of 16.

The **/K:filename** option tells the command processor to run the specified filename and then display the ROM-DOS command prompt. It is not recommended that this option be used in a **CONFIG.SYS SHELL=** statement.

The **/P** switch causes **COMMAND** not to exit, or in other words, to remain permanent. The **/P** switch should be used only when command is used in a **CONFIG.SYS SHELL** statement.

The **/c string** switch causes **COMMAND** to execute the command in **string** and then terminate. The string command can be any internal or external command.

The **/MSG** option indicates that all error messages should be stored in memory. This option is recommended only for diskette based systems. ROM-DOS keeps many of its error messages in the resident part of **COMMAND.COM** rather than using valuable memory to store them. If an error message is needed and ROM-DOS has been loaded from a diskette, the message will only be available if the boot disk is still in the drive. By using the **/MSG** option, the messages will be available in memory at all times. The **/P** option must be used along with the **/MSG** option.

Examples The following command will cause a new copy of **COMMAND** to be executed. It will perform a **DIR** command on the **C** drive and then exit back to the previous Command Processor.

```
COMMAND /C DIR C:
```

The following example shows loading of a permanent copy of command with an environment size of 256 bytes.

```
SHELL=C:\COMMAND.COM /P /E:256
```

DELTREE

Type External

Purpose The **DELTREE** command deletes files and subdirectories including empty subdirectories.

Syntax `DELTREE [/Y] [filespec] [[filespec][...]]`

Remarks The **DELTREE** command allows the deletion of files and subdirectories in the same step.

The *filespec* argument(s) indicate the name(s) of the file(s) or directory tree(s) to delete, Wildcards are allowed.

Options The **/Y** switch prevents **DELTREE** from prompting before deleting.

Examples The following **DELTREE** command deletes all files and directories in the tree **C:\TEMP**:

```
DELTREE C:\TEMP
```

Use **DELTREE** to delete individual files, one at a time, using wildcards. To delete selected files in the current directory, enter:

```
DELTREE *.*
```

DELTREE then prompts for each file it finds which allows the choice of individually deleting them.

DIR

Type Internal

Purpose Displays a list of the files that are in a directory.

Syntax `DIR [filespec] [/option]`

Remarks The **DIR** command can be used to list all the files in a directory, or to show the directory entries of specific files. The standard directory display format includes columns for filenames, filename extensions, file sizes, and the dates and times the files were created.

Options `/A attributes`

The `/A` option causes the **DIR** command to display only the files that match the specified *filespec* and have the given attribute. The table below shows the legal attribute descriptions.

Letter	Description
A	Archive
D	Directories
H	Hidden files
R	Read-only files
S	System files
X	Show attributes

-

The dash (-) symbol can be used to negate listed attributes. For example, to select all files that do not have the archive bit set, use the `/A -A` option.

`/B`

The `/B`, or bare, option causes the display to be displayed without volume label, date, time, or size information.

`/L`

The `/L` option causes the filenames to be displayed in lowercase.

`/P`

The `/P` option selects page mode, which makes ROM-DOS pause the display each time the screen is full. Press any key to go on to the next page of entries.

/O

The **/O** option causes the filenames to be displayed in sorted order. The sort order can contain one or more of the following letters:

Letter	Description
D	By date and time newest first
E	Alphabetic order by extension
G	Directories grouped before files
N	Alphabetic order by name
S	Size, smallest first

-

The dash (-) symbol can precede the sort option to reverse the sort order. For example, to sort all files in the directory in reverse alphabetic order, use the **/O-N** option.

/S

The **/S** option causes the display to include files in subdirectories also.

/W

Display list in a wide format without date, time, or size.

The **DIRCMD** environment variable can be used to set the default preferences for the **DIR** command. The **SET** command will assign the values to an environment variable. Refer to the **SET** command section for proper usage. For example, to always have the **/P** option set for **DIR**, the statement **SET DIRCMD=/P** could be used. The default settings in **DIRCMD** can be overridden by using the minus sign (-) preceding the option. To cancel the paging for a single use of the **DIR** command, enter **DIR /-P**.

Examples To see the directory entries of all files in the current drive and directory, type:

```
DIR
```

To see all files in the subdirectory MEMOS on drive **B**, type:

```
DIR B:\MEMOS
```

Display all files sorted by file name order.

```
DIR /ON
```

Display all hidden files.

```
DIR /AH
```

Display all files with a `.doc` extension, without file sizes, or volume labels.

```
DIR *.DOC /B
```

FCBS

Type CONFIG.SYS

Purpose The **FCBS** command allows the number of file control blocks (FCBs) open at one time to be specified.

Syntax `FCBS = number[,minimum number]`

Remarks *Number* specifies the maximum number of FCBs open at any given time. The default for this value is 4. The value for *number* must be in the range from 1 to 255. The minimum number specifies the minimum number of FCBs to be open at all times. The *minimum number* argument has the same default and range value as the *number* argument.

Example Set the maximum number of FCBs to 8 and leave at least 4 open at all times.

```
FCBS = 8,4
```

FIND

Type External

Purpose **FIND** is a filter to display only lines that contain a specified string.

The input to **FIND** may come from a file, or it may be piped in from another filter or a DOS command.

Syntax `FIND [/option] match-string [filespec]`

Options The `/C` option causes **FIND** to only display the count of lines found with the specified string.

The `/N` option causes **FIND** to display the line number of the line found containing the string.

The `/V` option causes **FIND** to display the lines that do not contain the string.

The **match-string** argument specifies the word or group of characters to search for.

The **filespec** argument specifies the file or group of files to search in. The complete drive and path can be specified. Wildcard characters can be used in the filename.

Examples The following example shows each line in the file **JUNK.C** that contains the string **printf**.

```
FIND printf junk.c
```

The following example shows each line in a directory listing that contains a **DIR**. The command first executes a **DOS DIR** command with the output piped into the **FIND** command. The **FIND** command then displays each line that contains the string "DIR".

```
dir | FIND DIR
```

The following example give a count of the lines in the file **MANUAL.TXT** that contain the string **ROM-DOS**.

```
FIND /C ROM-DOS MANUAL.TXT  
.....MANUAL.TXT: 105
```

HELP

Type Internal

Purpose Provides on-line help of each ROM-DOS command.

Syntax `HELP <command>`

Remarks `HELP` serves as a memory aid. For complete information about ROM-DOS commands, always consult this manual.

`HELP` for each command can also be displayed by entering `/?` following the command name.

The file `COMMAND.HLP` must be available to use this command.

Examples To list the help of the `DIR` command, type:

```
HELP DIR
```

or

```
DIR /?
```

All available batch file commands are also listed by `HELP`.

NEWFILE

Type `CONFIG.SYS`

Purpose The `NEWFILE` command allows continuation of `CONFIG.SYS` file processing from a new file. The file can be located on in another directory or even on a different drive.

Syntax `NEWFILE=filename`

Remarks The `NEWFILE` command is especially useful when the `CONFIG.SYS` file is located on an inaccessible drive or in ROM. Additional device drivers or instructions can be added easily to the new file and will be processed along with the main `CONFIG.SYS` file upon starting the system.

When the `NEWFILE=` instruction is processed, control will be passed from the present file (the one containing the `NEWFILE` instruction) to the file specified in the command. Any commands placed after the `NEWFILE` instruction in the original file will not be processed. If for some reason the specified file name can not be located, `CONFIG.SYS` processing will be terminated (even if

instructions were to be placed after the **NEWFILE** command) and the remainder of the startup process will be completed.

NEWFILE commands can be nested. The original **CONFIG.SYS** can call a second set of instructions via the **NEWFILE** command. The second file can in turn call a third file by using the **NEWFILE** command, and so on. Be sure that each filename in the successive steps has a unique name, otherwise, an infinite loop will be created as control is passed back to the same file repeatedly.

Each filename given in a **NEWFILE** command line will have an environment variable of the same name.

Example The following example will cause instructions in the file **NEWCFG.SYS**, located in the **C:\BIN** directory, to be executed as part of the **CONFIG.SYS** file. The contents of **NEWCFG.SYS** may include any of the commands listed in this section.

```
NEWFILE=C:\BIN\NEWCFG.SYS
```

PRINT

Type External

Purpose The PRINT utility prints a single file or a list of files.

Syntax **PRINT** [*filespec*] [/*options*]

Remarks Enter between 1 and 32 files for spooling to the printer. The files are output to the device in a spooled manner (while the user performs other operations).

If **PRINT** is entered without any parameters, then it displays all the files that are in the queue.

The first time **PRINT** is used the operator is prompted for the device to perform the operation. The following message is used to prompt the operator for the device.

```
Name of list device [PRN]:
```

The legal devices for printing are **LPT1**, **LPT2**, **LPT3**, **LPT4**, **COM1**, **COM2**, **COM3**, **COM4**, **AUX**, or **PRN**.

Options The **/B** option allows the user to set the buffer size. The default buffer size is 512 bytes. A larger buffer size causes print to operate faster. The maximum buffer size is 32k bytes and the minimum size 256 bytes. This option is only allowed the first time **PRINT** is run.

The **/C** option cancels only the file names listed after the **/C** command.

The **/F** option allows the user to set the maximum number of files to be queued up at one time. The default number of files is 10. The minimum is 2 and the maximum is 32. Support for more files is often useful when using wild cards in file names. This option is only allowed the first time **PRINT** is run (or until the next system reboot).

The **/P** option causes all files listed after this option to be submitted for printing. This is the default for filenames encountered on the **PRINT** command line.

The **/T** option cancels all the files from the print queue (list). Think of this as a terminator.

The **/H** option will display the help screen.

Examples **PRINT** puts three files into the print queue. The first file will start being printed after the command ends.

```
PRINT FILE1.TXT FILE2.TXT FILE3.TXT
```

The file FILE2.TXT will be removed from the print queue. All other files in the queue will print normally.

```
PRINT /C FILE2.TXT
```

All files in the print queue are canceled. Printing may continue for a short time because of the buffer in the printer.

```
PRINT /T
```

SHARE

Type External

Purpose **SHARE** installs the capabilities for file-sharing and file-locking on the hard disk.

Syntax **SHARE** [/options]

Or from **CONFIG.SYS**:

```
INSTALL=[drive:] [path] SHARE.EXE [/options]
```

Remarks The **SHARE** utility is most commonly used in a network or multitasking environment where file sharing is necessary. When **SHARE** is loaded, DOS will utilize the **SHARE** utility to validate read and write requests from application programs and users.

The **/L:#** option specifies the maximum number of files that can be locked at one time. The default number of files is 20.

The **/U** option unloads the share utility and frees the memory. **SHARE** will not unload if other TSRs have been loaded on top of it. The other TSRs must be unloaded first before trying to unload **SHARE**.

Examples The following example loads the **SHARE** program from the command line:

```
SHARE
```

The next example installs **SHARE** from the **CONFIG.SYS** file and changes the maximum number of locked files to 30:

```
INSTALL=C:\UTILS\SHARE.EXE /L:30
```

The final example unloads **SHARE** and frees the used memory.

```
SHARE /U
```

SWITCHES

Type **CONFIG.SYS**

Purpose The **SWITCHES** command allows special **CONFIG.SYS** file options.

Syntax SWITCHES=[/k] [/n] [/f]

Remarks The /k argument makes an enhanced keyboard behave like a conventional-style keyboard.

The /n argument prevents the use of the <F5> and <F8> function keys to bypass the startup commands.

The /f argument instructs ROM-DOS to skip the delay after displaying the **Starting ROM-DOS...** message at boot time. The delay allows the user time to use the F5 and F8 options to alter the processing of the startup files.

Examples The following example prevents the user from using the <F5> and <F8> keys at boot time.

```
switches = /n
```

TREE

Type External

Purpose The **TREE** command displays each subdirectory and optionally the files within them for a specified drive.

Syntax TREE [drive:] [/F]

Remarks The **TREE** command displays the full path of each subdirectory on a specified disk.

The *d*: specifies the drive that **TREE** will display the subdirectories from. This argument must be specified.

Options The /F switch causes **TREE** to display the files in each subdirectory.

Examples This command will display all subdirectories on drive C.

```
C:\DATA> TREE C:
```

This command will display all subdirectories on drive A along with the files within each sub directory.

```
C:\DATA> TREE A: /F
```

VER

Type Internal

Purpose Displays the version number of ROM-DOS in use. Allows revision of this version number.

Syntax `VER [n.nn] [/R]`

Remarks If a new version number is specified, two digits after the decimal are required. Note that this command revises only the record of the DOS version number; it does not change the actual operating system loaded in the computer.

The version command shows both the version of the **VER** command itself and the version of DOS in operation.

Options The **/R** option shows the full version and release number of ROM-DOS.

Example The following example changes the record of current DOS version in use to DOS 5.0. Any programs that are executed, following this command, will recognize that DOS 5.0 is running.

```
VER 5.0
```

XCOPY

Type External

Purpose The **XCOPY** command copies multiple files and optionally subdirectories from one disk to another.

Syntax `XCOPY [source] [target] [/options]`

Remarks The **XCOPY** command is used for copying multiple files and subdirectories, if they exist.

The *source* and the *target* parameter are complete drive path and file specification descriptions. If a path is not specified, **XCOPY** assumes the default path. If a file name is not specified then ***.*** is assumed.

The **ATTRIB** command may be used to modify the archive bit for the various **XCOPY** options that check the archive status of files. Refer to the **ATTRIB** command description for instructions.

Options The **/A** copies only source files that have the archive bit set in them. The archive is not reset.

The **/D<mm-dd-yy>** option causes **XCOPY** to copy only those files with a date later than the date specified in the **/D** option.

The **/E** option causes **XCOPY** to create subdirectories on the target even if they are empty.

The **/M** option causes **XCOPY** to copy only those source files that have the archive bit set. Once the source file is copied the archive bit is reset.

The **/P** option causes **XCOPY** to prompt before each file is copied. The prompt appears as follows:

```
C:\COMMAND.COM (Y/N) ?
```

If a Y is entered then the file is copied, otherwise, the file is not copied.

The **/S** option causes **XCOPY** to copy files in subdirectories of the source directory.

The **/V** option causes **XCOPY** to verify each write to the disk.

The **/W** option causes **XCOPY** to wait before starting to copy files. The following prompt is displayed.

```
Press any key to begin copying file(s)
```

Example **XCOPY** to the **A** drive all files in the BIN subdirectory that have an EXE extension and that have the archive bit set.

```
XCOPY \bin\*.exe a: /a
```

C

Programming Parameters

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Overview

This appendix contains information about programmable settings for the Falcon. Use the Falcon Configuration Utility in [Chapter 2](#) or the bar codes provided in [Appendix D](#) to program the Falcon.

[Table I on page C-2](#) provides the following information:

- **Code Parameter** is the “human” name for the programming option.
- **I.D. #** is the “decoder” name for the programming option. For example, to set a Code 39 minimum label length, use I.D. #**01**. Programming I.D. numbers given in this appendix can be used with all programming methods.
- **Type** tells what kind of setting to use for each code parameter.
 - **On/Off** is a toggle. **1** turns the parameter on, and **0** turns it off.
 - **Value** requires a two-character entry (e.g., **02** for two beeps after each good read).
- **Acceptable Input** gives the settings or range of settings for each code parameter.
- **Defaults** tells how the parameter is set when the predefined default **D0**, **D1**, or **D2** is selected.
 - **Predefined Default 0 (D0)** turns every on/off parameter off and sets all minimum and maximum lengths to the lowest values.
 - **Predefined Default 1 (D1)** turns every on/off parameter on, sets all minimum lengths to the lowest values, and sets all maximum lengths to the highest values. This default set is normally used only for troubleshooting. It gives the best chance of reading an unknown bar code symbology and also identifies the symbology of each bar code scanned.
 - **Predefined Default 2 (D2)** is the default set that was installed in the Falcon at the factory. This default set will work for most applications. To reset the Falcon to the original defaults, scan the **D2** bar code on [page D-2](#).

Table C-1: Parameters, Settings and Defaults

Code Parameter	I.D. #	Type	Acceptable Input	Defaults		
				D0	D1	D2
Code 39				<i>Enter 1 for On and 0 for Off.</i>		
Enable	00	On/Off	On or Off	Off	On	On
Minimum length	01	Value	00–50	00	00	00
Maximum length	02	Value	01–50	01	50	20
Enable checksum	03	On/Off	On or Off	Off	Off	Off
Send checksum	04	On/Off	On or Off	Off	Off	Off
Full ASCII mode	05	On/Off	On or Off	Off	On	On
Interleaved 2 of 5				<i>Enter 1 for On and 0 for Off.</i>		
Enable	08	On/Off	On or Off	Off	On	On
Minimum length	09	Value	02–50	02	02	06
Maximum length	0A	Value	02–50	02	50	10
Enable checksum	0B	On/Off	On or Off	Off	Off	Off
Send checksum	0C	On/Off	On or Off	Off	Off	Off
Use lengths 6 and 14 only (case code)	0D	On/Off	On or Off	Off	Off	Off
Matrix 2 of 5				<i>Enter 1 for On and 0 for Off.</i>		
Enable	10	On/Off	On or Off	Off	On	Off
Minimum length	11	Value	01–50	01	01	06
Maximum length	12	Value	01–50	01	50	10
Enable checksum	13	On/Off	On or Off	Off	Off	Off
Send checksum	14	On/Off	On or Off	Off	Off	Off
Standard 2 of 5				<i>Enter 1 for On and 0 for Off.</i>		
Enable	15	On/Off	On or Off	Off	On	Off
Minimum length	16	Value	01–50	01	01	06
Maximum length	17	Value	01–50	01	50	10
Enable checksum	18	On/Off	On or Off	Off	Off	Off
Send checksum	19	On/Off	On or Off	Off	Off	Off
Use 2-bar start/stop	1A	On/Off	On or Off	Off	Off	Off

Programming Parameters

Code Parameter	I.D. #	Type	Acceptable Input	Defaults		
				D0	D1	D2
Code 11				<i>Enter 1 for On and 0 for Off.</i>		
Enable	1B	On/Off	On or Off	Off	On	Off
Minimum length	1C	Value	01–50	01	01	04
Maximum length	1D	Value	01–50	01	50	10
Require 2 check digits	1E	On/Off	On or Off	Off	Off	Off
Send check digit(s)	1F	On/Off	On or Off	Off	On	Off
Codabar/Ames				<i>Enter 1 for On and 0 for Off.</i>		
Ames Enable	51	On/Off	On or Off	Off	On	Off
Codabar Enable	20	On/Off	On or Off	Off	On	On
Minimum length	21	Value	01–50	01	01	04
Maximum length	22	Value	01–50	01	50	20
Send start/stop	23	On/Off	On or Off	Off	On	Off
Codabar-to-CLSI conversion	24	On/Off	On or Off	Off	Off	Off
Wide intercharacter gaps allowed	25	On/Off	On or Off	Off	Off	On
MSI				<i>Enter 1 for On and 0 for Off.</i>		
Enable	26	On/Off	On or Off	Off	On	Off
Minimum length	27	Value	01–14	01	01	04
Maximum length	28	Value	01–14	01	14	10
Require 2 check digits	29	On/Off	On or Off	Off	Off	Off
2nd check digit Mod 11	2A	On/Off	On or Off	Off	Off	Off
Send check digit(s)	2B	On/Off	On or Off	Off	On	Off
Code 93				<i>Enter 1 for On and 0 for Off.</i>		
Enable	2C	On/Off	On or Off	Off	On	Off
Minimum length	2D	Value	01–50	01	01	02
Maximum length	2E	Value	01–50	01	50	20
Universal Product Code-A (UPC-A)				<i>Enter 1 for On and 0 for Off.</i>		
Enable	30	On/Off	On or Off	Off	On	On
Send system digit	31	On/Off	On or Off	Off	On	On
Send check digit	32	On/Off	On or Off	Off	On	Off
Convert UPC-A to EAN-13	33	On/Off	On or Off	Off	On	Off

Code Parameter	I.D. #	Type	Acceptable Input	Defaults		
				D0	D1	D2
Universal Product Code-E (UPC-E)				<i>Enter 1 for On and 0 for Off.</i>		
Use system digit 0	34	On/Off	On or Off	Off	On	On
Use system digit 1	35	On/Off	On or Off	Off	On	On
Convert UPC-E to UPC-A	36	On/Off	On or Off	Off	On	Off
Send system digit	37	On/Off	On or Off	Off	On	Off
Send check digit	38	On/Off	On or Off	Off	On	Off
European Article Numbering (EAN) / Japan Article Numbering (JAN)				<i>Enter 1 for On and 0 for Off.</i>		
Enable EAN-8/JAN-8	39	On/Off	On or Off	Off	On	On
Enable EAN-13/JAN-13	3A	On/Off	On or Off	Off	On	On
Convert EAN-13 to ISBN	3B	On/Off	On or Off	Off	Off	Off
Send EAN/JAN checksum	3F	On/Off	On or Off	Off	Off	Off
UPC, EAN, JAN Extensions				<i>Enter 1 for On and 0 for Off.</i>		
Allow 2-digit extensions	3C	On/Off	On or Off	Off	On	On
Allow 5-digit extensions	3D	On/Off	On or Off	Off	On	On
Require extensions	3E	On/Off	On or Off	Off	Off	Off
Code 128				<i>Enter 1 for On and 0 for Off.</i>		
Enable	40	On/Off	On or Off	Off	On	On
Minimum length	41	Value	01–50	01	01	02
Maximum length	42	Value	01–50	01	50	20
Enable UCC/EAN 128	43	On/Off	On or Off	Off	Off	Off
Labelcode 4/5				<i>Enter 1 for On and 0 for Off.</i>		
Enable	52	On/Off	On or Off	Off	On	Off
Convert	53	On/Off	On or Off	Off	Off	Off
Other Controls				<i>Enter 1 for On and 0 for Off.</i>		
Laser programming enable	B0	On/Off	On or Off	On	On	On
Autoterminator	B1	Value	Any single ASCII character (00 = Off)	(CR)	(CR)	(CR)
Auto-off timer	B2	Value	01–99 (in 4-sec. increments) (00 = Off)	75	75	75
Send assigned symbology identifiers*	B5	On/Off	On or Off	Off	On	Off

Programming Parameters

Code Parameter	I.D. #	Type	Acceptable Input	Defaults		
				D0	D1	D2
<i>*A = UPC-A D = M 2 of 5 G = EAN-8 J = Code 11 M = EAN-13</i> <i>B = 1 2 of 5 E = UPC-E H = MSI K = Code 128 N = Labelcode 4/5</i> <i>C = Code 39 F = S 2 of 5 I = Codabar L = Code 93 O = Ames</i>						
Good-read beep tone	B8	Value	00 = 2400 Hz 01 = 2600 Hz 02 = 2800 Hz 03 = 3000 Hz 04 = 3200 Hz 05 = 3400 Hz 06 = 3600 Hz 07 = 3800 Hz	00	00	00
Number of good-read beeps	B9	Value	01–04	01	01	01
Good-read beep duration	BA	Value	00 = 0.07 sec. 01 = 0.13 sec. 02 = 0.18 sec. 03 = 0.36 sec.	00	00	00
Beeper volume	BC	Value	00 = Off 01–09 (01 = Lowest; 07 = Highest; 08 = Higher; 09 = Lower)	07	07	07
Error beep tone	BD	Value	00 = 2400 Hz 01 = 2580 Hz 02 = 2770 Hz 03 = 3000 Hz 04 = 3270 Hz 05 = 3600 Hz 06 = 4000 Hz 07 = 4520 Hz	01	01	01
Long-range trigger mode (long-range scanner models only)	D4	On/Off	On = Release Scan Off = Spot Timeout	Off	Off	Off

Code Parameter	I.D. #	Type	Acceptable Input	Defaults		
				D0	D1	D2
Spot beam timeout <i>(long-range scanner models only)</i>	D5	Value	00 = 0.25 sec. 01 = 0.5 sec. 02 = 1 sec. 03 = 1.5 sec. 04 = 2 sec.	01	01	01
Release scan timeout <i>(long-range scanner models only)</i>	D6	Value	01–30 <i>(seconds)</i>	02	02	02
Spotting Beam Enable <i>(long-range scanner models only)</i>	D7	On/Off	On or Off	On	On	On
Keypress sound	DD	Value	00 = Off 01 = Click 02 = Beep	01	01	01
Enable CTL-ALT-DEL reboot	E0	On/Off	On or Off	Off	Off	On
Enable trigger programmability <i>(Note that for the Falcon 33x, this will effect Enter key programmability.)</i>	E1	On/Off	On or Off	On	On	On
Backlight auto-off timeout	E2	Value	01–99 <i>(seconds)</i> <i>(00 = Off)</i>	15	15	15
Double Action Key Mode <i>(33x models only)</i>	E3	Value	01 = Double Strike 02 = Press & Wait	01	01	01
Double Action Key Timeout <i>(33x models only)</i>	E4	Value	00 = 165 ms. 01 = 220 ms. 02 = 275 ms. 03 = 330 ms. 04 = 385 ms. 05 = 440 ms. 06 = 495 ms. 07 = 550 ms. 08 = 605 ms. 09 = 660 ms.	03	03	03

NOTES

D

Bar Codes

This appendix provides bar codes for common setup parameters for programming the Falcon. Factory default settings are underlined.

To make settings that aren't provided in this chapter, design custom bar codes or use the Falcon Configuration Utility to program the Falcon (refer to [Chapter 2](#)).

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Predefined Defaults



Code 39

ENABLE



MINIMUM LENGTH



MAXIMUM LENGTH



ENABLE CHECKSUM



SEND CHECKSUM



FULL ASCII MODE

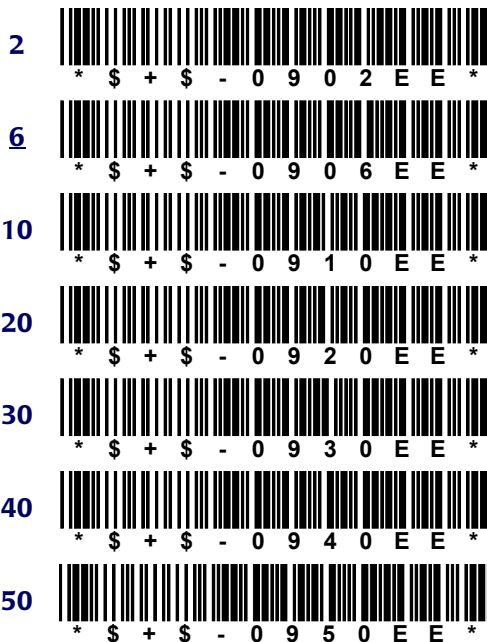


Interleaved 2 of 5

ENABLE



MINIMUM LENGTH



MAXIMUM LENGTH



ENABLE CHECKSUM



SEND CHECKSUM



USE LENGTHS 6 AND 14 ONLY (case code)



Matrix 2 of 5

ENABLE



Off



MINIMUM LENGTH

1



6



10



20



30



40



50



MAXIMUM LENGTH

1



10



20



30



40



50



ENABLE CHECKSUM

On



Off



SEND CHECKSUM

On



Off



Standard 2 of 5

ENABLE

On



Off



MINIMUM LENGTH

1



6



10



20



30



40



50

**MAXIMUM LENGTH**

1

10

20



30



40



50

**ENABLE CHECKSUM**

On

Off**SEND CHECKSUM**

On

Off**USE 2-BAR START/STOP**

On

Off**Code 11****ENABLE**

On

Off**MINIMUM LENGTH**4

10



20



30



40



50



MAXIMUM LENGTH

1  * \$ + \$ - 1 D 0 1 E E *

10  * \$ + \$ - 1 D 1 0 E E *


20  * \$ + \$ - 1 D 2 0 E E *


30  * \$ + \$ - 1 D 3 0 E E *

40  * \$ + \$ - 1 D 4 0 E E *


50  * \$ + \$ - 1 D 5 0 E E *


REQUIRE 2 CHECK DIGITS

On  * \$ + \$ - 1 E 1 E E *

Off  * \$ + \$ - 1 E 0 E E *

SEND CHECK DIGIT(S)

On  * \$ + \$ - 1 F 1 E E *

Off  * \$ + \$ - 1 F 0 E E *

Codabar/Ames

CODABAR ENABLE

On  * \$ + \$ - 2 0 1 E E *


Off  * \$ + \$ - 2 0 0 E E *


AMES ENABLE


On  * \$ + \$ - 5 1 1 E E *


Off  * \$ + \$ - 5 1 0 E E *


MINIMUM LENGTH


1  * \$ + \$ - 2 1 0 1 E E *


4  * \$ + \$ - 2 1 0 4 E E *

10  * \$ + \$ - 2 1 1 0 E E *

20  * \$ + \$ - 2 1 2 0 E E *

30  * \$ + \$ - 2 1 3 0 E E *

40  * \$ + \$ - 2 1 4 0 E E *

50  * \$ + \$ - 2 1 5 0 E E *

MAXIMUM LENGTH

1  * \$ + \$ - 2 2 0 1 E E *

10  * \$ + \$ - 2 2 1 0 E E *

20  * \$ + \$ - 2 2 2 0 E E *

30



40



50

**SEND STOP/START**OnOff**CODABAR-TO-CLSI CONVERSION**OnOff**WIDE INTERCHARACTER GAPS ALLOWED**OnOff**MSI****ENABLE**OnOff**MINIMUM LENGTH**

1



4



7



10



12



14

**MAXIMUM LENGTH**

1



4



7



10



12



14



REQUIRE 2 CHECK DIGITS

On 
* \$ + \$ - 2 9 1 E E *

Off 
* \$ + \$ - 2 9 0 E E *

2ND CHECK DIGIT MOD 11

On 
* \$ + \$ - 2 A 1 E E *

Off 
* \$ + \$ - 2 A 0 E E *

SEND CHECK DIGIT(S)

On 
* \$ + \$ - 2 B 1 E E *

Off 
* \$ + \$ - 2 B 0 E E *

Code 93

ENABLE

On 
* \$ + \$ - 2 C 1 E E *

Off 
* \$ + \$ - 2 C 0 E E *

MINIMUM LENGTH

2 
* \$ + \$ - 2 D 0 2 E E *

10 
* \$ + \$ - 2 D 1 0 E E *

20 
* \$ + \$ - 2 D 2 0 E E *

30 
* \$ + \$ - 2 D 3 0 E E *

40 
* \$ + \$ - 2 D 4 0 E E *

50 
* \$ + \$ - 2 D 5 0 E E *

MAXIMUM LENGTH

2 
* \$ + \$ - 2 E 0 2 E E *

10 
* \$ + \$ - 2 E 1 0 E E *

20 
* \$ + \$ - 2 E 2 0 E E *

30 
* \$ + \$ - 2 E 3 0 E E *

40 
* \$ + \$ - 2 E 4 0 E E *

50 
* \$ + \$ - 2 E 5 0 E E *






Code 128

ENABLE

On 
* \$ + \$ - 4 0 1 E E *

Off 
* \$ + \$ - 4 0 0 E E *

MINIMUM LENGTH

1	 * \$ + \$ - 4 1 0 1 E E *
2	 * \$ + \$ - 4 1 0 2 E E *
10	 * \$ + \$ - 4 1 1 0 E E *
20	 * \$ + \$ - 4 1 2 0 E E *
30	 * \$ + \$ - 4 1 3 0 E E *
40	 * \$ + \$ - 4 1 4 0 E E *
50	 * \$ + \$ - 4 1 5 0 E E *

MAXIMUM LENGTH

1	 * \$ + \$ - 4 2 0 1 E E *
10	 * \$ + \$ - 4 2 1 0 E E *
20	 * \$ + \$ - 4 2 2 0 E E *
30	 * \$ + \$ - 4 2 3 0 E E *
40	 * \$ + \$ - 4 2 4 0 E E *
50	 * \$ + \$ - 4 2 5 0 E E *

ENABLE UCC/EAN 128

On	 * \$ + \$ - 4 3 1 E E *
Off	 * \$ + \$ - 4 3 0 E E *

Labelcode 4/5**ENABLE**

On	 * \$ + \$ - 5 2 1 E E *
Off	 * \$ + \$ - 5 2 0 E E *

CONVERT

On	 * \$ + \$ - 5 3 1 E E *
Off	 * \$ + \$ - 5 3 0 E E *

UPC-A (Universal Product Code-A)**ENABLE UPC-A**

On	 * \$ + \$ - 3 0 1 E E *
Off	 * \$ + \$ - 3 0 0 E E *

SEND SYSTEM DIGIT

On	 * \$ + \$ - 3 1 1 E E *
----	---

Off 
* \$ + \$ - 3 1 0 E E *

SEND CHECK DIGIT

On 
* \$ + \$ - 3 2 1 E E *

Off 
* \$ + \$ - 3 2 0 E E *

CONVERT UPC-A TO EAN-13

On 
* \$ + \$ - 3 3 1 E E *

Off 
* \$ + \$ - 3 3 0 E E *

UPC-E (Universal Product Code-E)

USE SYSTEM DIGIT 0

On 
* \$ + \$ - 3 4 1 E E *

Off 
* \$ + \$ - 3 4 0 E E *

USE SYSTEM DIGIT 1

On 
* \$ + \$ - 3 5 1 E E *

Off 
* \$ + \$ - 3 5 0 E E *

CONVERT UPC-E TO UPC-A

On 
* \$ + \$ - 3 6 1 E E *

Off 
* \$ + \$ - 3 6 0 E E *

SEND SYSTEM DIGIT

On 
* \$ + \$ - 3 7 1 E E *

Off 
* \$ + \$ - 3 7 0 E E *

SEND CHECK DIGIT

On 
* \$ + \$ - 3 8 1 E E *

Off 
* \$ + \$ - 3 8 0 E E *

EAN (European Article Numbering/

JAN (Japan Article Numbering)

ENABLE EAN-8/JAN-8

On 
* \$ + \$ - 3 9 1 E E *

Off 
* \$ + \$ - 3 9 0 E E *

ENABLE EAN-13/JAN-13

On 
* \$ + \$ - 3 A 1 E E *

Off 
* \$ + \$ - 3 A 0 E E *

CONVERT EAN-13 TO ISBN



SEND EAN/JAN CHECKSUM



**UPC/EAN/JAN
Extentions**

ALLOW 2-DIGIT EXTENSIONS



ALLOW 5-DIGIT EXTENSIONS



REQUIRE EXTENSIONS



Other Controls

AUTOTERMINATOR



AUTO-OFF TIMER



SEND SYBOLOGY IDENTIFIER

On



* \$ + \$ - B 5 1 E E *

Off



* \$ + \$ - B 5 0 E E *

0.18



* \$ + \$ - B A 0 2 E E *

0.36



* \$ + \$ - B A 0 3 E E *

GOOD-READ BEEP TONE (in Hertz)

2400



* \$ + \$ - B 8 0 0 E E *

2800



* \$ + \$ - B 8 0 2 E E *

3200



* \$ + \$ - B 8 0 4 E E *

3600



* \$ + \$ - B 8 0 6 E E *

NUMBER OF GOOD-READ BEEPS

1



* \$ + \$ - B 9 0 1 E E *

2



* \$ + \$ - B 9 0 2 E E *

3



* \$ + \$ - B 9 0 3 E E *

4



* \$ + \$ - B 9 0 4 E E *

GOOD-READ BEEP DURATION

(in seconds)

0.07



* \$ + \$ - B A 0 0 E E *

0.13



* \$ + \$ - B A 0 1 E E *

BEEPER VOLUME

Off



* \$ + \$ - B C 0 0 E E *

Lowest



* \$ + \$ - B C 0 1 E E *

Medium



* \$ + \$ - B C 0 4 E E *

Highest



* \$ + \$ - B C 0 7 E E *

Higher



* \$ + \$ - B C 0 8 E E *

Lower



* \$ + \$ - B C 0 9 E E *

ERROR BEEP TONE (in Hertz)

2580



* \$ + \$ - B D 0 1 E E *

3000



* \$ + \$ - B D 0 3 E E *

3600



* \$ + \$ - B D 0 5 E E *

4520



* \$ + \$ - B D 0 7 E E *

LONG-RANGE TRIGGER MODE

(On = Release Scan; Off = Spot Timeout)

On**Off****SPOTTING BEAM ENABLE****On****Off****SPOT BEAM TIMEOUT (in seconds)****0.25****0.5****1****1.5****2****RELEASE SCAN TIMEOUT (in seconds)****1****2****3****5****10****30****KEYPRESS SOUND****Off****Click****Beep****ENABLE CTL-ALT-DEL REBOOT****On****Off****ENABLE TRIGGER PROGRAMMABILITY****On****Off****BACKLIGHT AUTO-OFF TIMEOUT (in seconds)****Off**

2



5



7



9



15



20



30



DOUBLE KEY ACTION MODE

Double Press



Press & Wait



DOUBLE KEY ACTION TIMEOUT

(delay in ms)

165



220



275



330



385



440



495



550



605



660



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DECLARATION OF CONFORMITY

PSC hereby declares that the Equipment specified below has been tested and found compliant to the following Directives and Stan-

Directives: EMC 89/336/EEC
Low Voltage 73/23/EEC
R&TTE 1999/5/EC

Standards

Equipment: EN 55022-A&B:1994/1998 ;EN 50082-1:1992/1998
EN 55024:1998, EN 60825-1:1996, EN60950:1998

Power Supplies: EN55014-1/2:1993/1997, EN61559-1:1997
EN61558-2-6:1997

Radios: ETS 300 328:1995/1996, EN300 826:1997
EN301.489.1/17:2000, EN60950:1992+A4

Equipment Type: Portable Data Terminal Equipment

Product: Falcon Family Models 31X, 32X, 33X, 34X, 51X, PT2000, Single
Dock Stations, and 4-Slot Dock Stations



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