Intermec

User's
Manual

JANUS™ 2010
Hand-Held Computer (4MB)

Contents

1 *Getting Started*

2 *Learning How to Use the Reader*

3

Learning About the Software

4

Using PC Cards in the Reader

5 *Configuring the Reader*

6 *Networking the Reader*

7

Working With IRL

Learning About IRL 7-3

10 *Troubleshooting*

11 *Reader Command Reference*

12

Configuration Command Reference

A

Reader Specifications

B

Reader Keypad Charts

C

Configuration and Full ASCII Charts

D

Software Utility Reference

G *Glossary*

I *Index*

Before You Begin

This section introduces you to standard warranty provisions, safety precautions, warnings and cautions, formatting conventions used in this manual, and sources of additional product information.

Warranty Information

To receive a copy of the standard warranty provision for this product, contact your local Intermec sales organization. In the U.S. call 1-800-755-5505, and in Canada call 1-800-688-7043. Otherwise, refer to the Worldwide Sales & Service list shipped with this manual for the address and telephone number of your Intermec sales organization.

Safety Summary

Your safety is extremely important. Read and follow all warnings and cautions in this manual before handling and operating Intermec equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the safety warnings and cautions.

Do not repair or adjust alone   Do not repair or adjust energized equipment alone under any circumstances. Someone capable of providing first aid must always be present for your safety.

First aid   Always obtain first aid or medical attention immediately after an injury. Never neglect an injury, no matter how slight it seems.

Resuscitation   Begin resuscitation immediately if someone is injured and stops breathing. Any delay could result in death. To work on or near high voltage, you should be familiar with approved industrial first aid methods.

Energized equipment   Never work on energized equipment unless authorized by a responsible authority. Energized electrical equipment is dangerous. Electrical shock from energized equipment can cause death. If you must perform authorized emergency work on energized equipment, be sure that you comply strictly with approved safety regulations.

Warnings and Cautions

The warnings and cautions in this manual use this format:

Warning
A warning warns you of an operating procedure, practice, condition, or statement that must be strictly observed to avoid death or serious injury to the persons working on the equipment.

Avertissement
Un avertissement vous alerte d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour éviter l'occurrence de mort ou de blessures graves aux personnes manupulant l'équipement.

Caution
A caution alerts you to an operating procedure, practice, condition, or statement that must be strictly observed to prevent equipment damage or destruction, or corruption or loss of data.

Conseil
Une précaution vous alerte d'une procédure de fonctionnement, d'une méthode, d'un état ou d'un rapport qui doit être strictement respecté pour empêcher l'endommagement ou la destruction de l'équipement, ou l'altération ou la perte de données.

About This Manual

The *JANUS 2010 User's Manual (4MB)* describes the reader's features and explains how you can operate, configure, network, and create programs for the 4MB JANUS reader.

This manual was written for two audiences:

- Users can read Chapters 1 through 4 for help operating the reader.

- Analysts and programmers can use the entire manual to manage the JANUS reader, its applications, and its connection to the data collection system. You should understand data collection programming, data communications, and DOS (commands, file structure, startup files, and device drivers).

What You Will Find in This Manual
This table summarizes the information in each chapter and appendix.

Chapter	What You Will Find
1	Summarizes the reader's features, functions, and accessories. Describes how to unpack your new reader and get it started for the first time.
2	Explains how to use the reader's keypad, display, batteries, drives, and scanner.
3	Explains how to use, manage, and program the software shipped with the reader.
4	Explains how to use PC cards with the reader.
5	Explains how to change the reader's configuration.
6	Introduces networking concepts and explains how to use your reader to communicate with other devices.
7	Explains how to create, run, and transmit IRL programs.
8	Explains how to configure the reader to operate in any DOS NLS language and use the matching keypad.
9	Explains how to warm boot, cold boot, and reset the reader. Also describes how to enable/disable a password, enter Storage mode, dump conventional memory, and load flash memory.
10	Lists solutions for the problems you may encounter while operating the reader.
11	Describes the commands that change the reader's operation.
12	Describes the commands that change the reader's configuration.
A	Presents the reader's specifications, lists the configuration command names and syntax, and describes the reader's default configuration settings.
B	Lists all of the keystroke combinations you can enter on the reader's keypad.
C	Contains reference tables for configuring communications protocols, using key codes, and using the full ASCII chart.
D	Describes the syntax for Interlnk, POWER.EXE, and the Auto-Loader batch files.
G	Glossary of terms used in this manual.
I	Index.

Terminology

You should be aware of how these terms are being used in this manual:

Term	Description
Reader	The generic term "reader" indicates any JANUS 2010 reader. More specific terms, such as "J2010 with an RF back," indicate a specific type of JANUS 2010 reader.
IC.EXE	The Interactive Configuration application (IC.EXE) was called "the configuration application" in previous versions of this manual.
PC cards	"PC cards" were called "PCMCIA cards" in previous versions of this manual. Intermec no longer uses the name of the Personal Computer Memory Card International Organization (PCMCIA) to refer to this type of PC card.
Type I PC card drive	"Type I PC card drives" were called "internal PC card drives" in previous versions of this manual.
Type II PC card drive	"Type II PC card drives" were called "external PC card drives" in previous versions of this manual.
"For help, see your JANUS PSK reference manual."	This manual does not refer to a specific PSK manual because you may have one or more PSK manuals, depending on the programming language(s) you use.

For definitions of the technical terms used in this manual, see the glossary.
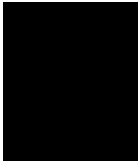
Format Conventions for Input From a Keyboard or Keypad

This table describes the formatting conventions for input from PC or host computer keyboards and reader keypads:

Convention	Description
`Special` text	Shows the command as you should enter it into the reader. See "Format Conventions for Commands" later in this chapter.
Italic text	Indicates that you must replace the parameter with a value. See "Format Conventions for Commands" later in this chapter.
Bold text	Indicates the keys you must press on a PC or host computer keyboard. For example, "press **Enter**" means you press the key labeled "Enter" on the PC or host computer keyboard.
`enter↵`	Shows the key you must press on the reader. For example, "press `enter↵`" directs you to press the key labeled "Enter" on the reader keypad.
`Ctrl` `Alt` `≡f` `.`	Shows a series of reader keys you must press and release in the order shown. For example, "Press `Ctrl` `Alt` `≡f` `.` to boot the reader."
`≡f` - `Alt`	Shows a series of reader keys you must press simultaneously. Also, you must press and hold the keys in the order shown. For example, "Press `≡f` - `Alt` to enter Control mode."

Format Conventions for Bar Codes

You can scan the bar codes listed in this manual to enter data or perform a command. Each bar code includes the name and human-readable interpretation. For example:

Change Configuration ——— *Name*

———————— *Bar code (Code 39)*

\$+ ———————————— *Human-readable interpretation*

2010U.073

Format Conventions for Software Screens and Messages

This manual includes illustrations that represent how the JANUS displays software screens and messages. Here are two examples:

```
    Configuration
 COM1/User-Defined

     (2 of 5)
DELAYS
  INTERCHARACTER:
    0 ms
  TURNAROUND:
    0 ms
  TIMEOUT:
    10 sec
  TRANSMIT ABORT
    00000 ms

  NEXT      PREV
?   ↓ ↑
```
2010U.063

```
Transmitting...
```
2010U.069
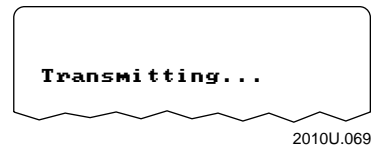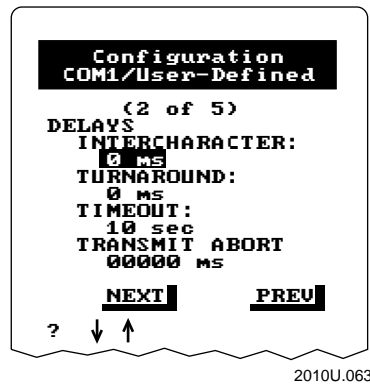
Format Conventions for Commands

This manual includes sample commands that are shown exactly as you should type them on your reader. The manual also describes the syntax for many commands, defining each parameter in the command. This example illustrates the format conventions used for commands:

When you use the LOADADD command, follow this syntax:

```
loadadd [path\]filename [path\filename path\filename...]
```

where:

path   is the drive and directory of the file(s) to include in the
           image file. If you do not include a *path*, the current
           directory is used.

filename is the name of the file or files to include in the image file
           and load to the reader.

You can include multiple *path\filename* and *path*.** parameters in the command. The *path*.** parameter loads all the files in a directory. For example, type this command at the DOS prompt and press ⌷enter↵⌷:

```
loadadd c:\janus\config.sys c:\atadrv\*.* c:\data\*.*
```
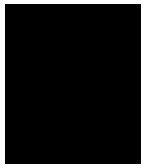
This table defines the conventions used in the example:

Convention	Description
`Special font`	Commands appear in this font. You enter the command exactly as it is shown.
Italic text	Italics indicate a variable, which you must replace with a real value, such as a number, filename, or keyword.
[ ]	Brackets enclose a parameter that you may omit from the command. Do not include the brackets in the command.
Required parameters	If a parameter is not enclosed in brackets [ ], the parameter is required. You **must** include the parameter in the command; otherwise, the command will not execute correctly. ***Note:*** *In previous versions of this manual, required parameters were enclosed in braces { }.*
where	This word introduces a list of the command's parameters and explains the values you can specify for them.

Suggested Reading

You may need to refer to the manuals listed below. To order additional manuals, contact your local Intermec representative or distributor.

Manual	Intermec Part No.
0100 Access Point User's Manual	062367
0110 Access Point User's Manual	065053
The Bar Code Book	051241
Data Communications Reference Manual	044737
DOS user's manual	064673
IRL Programming Reference Manual	048609
JANUS 2.4 GHz Installation Utility (4MB) User's Manual	064673
JANUS 2.4 GHz Terminal Emulation Quick Reference Guide	063682
JANUS 900 MHz Radio Frequency Quick Reference Guide	060207
JANUS 2010 and 2020 Optical Link Adapter Quick Reference Guide	058431
JANUS 2020 Battery Charger Quick Reference Guide	059955
JANUS 2020 Communications Dock Quick Reference Guide	059954
JANUS Application Simulator User's Manual	062778
JANUS PSK for Ada Reference Manual	062038
JANUS PSK for Basic Reference Manual	063191
JANUS PSK for C++ Reference Manual	062133
JANUS 900 MHz Terminal Emulation Quick Reference Guide	062178
PC-IRL Reference Manual	049212
RF System/9180 User's Manual	054292

If you are using the JANUS PSK, you may have one or more of the JANUS PSK manuals listed above, depending on the programming language you use. Refer to your PSK manual when you see these instructions:

"For help, see your JANUS PSK reference manual."

1

Getting Started

This chapter introduces the JANUS 2010 reader and explains how to get your new reader up and running.

What Is the JANUS 2010 Reader?

The JANUS 2010 is a combination hand-held bar code reader and computer. It contains a 386 microprocessor, contains Microsoft MS-DOS, and is PC-compatible.

Type I PC card drive

Bottom of reader

PC card to store files

Scanner or COM2 port

16 line by 20 character CGA display

Keypad

Antenna for radio frequency communications

Features
- PC-compatible
- 640K conventional memory
- Three internal memory drives
- Specialized for bar code data collection
- DOS operating system and file structure
- Runs PC applications

Keypad supports all 102 keys available on a PC

Rechargeable NiCad battery pack

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Accessories for the Reader

You can use these accessories with the JANUS 2010 reader:
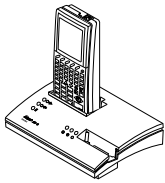
JD2010 Communications Dock   The dock allows the reader to communicate with a host computer and other devices through two serial ports, while simultaneously charging the NiCad battery pack in the reader. The dock also has a slot to charge a spare NiCad battery pack.
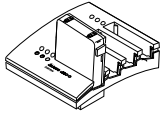
JZ2010 Battery Charger   The charger lets you charge up to four NiCad battery packs at one time. The battery charger senses when a battery pack is fully charged and will not overcharge it.
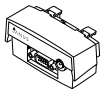
JL2010 Optical Link Adapter   The optical link adapter allows the reader to communicate with a host computer or other device by means of an RS-232 serial port. You can also connect a power supply to the optical link adapter to operate the reader and charge the NiCad battery pack.

Wands and Scanners   You can attach a wand or scanner to enter bar code data with the reader. For a list of input devices you can use, see "Attaching a Wand or Scanner" later in this chapter.
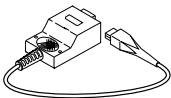
COM2 Hardware Adapter   The COM2 hardware (serial) adapter (Part No. 061799) lets you use the scanner port as COM2 if you do not need an input device.
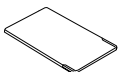
PC Cards   Intermec has certified third-party Type I and Type II PC cards, including memory, modem, and network cards. Memory cards you use in the JANUS reader provide additional disk storage space, not executable conventional memory. Contact your local Intermec sales representative for ordering information.
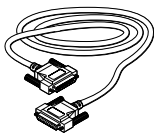
Cables   You may need to purchase cables for serial data communications between the reader and peripheral devices. For help, see "Physical and Environmental Specifications" in Appendix A.

JANUS 2010 Models and Options

The JANUS family of 2010 readers includes these models:

J2010   The basic reader is a combination hand-held programmable data collection computer. The reader has a Type I PC card drive for Type I memory cards and uses a serial port for data communications.

J2010 with 900 MHz RF Back or JG2010 with 2.4 GHz Radio   This reader complements the functionality of the basic reader with an optional RF back, which allows the reader to communicate with a host computer over a radio frequency (RF) network.

J2010 with a PCMCIA Back   This reader complements the functionality of the basic reader with an optional Type II PC card drive that accepts Type I or Type II memory and I/O cards.

2010U.092

| *J2010* | *J2010 with 900 MHz RF Back or JG2010 with 2.4 GHz Radio* | *J2010 with a PCMCIA Back* |
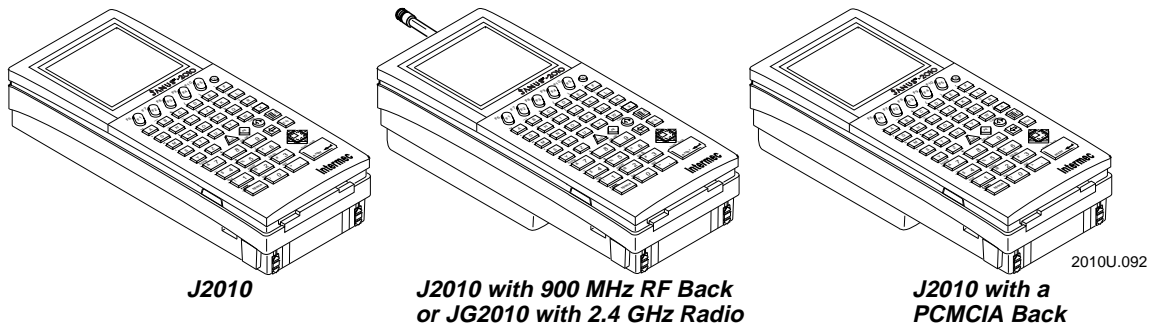
These options are available for all the reader models:

• Alphanumeric keypad that is available in English, French, German, Italian, and Spanish.

• Large numeric keypad that is available in English.

• Terminal emulation (TE) software and keypads that let the reader emulate an IBM 3270 or 5250 terminal (or display station).

• Radio frequency communications available for 900 MHz or 2.4 GHz networks.

This manual tells you how to use the basic features in all models of the JANUS reader. Special information about TE and RF are included in the quick reference guides that are shipped with this manual or with your 2.4 GHz installation kit.

Using the Reader for the First Time

Follow these steps to get your new JANUS 2010 reader up and running:

1. Unpack the reader, carrying case, NiCad battery pack, companion disks, and documentation.

2. Charge the NiCad battery pack.

3. Install the charged NiCad battery pack.

4. Turn on the reader for the first time.

5. Set the time and date.

6. Connect a wand or scanner.

7. Verify that the reader is operating correctly.

Unpacking the Reader

When you remove the reader from its box, save the box and shipping material in case you need to ship or store the reader. Check the contents of the box against the invoice for completeness and contact your Intermec representative if there is a problem.
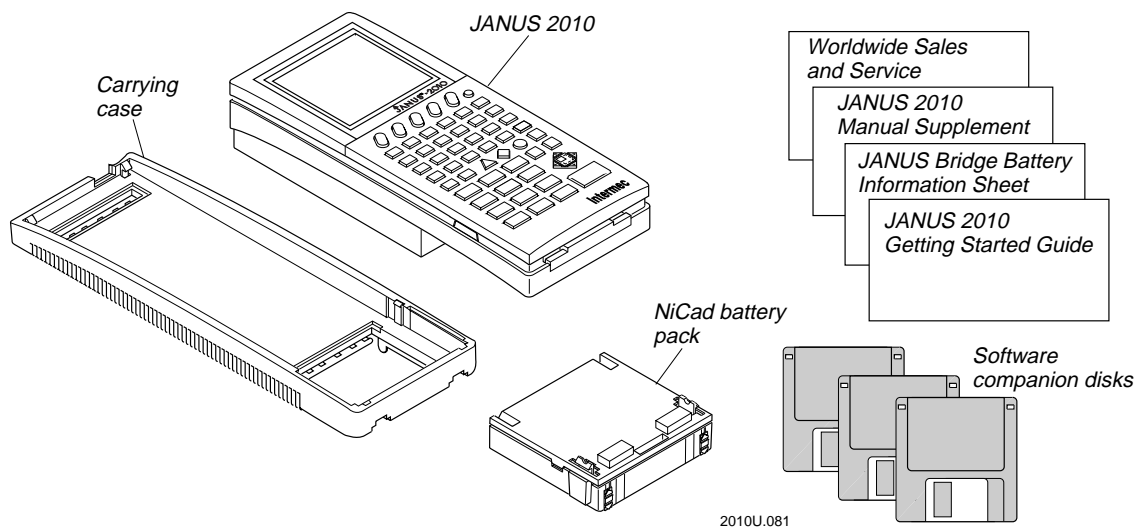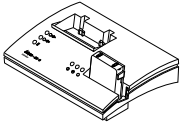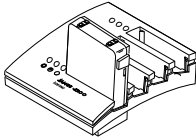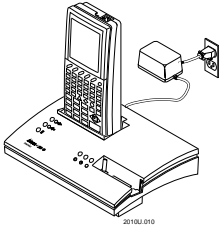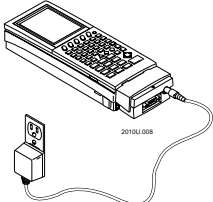
Look on the Boot Utilities companion disk 1 for a README.DOC file. This file may contain information about the reader that was not available when this manual was published. View or print this file with any text editor.

Charging the NiCad Battery Pack

The reader's nickel-cadmium (NiCad) battery pack is shipped to you completely discharged of power, so you must charge the battery pack before you can use the reader. There are four ways to charge the battery pack. For help, see the JANUS accessory quick reference guides.

Note: To learn about using and maximizing the reader's battery power, see "Managing Your Battery Power" in Chapter 2.

Method	Description	Time to Charge
	Place the battery pack in the battery slot of the communications dock.	About 2 hours
	Place the battery pack in the battery charger.	About 2 hours
	Install the battery pack in the reader, place the reader in the communications dock, and connect an external power supply to the dock.	About 15 hours (with the reader turned off)
	Install the battery pack in the reader, attach the optical link adapter to the reader, and connect an external power supply to the optical link adapter.	About 15 hours (with the reader turned off)

Installing the NiCad Battery Pack

You must install the newly charged battery pack into the reader.

To install the battery pack

1. Make sure the two yellow battery pack locks on the end of the battery pack are pushed down in the unlocked position.

2. Place the two battery pack tabs under the reader's back.
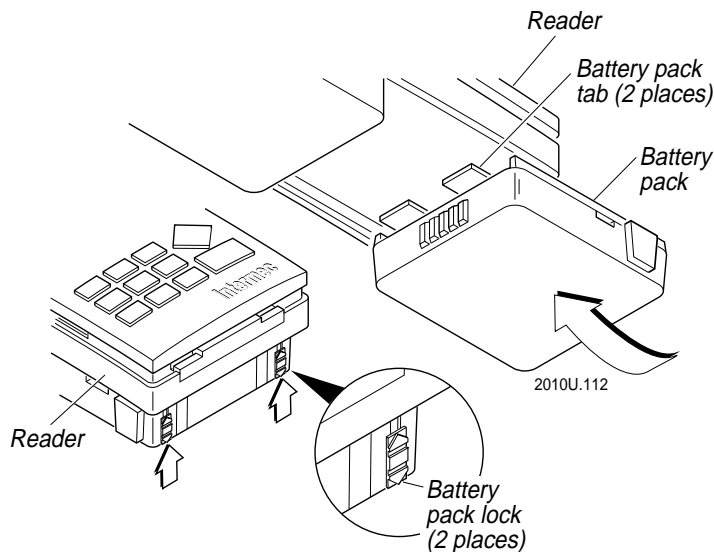
3. Slide the battery pack into the back of the reader until it snaps into place.

4. Push the two battery pack locks up to lock the battery pack in place.

   Note: The battery pack locks must be closed to use the reader.

Turning On the Reader for the First Time

When you turn on the reader for the first time, you need to perform an
initialization sequence to prepare the reader for operation.

To turn on the reader for the first time

1. After you install the charged battery pack, turn on the reader by pressing
    the yellow ⓘ/⊙ key on the top right of the keypad.

2. The Boot Loader menu appears, and the Reboot command is selected.

```
        BOOT LOADER
      Reboot
      Password
      Dump
      Load
      Resume
      Storage
      Off

   Can Not Resume
   Please Reboot
```
2010U.019
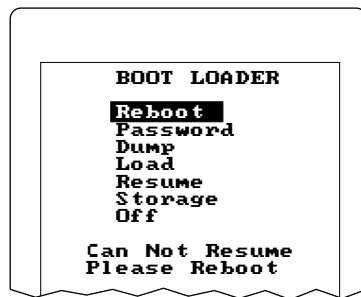
Press `enter↵` to reboot the reader. The reader performs a cold boot, which is
described in "Cold Booting the Reader" in Chapter 9.

*Note: If you do not press a key within 60 seconds after the reader displays a screen,
the reader shuts off and you have to start over at Step 1.*
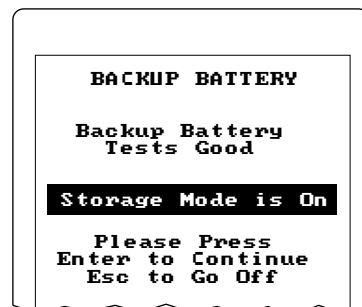
```
     BACKUP BATTERY

   Backup Battery
     Tests Good

  Storage Mode is On

    Please Press
  Enter to Continue
   Esc to Go Off
```
2010U.030

3. The Backup Battery screen appears, describing the status of the lithium
    bridge battery.

    Press `enter↵` to continue booting the reader.

    The reader continues booting and displays the DOS prompt when it
    finishes.

Setting the Time and Date

Next, you set the current time and date.

To set the time and date

1. Type this command at the DOS prompt and press ⌷enter↵:

   ```
   time
   ```

2. Type the current time in the format HH:MM:SS and then press ⌷enter↵.

   To type a colon on an alphanumeric keypad, press ▤f F. To type a colon on a large numeric keypad, press ▤f ➡|.

3. Type this command at the DOS prompt and press ⌷enter↵:

   ```
   date
   ```

4. Type the current date in the format MM-DD-YY and then press ⌷enter↵.

   To type a dash on an alphanumeric keypad, press ▤f H. To type a dash on a large numeric keypad, press ▤f ▤f ▤f G.

   Press ▤f H to type the dashes. Then press ⌷enter↵.

Attaching a Wand or Scanner

To enter bar code data, you need to attach an input device to the reader. You can use one of these Intermec input devices with the JANUS 2010:

* 1260-series, 1270-series, and 1280-series digital wands

* 146x CCD scanners

* 1500 infrared, 151x , 1545, and 155x visible laser scanners

* 1354 and 1355 badge scanners

To attach a wand or scanner to the reader

1. Turn off the reader by pressing Ⓘ/◎.

Caution
Attaching an input device while the reader is on could damage the reader and/or input device.

Conseil
N'attachez pas de périphérique d'entrée pendant que le lecteur est actif car cela pourrait endommager le lecteur et/ou le périphérique d'entrée.

2. Locate the modular connector on the top of the reader. The connector is designed so you can insert the input device cable only one way. Make sure the connector snaps into place securely.

    Note: If the wand or scanner does not have a 10-pin modular connector, you can order an adapter cable from your Intermec representative.

3. Turn on the reader by pressing Ⓘ/◎.

    For helpful tips on scanning bar codes, see the wand or scanner manual.

2010U.001
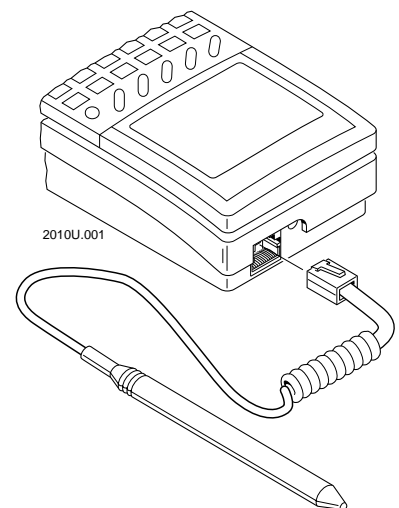
Verifying That the Reader Is Operating Correctly

Once you have turned on the reader and attached an input device, your JANUS reader is ready for operation. You can enter data by typing on the keypad or by scanning bar code labels.

For example, to view the contents of the reader's current drive, type this command at the DOS prompt and press ⌷enter ←⌷ :

```
dir
```

Or scan this bar code:

DIR

The directory of the current drive appears on the reader display.
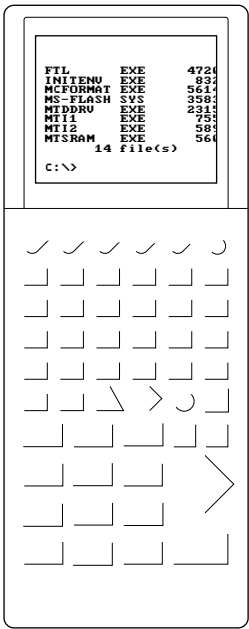
2010U.180

If you cannot see the cursor after you enter the DIR command, scan this bar code to move to the cursor's position in the reader's display area:

/-

To learn more about the reader's display and the position of the cursor, see "How to Use the Reader's Display" in Chapter 2.

Turning the Reader On and Off

The reader's Suspend/Resume key is the yellow ⓘ/o key in the upper right corner of the keypad, as shown in this illustration:

When you press ⓘ/o to turn the reader off, the reader does not shut off but goes into a Suspend mode. This mode is referred to as "off" in the rest of this manual.

In Suspend mode, the reader saves all memory and turns off the power to most hardware, including the CPU.

When you press ⓘ/o to turn the reader on, the reader resumes exactly where it was when you turned it off.

If a program was running when you turned off the reader, the program continues running from the same point when you turn the reader on.

If you change the battery pack while the reader is turned off, the reader resumes exactly where it was the next time the reader is turned on.

Note: You do not boot the reader by turning it off and on. To learn how and when to boot the reader, see "Booting the JANUS Reader" in Chapter 9.

Suspend/Resume key turns the reader on and off
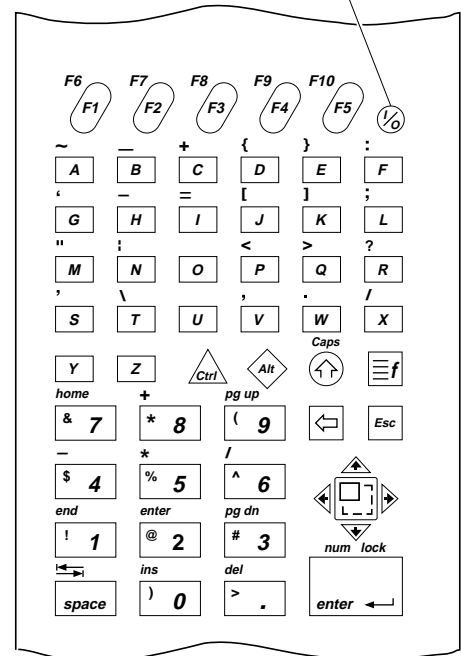
2010U.113

Where Do You Go From Here?

Now that your new JANUS reader is up and running, you can use this manual to learn how to perform these tasks:

For Help With This Task	See This Chapter
To learn to use the reader's keypad, display, audio signals, batteries, COM ports, drives, and scanner	Chapter 2, "Learning How to Use the Reader"
To learn to use the reader's software and manage its disk space and memory	Chapter 3, "Learning About the Software"
To learn to use PC cards in the reader's PC card drive or drives	Chapter 4, "Using PC Cards in the Reader"
To learn about configuration files and ways to change the reader's configuration	Chapter 5, "Configuring the Reader"
To add the reader to your data collection system and learn how to communicate with other devices	Chapter 6, "Networking the Reader"
To run IRL programs on the reader	Chapter 7, "Working With IRL"
To configure the reader for an international language and learn to use the matching keypad	Chapter 8, "Preparing the Reader for International Use"
To learn to boot the reader, solve problems, and respond to error messages	Chapter 9, "Booting and Resetting the Reader," and Chapter 10, "Troubleshooting"

2

Learning How to Use the Reader

This chapter describes and explains how to use the reader's keypad, display, audio signals, communications port, batteries, and drives.

JANUS 2010 Features

This chapter tells you about these features on the JANUS 2010 reader:

Communications port
You can use radio frequency (RF) on the J2010 with an RF Back.

Display
The reader display is 16 lines by 20 characters. You can use the viewport feature to move around a virtual PC-size screen.

Scanner or COM2 port
You can scan bar code data by attaching either a wand or a scanner, or use the port as COM2.

Keypad
There are three keypad options: an alphanumeric keypad that is available in five languages, a large numeric keypad, and terminal emulation keypads.

Drives
The reader has three internal memory drives and one or two PC card drives to run applications and store data.

2010U.014

Communications port
You can use the optical port on the reader to communicate with other devices.

Batteries
The reader uses a rechargeable NiCad battery pack and a lithium bridge battery to provide power. You can also attach an external power supply.

Using the Alphanumeric Keypad

The JANUS 2010 reader has three keypad options:

- Alphanumeric keypad
- Large numeric keypad
- Terminal emulation keypads

The alphanumeric keypad is an all-purpose keypad with 52 keys. Although the keypad is smaller than a regular PC keyboard, you use special keys on the reader's keypad and press key combinations to access all 102 keys that are available on a PC keyboard.

The alphanumeric keypad is available in English, French, German, Italian, and Spanish. For help with an international keypad, see Chapter 8, "Preparing the Reader for International Use."

The large numeric keypad has 34 keys and is available in English. The number keys are larger to make it easier to enter a lot of numeric data. For help using the large numeric keypad, see "Using the Large Numeric Keypad" later in this chapter.

Optional terminal emulation (TE) keypads come with the JANUS 2010 TE reader. The TE keypads are similar to the alphanumeric keypad, but contain additional keys available on an IBM 3270 or 5250 keyboard. For help using your TE keypad, see your JANUS TE documentation.

Finding the Special Keys

Before you use the reader's alphanumeric keypad, make sure you can find all of the different types of keys on the keypad.

Function keys

Suspend/Resume key *turns the reader on and off*

Control key

Alt key

Compound Function key *to access characters or perform functions that do not have an actual key on the keypad*

Shift key

Alphabetic keys

Numeric keys

Viewport key *moves the cursor and viewport up, right, down, and left*

2010U.195

Backspace key *erases or deletes the character to the left of the cursor*

Enter key
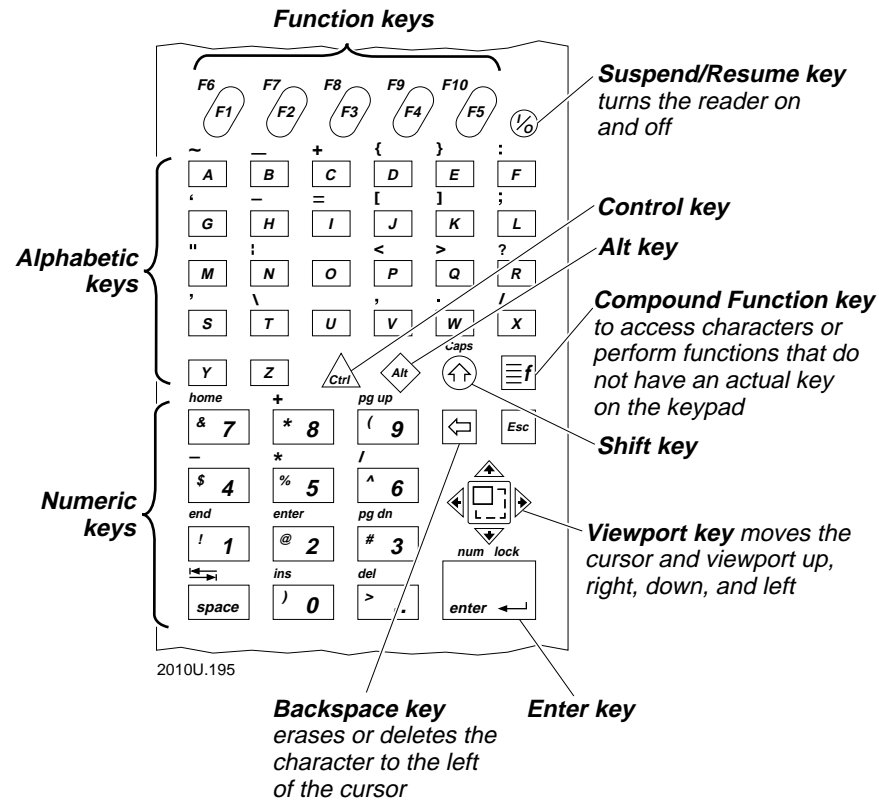
How to Type the Characters Printed on the Keypad

There are three types of characters and symbols printed on the alphanumeric keypad:

Third character

✳

Second character → *%* **5**

First character

Character	Description	To Type the Character
First	The first character is the one in the middle or lower right corner of the key. If there are two characters printed on the key, it is the larger character. Every key on the keypad has a first character.	• Press the key the character appears on.
Second	The second character is the one in the upper left corner of the key. Some keys do not have a second key. The alphabetic keys (A to Z) do not show the second key, but it is the uppercase version of the letter.	1. Press ⇧. 2. Press the key the character appears on.
Third	The third character is the one that appears just above the key, printed on the top cover of the JANUS reader. Some keys (such as Y and Z) do not have a third character.	1. Press ⧉f. 2. Press the key the character appears above.

To practice using an alphanumeric keypad, type these characters

- To type a lowercase f, press ⌐F⌐.
- To type an uppercase F, press ⟨↑⟩. Press ⌐F⌐.
- To type a colon (:), press ⌐≡f⌐. Press ⌐F⌐.
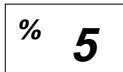
- To type the number 5, press ⌐5⌐.
- To type the percent sign (%), press ⟨↑⟩. Press ⌐5⌐.
- To type the asterisk (*), press ⌐≡f⌐. Press ⌐5⌐.

How the Ctrl, Alt, and Shift Keys Work

The JANUS keypad does not have an actual key for every character and function available. You use the Ctrl, Alt, and Shift keys to access characters or perform functions that do not have an actual key on the keypad. You also use the Shift key to type uppercase alphabetic characters.

The Ctrl, Alt, and Shift keys work differently on the JANUS keypad than on a regular PC keyboard. On a PC keyboard, you press and hold key combinations that require the Ctrl, Alt, or Shift keys. On the reader's keypad, you do not hold down these keys.

When you press ⟨Ctrl⟩, ⟨Alt⟩, or ⟨↑⟩, the key is held in a buffer until you press another key. The icon appears on the reader's display to remind you that the key is being held in the buffer. When you press another key, the key combination is entered into the reader and the icon disappears.

Ctrl
Alt
Shift

▲ ◆ ⇧

2010U.119
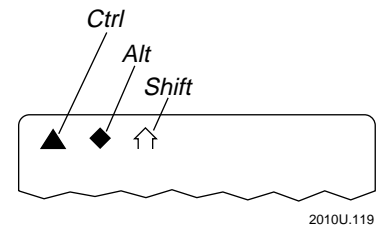
To flush the ⟨Ctrl⟩, ⟨Alt⟩, or ⟨↑⟩ key from the buffer without performing any action, just press the key again. The icon disappears from the display.

If you are programming or using applications that require a right and left Ctrl, Alt, or Shift key, you can access these keys on the reader's keypad. To enter a right Ctrl, Alt, or Shift key, press ⟨Ctrl⟩, ⟨Alt⟩, or ⟨↑⟩ on the keypad. To enter a left Ctrl, Alt, or Shift key, use the key combination from the "Reader Keypad Charts" in Appendix B.

To use the Ctrl, Alt, and Shift keys

1. Press △Ctrl, ◇Alt, or ⇑. The Ctrl, Alt, or Shift icon appears on the reader's display.

   For example, press ⇑. The Shift icon appears on the reader's display.
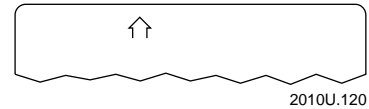
2. Press the second key. For example, press A to type the uppercase letter A. The Shift icon disappears from the reader's display.

   Or, to flush the key from the keypad buffer without performing any action, press △Ctrl, ◇Alt, or ⇑ again. The icon disappears from the reader's display.

How the Compound Function Key Works

The Compound Function key is a special key on the JANUS keypad. You use the ≡f key to access characters or perform functions that do not have an actual key on the keypad.

The ≡f key works like the △Ctrl, ◇Alt, and ⇑ keys. When you press ≡f, the key is held in a buffer and the Compound Function key icon appears on the reader's display.
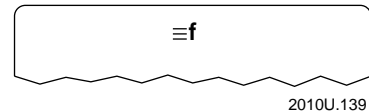
Once you press a key other than ≡f, the key combination is entered into the reader and the icon disappears from the display. For example, you press ≡f F to type the colon (:) character printed above the F key.

The ≡f key has three levels to access additional key combinations that are not displayed on the keypad. You can press ≡f up to three times and then press one more key to access a wide range of key combinations. For example, you can access the F11 key, F12 key, or the Ctrl-Break function.

For a complete list of key combinations, see Appendix B, "Reader Keypad Charts."

To use the Compound Function key

Press → *Display shows* `_f` → *Press the second key* `F` → *Display shows* `C:\>:`

or

Press twice → *Display shows* `_f` → *Press the third key* `F1` → *Enters the F11 function key. The display shows* `C:\>`

or

Press three times → *Display shows* `≡f` → *Press the fourth key* `C` → *On a reader with a large numeric keypad, the display shows* `C:\>+`

or

Press four times → *Display shows* → *When you press the ≡f key four times, you flush the keypad buffer without entering any key combination.*

2010U.122

Note: To enter the third key combination shown above, ≡f ≡f ≡f c , you must use a large numeric keypad.

Capitalizing All Characters

To type all alphabetic characters as uppercase letters, you can press ⇧ before every letter you type, or you can enable the Caps Lock feature.

To enable Caps Lock

1. Press ▤f.
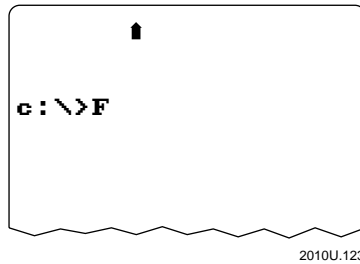
2. Press ⇧. The Caps Lock icon disappears from the reader's display.

2010U.123

3. Type an alphabetic character. The letter appears as a lowercase letter on the reader's display.

To disable Caps Lock

1. Press ▤f.

2. Press ⇧. The Caps Lock icon disappears from the reader's display.

3. Type an alphabetic character. The letter appears as a lowercase letter on the reader's display.

Note: You can also use the Keypad Caps Lock configuration command to enable or disable Caps Lock on the reader. For help, see the "Keypad Caps Lock" command in Chapter 12.

Learning How to Use the Cursor Keys

You can press keys to move the cursor around the reader's display screen. The reader's cursor keys work the same as the cursor keys on a regular PC keyboard. You can use the cursor keys to move around the reader's screen if you are running a program, entering data in a screen, editing a file, or editing a command at the DOS prompt.

Cursor keys on JANUS 2010
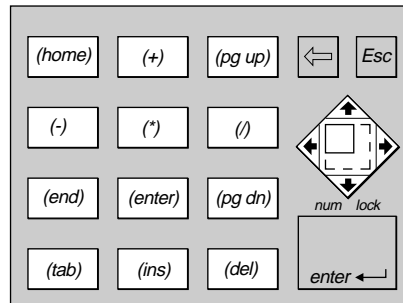
Cursor keys on PC keyboard
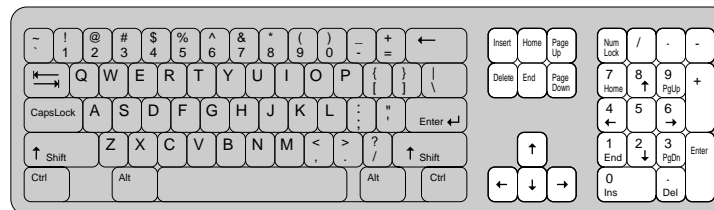
2010U.006

There are two ways to use cursor keys on the keypad:

*   Use the cursor keys and the viewport keys with the reader's number pad disabled.

*   Use the cursor keys with the reader's number pad enabled and the Num Lock turned off. For help, see "Using the Number Pad" later in this chapter.

The next table explains how to use each cursor key with the number pad disabled.

Cursor Key	To Use the Key	Description
Home	Press ▤f 7	Moves the cursor to the top left corner of the display. If you are at the DOS prompt, moves the cursor to the beginning of the line.
End	Press ▤f 1	Moves the cursor to the end of the last line displayed on the screen.
Page up	Press ▤f 9	Moves the cursor up one screen. If you are at the DOS prompt and the DOSKEY command is enabled, scrolls up one page of DOS commands.
Page down	Press ▤f 3	Moves the cursor down one screen. If you are at the DOS prompt and the DOSKEY command is enabled, scrolls down one page of DOS commands.
Insert	Press ▤f 0	Each character you type is inserted after the cursor until you exit Insert mode by pressing ▤f 0 again. Normally, you type text in Overwrite mode. Characters are typed over the existing characters on the screen.
Delete	Press ▤f .	Deletes or erases the character displayed above the cursor.
Arrow up	Press ⬆	Moves the cursor up one row or line. If you are at the DOS prompt and the DOSKEY command is enabled, scrolls up to the previous DOS command.
Arrow down	Press ⬇	Moves the cursor down one row or line. If you are at the DOS prompt and the DOSKEY command is enabled, scrolls down to the next DOS command.
Arrow right	Press ➡	Moves the cursor one character to the right.
Arrow left	Press ⬅	Moves the cursor one character to the left.

Using the Number Pad

You can use the number pad to move the cursor around the screen and to type numbers and mathematical symbols. The reader's number pad is designed to work like the number pad on a regular PC keyboard. If you are programming or using an application that requires the scan code for a character from the PC's number pad, you need to use the reader's number pad.

For example, you must use the PC's number pad to type a character from the extended ASCII character set. You cannot use the number keys above the alphabetic characters. You must also use the reader's number pad to type characters from the extended ASCII character set.

Number pad on JANUS 2010

Number pad on PC keyboard
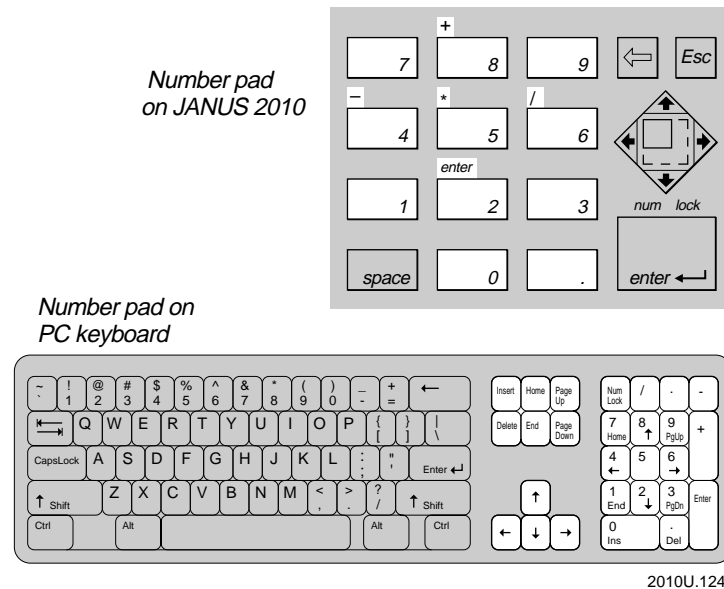
2010U.124

A PC keypad has a key labeled Num Lock. When you press the Num Lock key on a PC, a light turns on to tell you that the Num Lock is turned on and you can type numbers and mathematical symbols. When you press the Num Lock key again, the light turns off and the number pad becomes a cursor keypad. The reader's number pad works the same way. You can turn the Num Lock on and off from the number pad.

There are two ways to type numbers and mathematical symbols:

• Use the number keys 0 through 9 with the number pad disabled.

• Use the number keys 0 through 9 with the number pad enabled and the Num Lock turned on.

To enable the number pad

Press ≡f ≡f enter↵ .

To turn Num Lock on

Press ≡f enter↵ .

To turn Num Lock off

Press ≡f enter↵ .

To disable the number pad

Press ≡f ≡f enter↵ .

With the number pad enabled, you press ≡f enter↵ to toggle back and forth between Num Lock on and off.

To type these keys with the number pad enabled and Num Lock turned on

To type the characters in this figure, press a key on the number pad. For example, to type the number 2, press 2 .

You can also type any ASCII character in the extended character set. For help, see "How to Enter ASCII Characters" later in this chapter.
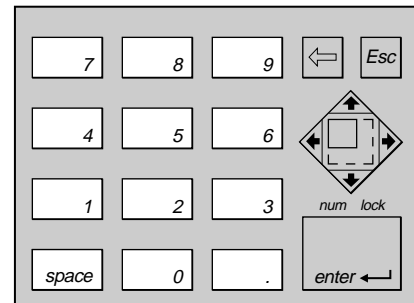
2010U.126

To use the cursor keys in this figure, press ⬆ and then press a key on the number pad. For example, to page up (pg up), press ⬆ 9 .
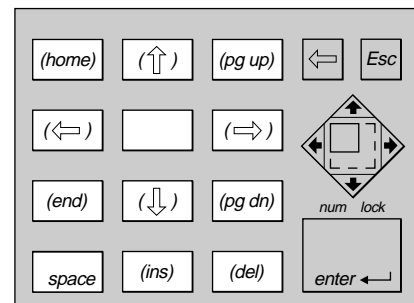
2010U.127

To type these keys with the number pad enabled and Num Lock turned off

To use the cursor keys in this figure, press a key on the number pad. For example, to move to the home position on the display, press ⬚3⬚.
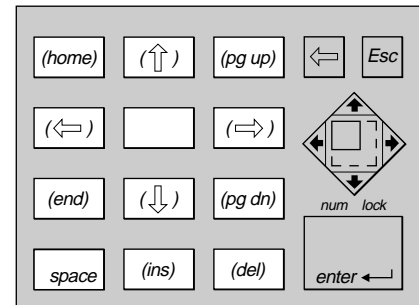
2010U.127

To type the characters in this figure, press ⬆ and then press a key on the number pad. For example, to type the number 6, press ⬆ ⬚6⬚.
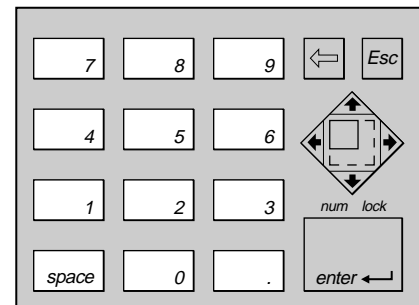
2010U.126

To type these keys with the number pad enabled and Num Lock turned on or off

To type the characters or use the cursor keys in this figure, press ▤f and then press a key on the number pad. For example, to type a plus (+) sign, press ▤f ⬚8⬚.
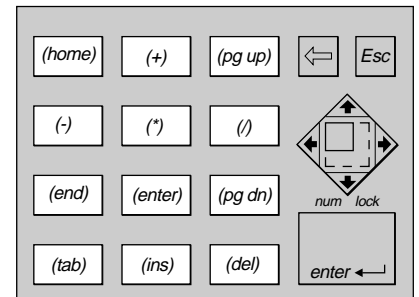
2020U.125

Note: You cannot type the secondary character printed on each numeric key (0-9) with the number pad enabled. You must disable the number pad to type these characters:
*& * ($ % ^ ! @ #) >*

Finding Out If the Number Pad Is Enabled or Disabled

You can turn the Num Lock on and off on the number pad. On the reader, it may be difficult to tell when the number pad and Num Lock are enabled. You can type a character to find out if the number pad is enabled or disabled.

To find out if the number pad is enabled or disabled

1. Press ⬆ and release it.

2. Press ⬚5⬚.

3. Use this table to find out if the number pad is enabled or disabled, and if Num Lock is turned on or off.

Displays	Status of the Number Pad
%	Number pad is disabled.
5	Number pad is enabled with Num Lock turned off.
blank	Number pad is enabled with Num Lock turned on.

How to Enter ASCII Characters

You can type any ASCII character in the ASCII extended character set. For help, see any DOS book for a chart with the values you can enter.

To enter an ASCII character

1. Press ⬆ ⬚5⬚ to find out the status of the number pad.

Displays	What Do You Do Next?
%	Press ⬅ to erase the character. Press ≣f ≣f enter↵ to enable the number pad. Press ≣f enter↵ to turn the Num Lock on.
5	Press ⬅ to erase the character. Press ≣f enter↵ to turn the Num Lock on.
blank	Go to Step 2.

2. Press and hold ⬧Alt⬧.

3. Type the three-digit decimal ASCII value for the character. The value cannot be larger than 255. For example, type ⬚0⬚ ⬚6⬚ ⬚4⬚ for the @ symbol.

4. Release the ⬧Alt⬧ key. The ASCII character appears on the reader's display.

5. To exit and disable the number pad, press ≣f ≣f enter↵.

Using the Large Numeric Keypad

The number keys on the large numeric keypad are larger to make it easy for you to type a lot of numeric data. The large numeric keypad is available only in an English version.

The large numeric keypad has 34 keys, and you can access all 102 keys available on a PC keyboard by pressing combinations of keys. For a list of key combinations, see Appendix B, "Reader Keypad Charts." This section describes how to use the large numeric keypad.

Finding the Special Keys

Make sure you can find these special keys on the large numeric keypad.
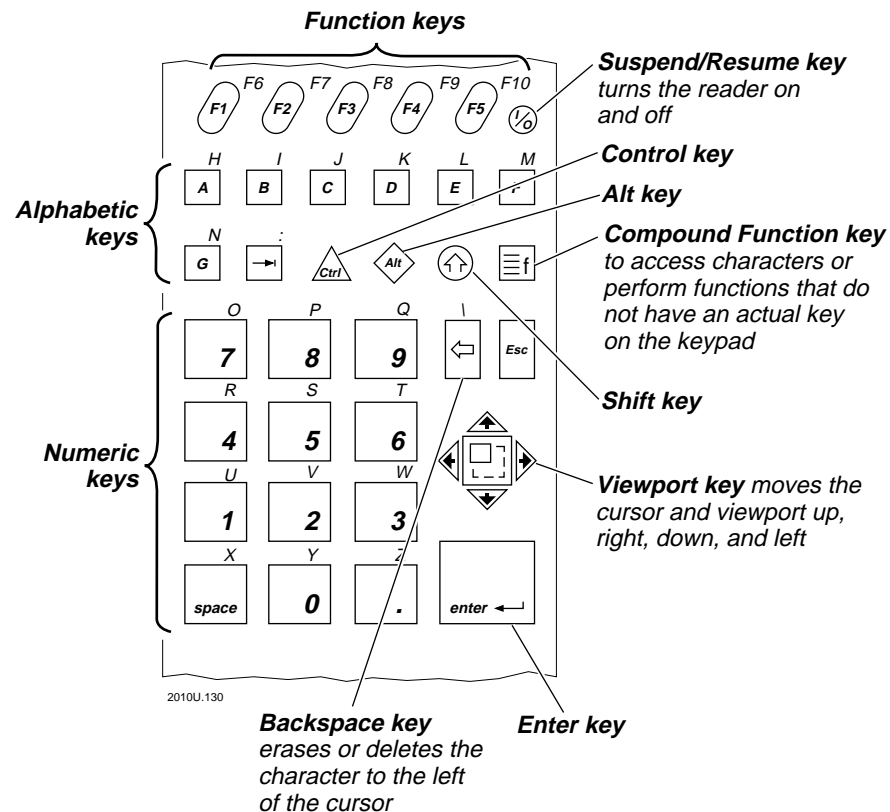
How to Type the Characters Printed on the Keypad

There are four types of characters and symbols printed on the large numeric keypad:

First and
Second
character   *Third and*
                               Fourth character

K

D

Character	Description	To Type the Character
First	The first character is the one in the middle of the key. Every key on the keypad has a first character.	• Press the key the character appears on.
Second	The second character is not shown on the key, but it is the uppercase version of the alphabetic key (A through G). The other keys do not have a second key.	1. Press ⇧. 2. Press the key the character appears on.
Third	The third character is the one that appears just above the key, printed on the top cover of the JANUS reader. Some keys, such as Esc, do not have a third character.	1. Press ▤f. 2. Press the key the character appears above.
Fourth	The fourth character is not shown above the key, but it is the uppercase version of the alphabetic key (H through Z). The other keys do not have a fourth key.	1. Press ⇧. 2. Press ▤f. 3. Press the key the character appears above.

To practice using a large numeric keypad, type these characters

R

4
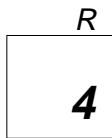
- To type the number 4, press ⎡4⎤.
- To type the lowercase r, press ⎡≣f⎤. Press ⎡4⎤.
- To type the uppercase R, press ⟨⇧⟩. Press ⎡≣f⎤. Press ⎡4⎤.

K

D

- To type a lowercase d, press ⎡D⎤.
- To type an uppercase D, press ⟨⇧⟩. Press ⎡D⎤.
- To type a lowercase k, press ⎡≣f⎤. Press ⎡D⎤.
- To type an uppercase K, press ⟨⇧⟩. Press ⎡≣f⎤. Press ⎡D⎤.

How to Type Other Characters

The large numeric keypad does not have an actual key for every character and function available. You use the ⟨Ctrl⟩, ⟨Alt⟩, ⟨⇧⟩, and ⎡≣f⎤ keys to access characters or perform functions that do not have an actual key on the keypad. This table tells you where to find more information about using the keys on the large numeric keypad.

Key	Where to Find More Information
⟨Ctrl⟩ ⟨Alt⟩ ⟨⇧⟩	See "How the Ctrl, Alt, and Shift Keys Work" earlier in this chapter.
⎡≣f⎤	See "How the Compound Function Key Works" earlier in this chapter.
home, pg up, pg dn, end, ⬆, ➡, ⬇, ⬅	See "Learning How to Use the Cursor Keys" earlier in this chapter. This section explains how to use the cursor keypad on an alphanumeric or large numeric keypad.
	For the key combinations to access the cursor keys on a large numeric keypad, see Appendix B, "Reader Keypad Charts."
⎡0⎤ through ⎡9⎤	See "Using the Number Pad" earlier in this chapter. This section explains how to enable and disable the number pad on an alphanumeric or large numeric keypad.
	For the key combinations to access the number pad keys and cursor keys on a large numeric keypad, see Appendix B, "Reader Keypad Charts."

For a list of the keystrokes you use to access every character or function on the large numeric keypad, see Appendix B, "Reader Keypad Charts."

How to Use the Reader's Display

You can use the JANUS reader's display to enter data, view or list files, run programs, monitor the reader's status, and for many other functions. The reader's display is 16 lines by 20 characters and is CGA compatible.

Icons to monitor
the reader's status

CGA-compatible
display shows
16 lines by
20 characters

2010U.025
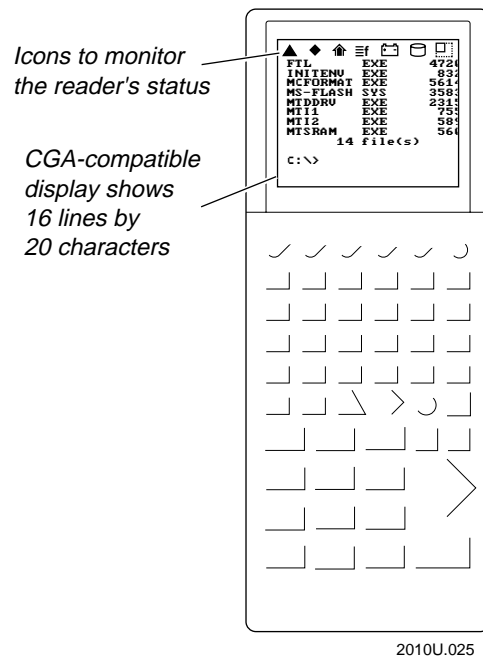
You can use these features of the display:

• Choose different display sizes and video modes.

• Use Text mode or Graphics mode to support different types of applications.

• Use the reader's screen as a viewport to see a full PC-size screen of 25 lines by 80 characters.

• Adjust the display's contrast, backlight, screen scrolling, character height, or character width.

• Use the reader's icons to monitor the status of special keys, battery power, PC card drive, RF communications, and viewport movement.

Each display feature is explained in the next sections.

Choosing the Display Sizes and Parameters

By default, the reader's display is configured with these values:

• 25 lines by 80 characters (full-sized virtual screen)

• Normal width characters

• Scroll at line 16

• Normal height characters

You can configure the reader's display to the sizes and parameters listed in the next table. If you select the 25 x 80 display size, you can customize the character width, character height, and the line at which the display scrolls; otherwise, those parameters are preset to match the display size.

One reason you may want to configure the display is to support the applications you run on the reader. For example, if you are running a JANUS PSK application designed to fit the reader's 16 x 20 screen, you may choose the 16 x 20 display size.

For help changing the configuration, see Chapter 5, "Configuring the Reader," or the "Display Setup" command in Chapter 12.

Note: If you are working at the DOS prompt, Intermec recommends that you set the display size to 25 x 80 or you may see inconsistent display results.

List of Display Sizes and Parameters

Display Size	Parameters	
25 x 80 (25 lines by 80 characters)	You can set these parameters:	
	Video Mode:	Set normal- or double-width characters. If you use double-width characters, the display size is 25 x 40. For each character width, you can also choose either Monochrome or Color mode. For help, see the "Display Setup" command in Chapter 12.
	Scroll Line:	Set the line at which the display scrolls to 8, 16, or 25.
		***Note:** If you run an application that uses a 25 line by 80 character display, the reader display will scroll at line 25.*
	Character Height:	Set normal- or double-height characters.
16 x 20 (16 lines by 20 characters)	These parameters are automatically set:	
	Video Mode:	Normal-width characters
	Scroll Line:	Line 16
	Character Height:	Normal-height characters
8 x 20 (8 lines by 20 characters)	These parameters are automatically set:	
	Video Mode:	Normal-width characters
	Scroll Line:	Line 8
	Character Height:	Double-height characters
16 x 10 (16 lines by 10 characters)	These parameters are automatically set:	
	Video Mode:	Double-width characters
	Scroll Line:	Line 16
	Character Height:	Normal-height characters
8 x 10 (8 lines by 10 characters)	These parameters are automatically set:	
	Video Mode:	Double-width characters
	Scroll Line:	Line 8
	Character Height:	Double-height characters

Using Text or Graphics Mode

You can use Text mode or Graphics mode on the reader. By default, the reader uses Text mode and you can set the display size to 25 x 80, 16 x 20, 8 x 20, 16 x 10, and 8 x 10. If your application only recognizes DOS mode, you must use a display size of 25 x 80 or 25 x 40. Other display sizes are not DOS standard and are for use only with custom applications. You can program applications to use blinking and reverse video characters in Text mode.

To use Graphics mode, your application needs to set Graphics mode when you start the application on the reader. As you exit the application, set Text mode again before returning to the DOS prompt. When the reader is set to use Graphics mode, you see a 128 x 160 pixel display size. You can use the reader's CGA display as a viewport to move around and see a 200 x 640 pixel virtual display. In Graphics mode, you automatically use the reader's virtual display (PC-size screen).

For help programming the reader or setting Graphics mode, see your JANUS PSK reference manual.

Using the Display as a Viewport

You can see one section of a PC-size screen on the reader's smaller display for applications that need to be PC compatible. You will only see 16 lines and 20 characters of data at one time. However, you can use the reader's display as a viewport to move around and see the entire screen. By moving the viewport, you use the reader's virtual display of 25 lines by 80 characters—the same size as a PC screen.

In the reader's default configuration, the display size is configured for 25 x 80. The first time you turn the reader on, it displays the upper left corner of the virtual display. This is the viewport's home position. Any line of data that is longer than 20 characters is in the unseen area of the virtual display. You move the viewport to see each part of the virtual display.

When you move the viewport out of the home position (upper left corner), the Viewport icon displays until the viewport is returned to its home position.
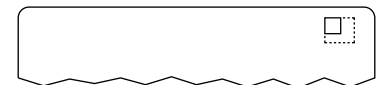
2010U.133

Note: *To use the display as a viewport, you must configure the reader display size to 25 x 80. For help, see the "Display Setup" command in Chapter 12.*

Trying Out the Viewport

When you display a directory list, you need to use the viewport to see all of the information in the list.

Viewport icon

Virtual PC
screen

2010U.134
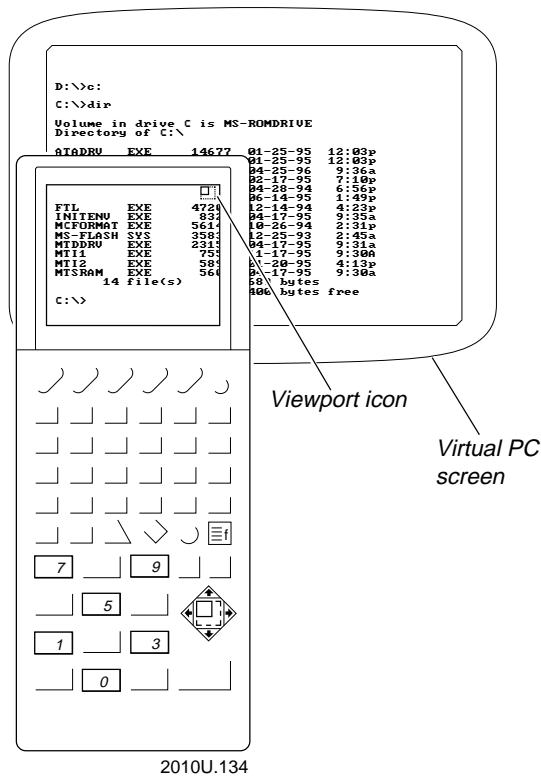
To try using the viewport

1. Change to drive C. Type this command and press [enter ⏎].

   c:

2. To see a directory list, type this command and press [enter ⏎].

   dir

3. Press [≡f] ◆. The viewport moves one "step" to the right to display the next part of the directory list. The Viewport icon appears on the reader's display.

4. Repeat Step 3 to move the viewport to the right again if you still cannot see all of the directory information.

5. Press [≡f] [≡f] [0]. The viewport moves to the cursor and you see the C:> prompt. The Viewport icon disappears from the reader's display.

What Are Viewport Movement Steps?

When you press ⊟f followed by an arrow key or scan the equivalent bar code label, the viewport moves one "step" in that direction. You can set the number of characters and lines the viewport moves in a single move or step. You can configure the reader to:

- Move the viewport right or left from 1 to 20 characters (or columns) in a single step. The default horizontal step is 10 characters.

- Move the viewport up or down from 1 to 9 lines (or rows) in a single step. The default vertical step is 9 lines.

For help, see the "Viewport Movement Steps" command in Chapter 12.

Moving the Viewport

You can configure the reader to have the:

- viewport automatically follow the cursor.

- operator manually move the viewport.

For help, see the "Viewport Movement Mode" command in Chapter 12.

Even if you configure the reader to automatically follow the cursor, you may want to move around the 25 x 80 screen to see other information. You can manually move the viewport by pressing the key combinations or scanning the bar code labels listed in the next table.

To Move the Viewport	Press These Keys	Or Scan This Bar Code
One step to the right	⊟f ➡	Viewport Right ||||||||||||||||||| *.-*
One step to the left	⊟f ⬅	Viewport Left ||||||||||||||||||| *%-*
Up one step	⊟f ⬆	Viewport Up ||||||||||||||||||| *%/*
Down one step	⊟f ⬇	Viewport Down ||||||||||||||||||| *%+*

To Move the Viewport	Press These Keys	Or Scan This Bar Code
To the lower right corner of the virtual display	≣f ≣f 1	Viewport End ||||||||||||||||||||||||| *..%.*
To the upper left corner of the virtual display	≣f ≣f 7	Viewport Home ||||||||||||||||||||||||| *..%/*
Up one page	≣f ≣f 9	Viewport Page Up ||||||||||||||||||||||||| *..%+*
Down one page	≣f ≣f 3	Viewport Page Down ||||||||||||||||||||||||| *..%-*
Moves the viewport to the cursor. This command may not work if you are using the reader in Graphics mode.	≣f ≣f 0	Viewport to Cursor ||||||||||||||||||| */-*
Moves the cursor to the viewport. This command does not work on applications that have different definitions for cursor movement and you may erase unentered data if you move the cursor backward.	≣f ≣f 5	Cursor to Viewport ||||||||||||||||||||||||| *..%%*

Note: If you are using a large numeric keypad, see Appendix B, "Reader Keypad Charts," for the viewport movement keystrokes.

If You Cannot See the Cursor

If you have moved the viewport and cannot see the cursor, try entering one of these two options:

To See the Cursor	Press These Keys	Or Scan This Bar Code
Move the viewport to the cursor's position. This command may not work if you are using the reader in Graphics mode.	≡f ≡f 0	Viewport to Cursor ||||||||||||||| */-*
Bring the cursor to the viewport. This command does not work on applications that have different definitions for cursor movement and you may erase unentered data if you move the cursor backward.	≡f ≡f 5	Cursor to Viewport ||||||||||||||| *..%%*

Adjusting the Display From the DOS Prompt

You can change several parameters to adjust the display:

• Make the screen contrast lighter or darker.

• Turn the display backlight on or off.

• Change the line at which the display scrolls.

• Change the height of the characters.

• Select automatic or manual viewport movement.

• Make the beep volume quieter or louder.

There are three ways to change these parameters:

• Use the reader's Control mode as described next.

• Use the Interactive Configuration application (IC.EXE). For help, see Chapter 5, "Configuring the Reader."

• Use the configuration commands to change each parameter. For help, see Chapter 12, "Configuration Command Reference."

You can use Control mode to change the display parameters at the DOS prompt or when you are running an application. You should only change the scroll line at the DOS prompt.

To use Control mode

1. To enter Control mode, press and hold ⌘f , press ◇Alt◇, and then release both keys. The ⌘f and ◇Alt◇ icons appear on the reader's display.

2. Press any of these key sequences to adjust the display.

Press	To Adjust the Display
♠	Make the display contrast darker.
♥	Make the display contrast lighter.
enter ↵	Turns the display backlight on or off.
8	Change the scroll line to line 8.
6	Change the scroll line to line 16.
5	Change the scroll line to line 25.
3	Change the characters to normal height.
9	Change the characters to double height.
2	Change the viewport to automatically follow the cursor.
1	Change the viewport so that you must manually move it.
◄	Make the beep volume quieter.
►	Make the beep volume louder.

3. Press Esc to exit Control mode. The ⌘f and ◇Alt◇ icons disappear from the reader's display.

Note: The display parameters you set in Control mode are reset to the default configuration value when you warm boot the reader. Display Contrast is reset only when you cold boot the reader.

Understanding the Icons

You can use the reader's icons to monitor the status of special keys, battery power, PC card drive, viewport movement, and RF communications. As you use the reader, the icons are turned on and off in the top line of the reader display to indicate the current status.

2010U.135
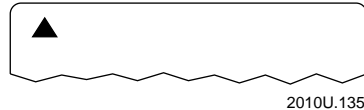
Ctrl   This icon appears when you press △Ctrl. The key is stored in the keypad buffer until you press another key. When you press a second key, the key combination is entered into the reader and the icon disappears.

2010U.136

Alt   This icon appears when you press ◇Alt. The key is stored in the keypad buffer until you press another key. When you press a second key, the key combination is entered into the reader and the icon disappears.

2010U.120

Shift   This icon appears when you press ⇧. The key is stored in the keypad buffer until you press another key. When you press a second key, the key combination is entered into the reader and the icon disappears.

2010U.138
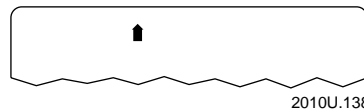
Caps Lock   This icon appears when you press ≡f ⇧ to enable the Caps Lock feature and type all alphabetic characters as uppercase letters. When you press ≡f ⇧ to disable Caps Lock, the icon disappears.

2010U.139
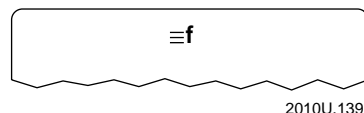
Compound Function   This icon appears when you press ≡f. You can press ≡f up to three times plus one more key to access a wide range of key combinations. Each time you press ≡f, an additional line appears on the Compound Function key icon to indicate the number of times you pressed the key. Once you press a key other than ≡f, the key combination is entered into the reader and the icon disappears.

2010U.140
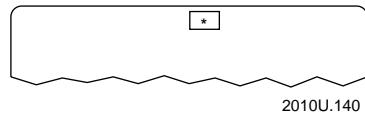
Connected   This icon contains an asterisk. It blinks on the display of a J2010 with an RF back when the RF interface is either actively channel searching or trying to reestablish RF communications with the network controller. When the Connect icon stays on, the RF interface is connected to a network controller. When RF communications are not enabled or are not possible, the Connect icon is turned off. For help, see your JANUS RF documentation.

2010U.141
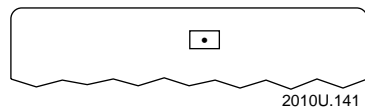
Data   This icon contains a period. It appears on the display of a J2010 with an RF back when data is buffered in the RF interface. The data is either being transmitted to the network controller, or received data has not been accepted by the reader's application. When no data is being buffered in the RF interface, the Data icon is turned off. For help, see your JANUS RF documentation.

2010U.142
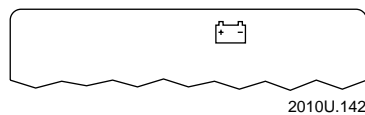
Battery   This icon turns on and stays on when the NiCad battery pack has approximately 15 to 45 minutes of power left. If you are using a J2010 with an RF back, you should replace or recharge the battery pack immediately because you will soon lose RF communications. For help, see your JANUS RF documentation.

If you continue to operate the reader without replacing or recharging the battery pack, the battery pack charge becomes very low. The Battery icon stays on, the reader chirps every 5 seconds, and then turns off after 1 minute. The laser scanner (or wand) and RF communications are turned off 15 seconds after the first chirp.

You cannot turn the reader on until you replace the battery pack. The Battery icon disappears when you replace or recharge the NiCad battery pack.

2010U.143
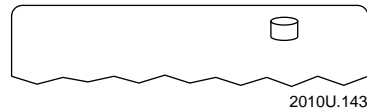
Disk Write   This icon appears when you read from and write to a PC card in the PC card drive. The icon disappears once the reader is finished reading from or writing to the PC card.

The disk write icon also blinks if the lithium battery on an SRAM card is low. The speed of the blinking indicates whether the card is in the reader's Type I or Type II PC card drive:

- The icon blinks every 1 second if the battery is low on the SRAM card in the Type I PC card drive.

- The icon blinks every 2 seconds if the battery is low on the SRAM card in the Type II PC card drive.

For help changing the SRAM card's battery, see "Replacing Lithium Batteries in an SRAM Card" in Chapter 4.

2010U.133
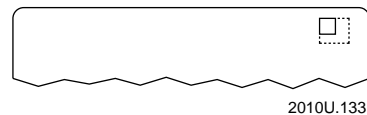
Viewport   This icon appears when you move the viewport out of the upper left corner of the virtual display, which is the viewport's home position. When you move the viewport back to the home position, the icon disappears.

Understanding the Reader's Audio Signals
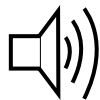
The JANUS reader has a beeper and internal speakers to sound audio signals or beep sequences as you use the reader. For example, you hear a low beep tone each time you enter or scan a valid command. The next table explains the purpose of each beep sequence you may hear.

You can change the beep volume, frequency, and duration to meet the needs of your working environment. For example, use a quiet beep in a library, a loud beep in a manufacturing plant, or a unique beep to distinguish the reader from other devices. For help, see the beeper commands in Chapter 12, "Configuration Command Reference."

Description of JANUS Reader Beep Sequences

Beep Sequence	Description
Low beep	You entered a valid command or the data you entered was stored.
	If the reader sounds a low beep after you insert a PC card, the reader recognized the card, but cannot read it. You need to configure the reader or format the card. For help, see Chapter 4, "Using PC Cards in the Reader."
High beep	You entered valid data, the reader decoded a label, or the reader decoded the last row of a two-dimensional symbology. When you cold boot the reader, you hear a high beep once the power-on self test (POST) has executed successfully.
Three low beeps	You entered an invalid command or data, or the reader detected an IRL syntax error while compiling. For help, see "Running IRL Programs" in Chapter 10.
Low beep, high beep, low beep	The reader detected an IRL runtime error (a nonfatal error). For help, see "Running IRL Programs" in Chapter 10.
High beep, low beep, high beep	There is an input or output (I/O) error. For help, see "Networking or Communicating With the Reader" in Chapter 10.
Three high beeps	There is a configuration error or a fatal IRL error. For help, see "Running IRL Programs" in Chapter 10.
Two low beeps, two high beeps	You updated the reader's configuration.
Medium beep, high beep	The reader recognized the PC card that you inserted. You can begin using the card.
High beep, medium beep	You hear this beep sequence when you remove a PC card.
Click	The reader clicks each time you press a key. You can disable the keyclick. For help, see the "Keypad Clicker" command in Chapter 12. The reader also clicks while you are scanning a two-dimensional symbology (Code 16K or Code 49) bar code label.
Chirp (every 5 or 15 seconds)	The reader chirps every 5 seconds when the NiCad battery pack is low, or every 15 seconds when the lithium bridge battery is low. For help, see "Learning About the Reader's Batteries" later in this chapter.
Double (shadow) beep or click	The reader sounds a double-beep when you enter a valid command or data and the NiCad battery pack or lithium bridge battery is low. You also hear a double-click when you press a key. The second beep or click is a lower tone that shadows the first. For help, see "Learning About the Reader's Batteries" later in this chapter.

Demonstrating the Reader's Audio Signals

You can use the IMBEEP.EXE program on companion disk 3 to make the reader sound each signal listed in the table above.

1. Copy the IMBEEP.EXE file from Application companion disk 3 to a drive on the reader. For help, see Chapter 3, "Learning About the Software."

2. Change to the drive where IMBEEP.EXE is stored.

3. Type this command and press enter ← :

    imbeep

    Or scan this bar code:

    |||█████|█|█|█|█|█|█|█|█|█|█|█|█|█|█|█
    IMBEEP

4. Follow the instructions on the screen. Press a letter from A to L to listen to each audio signal the reader sounds.

5. Press M to exit the program.

Using a Headphone or Earphone

When the reader is in a noisy environment, you can use a miniature headphone or earphone to hear the reader's audio signals.

Plug the headphone or earphone into the audio connector at the top of the reader, next to the scanner port.

2010U.190
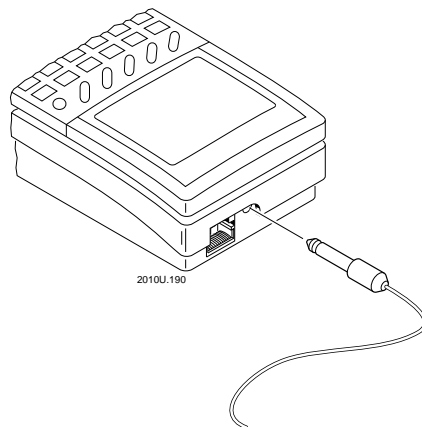
Note: *When a headphone or earphone is plugged into the audio connector, the reader's external beeper is silent.*

Locating the Communications Ports

Communications ports, also called COM ports, are locations from which data is passed into and out of the JANUS reader. You use serial communications through a COM port, which means that data is transmitted one bit at a time over a single line from one computer to another.

You can use the reader's COM ports to communicate with other RS-232 devices, such as modems and terminals, through COM1 by using one of these accessories or methods:

* JD2010 Communications Dock

* JL2010 Optical Link Adapter

* Line up the optical ports of two JANUS readers

You can communicate with other devices in an RF network through the logical COM4. You can also communicate over telephone lines through COM4 when you have a modem card inserted in the PC card drive. For help, see Chapter 6, "Networking the Reader."

This illustration shows the locations of the COM ports on a J2010 with a PCMCIA Back and a J2010 with an RF Back:
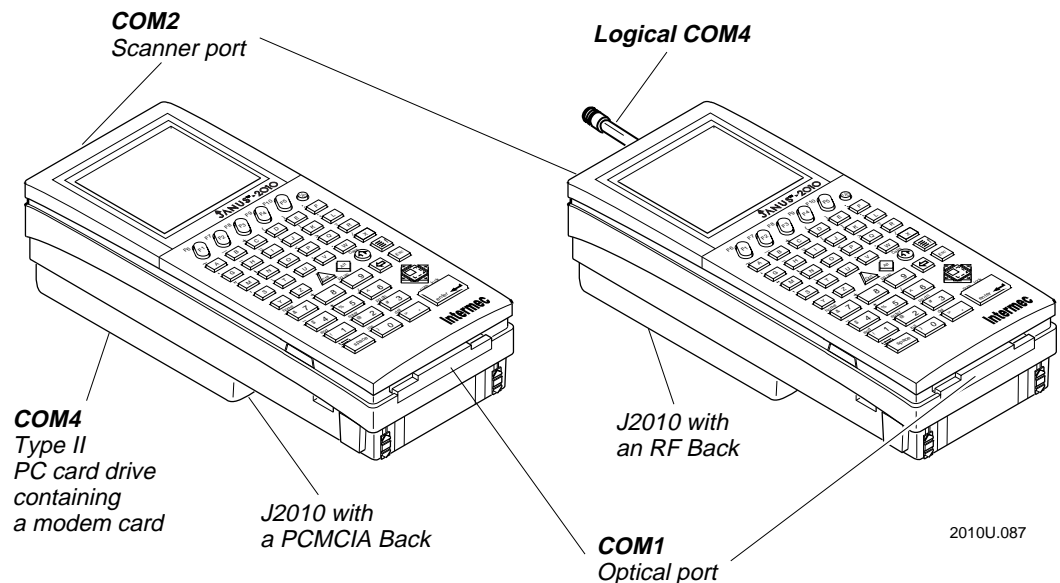
Note: A basic J2010 reader has neither a COM4 nor logical COM4 port.

Learning About the Reader's Batteries

There are two batteries in the JANUS 2010 reader:

Lithium bridge battery   This battery backs up the RAM and clock when the NiCad battery pack is discharged or removed from the reader.

NiCad (nickel-cadmium) battery pack   This battery provides the main power source to operate the reader.

These batteries are discussed in the next sections.

Lithium Bridge Battery

Your JANUS reader contains an internal rechargeable bridge battery that is designed to maintain your data (RAM) and clock while you change the NiCad battery pack.

Note: The internal bridge battery is NOT user-serviceable. You must return the JANUS device to Intermec to replace the battery.

How to Maximize the Internal Bridge Battery Life

Your lithium bridge battery will maintain data for 72 hours if you follow these guidelines:

*   If you are not using the reader for a period of time (more than 60 hours), press Ⓘ/⊘ to turn the reader off. Keep a charged NiCad battery pack in the reader. *If you leave the reader without at least a partially charged NiCad battery pack installed, the internal bridge battery will discharge and you will lose any data left in RAM.* The bridge battery will recharge after you insert another partially or fully charged main battery.

*   Remove any PC cards in the device.

*   If the NiCad battery pack charge becomes low, insert another charged NiCad battery pack or attach an external power supply. Use the communications dock or the optical link adapter to attach external power.

*   If you are not going to use the reader for **more than 1 week**, it is very important that you put the reader in Storage mode. For help, see "Using Storage Mode to Preserve the Bridge Battery" in Chapter 9.

*   Discharge durations of greater than one month will not damage the ability of the bridge battery to be recharged , but will cause loss of Time, Date and data in RAM. More than 30 such cycles will gradually lower the 72 hour data retention period. *You need to reset the Date and Time settings for such discharges or the device repeatedly reports a low backup battery.*

<table>
<tr><td>

⚠
CAUTION

</td><td>

Caution
The lithium bridge battery can only be replaced by a trained Intermec service technician. Opening the unit will void the warranty and may cause damage to the internal components.

Conseil
La pile au lithium ne peut être remplacée que par un technicien de service Intermec. Le fait d'ouvrir l'unité annule la garantie et peut endommager les pièces internes.

</td></tr>
</table>

Installing the Battery Pack

1. Make sure the two yellow battery pack locks on the end of the battery pack are pushed down in the unlocked position.

2. Place the two battery pack tabs under the reader's back.
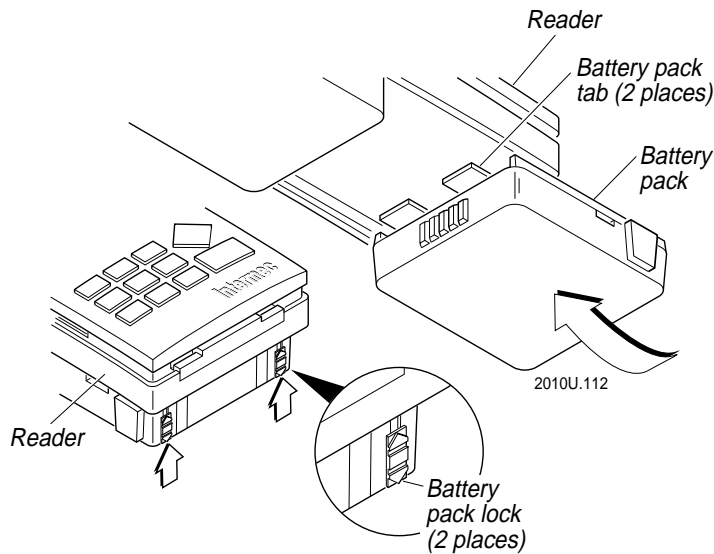
3. Slide the battery pack into the back of the reader until it snaps into place.

4. Push the two battery pack locks up to lock the battery pack in place and engage the interlock switch.

    Note: The battery pack locks must be closed to activate the interlock switch and allow you to use the reader.

Removing the Battery Pack

The battery pack is on the lower back side of the reader.

Caution

Removing the battery pack while the reader is on may cause loss of data.

Conseil

Ne détachez pas le jeu de piles pendant que le lecteur est actif car cela pourrait entraîner la perte de données.

To remove the battery pack

1. Turn off the reader by pressing ⬤.

2. Push the yellow two battery pack locks down and away from the reader to unlock the battery pack.

3. Press and hold the two release buttons on each side of the battery pack.

4. Slide the battery pack out of the reader.

Reader

Battery pack release button (2 places)

Battery pack

Battery pack lock (2 places)

Reader

Battery pack

2010U.017
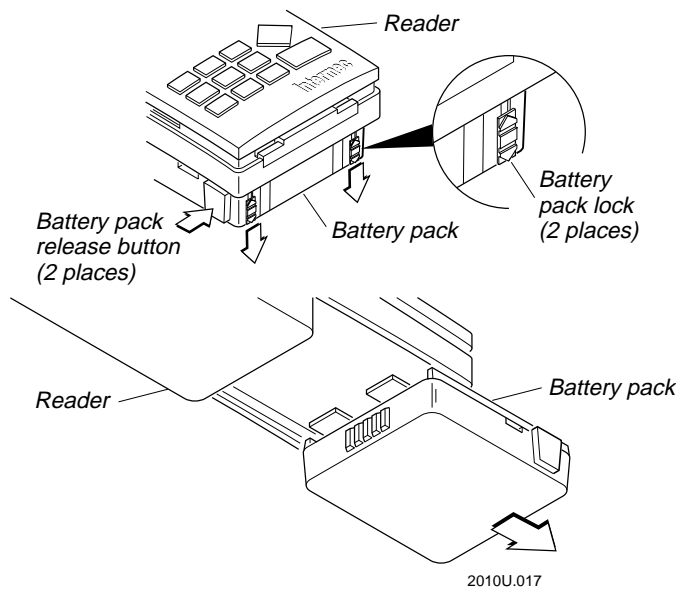
Checking the Power Remaining in the NiCad Battery Pack

You can use the POWER.EXE utility to check the power remaining in the reader's NiCad battery pack. To display the current power status, type this command at the DOS prompt and press ⌷enter↵⌷:

```
power
```

Or scan this bar code:

POWER

The Power Management Status screen appears similar to this example:

```
Power Management Status
-----------------------
Setting = ADV: MIN
CPU: idle 36% of time
AC Line Status : OFFLINE
Battery Status : High
Battery life (%) :
80
```
2010U.012

These fields help you estimate the power left in the NiCad battery pack:

AC Line Status   Tells you if external power is attached to the reader. ONLINE means the reader is using an external power supply. OFFLINE means the reader is using the NiCad battery pack for power.

Battery Status   Tells you if the NiCad battery pack is high, low, or charging. High power means the battery pack has more than 50% power remaining. Low power means there is less than 50% power remaining.

Battery Life (%)   Gives you an estimate of the amount of power remaining in the NiCad battery pack. This estimate is accurate to ± 10%. For example, if the battery life is at 20%, the battery pack is getting low and you need to replace it soon. The accuracy of the estimate depends upon variables such as the temperature, use, and age of the battery pack. When the AC Line Status is ONLINE, the Battery Life (%) is always 100%, even if the battery pack is not fully charged.

You may find that POWER.EXE performs differently for each battery pack. For example, you may find that one battery pack uses power at a faster rate and reaches 20% battery life sooner than a new battery pack. For a detailed description of POWER.EXE, see Appendix D, "Software Utility Reference."

Note: You can also use the IRL FP command to determine the power remaining in the reader's NiCad battery pack. For help, see the IRL Programming Reference Manual.

Charging the Battery Pack

You can recharge the NiCad battery pack using any of these JANUS 2010 accessories:

• Communications dock

• Battery charger

• Optical link adapter connected to a power supply

You do not need to discharge the battery pack every time before recharging the battery pack. Only discharge the battery pack if you notice problems with the battery pack's ability to hold a charge. The communications dock and battery charger use a charging method that maximizes battery life and prevents the loss of battery capacity due to the memory effect associated with NiCad batteries. For help about charging battery packs, see the accessory quick reference guides.

Note: Battery packs charged in a room temperature of 68°F (20°C) have a higher charge capacity and more charging cycles than battery packs charged at a higher temperature.

Disposing of the NiCad Battery Pack

The materials used in the construction of the JANUS 2010 battery pack are recyclable. Intermec strongly urges that you recycle the battery packs when they reach the end of their useful lives.
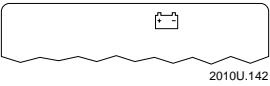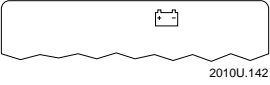
Additionally, the Environmental Protection Agency has classified worn out or damaged NiCad batteries or battery packs to be hazardous waste. Several states have passed legislation that prohibits discarding these batteries into the municipal waste stream.

If you have any question on how to recycle or dispose of the NiCad battery packs, contact your local, county, or state hazardous waste management office.

Recognizing a Low or Discharged Battery

If the Battery icon appears or the reader chirps, the NiCad battery pack or lithium bridge battery are almost discharged. Use this table to find out which battery is low or discharged:

Low NiCad or Lithium Battery Warning	What You Need to Do
 2010U.142 NiCad battery pack is low (15 to 45 minutes left).	• The Battery icon appears.	For a J2010, replace the battery pack soon. For a J2010 with an RF back, immediately replace the battery pack or you will soon lose RF communications.
 2010U.142 NiCad battery pack is critically low (1 minute left).	• The Battery icon remains on. • The reader chirps every 5 seconds for 1 minute and then turns off. • The reader double-beeps when you enter valid data and double-clicks when you press any key.	Immediately replace the battery pack or attach an external power supply. The laser scanner (or wand) and RF communications are turned off 15 seconds after the first chirp.
  Lithium battery is critically low (1 minute left).	• The Battery icon does not appear. • The reader chirps every 15 seconds for 1 minute and then turns off. • The reader double-beeps when you enter valid data, and double-clicks when you press any key. • The Backup Battery screen appears each time you turn the reader on.	You must keep a charged NiCad battery pack in the reader. You can also attach an external power supply. Save your data and back up all your files from drive E. Contact your Intermec service representative to replace the lithium battery.

Caution
When the Battery icon appears, save your data and replace the battery pack as soon as possible, or you may lose your data.

Conseil
Quand l'icône de la pile apparaît, enregistrez vos données et remplacez le jeu de piles aussitôt que possible, sinon vous pourriez perdre des données.

Managing Your Battery Power

To maximize the life of the reader's lithium bridge battery and NiCad battery pack, use these power management features.

Situation	Ways to Save Battery Power	Description
You will not use the reader again for 5 minutes, a few hours, or up to a week.	• Put the reader in Suspend mode.	Suspend mode saves the NiCad battery pack's power. Press ⓘ/ⓒ to put the reader in Suspend mode. For help, see "Turning the Reader On and Off" in Chapter 1. Make sure the battery pack is charged (not in a low battery state).
	• Use the Automatic Shutoff feature.	Automatic Shutoff puts the reader in Suspend mode when there is no activity on the reader for the length of time you set. For help, see the "Automatic Shutoff" command in Chapter 12.
You will not use the reader again for 1 week or longer.	• Put the reader in Storage mode and remove the NiCad battery pack.	Storage mode saves the lithium bridge battery's power. When you put the reader into Storage mode, you must remove the NiCad battery pack. For help, see "Using Storage Mode to Preserve the Bridge Battery" in Chapter 9.
You are operating the reader and the NiCad battery pack charge becomes low.	• Remove the battery pack and insert another charged battery pack. • Attach an external power supply to charge the battery pack installed in the reader. • Put the reader in Storage mode.	Unless the reader is in Storage mode, you need to keep a charged battery pack installed in the reader to save the lithium bridge battery's power. For help, see "Learning About the Reader's Batteries" earlier in this chapter.
You are using RF communications.	• Use the Duty Cycle parameters.	Duty Cycle automatically alternates RF communications between Receiving and Standby mode. In Standby mode, a J2010 with an RF back uses less NiCad battery pack power. For help, see the *JANUS 900 MHz Radio Frequency Quick Reference Guide.*

Using an External Power Supply

You can operate the reader using an external power supply with the following JANUS 2010 accessories:

• Communications dock

• Optical link adapter connected to a power supply

You can use the external power supply and charge the reader's NiCad battery pack at the same time. For help, see the accessory quick reference guides.

2010U.010

2010U.008
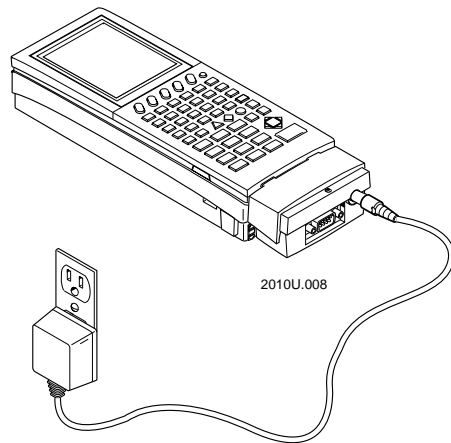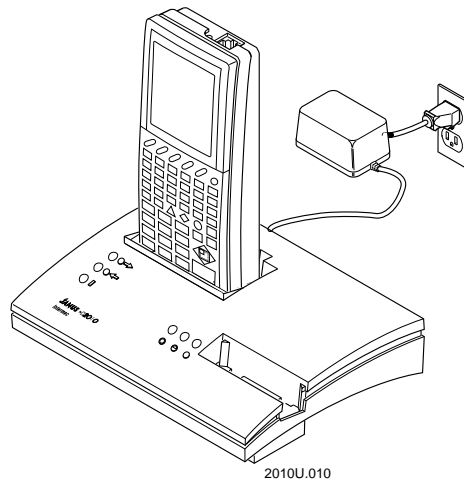
Defining the Reader's Drives

The reader has three standard memory drives, a Type I PC card drive, and (optionally) a Type II PC card drive to run applications and store data.

512K ROM drive
resident in flash memory

2MB ROM drive

Drive C

256K physical RAM drive

Drive D

Type I PC card drive

Drive E

Type II PC card drive

Drive F

Drive G

2010U.090
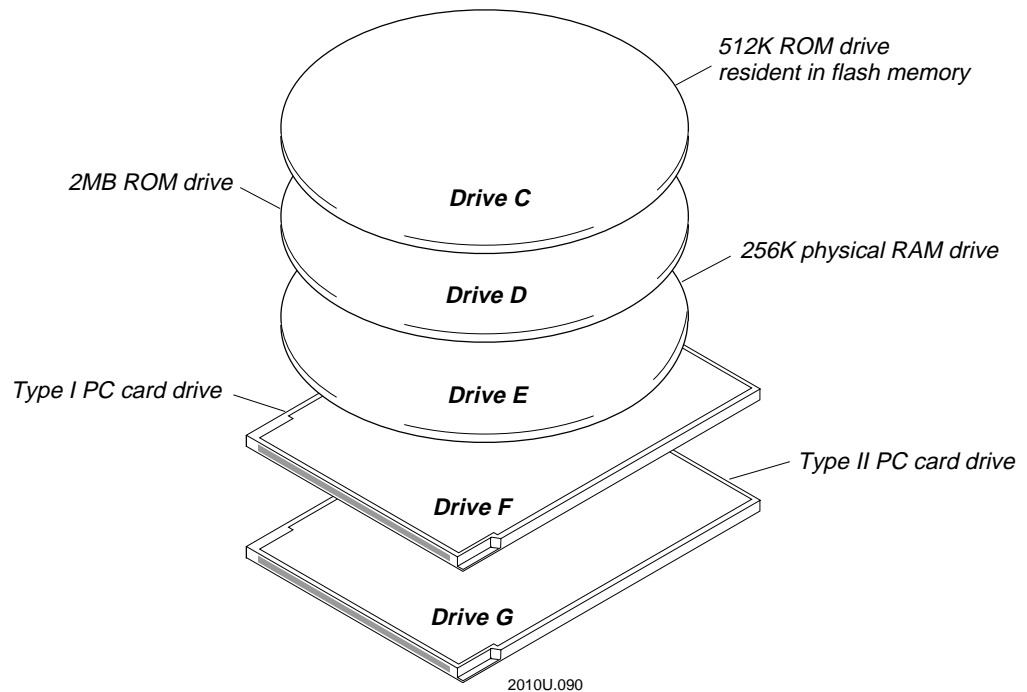
Drive C is a 512K ROM drive that resides in flash memory. Drive C is upgradeable, has limited write capability, and uses the file allocation table (FAT) type format. You can store files and applications on drive C; the AUTOEXEC.BAT and CONFIG.SYS startup files are stored on drive C. You must use special utilities to add, edit, or delete files on drive C. For help, see "Learning How to Change the Contents of Drives C" in Chapter 3.

Drive D is a 2MB ROM drive that uses a FAT-type format. The reader's DOS system files and applications are on drive D. You cannot modify drive D. For help, see "Learning How to Change the Contents of Drives C" in Chapter 3.

Drive E is a physical RAM drive and uses a FAT-based file format. You can use this drive to store data files and user applications. You can reduce or eliminate Drive E to free extended memory and use it for an application. For help, see "Creating and Using a Physical RAM Drive" in Chapter 3.

Drive F is a Type I PC card drive that is similar to a disk drive on a PC. You can use memory cards that comply with PCMCIA (Personal Computer Memory Card International Association) Standard 2.1. You can use memory cards to store applications or data files. For help, see Chapter 4, "Using PC Cards in the Reader."

Drive G is an optional Type II PC card drive that is similar to a disk drive on a PC. You can use memory or input/output (I/O) cards that comply with PCMCIA Standard 2.1. You can use memory cards to store applications or data files. You can use I/O cards (such as a modem card) to connect the reader to another device for communications. For help, see Chapter 4, "Using PC Cards in the Reader."

Managing the Reader's Memory and Disk Space

You can store applications and data on the reader's drives. The memory you need for an application usually depends on the application and the types of memory available on the reader. Use these guidelines to store and run applications on the reader.

Data storage   Use drive E to store data if the files are less than 256K. If you need to store data files larger than 256K, use a PC card in drive F or G. For help on selecting a PC card, see Chapter 4, "Using PC Cards in the Reader."

Applications and lookup tables   Use drive C or E to store all applications and lookup tables. You can use drive C to store applications that do not write to the same drive and read-only tables. Use drive C to store files that do not need to be changed often. If you need more memory or disk space, use a PC card in drive F or G. For help selecting a PC card, see Chapter 4, "Using PC Cards in the Reader."

Large applications   You may develop a large application that requires more conventional memory than you have available on the reader. You can remove any device drivers and TSRs that you do not need on the reader. For help, see "Making More Memory Available on the Reader" in Chapter 3. You can also purchase a DOS extender and develop your application so it can run using both conventional and extended memory.

3

Learning About the Software

This chapter describes how to use and manage the software that comes with the JANUS reader, how to change files on drive C, how to create programs for the reader, how to make more conventional memory available for the software you run on the reader, and how to upgrade the reader.

What Software Is Provided With the Reader?

The JANUS reader comes with this software:

Auto-Loader   Use this utility to change the contents of drive C. You can also use it to configure the reader to operate in any language supported by DOS National Language Support (NLS). For help, see "Learning How to Change the Contents of Drive C" later in this chapter and Chapter 8, "Preparing the Reader for International Use."

Binary file transfer (BFT)   Use BFT in a 900 MHz CrossBar or RF network to connect a host computer to one or more readers in order to transfer binary files or change the contents of the reader's drive C. For help, see "Downloading Applications Across the Network" in Chapter 6.

Boot Loader menu   Use this menu to reboot the reader, dump the reader's conventional memory, reload or upgrade the reader's software, or use Storage mode. For help, see Chapter 9, "Booting and Resetting the Reader."

Communications Manager   Use the Communications Manager to transmit/receive files and to see the status of the reader's COM port. For help, see "Running Communications Manager" in Chapter 6.

Configuration Manager   Use Configuration Manager to configure the reader. Configuration Manager consists of several programs that let you change the reader's configuration by running the Interactive Configuration application (IC.EXE), using Control mode, scanning bar code labels, typing commands at the DOS prompt, and receiving commands over an RF link. For help, see Chapter 5, "Configuring the Reader."

DOS   Use DOS commands and utilities to transfer files, create and run programs, create a RAM drive, and access files on PC cards. The reader supports many standard DOS 5.0 commands. For help using DOS, see any DOS manual.

Interactive Configuration application (IC.EXE)   Use IC.EXE to configure the reader. With menus and dialog boxes, this application simplifies the configuration process. For help, see Chapter 5, "Configuring the Reader."

InterInk   Use this DOS communications program to access the drives on a host computer as if they were on the reader, and vice versa. For help, see "Running Interlnk to Transfer Files" in Chapter 6.

IRL Desktop   Use the IRL Desktop to transmit, receive, and clear data files, and to download and run IRL programs. For help, see Chapter 7, "Working With IRL."

MakeDisk and PutDisk   MakeDisk creates an image file containing the files you want on the drive, and PutDisk places the new image on the JANUS drive. MakeDisk supports the creation of subdirectories on drives C and D. For more information, see "Using MakeDisk and PutDisk to Change Drives C or D" later in this chapter.

Direct Hardware Wedge   The Direct Hardware Wedge is a new feature of JANUS 4.0 software that provides hardware level PC compatibility. It provides bar code data to PC applications that directly access the hardware. The existing Virtual Wedge is a software wedge that is ten times faster than going through the PC hardware. Use the Virtual Wedge for maximum performance. Use the Direct Hardware Wedge for maximum PC compatibility.

PC card utilities and drivers   Use these drivers and utilities to access the reader's PC card drive, customize the reader to use the PC card software, and provide you with helpful tools. For help, see Chapter 4, "Using PC Cards in the Reader."

Reader Services   Reader Services are programs that are part of the reader's system software. These programs decode bar codes, process data input and output, configure the reader, and handle power management. You can create applications that use Reader Services. For help, see "Using Reader Services in Applications" later in this chapter.

Caution
Do not run any Intermec-provided JANUS 2010 application programs (such as IC.EXE) on your PC. Also, do not run any .EXE programs that use Intermec interrupt extensions or libraries on your PC. These programs will lock up your PC and may corrupt the PC BIOS.

Conseil
N'exécutez pas sur votre PC de programmes d'application JANUS 2010 fournis par Intermec (tels que IC.EXE). N'exécutez pas non plus sur votre PC de programmes .EXE qui utilisent des bibiothèques ou des extensions d'interruption car ces programmes bloqueront votre PC et pourraient corrompre le BIOS du PC.

What Software Is Provided on the Companion Disks?

A set of companion disks are provided with your JANUS reader. The disks contain files that may help you use the reader more efficiently. You can use Interlnk to copy files from the companion disks to the reader. For help, see "Running Interlnk to Transfer Files" in Chapter 6.

You can use a PC and the DOS DIR command to learn exactly what files are stored on the companion disks. Here are general descriptions of each disk:

Companion disk 1 The Boot Utilities companion disk contains the files you need to load or upgrade the reader's system software. This disk also contains the README.DOC, a text file that describes important information about the reader that was unavailable when this manual was published. This disk also contains a batch file, INSTALL.BAT, that you can use to install Auto-Loader onto a host computer. Auto-Loader lets you change the contents of drive C.

Companion disk 2 The MS-DOS Programs companion disk contains commands and device drivers. Some of these commands and drivers are already installed on the reader. This disk also contains applications, such as INTERLNK.EXE, MakeDisk, and PutDisk.

Companion disk 3 The Application companion disk contains applications such as Communications Manager and IRLXDESK.EXE. This disk also contains PC card drivers and utilities that control the reader's operation, prepare the reader to use the different types of PC cards, customize the reader to use the PC card software, and provide you with helpful tools.

Note: Companion disk 3 also contains LDKEYTAB.EXE and a .KTB file. Only an authorized Intermec service technician should use these files to load the keypad scan code table.

Using DOS Commands

Your JANUS device uses the MS-DOS operating system, and you can use DOS commands on the JANUS device just as you do on a PC. From the DOS prompt, you type a DOS command and press [enter ↵] to execute the command. For example:

```
dir
```

Or, you can create and scan bar code labels that contain DOS commands:

DIR Command

DIR

For help using DOS commands, see any DOS manual.

All DOS commands provided with the JANUS device are available on the MS-DOS Programs companion disk 2. The most commonly used commands are also stored on drive D. See the README.DOC for a list of the files on drive D.

Note: The DOS commands available on drive D are a subset of the DOS commands that are available on the MS-DOS companion disk. You can add or replace DOS commands on drive D as needed.

Your 4MB JANUS device supports these commands, but you cannot use them on drives C or D because they are ROM (read only memory) drives:

CHKDSK (You can analyze, but not fix, drives C and D with CHKDSK)

DISKCOMP

DISKCOPY

SCANDISK (You can analyze, but not fix, drives C and D with SCANDISK)

DEFRAG (DEFRAG will not work on drives C and D)

Defining the Startup Files

JANUS devices use two startup files to control how DOS uses hardware, memory, and files: AUTOEXEC.BAT and CONFIG.SYS. AUTOEXEC.BAT loads programs and defines paths. CONFIG.SYS loads device drivers and reserves memory for processing information. The commands in the startup files execute when you warm boot or cold boot the JANUS device.

You may modify the startup files for a variety of reasons:

- To change the default JANUS Startup menu.

- To support applications you will run on your JANUS device.

- To load drivers for your PC cards.

- To create physical RAM drives.

- To configure your JANUS device to operate in another language.

Because AUTOEXEC.BAT and CONFIG.SYS are stored on drives C or D, you must use Auto-Loader, binary file transfer (BFT), or MakeDisk and PutDisk to replace them.

The next sections illustrate what the two startup files may contain when your 4MB JANUS device arrives from the factory.

AUTOEXEC.BAT File

The AUTOEXEC.BAT file on your 4MB JANUS device should look like this one:

Command Line	Definition
`echo off`	The AUTOEXEC.BAT commands are not displayed on the screen as they are executed.
`cls`	Clears the screen.

`if not exist autoinst.bat goto T2`
`    call autoinst`
`    goto T3`
`:T2`
`if exist d:\autoinst.bat call`
`    d:\autoinst`
`:T3`
	These commands call the AUTOINST.BAT file, enabling you to update drives C or D with Auto-Loader.
	
	Do not remove these commands.
	
	Do not delete AUTOINST.BAT from drives C or D.

`set prompt=$p$g`	Sets the DOS prompt to display the current drive and directory, followed by the > symbol.
`set path=c:\;d:\;e:\;`	Directs DOS to look for commands and programs in the root directories of drives C, D, and E. Do not add drive G to the path, or else errors will occur when you do not have a PC card installed.

AUTOEXEC.BAT File (continued)

Command Line	Definition
`set temp=e:\`	A temp directory is required for MORE.COM to work correctly on ROM drives.
`set im_errpath=e:\`	Tells the JANUS device to write the configuration error file JANUS.ERR to drive E. The JANUS device must execute this command before it calls LOADUMA.EXE.
`d:`	
`d:\ipm_4m.exe` `REM d:\apm_4m.exe`	IPM_4M and APM_4M work with card services to manage the power on the PC card drive when you suspend and resume the JANUS device. ***Note:*** *Do not load both at the same time, but you must load one.*
`if exist d:\loaduma.exe d:\loaduma`	Loads Reader Services, Configuration Manager TSR, and the decode and scanner utilities that let the JANUS device operate as a bar code reader.
`d:\im_disp.exe`	Loads software required for the display.
`d:\ic /0 e:\janus.ini`	Loads the JANUS.INI configuration file if it exists.
`d:\kwc.com 0`	Sets the bar code wedge options. The default configuration is 0. Configuration parameters are: **0** Virtual wedge and expanded keyboard enabled. **1** Direct Hardware wedge and expanded keyboard enabled. **2** Direct Hardware wedge enabled and expanded keyboard disabled. **3** Virtual Wedge enabled and expanded keyboard disabled. **4** Display status.
`rfph 4`	Loads the RF protocol handler for COM4 only if you are using a JANUS RF device.

AUTOEXEC.BAT File (continued)

Command Line	Definition

`if not exist c:\fta.exe goto`
`    DOS_PROMPT`
`e:`
`fta.exe checkhost; exit`
	Runs the FTSERVER batch file if it is on drives C or D. FTSERVER runs FTA.EXE, which provides binary file transfer (BFT) on the JANUS device. If a host is trying to initiate a BFT session, FTA continues running; if not, FTA stops running.

`%IM_APPLICATION%` `:DOS_PROMPT`	After FTA terminates, %IM_APPLICATION% runs any application identified by the DOS environment variable IM_APPLICATION.
`c:`	Resets the JANUS device to drive C or D.
`cls`	Clears the screen.

CONFIG.SYS File

The CONFIG.SYS file on your 4MB JANUS device should look like this one:

Command Line	Definition

`[menu]`
`menuitem=sram, Load PCCard`
`menuitem=ata, ATA PCCard`
`menuitem=flash, Flash PCCard`
`menuitem=io, I/O PCCard`
`menuitem=no, No PCCard`
`menucolor=15,0`
`menudefault=sram, 20`
	Creates the Startup menu.

`shell=command.com /e:2000 /p`	Increases the size of the environment space to 2000 bytes. This line is required for Auto-Loader.
`device=d:\himem.sys /testmem:off` `dos=high`	Loads the DOS extended memory manager, HIMEM.SYS. You must load HIMEM before you load device drivers.
`device=d:\power.exe /low`	Loads APM power management.
`device=d:\sramdisk.sys 256 512 /e`	Creates the 256K RAM drive E.
`install=d:\card_sr.exe`	Loads software required for the PC card drives.

CONFIG.SYS File (continued)

Command Line	Definition

`[sram]`
`device=d:\cs.exe /poll:1`
`device=d:\csalloc.exe`
`    d:\csalloc.ini`
`device=mtsram.ext`
`device=mtddrv.exe`
	Loads software required for PC cards. CSALLOC is a DOS program that scans the system for available memory, I/O port, and interrupt request queue (IRQ) resources.

`[ata]`
`device=d:\cs.exe /poll:1`
`device=d:\csalloc.exe`
`    d:\csalloc.ini`
`device=\atadrv.exe /s:2`
`device=mtddrv.exe`
`device=d:\cardid.exe`
	Loads software required for ATA cards.

`[flash]`
`device=d:\cs.exe /poll:1`
`device=d:\csalloc.exe`
`    d:\csalloc.ini`
`device=d:\mti1.exe`
`device=d:\mti2p.exe`
`device=mtddrv.exe`
`device=d:\ftl.exe`
	Loads software required for flash cards.

`[io]`
`device=d:\cs.exe /poll:1`
`device=d:\csalloc.exe`
`    d:\csalloc.ini`
`device=mtsram.exe`
`device=mtddrv.exe`
`device=d:\cardid.exe`
	Loads software required for SRAM and I/O cards.

`[no]`	

`[common]`
`device=d:\interlnk.exe /drives:7`
`    /noprinter /com:1 /auto`
	Loads Interlnk as a resident device driver only if Intersvr is executing on a host computer that is connected to the JANUS device. Do not remove. Auto-Loader uses this line.

`buffers=10`	Sets the amount of memory that DOS reserves for data transferred to and from a disk.
`files=50`	Sets the number of files that can be open at one time. You need this command for IRL support.
`stacks=9,256`	Sets the amount of memory that DOS reserves to process hardware interrupts.

MS-DOS Startup Menu

The default JANUS startup menu is defined in
the menu configuration block in the
CONFIG.SYS file. It defines several different PC
Card configurations that you can enable on your
JANUS device. You can modify or disable the
JANUS startup menu by removing or changing
parameters in the menu configuration. Refer to
any MS-DOS 6.2 manual for more information on
setting up or changing the startup menu.

```
MS-DOS 6.2 Startup
===============
   1. SRAM PCCard
   2. ATA PCCard
   3. Flash PCCard
   4. I/O PCCard
   5. No PCCard
Enter a choice:


F5=Bypass startup
file
```
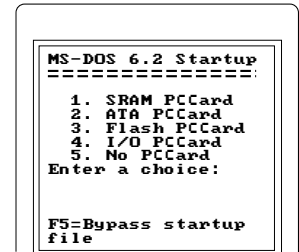
20X0A.002

Learning How to Change the Contents of Drive C

Drive C contains the reader's AUTOEXEC.BAT and CONFIG.SYS startup files,
as well as software for the PC card drive. You can use the remaining space on
drive C to store applications and data files. In general, drive C should contain
files that you often read or execute, but do not often write to or replace.

Drive C is a 512K ROM drive implemented in flash memory. It is upgradeable, but
has limited write capability. You can use DOS commands to read from drive C, but
you cannot use DOS commands to write to drive C.

To write to drive C, you must use one of these special utilities:

• Auto-Loader

• MakeDisk and PutDisk

• Binary file transfer (BFT)

These utilities let you create an image file that contains an "image" or
"snapshot" of all the files you want on drive C.

Then you use the utilities to load the image file to drive C.

Once you load the image file to drive C, the image file becomes transparent.
For example, when you use the DOS DIR command for a directory listing on
drive C, all you see are the individual files that were contained in the image
file. You cannot directly add, edit, or delete individual files on drive C. Instead,
you must replace the entire image.

You can use these utilities to create an image file and copy it to drive C:

Auto-Loader Auto-Loader creates an image file that contains the files you want placed on the reader's drive C, and then replaces the reader's old drive C image file with the new one. You run Auto-Loader on a host computer connected to the reader's COM1 port.

Binary File Transfer (BFT) Use BFT in a 900 MHz CrossBar or RF network to connect a host computer to one or more devices in order to transfer files or change the contents of drive C. For help, see "Downloading Applications Across the Network" in Chapter 6.

MakeDisk and PutDisk MakeDisk creates an image file containing the files you want on the drive, and PutDisk places the new image on the JANUS drive. MakeDisk supports the creation of subdirectories on drives C and D. For more information, see "Using MakeDisk and PutDisk to Change Drives C or D" later in this chapter.

The next table shows the tasks you can perform with Auto-Loader, BFT, and MakeDisk and PutDisk.

Image file

AUTOEXEC.BAT   CONFIG.SYS

AUTOINST.BAT   MTSRAM.EXE

Drive C

2020U.212
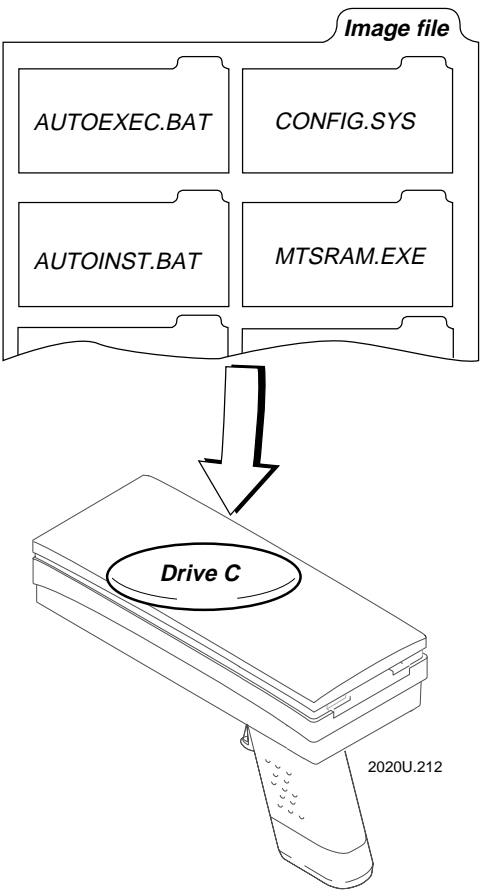
Summary of Methods for Changing the Contents of Drive C

Task You Want to Do	Use These Utilities	For Complete Instructions
Configure the reader to use a language.	Auto-Loader	See "Configuring the Reader for a Language" in Chapter 8.
Add or edit files on drive C without deleting all existing files.	Auto-Loader or MakeDisk/PutDisk	See "Adding or Editing Files on Drive C" later in this chapter. See "Using MakeDisk and PutDisk to Change Drives C or D" later in this chapter.
Replace some files on drive C without deleting all existing files.	Auto-Loader or MakeDisk/PutDisk	See "Adding or Editing Files on Drive C" later in this chapter. See "Using MakeDisk and PutDisk to Change Drives C or D" later in this chapter.
Replace all of the files on drive C.	Auto-Loader or MakeDisk/PutDisk	See "Replacing All Files on Drive C" later in this chapter. See "Using MakeDisk and PutDisk to Change Drives C or D" later in this chapter.
Deleting some files from drive C without deleting all existing files.	Auto-Loader or MakeDisk/PutDisk	See "Deleting Files From Drive C" later in this chapter. See "Using MakeDisk and PutDisk to Change Drives C or D" later in this chapter.
Copy one image file to multiple readers.	Auto-Loader or BFT or MakeDisk/PutDisk	See "Copying One Image File to More Than One Reader" later in this chapter. See "Downloading Applications Across the Network" in Chapter 6. See "Using MakeDisk and PutDisk to Change Drives C or D" later in this chapter.

Using Auto-Loader to Change Drive C

As noted on the previous page, you can use Auto-Loader to perform these tasks:

- Adding or editing files on drive C
- Replacing some files on drive C
- Replacing all of the files on drive C
- Deleting files from drive C

First you must install Auto-Loader onto the host computer.

Installing Auto-Loader on Your Host Computer

If you want to use Auto-Loader, you must install Auto-Loader from the Boot Utilities companion disk 1 onto your host computer. Before you start installing Auto-Loader, make sure you have:

- A copy of companion disk 1, which contains the Auto-Loader software.
- DOS 3.3 or higher running on the host computer.
- COM1 or COM2 available on the host computer.
- The host computer environment space, which is reserved by the SHELL command in CONFIG.SYS, should be at least four times the length of the pathname where the installation will copy the required files.

Note: If you want the reader to operate in another language, you must install Auto-Loader according to the instructions in Chapter 8, "Preparing the Reader for International Use."

To install Auto-Loader on your host computer

1. Insert companion disk 1 into a disk drive on your host computer.

2. Create the directory where you want to install Auto-Loader. Make that directory your current working directory.

   Note: Do not use the drive C root directory or install Auto-Loader on a pseudo-drive created with a third-party file compression software utility.

3. At the DOS prompt on the host computer, type this command:

    source:install [-*port*]

    where:

    source   is the disk drive where you inserted companion disk 1.

    port   is the number of the host computer's COM port that the
                reader is connected to. This parameter is optional; the
                default is COM1.

    Here are two examples:

    *   If companion disk 1 is in drive A, the reader is connected to the host
        computer's COM1, and you want the reader to operate in English, type
        this command on the host computer:

        a:install

    *   If companion disk 1 is in drive B, the reader is connected to the host
        computer's COM2, and you want the reader to operate in English, type
        this command on the host computer:

        b:install -com2

4. Wait for the installation procedure to finish and follow any instructions on
    the host computer's display.

The installation creates the C_FILES\COMMON directory that contains the
reader's default AUTOEXEC.BAT, CONFIG.SYS, and AUTOINST.BAT startup
files. You can edit these startup files before loading them onto the reader. Do
not remove or alter clearly commented statements required for Auto-Loader.

The installation also copies eight batch files into the directory you created for
Auto-Loader. The next sections describe how to use five of the batch files:
LOADADD, LOADNEW, MAKENEW, LOADIMG, and LOADXIMG. To learn
how to use the other batch files, see "Auto-Loader Batch Files" in Appendix D.

Because the batch files are customized for the drive and directory where they
are installed, you must reinstall Auto-Loader to move the files. Also, these
batch files are customized for English because you did not specify a country
when you installed Auto-Loader. If you want the reader to operate in another
language, you must install Auto-Loader according to the instructions in
Chapter 8, "Preparing the Reader for International Use."

Using an External Power Supply

When you use Auto-Loader, you must connect an external power supply to the communications dock or optical link adapter.

Auto-Loader uses MakeDisk and PutDisk software. Because PutDisk requires an external power supply, Auto-Loader also requires an external power supply.

Caution
The reader should be powered by an AC power source when you use the PutDisk command in case the battery pack goes low while the flash memory is being erased. If the power goes down when using PutDisk, the reader locks up and the system flash must be reloaded from the Boot Loader menu and you will lose data.

Conseil
Il faut alimenter le lecteur par une source de courant AC lors de l'exécution de la commande PutDisk dans le cas où le jeu de piles s'affaiblit pendant l'effacement du flash. Si le courant est coupé lors de l'exécution de PutDisk, le lecteur se verrouille, le flash système doit être rechargé du menu d'amorçage (Boot Loader) et vous perdez des données.

In the next procedures, Step 2 directs you to connect the power supply to the communications dock or the optical link adapter. You **must** perform this step.

Adding or Editing Files on Drive C

You can add or edit some files on your reader's drive C without overwriting all the files on drive C.

To add or edit files on drive C

Note: All files on drive C remain intact unless they are replaced by new files with the same name.

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Connect the power supply to the communications dock or the optical link adapter.

3. Create a working directory on the host computer.

4. Copy all the files you want to add or edit to your working directory.

   If you want to edit files that are on drive C, including the startup files, you can use Interlnk to copy files to your working directory on the host computer. Then you can edit the files and include them in the new image file for drive C. You can also copy files from the companion disks.

5. Make sure your current directory is the one where you installed the Auto-Loader batch files, or make sure that directory is listed in the path statement of your host computer's AUTOEXEC.BAT file.

6. Type this command:

   ```
   loadadd [path\]filename [path\filename path\filename...]
   ```

   where:

   path   is the drive and directory of the file or files to include in the image file and load to the reader. If you do not include a *path*, the current directory is used.

   filename is the name of the file or files to include in the image file and load to the reader.

   You can include multiple *path\filename* and *path**.* parameters in the command. The *path**.* parameter loads all the files in a directory.

   For example:

   ```
   loadadd c:\janus\config.sys c:\atadrv\*.* c:\data\*.*
   ```

7. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press △ ⟨Alt⟩ ☰f ⎵ . to warm boot the reader and load Interlnk into memory. Auto-Loader begins updating drive C.

8. When the update is complete, the reader reboots automatically. Exit Intersvr on the host computer by pressing **Alt**-**F4**. This message appears:

   ```
   Drive C:  Installation process completed.
   ```

9. Interlnk is still loaded in the reader's memory. If you need the conventional memory to run other applications, press △ ⟨Alt⟩ ☰f ⎵ . to warm boot the reader. Because Intersvr is no longer running on the host computer, a warm boot does not cause Interlnk to load itself into the reader's memory.

Auto-Loader saves all the files contained in the image file to the NEWDRV_C\C_FINAL directory and saves the image file in the NEWDRV_C\IMAGE directory. Auto-Loader overwrites these directories each time you use a LOAD or MAKE command, with the exception that LOADIMG.BAT and LOADXIMG.BAT preserves the image file for successive use.

Replacing All Files on Drive C

You can replace all the files on your reader's drive C by creating a new image file that contains all the files you want on drive C.

To replace all the files on drive C

Note: All the files on drive C will be overwritten.

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Connect the power supply to the communications dock or the optical link adapter.

3. Create a working directory on the host computer.

4. Copy all the files you want on drive C to the working directory except for the startup files, which must remain in C_FILES\COMMON.

   If you want to copy files from drive C, you may need to start Interlnk first to copy files. For example, if you have PC card drivers installed on drive C, you should copy them off the reader to your working directory.

   You can also copy files from the companion disks.

5. The command you type in Step 7 will copy the startup files from C_FILES\COMMON to drive C, overwriting the startup files on your reader.

   If you need to customize the default AUTOEXEC.BAT or CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.

6. Make sure your current directory is the one where you installed the Auto-Loader batch files, or make sure that directory is listed in the path statement of your host computer's AUTOEXEC.BAT file.

7. Type this command:

   ```
   loadnew [path\]filename [path\filename path\filename...]
   ```

   where:

path	is the drive and directory of the file or files to include in the image file and load to the reader. If you do not include a *path*, the current directory is used.
filename	is the name of the file or files to include in the image file and load to the reader.

You can include multiple *path\filename* and *path*.** parameters in the command. The *path*.** parameter loads all the files in a directory. For example:

```
loadnew c:\janus\data.txt c:\atadrv\*.* c:\data\*.*
```

8. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press ⌀Ctrl ⌀Alt ≣f ⌀. to warm boot the reader and load Interlnk into memory. Auto-Loader begins updating drive C.

9. When the update is complete, the reader reboots automatically. Exit Intersvr on the host computer by pressing **Alt-F4**. This message appears:

```
Drive C:  Installation process completed.
```

10. Interlnk is still loaded in the reader's memory. If you need the conventional memory to run other applications, press ⌀Ctrl ⌀Alt ≣f ⌀. to warm boot the reader. Because Intersvr is no longer running on the host computer, a warm boot does not cause Interlnk to load itself into the reader's memory.

Auto-Loader saves all the files contained in the image file to the NEWDRV_C\C_FINAL directory and saves the image file in the NEWDRV_C\IMAGE directory. Auto-Loader overwrites these directories each time you use a LOAD or MAKE command, with the exception that LOADIMG.BAT and LOADXIMG.BAT preserves the image file for successive use.

Deleting Files From Drive C

You can delete files from your reader's drive C by creating a new image file that contains all the files on drive C except for the files you want to delete.

To delete files from drive C

Note: All the files on drive C will be overwritten.

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Connect the power supply to the communications dock or the optical link adapter.

3. Create a working directory on the host computer.

4. Copy all the files you want on drive C to the working directory except for the startup files, which must remain in C_FILES\COMMON.

   If you want to copy files from drive C, you may need to use Interlnk to copy files. For example, if you have PC card drivers installed on drive C, you should copy them from the reader to the working directory on the host.

   You can also copy files from the companion disks.

5. The command you type in Step 7 will copy the startup files from C_FILES\COMMON to drive C, overwriting the startup files on your reader.

   If you need to customize the default AUTOEXEC.BAT or CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.

6. Make sure your current directory is the one where you installed the Auto-Loader batch files, or make sure that directory is listed in the path statement of your host computer's AUTOEXEC.BAT file.

7. Type this command:

   ```
   loadnew [path\]filename [path\filename path\filename...]
   ```

   where:

path	is the drive and directory of the file or files to include in the image file and load to the reader. If you do not include a *path*, the current directory is used.
filename	is the name of the file or files to include in the image file and load to the reader.

   You can include multiple *path\filename* and *path**.* parameters in the command. The *path**.* parameter loads all the files in a directory. For example:

   ```
   loadnew c:\janus\data.txt c:\atadrv\*.* c:\data\*.*
   ```

8. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press ⌃ ⌥ ⌤ . to warm boot the reader and load Interlnk into memory. Auto-Loader begins updating drive C.

9. When the update is complete, the reader reboots automatically. Exit Intersvr on the host computer by pressing **Alt-F4**. This message appears:

   ```
   Drive C:  Installation process completed.
   ```

10. Interlnk is still loaded in the reader's memory. If you need the conventional memory to run other applications, press ⌀Ctrl ⌀Alt ▤f ⎵. to warm boot the reader. Because Intersvr is no longer running on the host computer, a warm boot does not cause Interlnk to load itself into the reader's memory.

Auto-Loader saves all the files contained in the image file to the NEWDRV_C\C_FINAL directory and saves the image file in the NEWDRV_C\IMAGE directory. Auto-Loader overwrites these directories each time you use a LOAD or MAKE command, with the exception that LOADIMG.BAT and LOADXIMG.BAT preserves the image file for successive use.

Copying One Image File to More Than One Reader

You can copy an image file to more than one JANUS reader so drive C is the same on every reader. Follow these steps described in detail in the next sections:

1. Create the image file.

2. Rename the image file.

3. Load the image file onto more than one reader.

To create the image file with MAKENEW

Note: This procedure describes how to create an image file with MAKENEW, but you can use any LOAD or MAKE command to create the image file. For help with another command, see "Auto-Loader Batch Files" in Appendix D.

1. Connect the reader to the host computer through a communications dock or optical link adapter.

   Note: If you use the communications dock and plan to use Interlnk during this procedure (as described in Step 3), you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Connect the power supply to the communications dock or the optical link adapter.

3. Create a working directory on the host computer. Copy all the files you want on drive C to the working directory except for the startup files, which must remain in C_FILES\COMMON.

4. The command you type in Step 5 will create an image file that contains the default startup files in C_FILES\COMMON. If you must customize AUTOEXEC.BAT or CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.

5. To create an image file that contains the startup files in C_FILES\COMMON plus any additional files you specify, type this command on the host computer:

   ```
   makenew [path\]filename [path\filename path\filename...]
   ```

   where:

   path   is the drive and directory of the file or files to include in the image file. If you do not include a *path*, the current directory is used.

   filename   is the name of the file or files to include in the image file.

   You can include multiple *path\filename* and *path**.* parameters in the command. The *path**.* parameter loads all the files in a directory. For example:

   ```
   loadnew c:\janus\data.txt c:\atadrv\*.* c:\data\*.*
   ```

6. The image file is saved as NEWDRV_C\IMAGE\DRIVEC.IMG on the host computer. Each time you execute the MAKENEW command, this image file is overwritten. To protect the image file, you can rename it.

To rename the image file

When you execute a LOAD or MAKE command, Auto-Loader saves a copy of the drive C image file as NEWDRV_C\IMAGE\DRIVEC.IMG. You can copy that file to multiple readers.

Auto-Loader overwrites DRIVEC.IMG each time you create a new image file. If you rename DRIVEC.IMG, it will not be overwritten.

You can also create multiple image files and rename each with a unique name. For example, you can create an image file for each type of PC card you use in the reader. Each image file contains a CONFIG.SYS that loads the drivers for the PC card. When you need to switch PC cards in the reader, you can load the appropriate image file to the reader:

• NEWDRV_C\IMAGE\C-ATA.IMG

• NEWDRV_C\IMAGE\C-FLASH.IMG

To copy the image file to more than one reader

Note: All the files on each reader's drive C will be overwritten.

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Connect the power supply to the communications dock or the optical link adapter.

3. Type the LOADXIMG or LOADIMG command:

    • If the image file has the NEWDRV_C\IMAGE\DRIVEC.IMG default name, type this command on the host computer:

      ```
      loadximg
      ```

    • If the image file has any other name, type this command on the host computer:

      ```
      loadimg path\filename
      ```

      where:

      path   is the drive and directory of the image file to load.

      filename is the name of the image file to load.

      For example, to load the FLASH\C-ATA.IMG image file, type this command on the host computer:

      ```
      loadimg c:\flash\c-ata.img
      ```

4. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press ⌃Ctrl ⌥Alt ≡f ┌.┐ to warm boot the reader and load Interlnk into memory. Auto-Loader begins updating drive C.

5. When the update is complete, the reader reboots automatically.

6. To load the image file on another reader, disconnect the reader from the host computer, connect another reader to the host computer, and repeat Steps 3 through 5.

    Note: Interlnk is still loaded in memory on the reader you disconnected from the host computer. You can press ⌃Ctrl ⌥Alt ≡f ┌.┐ to warm boot the reader and remove Interlnk from memory.

7. When you finish updating your JANUS readers, you can exit Intersvr on the host computer by pressing **Alt-F4**. You will see this message:

    ```
    Drive C:  Installation process completed.
    ```

Using MakeDisk and PutDisk to Change Drives C or D

You can use the MakeDisk and PutDisk utilities to perform these tasks on your 4MB JANUS device:

- Adding or editing files on drives C or D.

- Replacing some files on drives C or D.

- Replacing all of the files on drives C or D.

- Deleting files from drives C or D.

Follow these steps, which the next sections describe in detail:

1. Create a working directory and fill it with files for drive C or D.

2. Create the new image file with MakeDisk.

3. Load the new image file onto the JANUS device with PutDisk.

Note: Due to its large size, MakeDisk is not loaded on drive D. You must copy the self-expanding executable C_MAKE.EXE from the Boot Utilities companion disk to a drive on the host PC and run C_MAKE.EXE. After running C_MAKE.EXE, delete all of the extracted files except for MAKEDISK.EXE.

Caution
Do not run any Intermec-provided JANUS application programs (such as IC.EXE) on your PC. Also, do not run any .EXE programs that use Intermec interrupt extensions or libraries on your PC. These programs will lock up your PC and may corrupt the PC BIOS.

Conseil
N'exécutez pas sur votre PC de programmes d'application JANUS fournis par Intermec (tels que IC.EXE). N'exécutez pas non plus sur votre PC de programmes .EXE qui utilisent des bibiothèques ou des extensions d'interruption car ces programmes bloqueront votre PC et pourraient corrompre le BIOS du PC.

Deciding Where to Run MakeDisk

You can run MakeDisk:

- on the RAM drive.
  If you want to make images larger than 256K on the RAM drive, you need to change your CONFIG.SYS file to enlarge the drive. Use the following to estimate the amount of space needed to create a RAM drive for running MakeDisk.

Note: On drive C you need to allocate space for your files, plus 15K, plus 512 bytes overhead per file, and 135K for the MS-DOS system files.

Note: On drive D you can omit the 135K for the MS-DOS system files.

• on a PC card inserted into the JANUS device.

• on a host computer with or without Interlnk.

   With Interlnk   You can use Interlnk to copy files from drives C or D to the host's working directory and then copy MAKEDISK.EXE to a working directory on the host computer. You can then run MakeDisk on the host computer.

   Without Interlnk   You can run MakeDisk on the host computer without Interlnk if you copy MAKEDISK.EXE to a working directory on the host computer. You can also use the DOS COPY commands to copy additional files from the companion disks instead of from drives C or D.

Creating and Filling the Working Source Directory

1. Create a working source directory where you will store the files you want on drives C or D.

   Since the use of subdirectories is fully supported by MakeDisk, you can create and populate subdirectories in the working source directory.

2. Create or copy files to the working directory.

   You can create or copy a maximum of 125 files to the drive C root directory or 128 files to drive D root directory. You can create or copy an infinite number of files to subdirectories below the root directory, provided they can fit in the allocated drive space.

   • If you are adding new files to drives C or D, copy all files currently on drives C or D as well as the new files to the working directory and its subdirectories.

   • If you are changing or replacing some of the existing files on drives C or D, copy all files currently on drives C or D to the working directory and its subdirectories. Edit the files you want to change or replace.

   • If you are replacing all files on drives C or D, copy the files you want on drives C or D to the working directory and its subdirectories.

   • If you are deleting files from drives C or D, copy all files currently on drives C or D to the working directory and its subdirectories. Delete the files you want to remove from drives C or D.

   You can use the DOS COPY command to copy files from the companion disks, or you can use Interlnk to copy files from the JANUS drives C or D.

Creating the New Image File

Create the image file by typing the command:

```
makedisk /s=[path] {/o=[output file] /d=[drvletter]}
```

where:

path   specifies the directory that contains the files for the image file. This directory is called the source directory.

The *path* parameter is **required**. You may choose to include the drive letter if the source directory resides on another drive. For example, you could enter A:\JANUS\IMAGE as the path. If you do not specify the path correctly, the command fails.

output file   specifies the full path and name of the image file to create. If you do not include this parameter, the image file is called DRIVE_C.IMG (DRIVE_D.IMG if you specified /d=d) and is placed in the current working directory.

The *output file* parameter is **optional**.

drvletter   specifies the target JANUS drive, either C or D. The default is drive C.

The *drvletter* parameter is **optional**.

All files in the source directory are placed into the image file, including hidden and read-only files. If subdirectories exist, they are also incorporated in the image file.

Note: If you have problems running MakeDisk or PutDisk, see Chapter 10 "Troubleshooting."

Loading the New Image File

Note: When you run PutDisk, all files on drives C or D are overwritten. Be sure to back up any files you want to keep before you continue.

1. Connect the JANUS device to the host computer.

    Note: If you use a communications dock and plan to use Interlnk during this procedure (as described in Step 3), you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Connect a power supply to the communications dock or optical link adapter.

Note: For JANUS 2010 and 2020 devices only. This step is recommended, but is not required.

Caution
JANUS 2010 and 2020 devices should be powered by an AC power source when you use the PutDisk command in case the battery pack goes low while the flash memory is being overwritten. If the power goes down when using PutDisk, internal safeguards permit a resume of the flash programming process. In rare cases, drive C flash must be reloaded from the Boot Loader menu and you will lose data.

Conseil
Les périphériques JANUS 2010 et 2020 doivent être alimentés par une source de courant alternatif lors de l'exécution de la commande PutDisk étant donné le risque de décharge de la batterie pendant que la mémoire flash est écrasée. Si le courant est coupé pendant l'exécution de PutDisk, des mesures de sécurité internes font en sorte de remettre en opération le processus de programmation flash. Il peut arriver, quoique rarement, qu'il faille recharger la mémoire flash du lecteur C à partir du menu Chargeur-amorce (Boot Loader) et que des données soient perdues.

3. If you created the image file on the host computer and want to load it to the JANUS device from the host, start Interlnk now (with the host as server, and the JANUS device as client).

Note: You can simply reboot the JANUS device after the connected host has Interlnk installed.

You do not have to start Interlnk if you followed one of these strategies:

• You created the image file on the JANUS device.

• You created the image file on the host computer, copied the file to a PC card, and inserted the PC card into the JANUS device.

4. Type this command on the JANUS device:

    ```
    putdisk /d=[drvletter] /i=[image filename]
    ```

    where:

    drvletter is the target JANUS drive to be updated. The default
                 is drive C.

    image   is the name of the drives C or D image file created by
    filename   MakeDisk. If you do not specify a path and filename,
                 PutDisk looks for DRIVE_C.IMG.

    You may receive error messages in the following conditions:

    *   If the specified file does not exist, PutDisk displays an error message
        and terminates.

    *   If you specify a path without a file name, PutDisk also displays an error
        message.

    *   PutDisk generates an error message if you attempt to put a
        DRIVE_C.IMG on drive D or a DRIVE_D.IMG on drive C.

    Note: PutDisk will overwrite all files on drives C or D.

For example, to copy the C-ATA.IMG image file from a PC card on the JANUS device to the JANUS drive C, type this command:

```
putdisk /i=g:\c-ata.img
```

PutDisk tries to determine if there is adequate power before replacing the drive image. If a power problem exists, PutDisk displays an error message and terminates.

You see messages on the JANUS device as PutDisk updates drives C or D, erases flash memory, and copies the DOS and new drives C or D image file to the JANUS device, and warm boots the JANUS device. If an error occurs, see Chapter 10, "Troubleshooting."

Examples of Using MakeDisk and PutDisk

Following are three examples of how you can use MakeDisk and PutDisk to change the contents of drives C or D:

*   In the first example, you run MakeDisk on the host, transfer the image file to the JANUS device on a PC card, and run PutDisk on the JANUS device to load the image file to drive C.

*   In the second example, you run MakeDisk on the host, use Interlnk to make the image file appear as if it were on the JANUS device, and run PutDisk on the JANUS device.

- In the third example, you run MakeDisk on the host, transfer the image file to the JANUS device on a PC card, and run PutDisk on the JANUS device to load the image file to drive D.

Example 1

In this example, the resulting image file will be larger than 256K, so you must create the image file on the host computer if the JANUS RAM drive is configured at 256K (factory default). This example assumes that the host computer and the JANUS device can share a PC card.

1. Connect the JANUS device to a host computer using an appropriate serial connection.

2. Create a source directory on the host computer by typing this command at the host computer's DOS prompt:

   ```
   mkdir c:\drivec
   ```

3. Fill the source directory with all the files you want to include in the new image file:

   a. Copy the files from the current drive C to the source directory. Because the host computer and JANUS device can share a PC card, you can insert the card into the JANUS PC card drive and copy all files from drive C to drive G. Then insert the card into the host computer's PC card drive and copy all the files to the source directory.

   b. Add any other files and/or subdirectories to the working directory that you want on drive C. These files may include source read-only data files and applications for your JANUS device.

   c. Edit AUTOEXEC.BAT, CONFIG.SYS, and other files in the source directory as necessary.

4. Insert the JANUS Boot Utilities companion disk into a drive on the host PC.

5. Copy the self-expanding executable C_MAKE.EXE to drive C on the host PC by typing:

   ```
   copy a:\c_make.exe c:\
   ```

6 Run C_MAKE.EXE and delete all of the extracted files except for MAKEDISK.EXE.

7. Type this command at the host computer's DOS prompt:

   ```
   makedisk /s=c:\drivec /o=newdrv.img
   ```

   An image file, NEWDRV.IMG, is created in the working directory of the host computer's drive C.

   Note: Do not create the image file in the directory where the source files reside.

8. Copy the image file from the host computer to the PC card and then insert the PC card into the JANUS PC card drive, drive G.

   Note: It is recommended that you provide an external power supply for the JANUS device before you execute PutDisk.

9. At the DOS prompt on the JANUS device, type this command to load the new image file onto drive C.

   ```
   putdisk /i=g:\newdrv.img
   ```

Example 2

In this example, you create the image file on the host computer, use Interlnk to make the image file appear as if it were on the JANUS device, and use PutDisk to load the image file to drive C.

1. Connect the JANUS device to a host computer using an appropriate serial connection.

2. Create a source directory on the host computer by typing this command at the host computer's DOS prompt:

   ```
   mkdir c:\drivec
   ```

3. Fill the source directory with all the files you want to include in the new image file:

   a. Copy the files from the current JANUS drive C to the source directory on the host PC. Use Interlnk with the host computer as the client and the JANUS device as the server.

   b. Add any other files to the source directory that you want on drive C. These files may include read-only data files and applications for your JANUS device.

      Note: Do not create the image file in the directory where the source files reside.

   c. Edit AUTOEXEC.BAT, CONFIG.SYS, and other files in the source directory as necessary.

4. Insert the JANUS Boot Utilities companion disk into a drive on the host PC.

5. Copy the self-expanding executable C_MAKE.EXE to drive C on the host PC by typing:

   ```
   copy a:\c_make.exe c:\
   ```

6 Run C_MAKE.EXE and delete all of the extracted files except for MAKEDISK.EXE.

7. Type this command at the host computer's DOS prompt:

   ```
   makedisk /s=c:\drivec /o=newdrv.img
   ```

MakeDisk creates an image file, NEWDRV.IMG, in the working directory of the host computer's drive C.

8. Restart Interlnk. Make the JANUS device the client, and the host computer the server. The new image file, NEWDRV.IMG, appears on the H drive root directory.

9. At the DOS prompt on the JANUS device, type this command to load the image file to drive C.

```
putdisk /i=h:\newdrv.img
```

Example 3
In this example, the resulting image file will update drive D. Since the image file will be larger than 256K, you must create the image file on the host computer if the JANUS RAM drive is configured at 256K (factory default). This example assumes that the host computer and your JANUS device can share a PC card.

1. Connect the JANUS device to a host computer using an appropriate serial connection.

2 Create a source directory on the host computer by typing this command at the host computer's DOS prompt:

```
mkdir c:\drived
```

3. Fill the source directory with all the files you want to include in the new image file:

   a. Copy the files from the current drive D to the source directory. Because the host computer and your JANUS device can share a PC card, you can insert the card into the JANUS PC card drive and copy all files from drive D to drive G. Then insert the card into the host computer's PC card drive and copy all the files to the source directory.

   b. Add any other files and/or subdirectories to the source directory that you want on drive D. These files may include read-only data files and applications for your JANUS device.

4. Insert the JANUS Boot Utilities companion disk into a drive on the host PC.

5. Copy the self-expanding executable C_MAKE.EXE to drive C on the host PC by typing:

```
copy a:\c_make.exe c:\
```

6 Run C_MAKE.EXE and delete all of the extracted files except for MAKEDISK.EXE.

7. Create the drive image by typing this command at the host computer's DOS prompt:

```
makedisk /s=c:\drived /o=newdrvd.img /d=d
```

An image file, NEWDRVD.IMG, is created in the working directory of the host computer's drive C.

Note: Do not create the image file in the directory where the source files reside.

8. Copy the image file from the host computer to the PC card and then insert the PC card into the JANUS PC card drive (drive G).

Note: It is recommended that you provide an external power supply for the JANUS device before you execute PutDisk.

9. At the DOS prompt on the JANUS device, type this command to load the new image file onto drive D.

```
putdisk /i=g:\newdrvd.img /d=d
```

Creating and Using a Physical RAM Drive

A physical RAM (random access memory) drive is a disk drive that exists only in your reader's extended memory. You create, read, write, and delete files on a RAM drive the same way you can on a hard disk drive. RAM drives are faster than hard disk drives because the contents of a RAM drive are, by definition, always resident in RAM.

By default, your reader's drive E is configured in the CONFIG.SYS file as a 256K RAM drive. You can use the same DOS commands and Norton utilities on a RAM drive that you can on a hard disk drive.

Understanding When Files Are Saved or Lost

Make sure you understand when the files on a RAM drive are saved or lost:

When You Do This	RAM Drive Files Are
You press ⓘ/⊘ to turn off the reader.	Saved
You warm boot the reader.	Saved
You cold boot the reader.	Lost
You load the reader's flash memory.	Lost
You put the reader in Storage mode.	Lost

When You Do This	RAM Drive Files Are
You execute CONFIG.SYS after changing the command that creates the RAM drive.	Lost
You turn off the reader (by pressing ⓘ⁄o or removing the battery) while the reader is performing a warm boot.	Lost

Copy all important files from the RAM drive to another drive or another computer before you perform any task that causes the files to be lost.

Note: If you need to cold boot the reader, you may be able to save the contents of the RAM drive. For help, see "Saving the Contents of the RAM Drive" in Chapter 10.

Deciding How Much Memory to Use for RAM Drives

The size of the RAM drive you create is limited only by the amount of extended memory in the reader. You can create multiple RAM drives as long as the sum of their sizes does not exceed the amount of memory available.

Decide how much memory you will use for the RAM drive or drives:

Up to 256K   If you use up to 256K, all applications have enough memory to operate normally. Intermec recommends that you adhere to a 256K limit.

From 256K to 320K   If you use more than 256K but less than 320K, the IRL Desktop and IC.EXE run slowly because the RAM drive is using memory these applications use for caching.

More than 320K   If you use more than 320K, Reader Services cannot run. For help deciding if you need Reader Services, see "Using Reader Services in Applications" later in this chapter.

Creating a RAM Drive

You create RAM drives with the SRAMDISK.SYS device driver. Because SRAMDISK.SYS works only in extended memory, the reader must be running an XMS extended memory manager, such as HIMEM.SYS. Your CONFIG.SYS must include a command that installs the memory manager **before** the command that creates the RAM drive. For example, the default CONFIG.SYS contains these commands in this order:

```
device=d:\himem.sys
device=d:\sramdisk.sys 256 512
```

When you create a physical RAM drive, DOS gives it the next available drive letter on the reader. For example, if you create two RAM drives, DOS may assign them drives E and F. In this case, the reader's Type I PC card drive is assigned drive G (instead of F) and the Type II PC card drive is assigned drive H (instead of G).

To create or change a RAM drive

1. To create or change a RAM drive, you must edit the reader's CONFIG.SYS file, which is on drive C. For help, see "Learning How to Change the Contents of Drive C" earlier in this chapter.

2. Verify that HIMEM.SYS or another XMS extended memory manager is loaded into memory by a command in the reader's CONFIG.SYS file.

3. Add a SRAMDISK.SYS command in the CONFIG.SYS file for each RAM drive you want to add. The SRAMDISK.SYS command(s) must appear **after** the command that loads the extended memory manager.

   The SRAMDISK.SYS command must follow this syntax:

   ```
   device=d:\sramdisk.sys [disksize sectorsize entries]
   ```

   where:

   disksize   is the size of the RAM drive in kilobytes; specifies the amount of extended memory allocated for the drive. Type a number from 16 to 256; the default is 64. You can create multiple RAM drives if the sum of their *disksizes* is 256K or less.

   > ***Note:** You may be able to use more than 256K of extended memory for the RAM drive. For help, see the previous section, "Deciding How Much Memory to Use for RAM Drives."*

   sectorsize   is the size of the disk sector in bytes. Type 128, 256, or 512; the default is 512. You can specify *sectorsize* only if you specify *disksize*.

   entries   is the maximum number of files and directories you can create in the RAM drive. Type a number from 2 to 1024; the default is 64. You can specify *entries* only if you specify *sectorsize* and *disksize*.

   Here are sample SRAMDISK.SYS commands:

   • To create a 64K RAM drive:

   ```
   device=d:\sramdisk.sys
   ```

   • To create two 128K RAM drives:

   ```
   device=d:\sramdisk.sys 128
   device=d:\sramdisk.sys 128
   ```

•   To create a 256K RAM drive with 128-byte sectors and up to 16 entries in its root directory:

    ```
    device=d:\sramdisk.sys 256 128 16
    ```

4. Load the reader's CONFIG.SYS file on drive C using Auto-Loader, BFT, or MakeDisk and PutDisk, as described in "Learning How to Change the Contents of Drive C" earlier in this chapter.

5. Press ⟨Ctrl⟩ ⟨Alt⟩ ⟨≡f⟩ ⟨.⟩ to warm boot the reader. The changes to the RAM drive are put into effect when CONFIG.SYS executes.

Caution
Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil
N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

Programming for the Reader

The applications you run on your reader control how it operates, interacts with users, and helps you solve your business problems. Intermec supports these programming languages on the JANUS reader:

•   Ada

•   Borland C/C++

•   Clipper

•   IRL

•   Microsoft C/C++

•   Microsoft QuickBasic

•   Microsoft's Visual Basic for DOS

Intermec also offers these products to help you create reader applications:

•   JANUS Programmer's Software Kit (PSK)

•   JANUS Application Simulator

•   Interactive Reader Language (IRL)

•   PC-IRL

Using JANUS PSK and JANUS Application Simulator

The JANUS 2010 fully supports the JANUS Programmer's Software Kit (PSK). Although many applications can be written with standard language functions, you can create applications using C or Basic that incorporate PSK library functions and Intermec-specific system software interrupts. These functions and interrupts give the programmer low-level control over the reader's hardware, such as the backlight, viewport, communications using Intermec protocols, and power management statistics.

The JANUS Application Simulator lets you run JANUS applications that use PSK functions on your PC so you can use DOS development tools and debuggers common in the software industry to debug the applications' logic and syntax. (Without the Application Simulator, you cannot run these applications on a PC because the PSK functions and interrupts cause a PC to lock up.)

To learn more, see these manuals:

- *JANUS PSK for C++ Reference Manual*
- *JANUS PSK for Basic Reference Manual*
- *JANUS PSK for Ada Reference Manual*
- *JANUS Application Simulator User's Manual*

Using IRL and PC-IRL

The JANUS 2010 fully supports IRL, as described in Chapter 7, "Working With IRL." You can write, compile, and run IRL programs on your reader. You can port existing IRL applications to the JANUS platform and take advantage of special JANUS commands and features.

Intermec recommends you use PC-IRL to create and download IRL programs. PC-IRL provides IRL programmers with an easy-to-use programming and debugging environment on a PC.

To learn more, see these manuals:

- *IRL Programming Reference Manual*
- *PC-IRL Reference Manual*

Making PSK Applications That Work With BFT

You can create PSK applications that can accept and respond to a host computer's request to initiate a binary file transfer (BFT) session.

You need to program your PSK application to accept the Prepare for Reboot command from any host computer. Your application responds by calling a Prepare for Reboot procedure (which may consist of housekeeping tasks such as closing files), and then notifies the PSK library and host computer that the reader is ready to be rebooted. At that point, the host can reboot the reader and open a BFT session.

To learn how to create BFT-ready PSK applications, see your JANUS PSK reference manual. To learn more about BFT, see "Downloading Applications Across the Network" in Chapter 6.

Preparing Applications to Recover From Lockups

If an application becomes locked in an infinite loop, you may not be able to terminate the application. You could warm or cold boot the reader, as described in Chapter 9, "Booting and Resetting the Reader," but the contents of both conventional memory and the RAM drive will be lost.

You can make it easier for a user to recover from a locked-up application. If you create applications in a programming language supported by the JANUS PSK and you follow the instructions in the JANUS PSK reference manual, those applications can check a flag called the application break bit whenever the program calls the appropriate function.

When an application gets into a loop or is waiting for input, the user can turn off the reader, enable the application break bit, and turn the reader on. As the reader resumes, your application finds the application break bit enabled and takes appropriate action.

For the steps the user should perform when an application locks up, see "Breaking Out of an Application" in Chapter 9.

Note: IRL programs automatically check the application break bit.

Using Reader Services in Applications

Reader Services are programs that decode bar codes, process data input and output (I/O), configure the reader, and handle all power management for the reader. AUTOEXEC.BAT loads Reader Services when you boot the reader. You do not interact directly with Reader Services because they operate as part of the reader's system software. You can create applications that use Reader Services. For help, see your JANUS PSK reference manual.

Reader Services include these programs:

Communications Utilities   Communications Utilities are transmit and receive functions that you can call with PSK functions or software interrupts. Communications Utilities let the reader transmit and receive buffers or bytes of data regardless of the communications protocol that you use.

Configuration Manager   Configuration Manager maintains the reader's current configuration file (such as JANUS.INI), ensures that the reader operates according to that configuration, and lets you change the reader's configuration file. Configuration Manager is a terminate and stay resident program (TSR) that loads into the reader's memory during a warm or cold boot.

Input Manager   Using software interrupts and library functions, your reader applications can use Input Manager as an interface for all data I/O from the reader's COM ports, wand, scanner, and keypad. Input Manager also handles all power management during data I/O. For help with software interrupts and library functions, see your JANUS PSK reference manual.

You can use Input Manager to customize how the reader handles data from the keypad, wand, or scanner. The reader can display all input, beep when labels are scanned, and parse reader commands. For example, when you scan a bar code label, Input Manager can identify the symbology and if the label includes reader commands.

Virtual Wedge   The Virtual Wedge decodes and manages bar code input, making the reader functionally equivalent to a wedge reader connected to a PC. This capacity facilitates rapid porting of PC applications to the reader. When you scan a bar code label, the Virtual Wedge inserts the data into the keyboard buffer as if it had been typed. The Virtual Wedge sends configuration commands to Configuration Manager. The Virtual Wedge also recognizes and implements reader commands.

Direct Hardware Wedge   The Direct Hardware Wedge is a new feature of JANUS 4.0 software that allows bar code data to emulate keystrokes on the keypad. For more information on the Virtual Wedge and Direct Hardware Wedge, see "Understanding the Bar Code Wedge," later in this chaper.

Making More Memory Available on the Reader

Your JANUS reader may not have enough conventional memory available for the applications you want to run. If so, you may be able to free some conventional memory by performing these tasks:

• Not installing the PC card drivers to free about 60K of memory

• Unloading the Reader Wedge TSR to free about 80K of memory

Not Installing the PC Card Drivers

You do not need to install PC card drivers if you are not using PC cards in your reader. You may be able to save up to 60K in conventional memory by not installing the drivers. Choose the No PC Card option on the MS-DOS startup menu and PC card drivers will not be installed when you boot the reader.

```
MS-DOS 6.2 Startup
===============
  1. SRAM PCCard
  2. ATA PCCard
  3. Flash PCCard
  4. I/O PCCard
  5. No PCCard
Enter a choice:


F5=Bypass startup
file
```
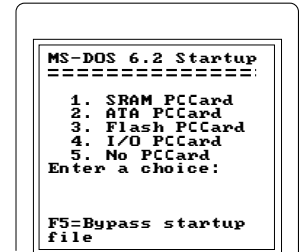
20X0A.002

Unloading and Loading Reader Wedge TSR

The Reader Wedge TSR (RWTSR.EXE) must be loaded in memory before you can execute Reader Wedge PSK functions such as im_receive_input. However, you do not need RWTSR.EXE loaded when you are not running a PSK application. You can unload RWTSR.EXE and save about 80K.

Note: If you run a C program that contains PSK Version 2.1 Reader Wedge functions, the program automatically loads and unloads RWTSR.EXE for you.

To load the Reader Wedge TSR

• Type this command at the DOS prompt:

  rwtsr

  Or scan this bar code:

  ‖‖█‖‖█‖‖ ‖ ‖‖‖‖‖ ‖‖‖ ‖‖‖‖ ‖‖ ‖‖‖
  RWTSR

To unload the Reader Wedge TSR

• Type this command at the DOS prompt:

  rwtsr -d

  Or scan this bar code:

  ‖‖█‖‖█ ‖ ‖‖‖‖‖ ‖‖‖‖ ‖‖‖‖ ‖‖ ‖‖‖‖ ‖‖‖‖‖ ‖‖ ‖‖‖
  RWTSR -D

Understanding the Bar Code Wedge

The Bar Code Wedge is a Reader Services feature that enables your JANUS device to decode bar codes, making it functionally equivalent to a wedge reader connected to a PC. Prior to JANUS 4.0 software, the only wedge option was the Virtual Wedge. With the 4.0 software release, the Reader Services wedge feature has a second option, the Direct Hardware Wedge.

When you scan a bar code with the Virtual Wedge Option enabled, data is inserted directly into the keyboard buffer as if it had been typed. The Direct Hardware Wedge provides hardware level PC compatibility and processes the scanned data directly as individual keystrokes.

The Direct Hardware Wedge provides bar code data to applications that directly access the hardware, it is the option to select when working with applications (for example, Attachmate, FTP, Zstem for DOS, PC-TCP for DOS, and others) that require keystroke interrupts to occur when data is received. The Virtual Wedge option, which is up to 10 times faster than going through the PC hardware, is the option you should select when you need maximum performance.

If you have developed advanced applications for your JANUS device, you need to customize how the reader and application handle data from the keypad, wand, or scanner. Refer to the JANUS Programmer's Software Kit and reference manuals for instructions.

The Virtual Wedge is the default configuration. You can enable the Direct Hardware Wedge by using the KWC.COM program. For more information, see "Using the Wedge Configuration Program," later in this chapter.

Enabling Direct Hardware Wedge Functions

When you enable the Direct Hardware Wedge function, you disable the portion of the Virtual Wedge that inserts data directly into the keyboard buffer. With the Direct Hardware Wedge function enabled, data is inserted into the hardware to be processed as actual keystrokes. The processing of Reader Services commands and configuration bar codes is not affected by the wedge option you select.

Intermec recommends that you enable the Direct Hardware Wedge if you experience any of the following problems using off-the-shelf PC software on your 4MB JANUS device.

- You scan a bar code and get a "read beep," but the data isn't received by your application.

- You scan a bar code and characters are dropped.

- Your application uses bar codes to manipulate screen functions and the screen doesn't respond correctly.

Note: If you attempt to run the wedge configuration program on a JANUS device running version 3.0 or earlier software, the Direct Hardware Wedge feature will not be available. The Direct Hardware Wedge feature requires a software modification and a new KSCPU chip.

Using the Wedge Configuration Program

You can use the wedge configuration program (KWC.COM) to set wedge options on your 4MB JANUS device. To start KWC.COM, type this command at the DOS prompt and press ⏎.

kwc

Or, scan this bar code.

||||||||||||||||||||||||||

KWC

The main menu appears, displaying five configuration options.

```
C:\ >KWC
Keyboard Control
Copyright 1996
Intermec Corp.
Version 1.00

Usage: KWC x
0 - KW off , XKBD on
1 - KW on  , XKBD on
2 - KW on  , XKBD off
3 - KW off , XKBD off
4 - status only

C:\ >
```

20X0A.004

Option 0   Option 0 is the default configuration. Select Option 0 to enable the Virtual Wedge and the expanded keyboard. To select this option, type the following command at the DOS prompt and press ⏎.

kwc 0

Or, scan this bar code.

||||||||||||||||||||||||||||||

KWC 0

```
C:\ >KWC 0
Keyboard Control
Copyright 1996
Intermec Corp.
Version 1.00

KW Disabled
XKB Enabled


C:\ >_
```

20X0A.005

Note: The AUTOEXEC.BAT on your 4MB JANUS device is set to Option 0 (Virtual Wedge enabled/extended keyboard enabled). To permanently change this option, you will need to modify your AUTOEXEC.BAT file and load a new image to drive C.

Option 1   Select Option 1 to enable the Direct Hardware Wedge and the expanded keyboard. To select this option, type the following command at the DOS prompt and press ⌜enter ←⌟.

`kwc 1`

Or, scan this bar code.

‖|‖‖‖|‖‖‖|‖‖|‖|‖‖|‖‖|‖|‖‖|

KWC 1
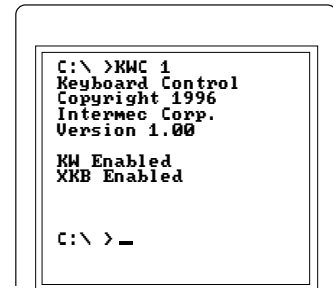
```
C:\ >KWC 1
Keyboard Control
Copyright 1996
Intermec Corp.
Version 1.00

KW Enabled
XKB Enabled


C:\ >_
```
20X0A.006

Note: The following two options disable the expanded keyboard buffer. The expanded keyboard buffer allows the JANUS device to consistently process bar codes that are longer than 15 characters. Do not disable the expanded keyboard unless your application continues to experience compatibility problems.

Option 2   Select Option 2 to enable the Direct Hardware Wedge and disable the expanded keyboard. To select this option, type the following command at the DOS prompt and press ⌜enter ←⌟.

`kwc 2`

Or, scan this bar code.

‖|‖‖‖|‖‖‖|‖‖|‖|‖‖|‖‖|‖|‖‖|

KWC 2
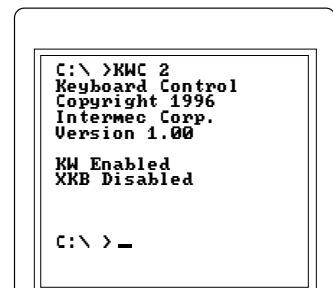
```
C:\ >KWC 2
Keyboard Control
Copyright 1996
Intermec Corp.
Version 1.00

KW Enabled
XKB Disabled


C:\ >_
```
20X0A.007

Option 3   Select Option 3 to disable the Virtual Wedge and the expanded keyboard. To select this option, type the following command at the DOS prompt and press ⌜enter ←⌟.

`kwc 3`

Or, scan this bar code.

‖|‖‖‖|‖‖‖|‖‖|‖|‖‖|‖‖|‖|‖‖|

KWC 3

```
C:\ >KWC 3
Keyboard Control
Copyright 1996
Intermec Corp.
Version 1.00

KW Disabled
XKB Disabled


C:\ >_
```
20X0A.008

Option 4   Select Option 4 to display the current wedge configuration status. To select this option, type the following command at the DOS prompt and press ⌨enter↵ .

kwc 4

Or, scan this bar code.

|||**|||||||** ** **|||||** *||* **|||||** **||** |||

KWC 4

4

Using PC Cards in the Reader

This chapter describes how to use PC cards and your reader's Type I and Type II PC card drives.

Learning About PC Cards

The PC card drives expand both the JANUS reader's disk space and input/output capabilities. With a PC card, you can store and transfer information to other readers and computers that also have PC card drives.

A PC card drive is similar to a disk drive on a PC, and the PC card is similar to a floppy disk.

2010U.151
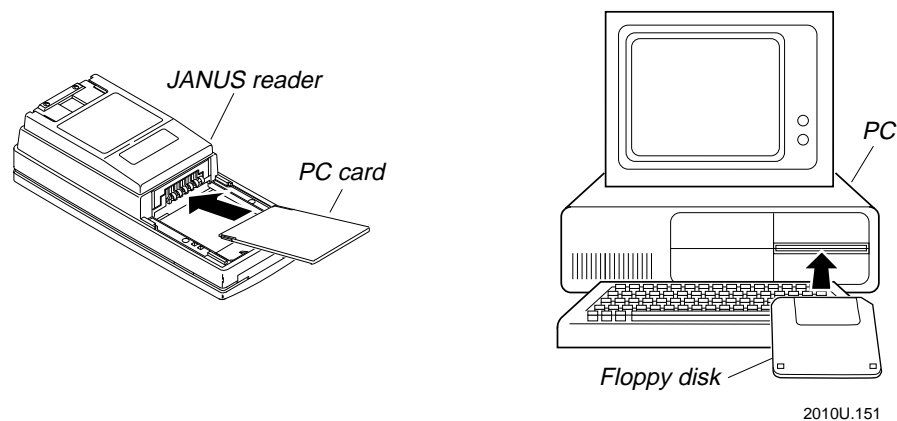
Note: PC cards were called PCMCIA cards in previous versions of this manual.

The next sections introduce PCMCIA and describe how the JANUS readers support PC cards.

What Is PCMCIA?

PCMCIA (Personal Computer Memory Card International Association) defines a set of hardware and software standards for memory and expansion cards that are available for personal computers. With Intermec's version JANUS 2.1 software or later, the JANUS readers can use PC cards that comply with PCMCIA Standard 2.1.

Features of the JANUS PC Card Software

JANUS software supports PC cards by offering these features:

- Compliance with the PCMCIA Standard 2.1

- SystemSoft software that controls the PC card drives

- DOS commands that make it easy to format and use PC cards

- Compatibility in the JANUS family of devices so you can share PC cards between the readers

Locating the PC Card Drives

The standard JANUS 2010 reader comes with a Type I PC card drive for Type I memory cards. The JANUS 2010 with a PCMCIA Back also has a Type II PC card drive for Type I or Type II memory and expansion cards.

Modem PC card (Type II)

Type II PC card drive

J2010 with a PCMCIA Back

Memory PC card (Type I)

2010U.152

Type I PC card drive
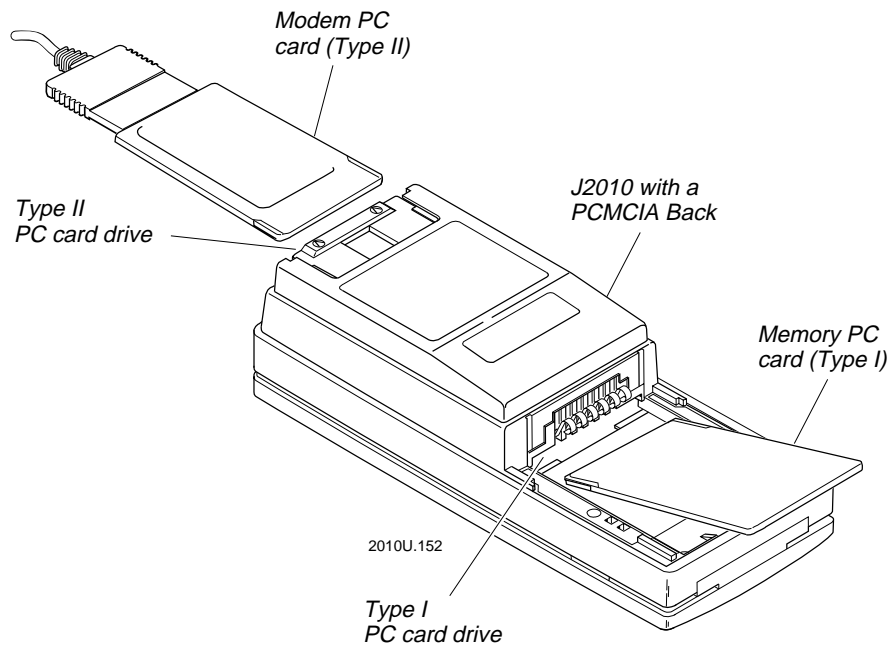
Which PC Cards Are Supported by JANUS?

JANUS readers use cards that comply with Intel ExCA or PCMCIA Standards 1.0, 2.0, and 2.1. There are three types of PC cards; you can identify them according to physical size:

Type I   These cards are 3.3mm thick.

Type II   These cards are 5mm thick.

Type III These cards are 10.5mm thick.

You can use Type I or Type II cards in the PC card drives on the JANUS readers. You cannot use Type III cards with a JANUS reader.

PC Card Drive	Type of Card	Purpose of Card
Type I PC card drive	Type I	Adds disk storage.
		You can use a Type I memory card.
Type II PC card drive	Type I or II	Adds disk storage or connects to an I/O device.
		You can use a Type I memory card or a Type II I/O card, such as a modem card.
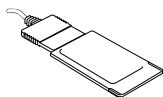
Which Expansion Cards Are Recommended?

You can use expansion or input/output (I/O) cards to connect the reader to I/O devices. Modem cards and network cards are examples of I/O cards.

For a complete list of Intermec-supported PC cards, see your Intermec sales representative.
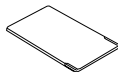
Which Memory PC Cards Are Recommended?

You can use Type I or Type II memory cards that have up to 64MB of memory formatted with a DOS file allocation table (FAT). There are many types of memory PC cards available. The memory cards you use on the JANUS reader provide additional disk storage space, not more executable conventional memory.

Intermec recommends using ATA, flash, or SRAM cards in your reader. Choose the type of memory card that meets your data storage needs:

Memory Card	For Which PC Card Drive?	Type of Data Storage
ATA	Type II PC card drive	Use an ATA flash card to store large amounts of data that change frequently.
		ATA cards retain their data without the use of a backup battery and are available in larger memory sizes.
Flash	Type I PC card drive Type II PC card drive	Use a flash card to store data that does not change as frequently.
		Flash cards retain their data without the use of a backup battery.
SRAM	Type I PC card drive Type II PC card drive	Use an SRAM card to store data that changes frequently.
		An SRAM card has a lithium battery to back up data for the life of the battery.

Note: Intermec recommends that you use ATA and SRAM cards for most data storage needs. You should only use a flash card as a low-cost alternative. If you decide to use a flash card, Intermec recommends flash cards that store 1MB or more of data.

Configuring the Reader to Reset the Type I Drive

When you replace the NiCad battery pack, the reader cannot determine if you also replaced the Type I PC card. Therefore, if you remove the battery pack while running an application that has open files, your data may become corrupted when you turn the reader back on.

You can configure the reader to specify how it will operate when the Type I PC card drive contains a PC card and you replace the battery pack. The reader can automatically reset the Type I PC card drive, prompt you to reset the drive, or not reset the drive. By default, the reader does not reset the drive. Follow these steps to configure the reader:

1. Load the IPM_4M.EXE program into memory.

2. Use the "Internal Drive Reset After Battery Change" command in Chapter 12. (The phrase "internal drive" refers to the Type I PC card drive.)

   Or use IC.EXE to set the RESET INTERNAL DRIVE AFTER BATTERY CHANGE parameter.

Note: If IPM_4M.EXE is not already loaded, the Internal Drive Reset After Battery Change command and Reset Internal Drive After Battery Change parameter have no effect on the reader.

To load IPM_4M.EXE into memory

• IPM_4M.EXE is loaded into memory when you boot the reader because this command appears in the default AUTOEXEC.BAT file:

`d:\ipm_4m.exe`

IPM_4M.EXE is stored on drive D and the Application companion disk 3. If the command is not in your AUTOEXEC.BAT file, type this command at the DOS prompt:

`d:\ipm_4m`

Or scan this bar code:

D:\IPM_4M

To use the "Internal Drive Reset After Battery Change" command

• See "Internal Drive Reset After Battery Change" in Chapter 12.

To set the RESET INTERNAL DRIVE AFTER BATTERY CHANGE parameter

1. To start IC.EXE, type this command at the DOS prompt:

`ic`

Or scan this bar code:

IC

2. Choose Power Mgmt from the Op menu. This screen appears.


```
        Configuration
      Oper/Power Mgmt


AUTO SHUTOFF:
  INTERVAL:01
       UNITS:MINUTES


RESET INTERNAL
DRIVE AFTER BATTERY
CHANGE:
 Do Not Reset Card


  OK            Cancel
```
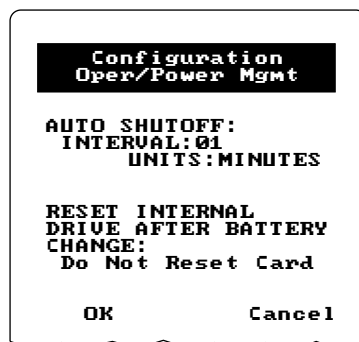
2010U.154

3. In the RESET INTERNAL DRIVE AFTER BATTERY CHANGE field, choose one of these options:

    Reset Card   The reader resets the drive if you replace the battery pack while a PC card is in the drive.

    Prompt for Reset   The reader prompts you to reset the drive if you replace the battery pack while a PC card is in the drive.

    Do Not Reset Card   The reader will not reset the drive. When you change a card, you must reboot the reader.

⚠️ **CAUTION**

Caution
If you set the Do Not Reset Card option, you must reboot the reader after changing a PC card or you may lose data.

Conseil
Si vous réglez l'option Do not reset card, vous devez réinitialiser le lecteur après avoir changé une carte PC ou vous risquez de perdre des données.

4. Choose OK to exit the screen. Then choose Exit from the File menu. When prompted, save the changes.

Inserting and Removing PC Cards

When you insert and remove PC cards, you must know:

*   The types of cards to install in each drive (see the previous section).

*   The correct orientation of the card as you insert it (see this section).

If you are ready to begin using your PC card, you can skip ahead to "Configuring, Formatting, and Using PC Cards" later in this chapter.

Inserting Cards Into the Type I PC Card Drive

The JANUS 2010 Type I PC card drive is located underneath the battery pack on the back of the reader. You can only use a Type I memory PC card in the Type I drive.

To insert a PC card

1. Turn off the reader by pressing ⓘ/ⓞ on the reader keypad.

2. Remove the battery pack. For help, see "Removing the Battery Pack" in Chapter 2.

3. Identify the two notches on the edges of the PC card. Look at the connector end of the card. There is a single-walled notch on one side, and a double-walled notch on the other side.
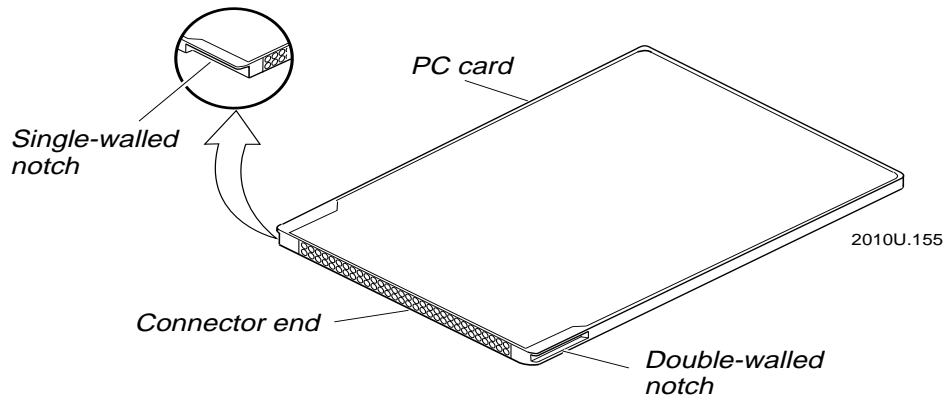
4. Insert the card into the drive slot, connector end first with the double-walled notch on the left edge of the card.
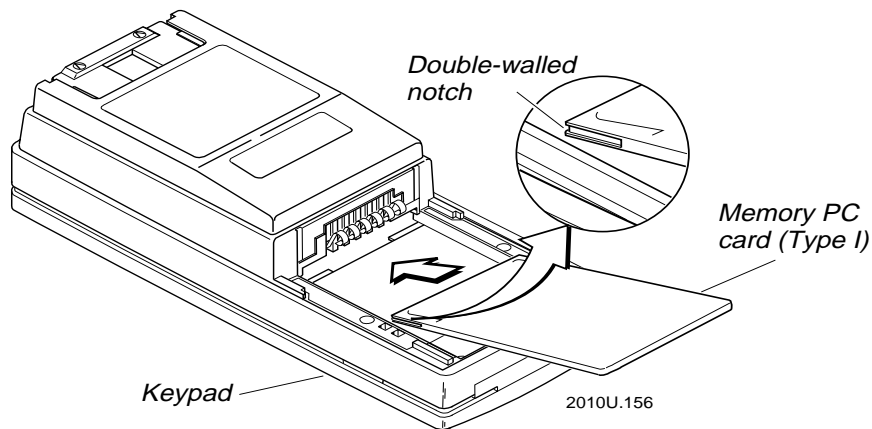
5. Push the card into the slot until it fits firmly in the connector. The card will click or snap into place when seated correctly. The card must be all the way in before you can install the battery pack.

   Note: Do not force a PC card into the drive slot. If the card does not fit easily into the connector, remove it and make sure you have the card oriented correctly. Then try again.

6. Install the battery pack. For help, see "Installing the Battery Pack" in Chapter 2.

7. Press ⒤⒪ to turn the reader on. The reader sounds an audible beep tone to indicate that it recognizes the PC card. For a description of the beep tones, see "Understanding the Reader's Audio Signals" in Chapter 2.

   Note: You may also be prompted to reset the Type I PC card drive when you turn the reader on. For help, see "Configuring the Reader to Reset the Type I Drive" earlier in this chapter.

To remove a PC card

1. Make sure the reader is finished writing to the PC card.

Caution
Do not remove the PC card when the disk write icon is on or you may lose data.

Conseil
N' enlevez la carte PC quand l'icône d'écriture sur disque est active car vous pourriez perdre des données.

2. Press ⒤⒪ to turn off the reader.

3. Remove the battery pack. For help, see "Removing the Battery Pack" in Chapter 2.

4. Using your thumbs, push the PC card away from the slot until the card is released from the connector inside the reader.

PC card

2010U.157
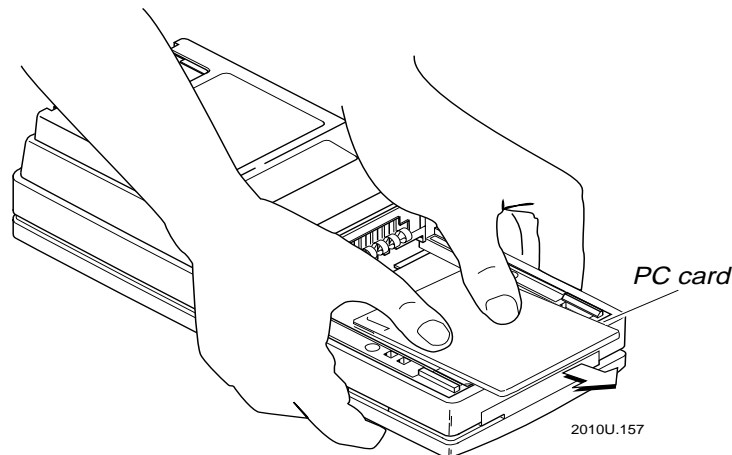
5. Pull the card up and out of the reader.

6. Install the battery pack. For help, see "Installing the Battery Pack" in Chapter 2.

Inserting Cards Into the Type II Drive

A JANUS 2010 with a PCMCIA Back has two PC card drives. The PCMCIA Back provides a Type II PC card drive that is located on the back of the reader on the top edge near the scanner/wand connector. You can use a Type I or Type II PC card in the Type II drive.

To insert a PC card

1. Make sure the reader is on. Press ⊚ to turn on the reader.

    Note: The reader must be turned on when you insert a card into the Type II drive or the reader may not recognize the card.

2. Hold the reader in one hand with the keypad pointed toward the floor. With your other hand, push the PC card drive door away from the reader until the door is released.

PC card drive door

PCMCIA back

2010U.158

3. Identify the two notches on the edges of the PC card. Look at the connector end of the card. There is a single-walled notch on one side, and a double-walled notch on the other side.

PC card

Double-walled notch

2010U.159
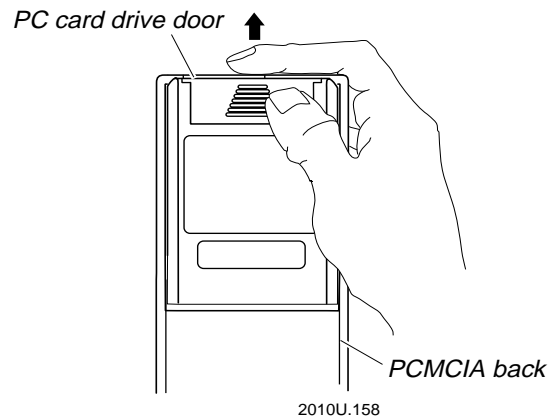
Connector end

Single-walled notch
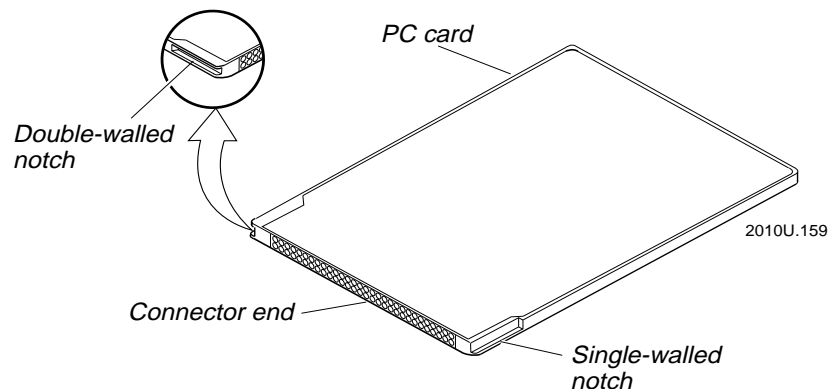
4. Insert the card into the drive slot, connector end first with the single-walled notch on the right edge of the card.

Single-walled
notch

2010U.160
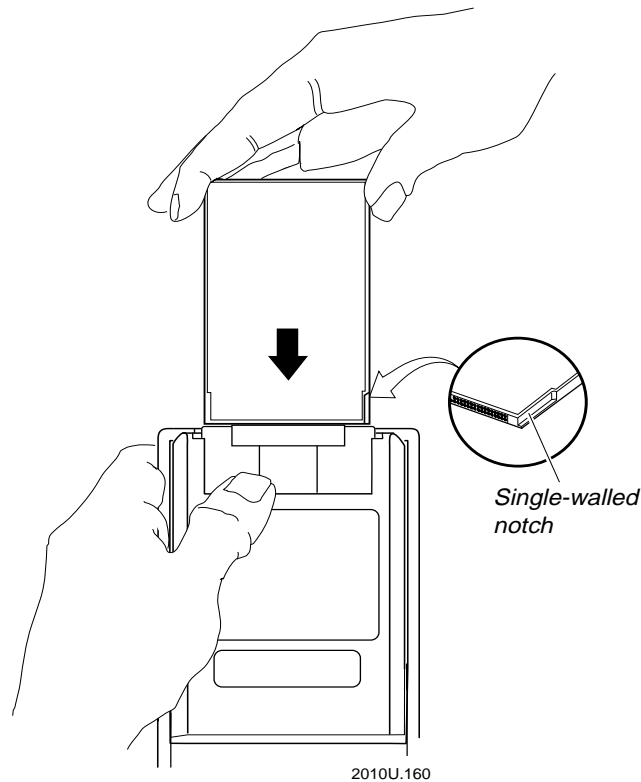
5. Push the card into the drive slot until it fits firmly in the connector. The card will click or snap into place when seated correctly.

   Note: Do not force a PC card into the drive slot. If the card does not fit easily into the connector, remove it and make sure you have the card oriented correctly. Then try again.

   Approximately 5 seconds after you insert the card, the reader sounds an audible beep tone to indicate that it recognizes the card. For a description of the beep tones, see "Understanding the Reader's Audio Signals" in Chapter 2.

6. To install the drive door, line up the three tabs on the door with the slots in the reader. Slide the door into the reader until it snaps into place.

   Note: If you are using a card with an external cable, do not install the drive door.

To remove a PC card

Caution
Do not remove the PC card when the disk write icon is on or you may lose data.

Conseil
N' enlevez la carte PC quand l'icône d'écriture sur disque est active car vous pourriez perdre des données.

1. Make sure the reader is finished writing to the PC card.

2. You can remove the card with the reader turned on or off.

3. Hold the reader in one hand with the keypad pointed toward the floor. With your other hand, push the PC card drive door away from the reader until the door is released.

PC card
drive door

PCMCIA
Back

2010U.161
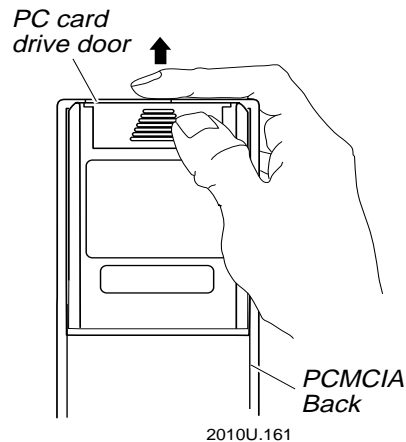
4. Using your thumb, push the card ejector mechanism away from the reader until the card is released from the connector inside the reader.

Card ejector mechanism

PCMCIA
Back

2010U.162

5.   Pull the card up and out of the reader.

PC card

PCMCIA back

2010U.163
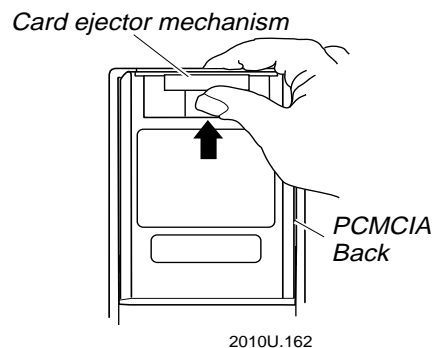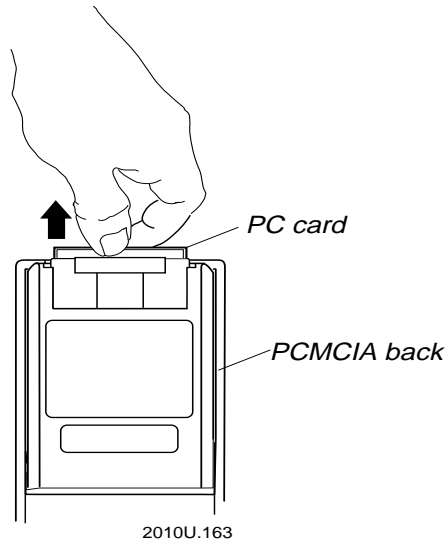
6.   When you are ready to close the drive door, line up the three tabs on the
     door with the slots in the reader and slide the door into the reader until it
     snaps into place.

Reader Beeps for PC Cards

When you insert or remove a PC card, the JANUS reader beeps to indicate
whether or not the reader recognizes the card. For a description of the
beep tones, see "Understanding the Reader's Audio Signals" in Chapter 2.
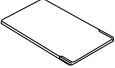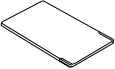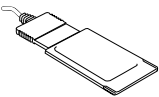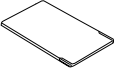
If the reader does not sound a beep sequence, remove the card. For the
Type II PC card drives, verify that the reader is turned on. Try inserting
the card again.

*Note: When you insert or remove a card from the Type I PC card drive, the reader
beeps after you install the battery pack and turn the reader on.*

Configuring, Formatting, and Using PC Cards

By default, the JANUS reader is configured for SRAM cards. You need to
configure the reader and format any other type of PC card before you can use
the card in your reader. The next table shows a brief overview of the process
for each type of PC card. After you scan this overview, you may want to read
the next sections for more details.

Type of Card	Step 1: Configure the Reader	Step 2: Format the Card	Step 3: Use the Card

ATA	Edit the CONFIG.SYS file and activate or add card drivers and utilities.	Use ATAINIT.EXE and FORMAT.COM:
		
		`atainit {drive:}`
		`format {drive:}`
			Use DOS commands, for example:
			
			`copy`
			`delete`
			`move`

Flash	Edit the CONFIG.SYS file and activate or add card drivers and utilities.	Use MCFORMAT.EXE:
		
		`mcformat`
			Use DOS commands, for example:
			
			`copy`
			`delete`
			`move`

I/O (Modem)	Edit the AUTOEXEC.BAT and CONFIG.SYS files and activate or add card drivers and utilities.	No formatting is required.	Use a commercially available communications program.

SRAM	Edit the CONFIG.SYS file and activate or add card drivers and utilities.
	
	Note: SRAM card is the default in the reader's CONFIG.SYS file.
		Use FORMAT.COM:
		
		`format {drive:}`
			Use DOS commands, for example:
			
			`copy`
			`delete`
			`move`

The next sections give you detailed instructions to configure, format, and use ATA, flash, I/O, and SRAM PC cards in the readers. The JANUS reader is already configured to use SRAM cards.

To format your SRAM card

- Type the command at the DOS prompt:

  `format {drive:}`

  where *drive* is the PC card drive. You can begin using the card.

Preparing to Use ATA Cards

To use an ATA flash card in the PC card drive, you need to:

1. Configure the reader to use an ATA card by selecting the ATA card option on the MS-DOS Startup menu.

2. Initialize and format the ATA card.

3. Use the ATA card.

Initializing and Formatting an ATA Card

1. Insert the ATA card in the PC card drive.

2. Type this command at the DOS prompt:

   ```
   atainit {drive:}
   ```

   where *drive* is the PC card drive.

   Note: ATAINIT only works with ATA cards that are supported by the ATADRV.EXE driver. If you are unable to use your ATA card, it may be an unsupported card. Check the documentation that COMES with the ATA card.

   Caution
   Make sure you enter the correct drive letter when you initialize the ATA card or you may erase the wrong drive.

   Conseil
   Assurez-vous de ne pas faire d'erreur en tapant la lettre identifiant le lecteur pour le formatage de la carte ATA. Sinon, vous risquez d'effacer un lecteur incorrect.

   The program displays the parameters (Fixed Cylinders, Heads, and Physical Sectors) for your ATA card. The next prompt is:

   ```
   Here are the parameters that were returned, examine
   them carefully to ensure they match what was expected.
   Press ENTER to accept and continue or <P> to prompt.
   ```

   Note: You can press Esc *at any time to abort and exit the initialization program.*

3. Press enter↵ to accept the values that are displayed. The next prompt is:

   ```
   Do you wish a compact format?
   ```

4. If your ATA card is 4MB or less, press Y . If your ATA card is greater than 4MB, press N . ATAINIT begins initializing the card and displays these messages.

   ```
   Partition table successfully written.
   BPB Boot sector successfully wiped.
   Proceed with a DOS "FORMAT /U" command.
   ```

5. Type this command at the DOS prompt:

    ```
    format /u {drive:}
    ```

    where *drive* is the PC card drive.

> **Caution**
> ***Make sure you enter the correct drive letter when you format the ATA card or you may erase the wrong drive.***
>
> **Conseil**
> ***Assurez-vous de ne pas faire d'erreur en tapant la lettre identifiant le lecteur pour le formatage de la carte ATA. Sinon, vous risquez d'effacer un lecteur incorrect.***

The program displays the next message.

```
WARNING: ALL DATA ON NON-REMOVABLE DISK
DRIVE G: WILL BE LOST!
Proceed with Format (Y/N)?
```

6. Press `Y` to continue. When the card is formatted, the next prompt is displayed.

    ```
    Volume label (11 characters, ENTER for none)?
    ```

7. Press `enter↵` if you do not want to enter a label for the card, or type a label name (up to 11 characters long) and press `enter↵`. The program displays the card's capacity and other drive statistics. You are ready to use the ATA card.

Using an ATA Card

You can use standard DOS commands to copy, delete, and move files, and to create and remove directories on an ATA card. To learn which DOS commands are available on the reader, see the MS-DOS Programs companion disk 2.

For example, on a JANUS 2010 with a PCMCIA Back, you can copy all the files from drive E to drive G by typing this command at the DOS prompt:

```
copy e:\*.* g:
```

To delete all the files on the ATA card in drive G, type this command at the DOS prompt:

```
del g:\*.*
```

If you need more information about DOS commands, refer to any book that describes DOS commands.

Preparing to Use Flash Cards

To use a flash card in the PC card drive, you need to:

1. Configure the reader to use a flash card by selecting the Flash card option on the MS-DOS Startup menu.

2. Erase the flash card if it has been formatted already. If you have an unformatted card, proceed to Step 3.

3. Format the flash card using the MCFORMAT utility.

Note: Intermec recommends using flash cards that store 1MB or more of data.

Erasing a Previously Formatted Flash PC Card

If your flash card has already been formatted, you must erase the card and clear its memory before you can format the card again. If your flash card has never been formatted, proceed to the next section.

To erase a previously formatted flash card

1. Insert the flash card in the PC card drive.

2. Type this command at the DOS prompt:

   `mcformat`

   Or scan this bar code:

   ‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

   MCFORMAT

   The MCFORMAT main menu appears:

   ```
               PC Memory Card Formatter
                  (C) 1994 INTEL Corporation
       Copyright 1994 SystemSoft Corp. All Rights Reserved
                  Version 1.01 (241 3-05)F

       MCFORMAT options

       Choose one of the following:

         1. Create and format a new partition.
         2. Format an existing partition.
         3. Erase a partition.
         4. Display partition information.

       Enter your choice. [4]

       To quit MCFORMAT, press [ESC].
   ```

   2010U.165

3. Press ⌷3⌷ to select Option 3. You will see this information.
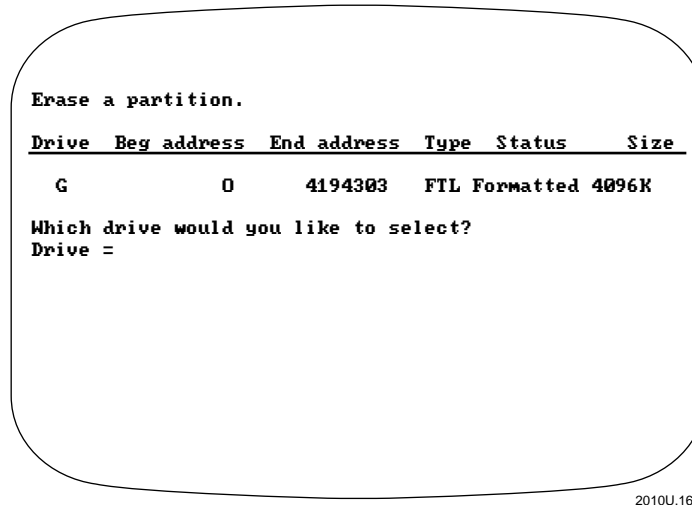
```
Erase a partition.

Drive  Beg address  End address  Type  Status      Size

  G            0       4194303   FTL Formatted 4096K

Which drive would you like to select?
Drive =
```

2010U.166

4. Press the letter of the PC card drive. For example, press ⌷G⌷ to format a flash card in the Type II drive. The program displays the next prompt:

   This command will erase drive G: entirely.

   Do you want to continue (Y/N)?

5. Press ⌷Y⌷ to begin erasing the flash card. The program displays the next message and the percent complete as it erases the card. Do not remove the flash card while the program is erasing the card.

   DO NOT REMOVE CARD WHILE ERASING!

   Erasing card.

   100% complete

   Press return for main menu.

6. Press ⌷enter↵⌷ to return to the MCFORMAT main menu.

7. Press ⌷Esc⌷ to exit MCFORMAT. You are ready to format the flash card.

Formatting a Flash PC Card

1. Insert the flash card in the PC card drive.

2. Type this command at the DOS prompt:

   mcformat

   Or scan this bar code:

   |||||||||||||||||||||||||||||||||||||||||||||

   MCFORMAT

The MCFORMAT main menu appears.

3. Press ⌑1⌑ to select Option 1. This information appears:
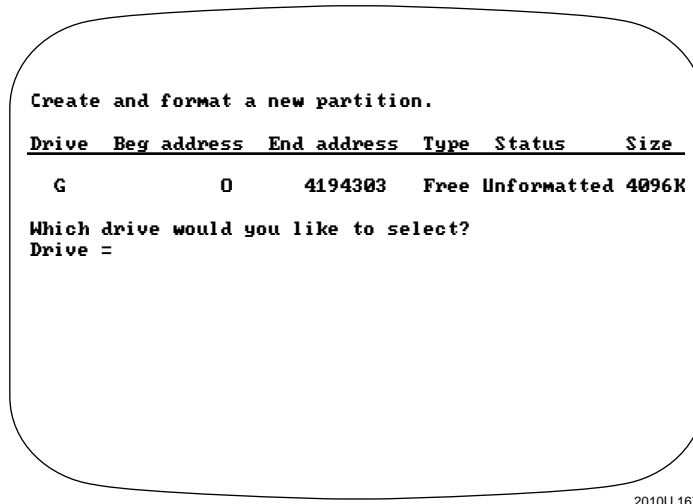
```
Create and format a new partition.

Drive  Beg address  End address  Type  Status       Size

  G            0       4194303    Free Unformatted 4096K

Which drive would you like to select?
Drive =
```

2010U.167

4. Press the letter of the PC card drive. For example, press ⌑G⌑ to format a flash card in the Type II PC card drive. The program displays the next prompt:

    ```
    Would you like to format entire card with FLASH(1) or FTL(2)  (1/2)?
    ```

5. Press ⌑1⌑ to format the entire card in an MS-Flash format, or press ⌑2⌑ to format the entire card in an FTL flash format. The program displays the next prompt:

    ```
    Are you ready to format drive G: with FTL format (Y/N)?
    ```

    Note: For most applications, Intermec recommends that you format a flash card in FTL (file translation layer) flash format. You should use the MS-Flash format when you are using the flash card in a JANUS reader and also in another PC card slot that supports MS-Flash format, but not FTL flash format.

6. Press ⌑Y⌑ to begin formatting the card. The program begins formatting the flash card and displays the percent complete as it is working. Do not remove the flash card while the program is formatting the card.

    The next prompt is:

    ```
    100% complete
    Format Complete
    Please input a volume label. (11 Characters, Press
    enter for no label)

    Label =
    ```

7. Press |enter←| if you do not want to enter a label for the card, or type a label name (up to 11 characters long) and press |enter←| . The program displays the current card status followed by the next prompt.

   ```
   Press return for main menu.
   ```

8. Press |enter←| to return to the MCFORMAT main menu.

9. Press |Esc| to exit MCFORMAT. You are ready to use the flash card.

Note: If you have trouble formatting the flash card or the reader does not recognize the card, you may need to install additional flash card drivers. For help, see "Using PC Cards" in Chapter 10.

Using a Flash PC Card

You can use standard DOS commands to copy, delete, and move files, and to create and remove directories on a flash card. To learn which DOS commands are available on the reader, see the MS-DOS Programs companion disk 2.

For example, on a JANUS 2010 with a PCMCIA Back, you can copy all the files from drive E to drive G by typing this command at the DOS prompt:

```
copy e:\*.* g:
```

To delete all the files on the flash card in drive G, type this command at the DOS prompt:

```
del g:\*.*
```

If you need more information about DOS commands, refer to any book that describes DOS commands.

You can also use MCFORMAT to format an exiting partition on the flash PC card, or display information about the card's partitions. To do so, start MCFORMAT and choose options 2 or 4, respectively.

Preparing to Use I/O Cards

You can use I/O expansion cards in the PC card drive. To use an I/O card in the drive, you need to add the I/O card drivers and utilities to AUTOEXEC.BAT and CONFIG.SYS.

Note: Before you use an I/O card in your JANUS device, read the documentation shipped with the PC card for any instructions on using your card. Some cards may need to be configured before they can be used in the PC card drive.

Configuring the JANUS device to Use an I/O Card

Follow these steps to configure the JANUS device for an I/O card:

1. Edit the AUTOEXEC.BAT file, which is stored on the drive C.

2. Search for this line in the AUTOEXEC.BAT file:

   ```
   d:\apm_4m.exe
   ```

   If the line is remarked out, delete the REM characters. If you cannot find this line, add it to the AUTOEXEC.BAT file.

3. Remark out this line:

   ```
   d:\ipm_4m.exe
   ```

   Note: Do not load both IPM_4M.EXE or APM_4M.EXE at the same time.

4. Save your changes to the AUTOEXEC.BAT file.

5. Edit the CONFIG.SYS file on the JANUS drive C.

6. Search for this line in the CONFIG.SYS file:

   ```
   device=d:\cardid.exe d:\cardid.ini
   ```

   If the line is remarked out, delete the REM characters. If you cannot find this line, add it to the CONFIG.SYS file.

7. To save conventional memory, remark out any lines that load drivers for ATA, flash, or SRAM cards.

8. Save your changes to the CONFIG.SYS file.

9. Replace the AUTOEXEC.BAT and CONFIG.SYS files on the JANUS drive C.

Resetting the PC Card Drive for I/O Cards

By default, the PC card drive is not reset when you suspend or resume the JANUS device. Therefore, you can keep files open when you suspend and resume without losing data.

However, if you have an I/O card in the PC card drive, you must reset the drive when you resume the device. You can configure the device to reset the drive after a suspend/resume cycle by running the APM_4M.EXE program.

To load APM_4M.EXE into memory

- Type this command at the DOS prompt:

  ```
  d:\apm_4m
  ```

  Or scan this bar code:

  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||

  D:\APM_4M

  You can add this command to your AUTOEXEC.BAT file to start APM_4M.EXE whenever you boot the reader:

  ```
  d:\apm_4m.exe
  ```

  Note: APM_4M.EXE is also available on the Application companion disk 3.

Preparing to Use SRAM Cards

To use an SRAM card in the PC card drive, you need to:

1. Configure the reader to use an SRAM card by selecting the SRAM card option on the MS-DOS Startup menu.

2. Format the SRAM card.

3. Use the SRAM card.

By default, your JANUS reader is configured to use SRAM cards. You can proceed to the procedure for formatting the SRAM card, unless you configured your reader to use another type of PC card. In that case, you need to configure the reader to use an SRAM card.

Formatting an SRAM PC Card

Follow these steps to format an SRAM card:

1. Insert the SRAM card in the PC card drive.

2. Type this command at the DOS prompt:

   ```
   format {drive:}
   ```

   where *drive* is the PC card drive. You are ready to use the SRAM card.

Using the SRAM PC Card

You can use standard DOS commands to copy, delete, and move files, and to create and remove directories on an SRAM card. To learn which DOS commands are available on the reader, see the MS-DOS Programs companion disk 2. For help using DOS commands, see any DOS manual.

For example, on a JANUS 2010 with a PCMCIA Back, you can copy the files from an SRAM card in the Type I PC card drive (F) to an SRAM card in the Type II PC card drive (G) by typing this command at the DOS prompt:

```
copy f:\*.* g:
```

To delete all the files on the SRAM card in drive G, type this command at the DOS prompt:

```
del g:\*.*
```

Replacing Lithium Batteries in an SRAM Card

Each SRAM card has a lithium battery to save data when the card is not in the reader. When an SRAM card's battery is low, the disk write icon flashes:

- every 1 second if the lithium battery is low on the SRAM card in the Type I PC card drive.

- every 2 seconds if the lithium battery is low on the SRAM card in the Type II PC card drive.
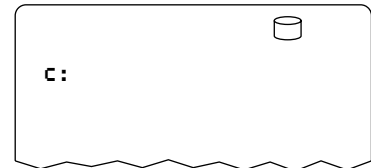
2010U.149

When the disk write icon flashes, you should save the data on the SRAM card and change the lithium battery as soon as possible.

Caution
If the lithium battery in the SRAM card goes low, you need to back up any data on the card before changing the battery. If the lithium battery goes dead, any data on the SRAM card is lost.

Conseil
Si la pile au lithium de la carte SRAM s'affaiblit, il faut faire une copie de sauvegarde de données stockées sur la carte avant de changer la pile. Si la pile lithium perd toute puissance, les données stockées sur la carte sont perdues.

To replace the lithium battery in the SRAM card

1. Copy any files you want to save from the SRAM card to another drive on the reader or to a host computer.

2. Remove the card from the reader. For help, see "Inserting and Removing PC Cards" earlier in this chapter.

3. Use the documentation that came with your SRAM card to replace the lithium battery.

4. Install the card in the reader. For help, see "Inserting and Removing PC Cards" earlier in this chapter.

5. Format the card. For help, see "Formatting an SRAM PC Card" earlier in this chapter.

6. Copy any files you saved in Step 1 back onto the SRAM card.

Managing the Power on the PC Card Drive

You can use a utility called CARDINFO.EXE to manage the power on the PC card drive. You can also use CARDINFO.EXE to get information about the card inserted in your JANUS reader.

You can run CARDINFO at any time to:

- display information about the type of card that is currently inserted in each PC card drive.

- turn on or off the power to a PC card drive when a PC card is installed in the drive.

- display the drive letter designation for your ATA PC card.

- display detailed information about the PC card and drive configuration, including the I/O ports, interrupt request (IRQ) resources, and memory areas that are being used by each card.

- display the latest error that occurred for a PC card that is installed in a drive.

To run CARDINFO on the reader, type one of these commands at the DOS prompt:

Command	Description
`cardinfo`	Displays information about the card inserted in each PC card drive, including the type of card, size, card manufacturer, and product name.
`cardinfo /off {:slot}`	Turns off the power to all the PC card drives. Use the slot option to turn off the power to only one PC card drive. The JANUS 2010 Type I PC card drive is slot 0; the Type II PC card drive is slot 1.
`cardinfo /on {:slot}`	Turns on the power to all the PC card drives. Use the slot option to turn on the power to only one PC card drive. The JANUS 2010 Type I PC card drive is slot 0; the Type II PC card drive is slot 1.
`cardinfo /c`	Displays information about the card in each PC card drive, including the type of card, size, card manufacturer, product name, and Card Services.
`cardinfo /v ¦more`	Displays extensive information about the card in each PC card drive, including the type of card, size, manufacturer, product name, Card Services, client, and card configuration.
	Use the DOS More switch because the output is usually more than one screen long.
`cardinfo /?`	Displays information about CARDINFO options.

Use CARDINFO to manage the reader's power when an I/O card is in the PC card drive. For example, a modem card draws power even when it is not in use, so you can conserve the NiCad battery pack by turning off the power to the PC card drive when you are not using the modem card.

To turn off the power to the PC card drive

• When you are not using the modem card, type this command:

  `cardinfo /off:1`

  Or scan this bar code:

CARDINFO /OFF

To turn on the power to the PC card drive

• When you are ready to use the modem card, type this command:

```
cardinfo /on:1
```

Or scan this bar code:

||||||||| |||| ||||| ||| ||||| ||||||| ||||| | |||| | ||| ||||| ||| || | ||| |||||| ||| |||
CARDINFO /ON

Managing the PC Card Drivers in the Startup Files

The PC card drivers and utilities are stored on the JANUS reader and the Application companion disk 3. These files control how the PC card drives operate, customize the reader to use the PC card software, and provide you with helpful tools.

Note: Your reader is customized to use the PC card drivers and cards as efficiently as possible. For help with advanced card configuration and power management, see the SystemSoft CardSoft 3.1 Software User's Guide, *which is stored as the executable zipped file CSUG_DOC.EXE on companion disk 3. The guide is in Microsoft Word 2.0 format.*

This section covers these topics:

• Drivers in CONFIG.SYS

• Drivers in AUTOEXEC.BAT

• Tips for Enabling PC Card Drivers

Drivers in CONFIG.SYS

Your CONFIG.SYS must contain these lines to support the PC card drive:

```
device=d:\cs.exe /poll 1
device=d:\csalloc.exe d:\csalloc.ini
install=d:\card_sr.exe
```

Note: If you delete or remark out these lines, you cannot use the PC card drives.

CONFIG.SYS also contains lines that support specific types of PC cards, such as ATA cards. To save conventional memory, you can comment out all the drivers except for the ones that apply to the type of card (or cards) currently installed in the reader.

Type of Card	Lines You Need to Activate the Device Drivers

ATA	`device=c:\atadrv.exe /s:2`
	`device=c:\mtddrv.exe`
	`device=d:\cardid.exe d:\cardid.ini`

Flash	`device=c:\mti1.exe`
	`device=c:\mti2p.exe`
	`device=c:\mtddrv.exe`
	`device=c:\ftl.exe (or: c:\ms-flash.sys)`

I/O	`device=d:\cardid.exe d:\cardid.ini`
SRAM	`device=c:\mtsram.exe` `device=c:\mtddrv.exe`

Drivers in AUTOEXEC.BAT

The AUTOEXEC.BAT file loads one of these drivers:

- IPM_4M.EXE for ATA, flash, and SRAM cards

- APM_4M.EXE for I/O cards

You load one or the other, but not both drivers at the same time. If you need to install both, install APM_4M.EXE because it does everything IPM_4M.EXE does.

Tips for Enabling PC Card Drivers

Consider these guidelines:

- If you are using two different types of PC cards in your JANUS 2010 reader, make sure you enable all the drivers in CONFIG.SYS for both types. Otherwise, one or both cards may not operate correctly.

- If you use several types of PC cards, you can expect to edit the CONFIG.SYS file often to activate and deactivate these device drivers. You may consider creating several versions of the CONFIG.SYS file, each of which supports a different type of card.

- If you are having trouble or if you want to customize your system, you can use the CONFIG.EXE configuration utility, which is stored on companion disk 3.

  For instructions, read the *SystemSoft CardSoft 3.1 Software User's Guide.* The guide is in Microsoft Word 2.0 format and stored as the executable zipped file CSUG_DOC.EXE on companion disk 3.

  Note: *You must run CONFIG.EXE on a PC, not on a JANUS reader.*

5

Configuring the Reader

This chapter discusses the reader's configuration parameters and files, explains how to configure the reader, describes how to restore the default configuration, and concludes by listing the configuration parameters.

About the Configuration Parameters

You can customize many operating characteristics of the JANUS reader, such as the volume of its beeper and the bar code symbologies it decodes. These characteristics are governed by configuration parameters. The values you set for the parameters determine how the reader operates.

By customizing the reader's configuration, you can set up the JANUS 2010 to operate easily and efficiently within your data collection system.

Note: To learn the purpose and syntax of each configuration command, see Chapter 12, "Configuration Command Reference." The commands are listed alphabetically.

The configuration parameters can be organized into three groups, which are described in the next sections:

- Choosing the Symbologies the Reader Will Decode
- Specifying How the Reader Will Communicate
- Controlling How the Reader Will Operate

Choosing the Symbologies the Reader Will Decode

This list contains all the bar code symbologies the reader can decode:

Codabar	Code 2 of 5	Interleaved 2 of 5 (I 2 of 5)
Code 11	Code 39	MSI
Code 128	Code 49	Plessey
Code 16K	Code 93	UPC/EAN

To ensure that the reader can operate quickly and efficiently, you should enable only the bar code symbologies that you are going to scan. If you enable multiple symbologies, the reader may on rare occasions decode a bar code according to the wrong symbology and produce erroneous results.

When you enable each bar code symbology, you may need to set a check digit, the length of the bar code label, or other options. For help, see Chapter 12, "Configuration Command Reference."

Specifying How the Reader Will Communicate

Before you can use the reader to communicate with another computer device, you must specify how the reader will transmit and receive data.

For an introduction to networking concepts, see "Planning the Network Connection" in Chapter 6. To learn how to configure the reader to fit into your network, see "Configuring the Reader for Communications" in Chapter 6.

Controlling How the Reader Will Operate

The operating parameters let you adjust the way the reader operates. By customizing the operating parameters, you can:

- set the reader to automatically shut off after a specified length of time.

- modify bar coded data using preambles, postambles, and the key code look-up table.

- enable or disable specific reader commands.

- change the duration, frequency, and volume of the beeper.

- control the display contrast, mode, setup, viewport movement, and backlight timeout.

- enable or disable the keypad clicker, Ctrl key functions, numeric keypad, and keypad caps lock.

- customize the way the scanner operates by selecting scan ahead data buffering, type of scanner devices, decode security level, scanner timeout value, and trigger modes.

About the Configuration Files

The parameter settings that are currently enabled on the reader comprise what is called the reader's current configuration or its online configuration. This current configuration may or may not be saved in a configuration file.

A configuration file is an ASCII text file that contains settings for some or all of the reader's configuration parameters. To see a sample configuration file and its format, see "Editing a Configuration File" later in this chapter.

Configuring the Reader With Configuration Files

To configure the reader with a configuration file, you load the file into IC.EXE and let IC.EXE configure the reader to match the parameters in the configuration file. You can use IC commands at the DOS prompt, or you can start the menu-driven IC.EXE application.

This manual uses the phrase "load the configuration file" to indicate this process of configuring the reader with a configuration file, even though technically you do not load the configuration file into the reader's memory.

A configuration file can contain settings for all the configuration parameters, or just a few. When you load a configuration file, only those parameters contained in the file are changed in the reader's current configuration. If the configuration file does not contain a setting for a parameter, the current setting remains in effect on the reader.

Creating Configuration Files

You can use the menu-driven IC.EXE to create configuration files. For help, see "Using the Interactive Configuration Application" later in this chapter.

Or you can type this command at the DOS prompt to create a configuration file that contains the reader's current configuration:

```
ic /s path\filename
```

where:

/s   saves the current configuration into a file.

path   is the drive and directory where you want to store the file.

filename   is the name of the configuration file.

For example, type this command:

```
ic /s e:\network\reader\janus.ini
```

The reader checks if the filename already exists. If it does, the reader prompts you to overwrite the existing file. If you choose Yes, the reader saves the current configuration in the file. If you choose No, the reader does not save the current configuration.

Creating Multiple Configuration Files

You can create multiple configuration files as long as each has a unique name and the .INI extension, such as JANUS.INI. Each configuration file can be customized for a specific application, environment, or task.

For example, you can create a file that contains the current configuration and edit the file to delete all parameters except the ones that specify the bar code symbologies the reader decodes. Now you can use this file to change the symbologies enabled on the reader without changing other parameters. You can create several configuration files, each of which enables a different set of symbologies.

You can also create configuration files that contain a subset of parameters: DISPLAY.INI for display parameters, NETWORK.INI for communications parameters, and BEEP.INI for beeper parameters.

Backing Up Your Configuration Files

You should create a backup copy of your configuration files to ensure that you have a record of each reader's configuration. Store the backups on a host computer, disk, or PC card for safekeeping.

You can also use the tables at the end of this chapter to record the options you select for each parameter.

How to Configure the Reader

You can configure the reader by using any of the methods described in detail in the next sections:

Using the Interactive Configuration Application (IC.EXE)   With menus and dialog boxes, IC.EXE lets you view and change the current configuration, create configuration files, and configure the reader with configuration files.

Configuring the Reader by Scanning Bar Codes   You can change the reader's current configuration by scanning Code 39 or Code 93 bar code labels that contain configuration commands. This is a fast, easy way to change the reader's configuration. You can scan the bar code labels in this manual, or you can create your own bar code labels.

Configuring the Reader With IRL Z Commands   You can change the reader's current configuration by running IRL programs that contain Z commands that modify the reader's configuration.

Configuring the Reader With PSK Functions   You can change the reader's current configuration by running PSK applications that contain IM_COMMAND functions that modify the reader's configuration.

Sending Commands From a Host Computer   You can change the reader's current configuration by sending configuration commands from a host computer to the reader. The host computer must be running an application that lets you send commands to the reader. The reader must be running an application that accepts configuration commands, such as the IRL Desktop or an application that uses the Reader Services input manager.

Editing a Configuration File   You can manually edit a configuration file with a standard ASCII text editor on a host computer or reader. Then you load the configuration file from the DOS prompt, or use IC.EXE to load the file.

Loading a Configuration File From the DOS Prompt   You can change the reader's current configuration by typing an IC command at the DOS prompt that configures the reader with the configuration file you specify.

Loading a Configuration File Whenever You Boot   You can add a command to AUTOEXEC.BAT that configures the reader with the configuration file you specify when you warm or cold boot the reader. If you do not use this feature, the reader returns to its default configuration during a boot.

Using the Interactive Configuration Application

The Interactive Configuration application (IC.EXE) is a menu-driven application that lets you create configuration files, configure the reader, and view system information. To start IC.EXE, type this command at the DOS prompt and press |enter ←| :

ic

Or scan this bar code:

|||||||||||||||||||||||||||||

IC

The main menu appears, displaying four menus:

```
            Configuration
  File   Sym   Com   Op
```

2010U.043
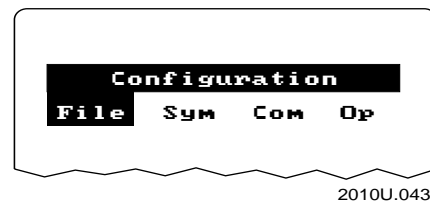
File   Select the File menu to load or save configuration files, or return to the default configuration. You can also display software versions, equipment information, and available memory. You quit IC.EXE by selecting Exit from this menu.

Sym   Select the Sym menu to choose the bar code symbologies that the reader can decode. For some symbologies, you must also configure the check digit and label length.

Com   Select the Com menu to choose a communications protocol for each COM port, define the parameters for each protocol, and activate one protocol.

Op   Select the Op menu to change the operating parameters for the reader. These parameters include automatically turning the reader on and off, display options, beeper control, keypad options, reader commands, and scanner operation.

Note: After you select a menu, you can press ⊘ to display the online help screen.

You can use the keystrokes described next to move around in IC.EXE, or you can scan bar code labels. For help, see "Scanning Bar Codes to Select Menu Options" in Appendix C.

Selecting Menus and Commands

Press ◀ or ▶ to select a menu name from the IC.EXE main menu. Then press [enter↵] to display the commands in the selected menu. In this example, you press ▶ ▶ [enter↵] to display the Op menu:
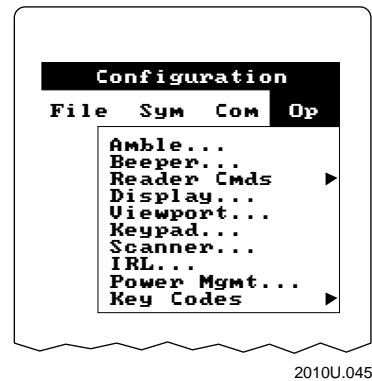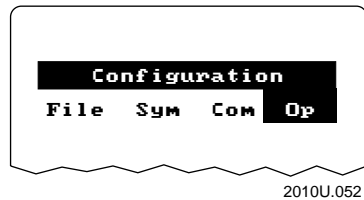
```
┌──────────────────────────┐
│   Configuration          │
│                          │
│  File  Sym  Com  Op      │
│                          │
└─────/\/\/\/\/\/\/\/\──────┘
```
2010U.052

```
┌──────────────────────────────┐
│      Configuration           │
│                              │
│   File  Sym  Com  Op         │
│        ┌──────────────────┐  │
│        │ Amble...         │  │
│        │ Beeper...        │  │
│        │ Reader Cmds    ▶ │  │
│        │ Display...       │  │
│        │ Viewport...      │  │
│        │ Keypad...        │  │
│        │ Scanner...       │  │
│        │ IRL...           │  │
│        │ Power Mgmt...    │  │
│        │ Key Codes      ▶ │  │
│        └──────────────────┘  │
└───────/\/\/\/\/\/\/\/\───────┘
```
2010U.045

Press ▲ or ▼ to select a command or option from a menu, and then press [enter↵] to execute the command or option.

Note: The Sym, Com, and Op menus list the configuration parameters you can configure. An asterisk (*) on the Sym or Com menu indicates that the symbology or protocol is active.

Filling In Fields, Marking Check Boxes, and Saving Changes

Screens list the options for each configuration parameter. Below each option name is either a toggle field or an entry field:

• In a toggle field, you press ◀ or ▶ to view the options for that field.

• In an entry field, you type a value into the field.

To move to the next field, press ▼ or [≡f] [space] or [F2]. To move to the previous field, press ▲ or [≡f] [≡f] [space] or [F9].

To learn how to enter ASCII control characters into fields, see "Entering ASCII Control Characters" in Appendix C. You can use ASCII control characters for some communications protocol characters, preambles, and postambles.

Some screens contain check boxes. Check boxes are used when more than one option can be selected at a time. Press [space] to mark or clear check boxes.

When you exit a screen, you can save or discard your changes:

- To exit a screen and save the changes, press ⌷enter← or choose OK.

- To exit a screen without saving the changes, press ⌷Esc or choose CANCEL.

Using a Series of Screens to Configure a Parameter

Sometimes IC.EXE presents a series of screens for one parameter. You must fill in fields or select options on each screen to configure the parameter.

For example, when you configure the User-Defined protocol for COM1, IC.EXE displays five screens of options for the protocol. Here are the first two screens in that series:

```
  Configuration
COM1/User-Defined

    (1 of 5)
BAUD:
  9600
PARITY:
  Even
DATA BITS:
  7
STOP BITS:
  1
                  NEXT

?  ↓ ↑
```
2010U.053

```
  Configuration
COM1/User-Defined

    (2 of 5)
DELAYS
  INTERCHARACTER:
    0 ms
  TURNAROUND:
    0 ms
  TIMEOUT:
    10 sec
  TRANSMIT ABORT
    00000 ms
    NEXT      PREV

?  ↓ ↑
```
2010U.063

You can tell that a screen is part of a series when you see the Next and Prev commands at the bottom of the screen. Next and Prev let you move forward to the next screen or back to the previous screen.
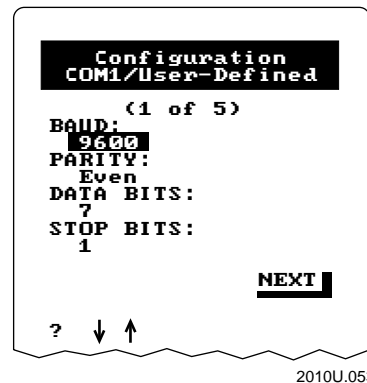
Pressing ⌷enter← while the cursor is in any field is the same as choosing Next. As described earlier, you press ✦ or ⌷≣f ⌷space or ⌀F2 to move to the next field in the screen. You press ✦ or ⌷≣f ⌷≣f ⌷space or ⌀F3 to move to the previous field.

Using Multiple Configuration Files

This example illustrates how to create and use multiple configuration files. Your JANUS reader will be used in two settings: in a tool room, where it is very quiet, and on the warehouse floor, where there is a substantial level of noise. You decide to create two INI files, one with the beeper volume set low and one with the beeper volume set high.

To create two INI files with different beeper volumes

1. Start IC.EXE, choose the Beeper command from the Op menu, and set the beeper volume to Quiet.

2. Choose the Save As command from the File menu and press `enter↵`. The Configuration screen appears.
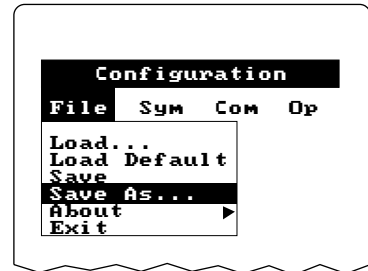
3. Specify a unique DOS filename for the INI file, such as QUIET.INI. Make sure the filename includes a path with a drive that you can write to, such as drive E:

   `e:\quiet.ini`

```
     Configuration
File  Sym  Com  Op
Load...
Load Default
Save
Save As...
About           ▶
Exit
```

2010U.067

Note: If you store the configuration file on drive E, the file will be erased when you cold boot the reader, load flash memory, put the reader in Storage mode, or execute CONFIG.SYS after changing the command that creates drive E.

4. Choose Exit from the File menu. This screen prompts you to update the online configuration before you exit:

   The online configuration (also called the current configuration) is the set of parameters currently enabled on the reader.

5. Press `enter↵` to choose Yes and apply the changes to the reader. The reader now beeps quietly.

6. Restart IC.EXE, choose Beeper from the Op menu, and change the beeper volume to Very Loud.

```
   Configuration
    Information
Update online
configuration?



   Yes      No

     Cancel
```
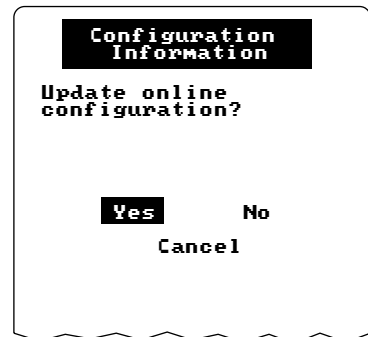
2010U.107

7. Choose Save As from the File menu, and specify a unique DOS filename for the INI file, such as VERYLOUD.INI.

8. Choose Exit from the File menu. Again, IC.EXE prompts you to update the online configuration before exiting.

9. Press ♦ to select No and press `enter↵`. The reader is still configured to beep quietly.

To configure the reader with the other INI file

When you are ready to make the reader beep very loudly, you need to configure the reader with the VERYLOUD.INI file. Follow either method:

• You can type this command at the DOS prompt and press ⌜enter↵⌝:

    ic /l e:\veryloud.ini

   For help, see "Loading a Configuration File From the DOS Prompt" later in this chapter.

• You can use IC.EXE, as follows:

   1. Start IC.EXE.

   2. Choose Load from the File menu and press ⌜enter↵⌝.

   3. Select VERYLOUD.INI from the list of filenames and press ⌜enter↵⌝.

   4. Choose Exit from the File menu and press ⌜enter↵⌝.

   5. When the reader prompts you to update the online configuration, press ⌜enter↵⌝ to choose Yes. The reader is now configured to beep loudly.

Configuring the Reader by Scanning Bar Codes

You can configure the reader by scanning bar code labels listed in this manual or by creating your own Code 39 or Code 93 bar code labels. For help, see Chapter 12, "Configuration Command Reference."

You can create bar code labels that contain more than one configuration command. For example, you can configure a reader for User-Defined protocol (PS0) on COM1 (IS1), with a baud rate of 2400 (IA4), even parity (IB1), 8 data bits (II8), and 2 stop bits (IC2) by scanning three bar codes. Each bar code starts with $+ (the Change Configuration command) followed by the syntax and option for each parameter.

Configure for COM1, Configure User-Defined Protocol

|||||||||||||||||||||||||||||||||||||||||

$+IS1PS0

Set to 2400 Baud, Even Parity, 8 Data Bits, and 2 Stop Bits

|||||||||||||||||||||||||||||||||||||||||||||||

$+IA4IB1II8IC2

Activate User-Defined Protocol

|||||||||||||||||||||||||||||||

$+PA0

The bar code labels change the reader's current configuration, but the changes are not saved to a configuration file.

Note: Quotation marks are required if parameter options conflict with the reader configuration commands. For example, to set a preamble to BV, use $+AD"BV". If you leave out the quotation marks ($+ADBV), the reader will mistake the command as setting the preamble (AD) to no characters and changing the beep volume (BV). Type two sets of quotation marks ("") to include one quotation mark in the command.

Configuring the Reader With IRL Z Commands

You can automatically configure the reader each time you run an IRL program by including Z commands in the program. These Z commands change the reader's current configuration, but the changes are not saved to a configuration file.

You should use this configuration method when you want to run an IRL program that requires the reader to have a specific configuration. Include Z commands at the beginning of the IRL program to modify the configuration, and then include more Z commands at the end of the program to restore the configuration to its previous settings.

For example, to change the display mode from buffered to transparent, insert this Z command in your IRL program:

```
Z"$+DM1"
```

When the IRL program reaches this command statement, it configures the reader and then executes the next command line in the program.

For help using Z commands, see your *IRL Programming Reference Manual.*

Configuring the Reader With PSK Functions

You can automatically configure the reader each time you run a PSK application by including IM_COMMAND functions in the application. These IM_COMMAND functions change the reader's current configuration, but the changes are not saved to a configuration file. For help using IM_COMMAND functions, see your JANUS PSK reference manual.

Sending Commands From a Host Computer

You can create reader applications that use Reader Services to accept configuration command strings from the host computer. These command strings change the reader's current configuration, but the changes are not saved to a configuration file.

For example, to configure the reader to decode Code 93, the host computer sends this command to a reader application:

```
$+CF1
```

The reader application must have been designed to accept command syntax from the host computer. The reader cannot accept commands when it is at the DOS prompt. For help using Reader Services, see your JANUS PSK reference manual.

Editing a Configuration File

A configuration file contains commands that modify the reader's configuration. You can manually edit a configuration file to add, delete, or modify the commands. Choose one of these methods:

*   Upload the configuration file to a host computer, edit the file using any standard ASCII text editor, and download the file to the reader.

*   Start Interlnk with the host computer as the client and the reader as the server. From the host computer, use any standard ASCII text editor to edit the configuration file on the reader.

*   Edit the configuration file on the reader with the EDLIN.EXE editor.

After editing the configuration file, you must configure the reader with the file. For help, see the next section, "Loading a Configuration File From the DOS Prompt."

This table lists and describes the commands in a sample INI file:

Command	Description
`AD""`	Preamble disabled.
`AE"\x0D"`	Postamble set to CR.
`BD"00050L"BD"00050H"`	Beep duration set to 50 ms for low and high beeps.
`BF"01200L"BF"02400H"`	Beep frequency set to 1200 Hz for low beeps and 2400 Hz for high beeps.
`BV"1"`	Beep volume set to quiet.
`CA"99"`	Interleaved 2 of 5 set to variable length with a check digit.

Make sure you follow these conventions when you edit the INI file:

- Type all configuration commands in uppercase, or else the reader cannot recognize them as commands.

- Enclose the command options in quotes (BV"1") when you are editing the configuration file. Quotation marks designate the end of a configuration command.

- Use double quotes to enter a quote in the command line. For example, the reader interprets AD""4 as a command to set the preamble (AD) to the characters " and 4.

For a list of configuration commands in alphabetical order by command syntax, see the "Configuration Commands by Syntax" table in Appendix A. For a complete description of each command, see Chapter 12, "Configuration Command Reference."

Loading a Configuration File From the DOS Prompt

You can type a command at the DOS prompt that causes IC.EXE to configure the reader with the specified configuration file without opening the menu-driven IC.EXE interface.

To load a configuration file from the DOS prompt

- Type this command at the DOS prompt:

  ```
  ic /l path\filename
  ```

  where:

  /l   loads the configuration file.

  path   is the drive and directory that contains the configuration file.

  filename   is the name of the configuration file you want to load.

  For example, type this command:

  ```
  ic /l e:\network\reader\janus.ini
  ```

  If there are no errors in the configuration file, the reader displays this message and configures the reader with the configuration file:

  ```
  Loading reader
  Configuration from
  {path\filename}
  ```

If the configuration file contains errors, the reader displays a message stating that the reader configuration is unchanged. The reader generates an error file with the same filename as the configuration file, but with the extension .ERR. This file lists the line numbers with the incorrect syntax and the reason for the error. The command SET IM_ERRPATH=E:\ in AUTOEXEC.BAT specifies that the error file is written to drive E. You can view the file by typing this command at the DOS prompt on drive E:

```
type filename.err
```

Loading a Configuration File Whenever You Boot

Each time you cold boot the reader, the reader returns to its default configuration. If you do not want the default configuration, you can add a command to AUTOEXEC.BAT that configures the reader with another configuration file every time you warm or cold boot the reader.

The reader's AUTOEXEC.BAT file is stored on drive C. Because drive C is a ROM drive resident in flash memory, you must use special utilities to change its contents. For help, see "Learning How to Change the Contents of Drive C" in Chapter 3.

To load a configuration file when you boot the reader

1. Create the configuration file to load when you boot the reader. For example, to save the current configuration in a file, start IC.EXE and select Save As from the File menu. Type a unique DOS filename for the file, such as JANUS.INI.

2. Add this line to the reader's AUTOEXEC.BAT file:

```
d:\ic /l path\filename
```

where:

/l   loads the configuration file.

path   is the drive and directory that contains the configuration file.

filename is the name of the configuration file you want to load.

For example, type this command:

```
d:\ic /l e:\network\reader\janus.ini
```

3. Copy the configuration file and new AUTOEXEC.BAT onto drive C.

   Or copy the configuration file onto a memory card in one of the PC card drives. Because the reader cannot boot from drive F, you should not copy the new AUTOEXEC.BAT file to drive F and expect the reader to boot from drive F.

   Note: If you store the configuration file on drive E, the file will be erased when you cold boot the reader, load flash memory, put the reader in Storage mode, or execute CONFIG.SYS after changing the command that creates drive E.

Restoring the Reader's Default Configuration

When you configure the reader according to the instructions presented in this chapter, the parameters remain in effect until you reconfigure the parameters or cold boot the reader.

You can return the reader to its default configuration, which is described in Appendix A. Choose one of these methods:

- Type this command at the DOS prompt and press ⏎ :

  ```
  ic /d
  ```

  Or scan this command at the DOS prompt:

  IC /D

- Use IC.EXE to restore the default configuration. At the DOS prompt, type `ic` and press ⏎ . Choose the Load Default command from the File menu. Then choose Exit from the File menu. When prompted to update the online configuration, choose Yes.

- Cold boot the reader. During a cold boot, the reader returns to its default configuration. For help, see "Cold Booting the Reader" in Chapter 9.

  Note: The reader does not return to its default configuration during a cold boot if you followed the instructions in the previous section, "Loading a Configuration File Whenever You Boot."

Recording Your Reader's Configuration

These tables list all of the configuration parameters, their options, and where to find them in IC.EXE. The default setting for each parameter is identified in ***bold italics*** in these tables.

You should have an accurate record of the reader's configuration settings in case the reader is ever reset and the configuration setup is lost:

- You can back up the reader's configuration files and store the backups on another reader, a host computer, a PC card, or a disk.

- You can record the configuration on the following pages by circling the option you chose for each parameter or writing the value.

Bar Code Symbologies Table

Parameter	Options	Location in IC.EXE
Codabar	Disabled ABC ***Standard***	Sym menu, Codabar option
Start/Stop	Concatenated Discard ***Retain ABCD*** Retain DC1-DC4	Sym menu, Codabar option
Code 11	Disabled One check digit ***Two check digits***	Sym menu, Code 11 option
Code 16K	Disabled ***Standard*** With function code 1	Sym menu, Code 16K option
Code 2 of 5	***Disabled*** 3 bar start/stop, label length 2 bar start/stop, label length	Sym menu, 2 of 5, I2 of 5 option
Code 39	Disabled ***No check digit*** Check digit HIBC AIAG check digit	Sym menu, Code 39 option
Check digit	***Discard*** Retain	Sym menu, Code 39 option
ASCII	Non-full ASCII ***Full ASCII*** Mixed-full ASCII	Sym menu, Code 39 option
Code 49	Disabled ***Enabled***	Sym menu, Code 49 option
Function Code 1	***Disabled*** ASCII character	Sym menu, Code 49 option

---

Bar Code Symbologies Table (continued)

Parameter	Options	Location in IC.EXE
Function Code 2	Disabled ASCII character ***CR LF***	Sym menu, Code 49 option
Function Code 3	***Disabled*** ASCII character	Sym menu, Code 49 option
Code 93	Disabled ***Enabled***	Sym menu, Code 93 option
Code 128	Disabled ***Standard*** UCC/EAN-128	Sym menu, Code 128 option
Interleaved 2 of 5	Disabled Fixed length # Variable length, no check digit Case Code, check digit ***Variable length, check digit***	Sym menu, 2 of 5, I2 of 5 option
MSI	***Disabled*** No check digit 1 modulus 10 check digit 2 modulus 10 check digits	Sym menu, MSI option
Check digits	***Discard*** Retain	Sym menu, MSI option
Plessey	***Disabled*** Discard check digit Retain check digit	Sym menu, Plessey option
UPC/EAN		Sym menu, UPC/EAN option
Check digit	Discard ***Retain***	Sym menu, UPC/EAN option
EAN-8	Disabled ***Enabled***	Sym menu, UPC/EAN option
Supplementals	***Yes*** No	Sym menu, UPC/EAN option
UPC-A/EAN-13	Disabled ***Enabled*** UPC-A only	Sym menu, UPC/EAN option
UPC-E	Disabled ***Enabled***	Sym menu, UPC/EAN option
Number system digit	Discard ***Retain***	Sym menu, UPC/EAN option
UPC-A leading zero	Discard ***Retain***	Sym menu, UPC/EAN option

Communications Table

Parameter	Options	Location in IC.EXE
Communications Dock Port	Auxiliary ***Network***	Com menu, COM1 or COM2 option, Dock Port option
COM Port, Select	***COM1*** COM4	Not available in IC.EXE
COM Port, UART Restore	***00 Hex*** Hex value	Com menu, COM1 or COM2 option UART Restore option
Communications Protocol Configure	User-Defined ***Point-to-Point*** Polling Mode D Multi-Drop PC Standard	Com menu, COM1 or COM2 option, Configure option
Communications Protocol, Activate	User-Defined ***Point-to-Point*** Polling Mode D Multi-Drop PC Standard None	Com menu, COM1 or RF option, Activate option
Communications Protocol, User-Defined Multi-Drop	***Disabled*** Enabled	Com menu, Configure option, User-Defined protocol

Communications Protocol Parameters Table

Parameter	Options	Location in IC.EXE
Address, Multi-Drop	A to Z, 0 to 5 ***A***	Com menu, COM1 or COM2 option, Multi-Drop protocol
AFF	***Disabled*** Any ASCII character	Com menu, COM1 or COM2 option, User-Defined protocol
Baud Rate	110 300 600 1200 2400 4800 ***9600*** 19200 38400	Com menu, COM1 or COM2 option, All protocols except Multi-Drop
Data Bits	***7 bits*** 8 bits	Com menu, COM1 or COM2 option, All protocols except Polling Mode D
EOF	***Disabled*** Any ASCII character	Com menu, COM1 or COM2 option, User-Defined protocol
EOM Transmit	Disabled Any two ASCII characters ***CR and LF***	Com menu, COM1 or COM2 option, User-Defined protocol
EOM Receive	Disabled Any two ASCII characters ***CR and LF***	Com menu, COM1 or COM2 option, User-Defined protocol
EOR	***Disabled*** Any two ASCII characters	Com menu, COM1 or COM2 option, User-Defined protocol
Flow Control	***None*** XON/XOFF response XON/XOFF control XON/XOFF response and control CTS checking/RTS control	Com menu, COM1 or COM2 option, User-Defined protocol Point-to-Point protocol Polling Mode D protocol

Communications Protocol Parameters Table (continued)

Parameter	Options	Location in IC.EXE
Intercharacter Delay	*0* 1 ms 2 ms 5 ms 10 ms 20 ms 50 ms 100 ms	Com menu, COM1 or COM2 option, User-Defined protocol Point-to-Point protocol
IRL BAK	Disabled Any ASCII character *BEL*	Com menu, COM1 or COM2 option, User-Defined protocol
IRL End Program Block	Disabled Any ASCII character *SO (shift out)*	Com menu, COM1 or COM2 option, User-Defined protocol
IRL EOP	Disabled Any ASCII character *SYN (synchronous idle)*	Com menu, COM1 or COM2 option, User-Defined protocol
IRL PAK	Disabled Any ASCII character *RS (record separator)*	Com menu, COM1 or COM2 option, User-Defined protocol
IRL PSS	Disabled Any ASCII character *CR (carriage return)*	Com menu, COM1 or COM2 option, User-Defined protocol
IRL RUN	Disabled Any ASCII character *DC2 (device control 2)*	Com menu, COM1 or COM2 option, User-Defined protocol
IRL SOP	Disabled Any ASCII character *SI (shift in)*	Com menu, COM1 or COM2 option, User-Defined protocol
LRC	*Disabled* Enabled	Com menu, COM1 or COM2 option, User-Defined protocol
NEG	*Disabled* Any ASCII character	Com menu, COM1 or COM2 option, User-Defined protocol
Parity	None *Even* Odd Mark Space	Com menu, COM1 or COM2 option, All protocols except Polling Mode D

Communications Protocol Parameters Table (continued)

Parameter	Options	Location in IC.EXE
POL	*Disabled* Any ASCII character	Com menu, COM1 or COM2 option, User-Defined protocol
Records Per Block	*All records transmitted in one block* 1-99 records transmitted per block	Com menu, COM1 or COM2 option, User-Defined protocol
REQ	*Disabled* Any ASCII character	Com menu, COM1 or COM2 option, User-Defined protocol
RES	*Disabled* Any ASCII character	Com menu, COM1 or COM2 option, User-Defined protocol
SEL	*Disabled* Any ASCII character	Com menu, COM1 or COM2 option, User-Defined protocol
SOM	*Disabled* Any ASCII character	Com menu, COM1 or COM2 option, User-Defined protocol
Stop Bits	*1 bit* 2 bits	Com menu, COM1 or COM2 option, User-Defined protocol Polling Mode D protocol PC Standard protocol
Timeout Delay	5 ms 100 ms 500 ms 2 sec *10 sec* 20 sec 40 sec 60 sec no timeout	Com menu, COM1 or COM2 option, User-Defined protocol Point-to-Point protocol
Transmit Abort Timeout	*Disabled (0)* 1-65000 ms	Com menu, COM1 or COM2 option, User-Defined protocol Multi-Drop protocol

Communications Protocol Parameters Table (continued)

Parameter	Options	Location in IC.EXE
Turnaround Delay	*0* 1 ms 2 ms 5 ms 10 ms 20 ms 50 ms 100 ms	Com menu, COM1 or COM2 option, User-Defined protocol Point-to-Point protocol

Operations Table

Parameter	Options	Location in IC.EXE
Automatic Shutoff	Disabled (0) 15 sec *1 minute* 1 - 60 minutes	Op menu, Power Mgmt option
Beep Duration	1 ms to 60,000 ms *High beep 50 ms* *Low beep 50 ms*	Op menu, Beeper option
Beep Frequency	20 to 20,000 Hz *High beep 2000 Hz* *Low beep 1000 Hz*	Op menu, Beeper option
Beep Volume	Off Quiet *Normal* Loud Very loud	Op menu, Beeper option
Command Processing	Disable all reader commands *Enable all reader commands* Enable override Disable override	Op menu, Reader Commands option
Enable/Disable specific commands	Abort program (IRL) Backlight Backspace Change Configuration Clear Clear File (IRL) Cursor to Viewport Download Program (IRL) End Change Configuration Enter Enter Accumulate mode	Op menu, Reader Commands option, Enable option

---

Operations Table (continued)

Parameter	Options	Location in IC.EXE
Enable/Disable specific commands (continued)	Enter Key Code Exit Accumulate mode IRL Program Resume Laser Off Laser On Multiple-Read Labels Prepare for Reboot Reboot Receive File (IRL) Run Program (IRL) Set Clock Transmit File (IRL) Viewport to Cursor Viewport Down Viewport End Viewport Home Viewport Left Viewport Page Down Viewport Page Up Viewport Right Viewport Up	
Decode Security	Low ***Moderate*** High	Op menu, Scanner option
Display Backlight Timeout	Disabled (0) 1 - 60 seconds ***10 seconds***	Op menu, Display option
Display Contrast	0 - 7 ***3***	Op menu, Display option
Display Mode, IRL	***Buffered*** Transparent	Op menu, IRL option
Display Setup	***25 x 80*** 16 x 20 8 x 20 16 x 10 8 x 10	Op menu, Display option
Video mode	0 1 2 ***3***	Op menu, Display option

Operations Table (continued)

Parameter	Options	Location in IC.EXE
Scroll line	8 ***16*** 25	Op menu, Display option
Character height	***1x (normal)*** 2x (double)	Op menu, Display option
Internal Drive Reset	***Do not reset card*** Reset card Prompt for reset	Op menu, Power Mgmt option
Key Code Look-Up Table	Keys changed ***No modifications***	Op menu, Key Codes option
Keypad Caps Lock	Enabled ***Disabled***	Op menu, Keypad option
Keypad Clicker	Disabled ***Enabled***	Op menu, Keypad option
Keypad Ctrl Key Functions	***Enabled*** Disable Ctrl-Alt-Del Disable Ctrl combinations	Op menu, Keypad option
Keypad, Numeric	Disabled ***Enabled***	Op menu, Keypad option
Postamble	***<CR>*** Disabled (no char.) Any 25 ASCII characters	Op menu, Amble option
Preamble	***Disabled (no characters)*** Any 25 ASCII characters	Op menu, Amble option
Scan Ahead	***Disabled*** Enabled	Op menu, Scanner option
Scanner Devices	***All compatible scanners*** 1461 CCD 1500 1515 1545 Symbol scanner	Op menu, Scanner option
Scanner Mode	***One-Shot mode*** Automatic mode	Op menu, Scanner option
Scanner Redundancy	None ***Normal*** High	Op menu, Scanner option

Operations Table (continued)

Parameter	Options	Location in IC.EXE
Scanner Timeout	***Disabled (0)*** 1-60 seconds	Op menu, Scanner option
Scanner Trigger	***Level*** Edge	Op menu, Scanner option
Viewport Movement Keys	***Enabled*** Disabled	Op menu, Keypad option
Viewport Movement Mode	***Auto*** Manual	Op menu, Viewport option
Viewport Movement Steps	1 - 20 horizontal ***10 horizontal*** 1 - 9 vertical ***9 vertical***	Op menu, Viewport option

6

Networking the Reader

This chapter introduces networking concepts and explains how to use COM ports, configure the reader for communications, run InterInk, use Communications Manager, and download applications with binary file transfer (BFT).

How the JANUS 2010 Fits Into Your Network

The JANUS reader is a versatile hand-held computer that you can easily add to your network or distributed data collection system. For example, you can connect your JANUS 2010 directly to another reader or computer, enabling both computers to share files, data, and programs.

Two Readers Communicating Through Their Optical Ports
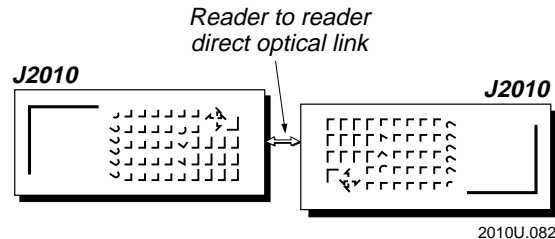
Reader and PC Communicating Through Direct Cabling
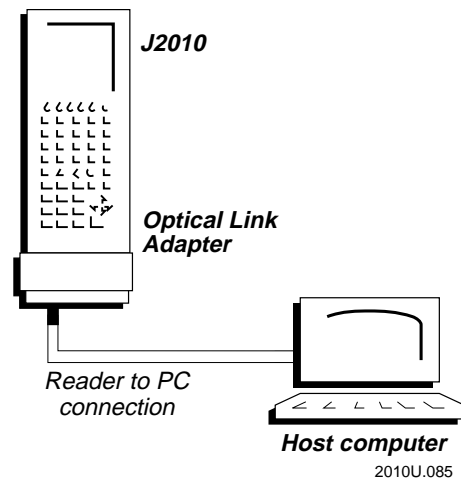
JANUS Readers in an Ethernet and CrossBar Data Collection Network

Mainframe

File server

CRT terminals

Ethernet

9154/9161 CrossBar Controller

PC

JANUS
*Communications dock
hardwired to
CrossBar controller*

JANUS
*Communications dock
hardwired to
CrossBar controller*

2010U.094

JANUS
*Communications dock
hardwired to PC*
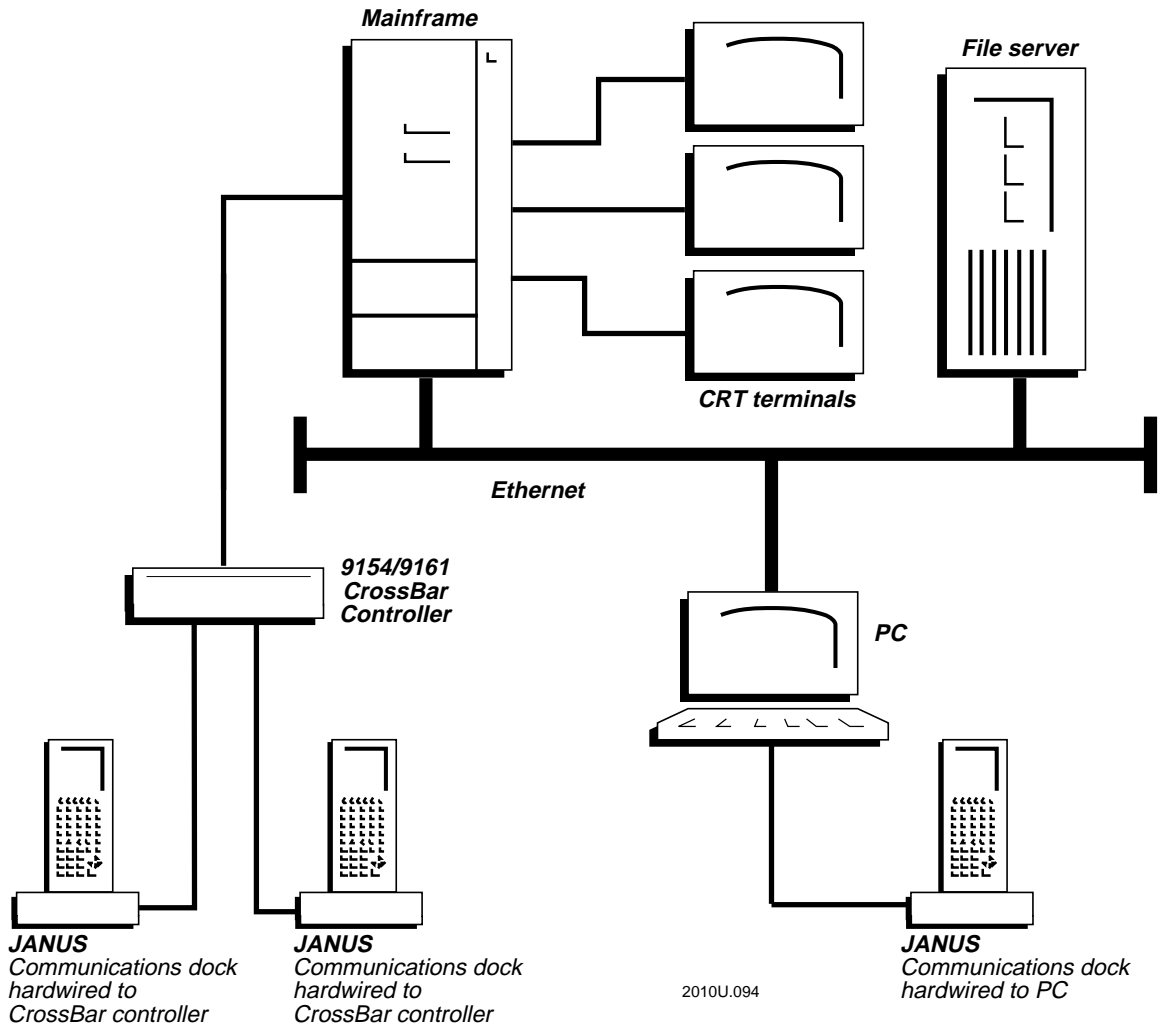
You can make the JANUS 2010 an end device in your local area network or distributed data collection system. The reader is often used as a downline data collection computer connected to powerful upline systems.

JANUS Readers in a Radio Frequency (RF) Data Collection Network

9180
Network
Controller

Host computer

9181 Base
Radio Unit

9183
Repeater

J2010 with
an RF Back

JR2020 (RF)
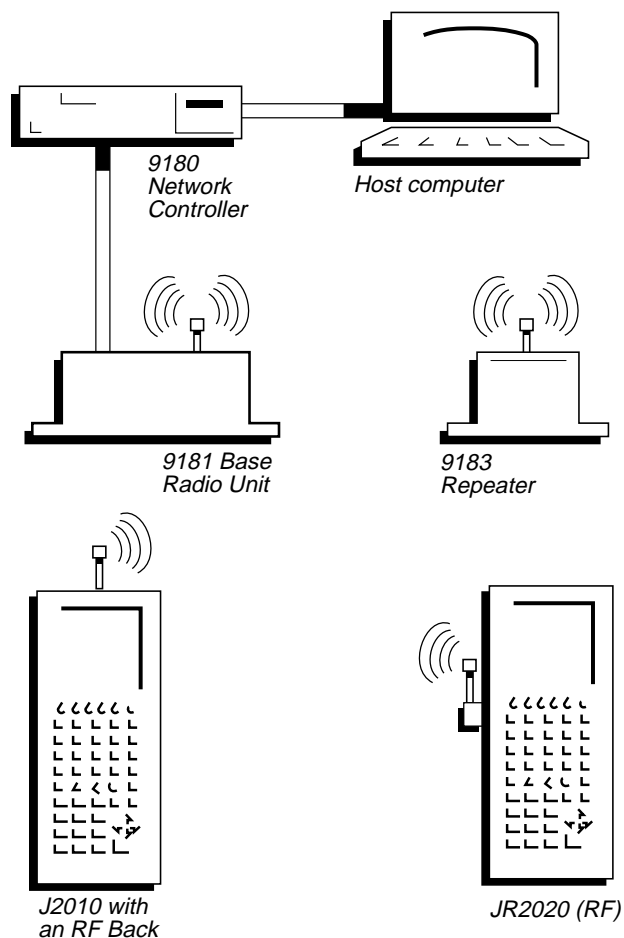
2010U.093

You can use a JANUS 2010 with an RF back as an end device in your RF network. For help, see your JANUS RF documentation.

Working With JANUS COM Ports

Communications ports, also called COM ports, are locations from which data can be passed into and out of the reader. COM ports offer serial communications, which means that data is transmitted one bit at a time over a single line from one computer to another. The next sections cover these topics:

*   Identifying JANUS COM Ports

*   Examining the COM1 Optical Port Signals

*   Understanding How IRQs Affect COM Ports

*   Designating the Scanner Port as COM2

Identifying JANUS COM Ports

This illustration identifies the COM ports on the reader, and the table explains how each is designated as a COM port.

COM2
Scanner port

Logical COM4

COM4
External PC card drive containing a modem card

J2010 with a PCMCIA Back

J2010 with an RF Back

COM1
Optical port

2010U.087
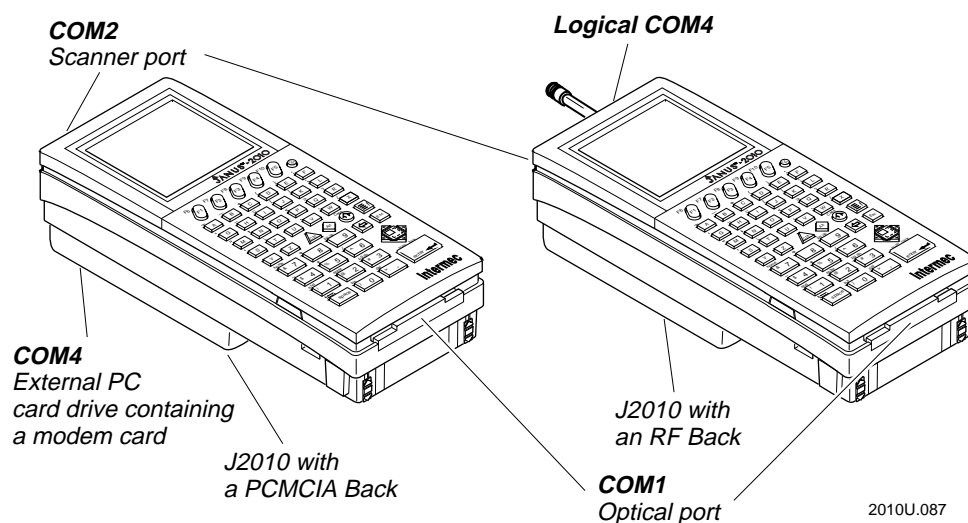
Port	How Is it Designated as a COM Port?
COM1	By default.
COM2	Use IC.EXE or scan two Communications Port configuration commands: Scanner or COM2 (IX), and UART Restore (IW).
COM4	Use the modem card's configuration tool.
Logical COM4	By default in JANUS 2010 with RF back.

Note: Intermec recommends that you do not designate any COM port as COM3. For details, see "Understanding How IRQs Affect COM Ports" later in this chapter.

Examining the COM1 Optical Port Signals

The reader's COM1 is an optical serial port. You can communicate through COM1 using a communications dock, optical link adapter, or another reader. This illustration shows the optical port's signals:

COM 1
Optical port

Request to Send
Clear to Send
Port Select
Receive Data
Transmit Data

2010U.183
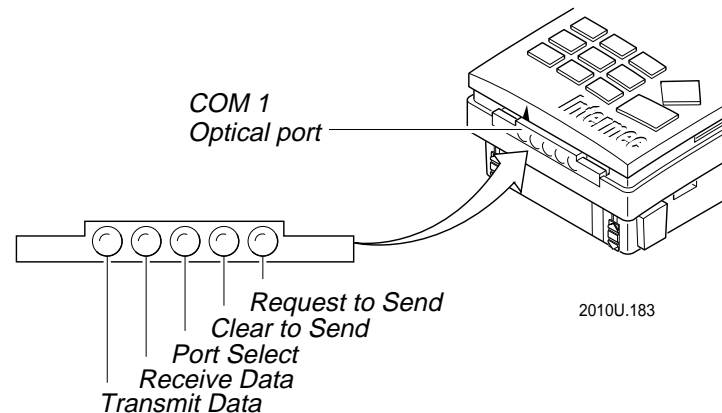
Understanding How IRQs Affect COM Ports

According to the industry standard architecture (ISA) for PCs, the COM ports on a PC must share hardware interrupt requests (IRQs). Because your JANUS reader is PC compatible, the reader's COM ports also share IRQs:

IRQ3 is assigned to both COM2 and COM4.

IRQ4 is assigned to both COM1 and COM3.

The ISA practice of sharing IRQs causes limitations on the JANUS readers:

• The Intermec protocol handlers, PHIMEC and PHPCSTD, cannot share IRQs. You can load PHIMEC or PHPCSTD only on COM1.

• The Intermec RF protocol handler (RFPH) uses "logical COM ports." RFPH designates the RF port as "logical COM4" but does not use IRQ3. Instead, IRL uses the logical port numbers to direct transmits and receives. For example, X4P transmits using "logical COM4."

• Intermec recommends that you do not designate any JANUS port as COM3. Because COM1 and COM3 share an IRQ, you cannot use COM1 if you use COM3.

• You may experience an IRQ conflict if you use COM2 and COM4 at the same time, because the two ports share IRQ3. Whether you experience a conflict depends on the third-party software you use on COM2 and COM4.

Designating the Scanner Port as COM2

If you do not need to connect a scanner to the JANUS 2010, you can designate the scanner port as COM2 and take advantage of another communications port. The scanner port is a modular connector on the top of the reader.

Scanner port or
COM2

2010U.171
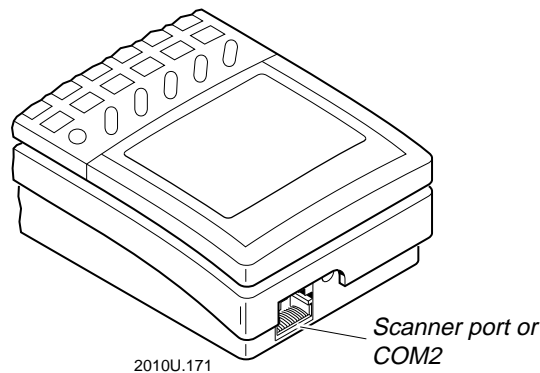
You must use the COM2 Hardware Adapter (Part No. 061799) to use the scanner port as COM2. For details, see the *COM2 Adapter Quick Reference Guide.*

You can designate the scanner port as COM2 with these two commands, which are described in Chapter 12:

• Communications Port, UART Restore

• Communications Port, Choose Scanner or COM2

You can also use IC.EXE to designate the scanner port as COM2 by following these steps:

1. Start IC.EXE and choose COM2 from the COM menu. The Configuration COM2 screen appears.

2010U.172
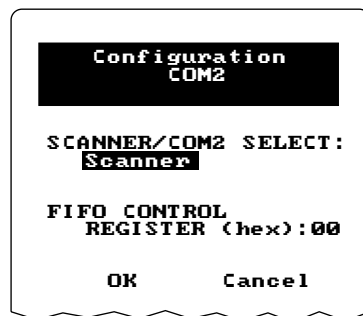
2. Set the SCANNER/COM2 SELECT parameter to COM2.

3. Exit IC.EXE. When prompted, save the changes to the online configuration.

For help using IC.EXE, see Chapter 5, "Configuring the Reader."

Planning the Network Connection

In most networking and data communications situations, the JANUS reader uses a communications application, communications protocol, and protocol handler to communicate with another computer device.

What is a communications application? A communications application is a software program that lets the reader communicate with another computer device. Many specialized communications applications are available because there are many specialized data communications tasks to be performed. For example, a communications application may establish a connection with another computer, transfer files, and perform error checking—or it may make remote directories and files available to the local user.

Communications applications usually require communications protocols and protocol handlers to handle the actual transmission of data. However, you do not need a communications protocol or protocol handler if the application will access the COM port directly.

What is a communications protocol? Communications protocols determine exactly how data is transmitted between the reader and the connected device. Each protocol has parameters you can set, such as baud rate and parity. Both the reader and the connected device must use the same protocol and parameter settings to communicate properly.

What is a protocol handler? Protocol handlers are programs you run only on the JANUS reader. The protocol handler transmits and receives data in the manner specified by the communications protocol. Each protocol handler is used with a specific communications protocol.

The next sections explain how to choose a communications application, communications protocol, and protocol handler for each COM port on the reader.

Choosing a Communications Application

You can use one of the three communications applications provided with your reader, you can create a JANUS PSK communications application, or you can purchase a third-party communications application:

IRL Desktop You can use the IRL Desktop to transfer IRL programs and IRL data files between the reader and a host computer. For help, see Chapter 7, "Working With IRL."

Interlnk You can use this DOS utility to access the drives on the host computer as if they are on the reader, and vice versa. For help, see "Running Interlnk to Transfer Files" later in this chapter.

Communications Manager   You can use Communications Manager to transmit and receive data files, and to request COM port and protocol status. For help, see "Running Communications Manager" later in this chapter.

JANUS PSK communications application   You can create your own communications application using the software libraries provided with the JANUS Programmer's Software Kit. For help, see your JANUS PSK reference manual.

File transfer application for BFT   You can use the file transfer application to transfer binary files. For help, see "Downloading Applications Across the Network" later in this chapter.

Third-party communications application   You can use a third-party communications application that conforms to the requirements of the JANUS reader.

Choosing a Communications Protocol

The reader can communicate in any of seven configurable protocols. The protocols are introduced briefly here. For details about their characteristics and parameters, see "Communications Protocol, Configure" in Chapter 12.

Multi-Drop Protocol   Multi-Drop follows the same protocol sequences as Polling Mode D with the extension of device addressing, which allows up to 32 devices on one 4-wire RS-485 twisted pair line. Multi-Drop protocol is typically used in CrossBar networks. Due to timeout parameters, the baud rate must be 2400 or higher.

No Protocol   No Protocol is for communications applications, such as Interlnk, that directly access the COM port instead of using a protocol handler. When you do not use a protocol, you can switch between direct COM port access and using a protocol handler.

PC Standard Protocol   PC Standard handles data transfer on a character-by-character basis or by either filling a receive buffer or transmitting a buffer of data. This protocol is designed to be compatible with the standard PC BIOS functions. The one exception is that the PC Standard protocol can buffer data that is received to avoid losing characters if a program has not checked for data recently.

Point-to-Point Protocol   Point-to-Point is an unsolicited protocol in which the reader transmits data whenever it has something to transmit. The data is followed by a CR LF as the EOM characters. The reader is always in a receiving state and does not wait for select commands. This protocol does not perform any error checking or acknowledgment handshaking.

Point-to-Point protocol is typically used to connect the reader to a CRT terminal or host computer. Since Point-to-Point is an unsolicited protocol, you can initiate the transmit command from the reader or the host.

Polling Mode D Protocol   Polling Mode D requires the host computer to ask the reader for data it might have (polling) and to request to send data to the reader (selecting). PC-IRL uses this protocol.

RF Protocol   RF Protocol is used in radio frequency (RF) networks only. For details, see your JANUS RF documentation.

User-Defined Protocol   User-Defined is a powerful protocol because you can configure the protocol to your own requirements. For example, you can configure User-Defined to act like a Point-to-Point protocol, except that it requires an LRC and an acknowledgment from the receiver. You can also define the communications characters such as SOM, POL, or SEL, or disable these characters by setting them to null.

You can also use User-Defined protocol to define User-Defined Multi-Drop protocol. In User-Defined Multi-Drop, you must set the POL and SEL protocol characters in a predetermined combination. For help, see "POL and SEL Combinations for Multi-Drop Protocol" in Appendix C.

Choosing a Protocol Handler

There are three protocol handlers:

PHIMEC   The Intermec protocol handler. PHIMEC lets you communicate with other Intermec devices such as concentrators.

PHPCSTD   The PC Standard protocol handler. PHPCSTD provides low-level communications abilities and protocol services at the DOS level for non-communications software, including byte-by-byte transfer and status information.

RFPH   The RF protocol handler. RFPH lets you communicate with devices in an RF network.

You will use each protocol handler with a specific communications protocol:

Use This Protocol Handler	With This Communications Protocol
PHIMEC	User-Defined Protocol
	Point-to-Point Protocol
	Polling Mode D Protocol
	Multi-Drop Protocol
PHPCSTD	PC Standard Protocol
RFPH	RF Protocol

Note: You do not load a protocol handler if you choose No Protocol as your communications protocol. For example, if you decide to use the Interlnk communications application, you do not need a communications protocol or protocol handler, so you choose No Protocol and do not load a protocol handler.

PHIMEC and PHPCSTD are not loaded when you boot your reader because they use a lot of conventional memory. RFPH is loaded when you boot a JANUS 2010 with an RF back.

When you load a protocol handler that corresponds to the active protocol, the active protocol tells the protocol handler how to communicate. For help, see "Loading and Unloading a Protocol Handler" later in this chapter.

Configuring the Reader for Communications

Prepare the reader to communicate with another device by performing these steps for every reader COM port that you want to communicate through:

1. Choose a COM port to configure. Decide which communications application, communications protocol, and protocol handler to use for that COM port. For help, see "Working With JANUS COM Ports" and "Planning the Network Connection" earlier in this chapter.

2. Select the COM port.

3. Configure the communications protocol(s) for the COM port.

4. Activate one communications protocol for the COM port.

5. Load the protocol handler for the COM port.

6. If you do not load a protocol handler, you may need to specify a value to restore the UART FIFO control register for the COM port.

7. Connect the reader to the device it will communicate with.

8. Repeat Steps 1 through 7 for every COM port you want to configure.

Steps 2 through 7 are described in detail in the next sections.

Selecting the COM Port

Begin configuring the reader by selecting a COM port. All changes you make
in the reader's configuration that relate to communications are applied to the
selected COM port until you select another COM port.

To select the reader's COM port

1. Decide which reader COM port to use. For help, see "Identifying JANUS
   COM Ports" earlier in this chapter.

2. Select the reader's COM port with the Communications Port, Select COM
   Port command. The reader will apply all subsequent changes in its
   communications configuration to the selected port.

   For help, see "Communications Port, Select COM Port" in Chapter 12.

Configuring the Communications Protocols

Next, identify and configure one or more communications protocols to use on
the selected COM port.

To configure a communications protocol or protocols for a COM port

1. Select the communications protocol with the Communications Protocol,
   Configure command. The reader applies all subsequent changes in its
   communications configuration to the selected protocol. For help, see
   "Communications Protocol, Configure" in Chapter 12.

   Note: For a CrossBar network, configure the reader for Multi-Drop protocol.

2. Set the parameters (such as baud rate) for the communications protocol.
   Make sure the values you set for the reader match the values set for the
   device it will communicate with.

   There are three ways to set communications parameters:

   • You can use IC.EXE.

   • You can scan the configuration commands listed in Chapter 12.

   • You can use DOS commands. For example, you can type the MODE
     command at the DOS prompt, or an application using the COM port
     can execute standard DOS commands.

The method you choose depends on the COM port, as follows:

Methods for Setting Communications Parameters

COM Port	Use IC.EXE?	Scan Commands?	Type DOS Commands?
COM1	Yes	Yes	Yes
COM2	No	No	Yes
RF (logical COM4)	Yes	Yes	No
COM4	No	Yes	Yes

Note: You cannot set communications parameters for COM2 by scanning configuration commands because the scanner port is functioning as COM2, not as a scanner.

3. Repeat Steps 1 and 2 for every communications protocol you want to configure for the selected COM port.

Here are the parameters you can set for each communications protocol:

Multi-Drop Protocol Parameters

• Baud rate, parity, and data bits
• Transmit abort timeout
• Address, multi-drop

PC Standard Protocol Parameters

• Baud rate, parity, data bits, and stop bits

Point-to-Point Protocol Parameters

• Baud rate, parity, data bits, and stop bits
• Flow control
• Intercharacter delay, turnaround delay, and timeout delay
• Transmit abort timeout

Polling Mode D Protocol Parameters

• Baud rate
• Flow control
• Transmit abort timeout

User-Defined Protocol Parameters

- Baud rate, parity, data bits, and stop bits
- Flow control and LRC
- Intercharacter delay, turnaround delay, and timeout delay
- Transmit abort timeout
- SOM and EOM
- AFF, NEG, POL, REQ, RES, and SEL
- EOF, EOR, and records per block
- IRL parameters: BAK, End, EOP, PAK, PSS, Run, and SOP
- User-Defined, Multi-Drop Enable

Activating One Communications Protocol

A COM port can only use one communications protocol at a time. You designate the communications protocol that a port will use when you activate the communications protocol. You must activate one communications protocol for the COM port.

To activate one communications protocol for a COM port

- Execute the Communications Protocol, Activate command to activate the communications protocol. For help, see "Communications Protocol, Activate" in Chapter 12.

Loading and Unloading a Protocol Handler

You can load protocol handlers in several ways:

- Manually load them at the DOS prompt.
- Load them from AUTOEXEC.BAT when you boot the reader.
- Include them in a batch file that also executes your program.
- Load them when you start IRL Desktop or Communications Manager.

Note: A protocol handler is active when its corresponding communications protocol is active. For example, if the PC Standard protocol handler is loaded, it will not become active until you use the Communications Protocol, Activate command to activate the PC Standard protocol.

If you are using a third-party communications application that directly accesses the COM port, do not load a protocol handler. Instead, activate No Protocol in the reader's configuration. You cannot download reader configuration commands from the host computer when using third-party software.

Loading and Unloading a Protocol Handler at the DOS Prompt

You can load the protocol handlers from the DOS command line. You should unload the protocol handler when you are finished to maximize memory.

To load a protocol handler

• Type this command at the reader's DOS prompt:

protocol_handler port

where:

protocol_handler   is the protocol handler you are loading:

PHIMEC   Intermec protocol handler
PHPCSTD   PC Standard protocol handler
RFPH   RF protocol handler

port   is the number of the COM port for which you are loading the protocol handler.

For example, to load the Intermec protocol handler on COM1, type this command at the DOS prompt:

phimec 1

Or scan this bar code:

PHIMEC 1

To unload a protocol handler

• Type this command at the DOS prompt:

unload *protocol_handler port*

For example, to unload the Intermec protocol handler from COM1, type this command at the DOS prompt:

unload phimec 1

Loading a Protocol Handler When You Boot the Reader

You may want a protocol handler always loaded in the reader's memory. First, make sure you have enough conventional memory to load a protocol handler and operate the reader. Then add a command to AUTOEXEC.BAT to load the protocol handler. When you boot the reader, AUTOEXEC.BAT will load the protocol handler into memory.

The command you add to AUTOEXEC.BAT should match the command you type at the DOS command line. For help, see the previous section.

Loading and Unloading a Protocol Handler With a Batch File

If you create your own application or use software that does not have built-in protocol handlers, you can create a batch file that automatically loads and unloads the protocol handler whenever you enter and exit the application.

Note: Name the batch file carefully. COMMAND.COM executes files in this order: .COM, .EXE, .BAT. If a batch file (.BAT) and an application (.EXE) have the same filename, when you type the filename the reader runs the application instead of the batch file. Therefore, the batch file that loads the protocol handlers for your application should have a different filename than the application itself.

This batch file loads PHIMEC and PHPCSTD, runs Communications Manager, and unloads the protocol handlers when you exit Communications Manager. You can edit this batch file to load only one protocol handler, freeing some conventional memory for the application.

Example Batch File

Command Line	Definition
`set CMPCST=` `set CMUSER=`	Clears the environment variables used by this batch file.
`phimec 1`	Loads the Intermec protocol handler for COM1.
`if not errorlevel 1 set CMUSER=1`	If the Intermec protocol handler is already loaded, an error is returned and the variable is not set.
`phpcstd 1`	Loads the PC Standard protocol handler for COM1.
`if not errorlevel 1 set CMPCSTD=1`	If the PC Standard protocol handler is already loaded, an error is returned and the variable is not set.
`cmanager %1 %2 %3`	Executes Communications Manager. You can replace this with your application executable.
`if not "%CMPCSTd%"=="1" goto :nopcstd` `unload phpcstd 1`	Unloads the PC Standard protocol handler if it was loaded by this batch file.

`if errorlevel 1 echo unload failure`
`    on pcstd`
`:nopcstd`
	Checks for failure to unload the PC Standard protocol handler.

`if not "%CMUSER%"=="1" goto :nouser` `unload phimec 1`	Unloads the Intermec protocol handler if it was loaded by this batch file.

`if errorlevel 1 echo unload failure`
`    on userdef`
`:nouser`
	Checks for failure to unload the Intermec protocol handler.

Loading and Unloading a Protocol Handler With an Application

You can load a protocol handler for a designated port when you start the IRL Desktop or Communications Manager. When you exit the program, the protocol handler is automatically unloaded.

To load a protocol handler by starting IRL Desktop or Communications Manager

• Type this command at the DOS prompt:

    application [*-portph*]

    where:

    application   is the application you are executing:

`irl`	IRL Desktop
`cmgr`	Communications Manager

    port   is the number of the reader's COM port.

    ph   is the code for the protocol handler:

`i`	Intermec protocol handler
`p`	PC standard protocol handler
`r`	RF protocol handler

    For example, to load the Intermec protocol handler on COM1 and execute the IRL Desktop, type this command at the DOS prompt:

    `irl -1i`

    Or scan this bar code:

    IRL -1I

Specifying a Value for the FIFO Control Register

If you turn off your JANUS reader while running a non-Intermec communications application, the reader cannot access and save the contents of the First In First Out (FIFO) control register (FCR). The FCR contains a hex value that controls the Universal Asynchronous Receiver/Transmitter (UART) buffer.

When you turn the reader back on, the reader sets the FCR to its default value, 0 hex, unless you have already specified a value that the reader can use to restore the FCR. You should specify another value if the default is not appropriate for how the communications application configures the FCR.

The next procedures show you how to perform these tasks:

• Determine if you should specify a value for the FCR

• Calculate the two-digit hex value for the FCR

• Specify the two-digit hex value for the FCR

To determine if you should specify a value

• You must specify a value if you plan to perform either of these activities:

COM1   You plan to run a non-Intermec communications application on COM1 that changes the reader's COM1 UART FCR to use UART 16x550 mode, and you do not load an Intermec protocol handler into memory.

COM2   You plan to run a non-Intermec communications application on COM2 that changes the reader's COM2 UART FCR to use UART 16x550 mode.

Many communications applications change the reader's COM1 or COM2 UART FCR to use UART 16x550 mode. To learn if your application uses UART 16x550 mode, see its manual.

To calculate the two-digit hex value

1. Use the illustration on the next page as a guide for calculating the value for the FCR.

   In this illustration, the two-digit hex value is the value you will specify for the FCR. Calculate this value by converting the contents of the FCR byte to two hexadecimal numbers.

   The FCR byte contains eight bits. Each bit represents a parameter that controls how the UART buffer operates. You set or clear each parameter by setting each bit to 1 or 0.

2. Choose 1 or 0 for each bit in the FCR byte. Read the descriptions to decide whether to set or clear each bit.

3. Convert the bits to two hexadecimal numbers. The resulting two-digit hex number is the value you will specify for the FCR.

   For example, a two-digit hex value of 81 enables UART 16x550 mode, requires the buffer to receive four bytes of data before generating a receive interrupt, and leaves all other parameters disabled:
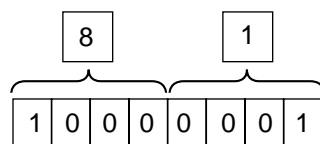
2010U.089

Method for Calculating the Two Digit Hexadecimal Value for the UART FIFO Control Register (FCR)

Two-digit hex value

FIFO control register (FCR) byte

7 6 5 4 3 2 1 0

Descriptions of each bit

0 to disable FIFO (16x450 mode)
1 to enable FIFO (16x550 mode)

0 does not reset
1 to reset receive FIFO

0 does not reset
1 to reset transmit FIFO

0 for a single transfer direct memory access (DMA)
1 for a multiple transfer DMA that empties
   all of the FCR contents in one DMA transaction

Reserved (always 00)

Indicates the number of bytes that the buffer must
receive before generating a Receive Interrupt:

7	6	Number of bytes
0	0	1
1	0	4
0	1	8
1	1	14

2010U.088

To specify the value

• Specify the value for the FCR using one of these methods:

Use IC.EXE   Start IC.EXE, choose the COM port from the COM menu, and type the value into the FIFO CONTROL REGISTER parameter. For help using IC.EXE, see Chapter 5, "Configuring the Reader."

Scan a command   Scan the Communications Port, UART Restore command in Chapter 12, "Configuration Command Reference."

Use software interrupts   Use software interrupts in your application. For help, see your JANUS PSK reference manual.

Connecting the Reader to Another Device

You can physically connect the reader to another device using one of the three methods described next.

Note: If you have a JANUS 2010 with an RF back, you do not physically connect the reader to another device. The reader communicates through radio signals instead of a physical connection.

Communications Dock   Place the reader in a communications dock and connect one or two devices to the dock's serial ports. The dock's network port is a 25-pin DTE connector and the auxiliary port is a 25-pin DCE connector. Depending on how you set the dock's DIP switches, the reader communicates with both ports or the ports communicate with each other.

If you plan to run Interlnk with the reader connected to a host computer through the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

If the reader will communicate through **only one** port (network or auxiliary) on the reader communications dock, you must select that port with the Communications Dock Port command. For help, see "Communications Dock Port" in Chapter 12 or the *JANUS 2010 Communications Dock Quick Reference Guide.*

25-pin DTE cable connected to a peripheral device

Power cord connected to an electrical outlet

Communications Dock

2010U.051
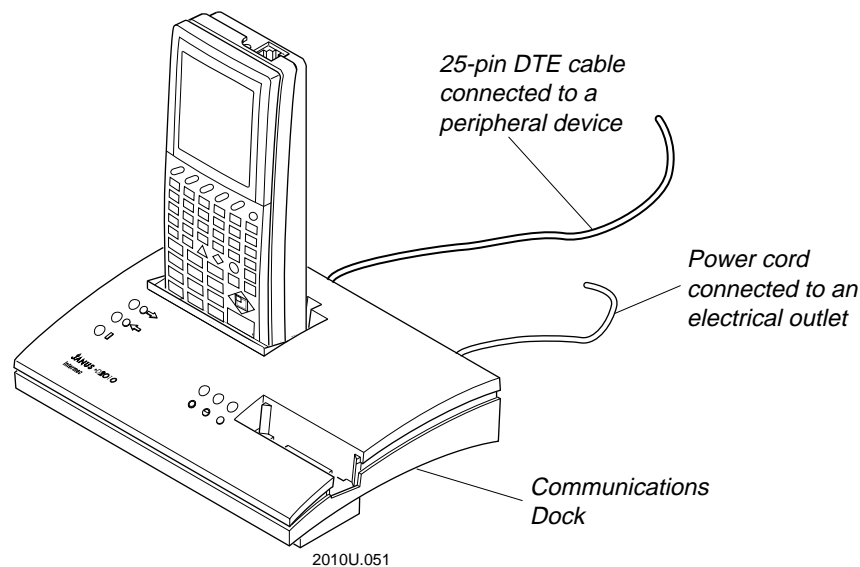
Optical Link Adapter   Connect the optical link adapter to the optical port on the end of the reader. Then connect a device to the optical link adapter's serial port, which is a 9-pin DTE connector. For help, see the *JL2010 Optical Link Adapter Quick Reference Guide.*

2010U.066

Power cord connected to an electrical outlet

Optical Link Adapter

9-pin DTE cable connected to a peripheral device
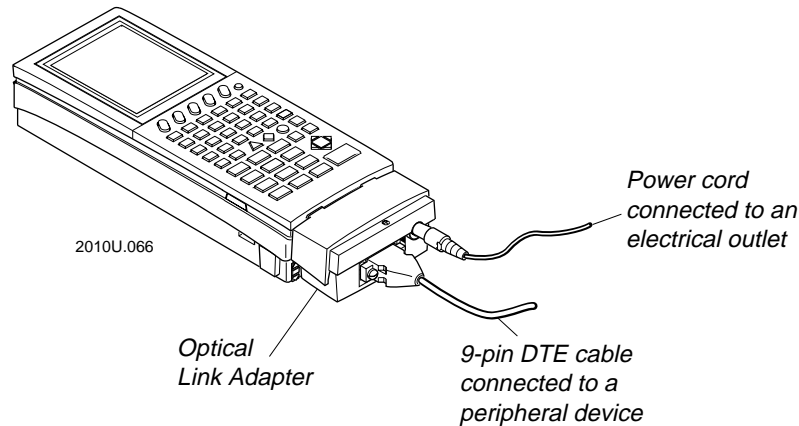
Reader-to-reader   Align two JANUS readers for direct communications. Line up the receive signal on the first reader with the transmit signal on the second reader. Line up the transmit signal on the first reader with the receive signal on the second reader. An arrow on the bottom of the reader helps you align the readers. The readers can be no more than 1 inch apart.

Maximum spacing of 1"

Locator arrow

Transmit Data

Receive Data

Indicates direction of transmission

2010U.005
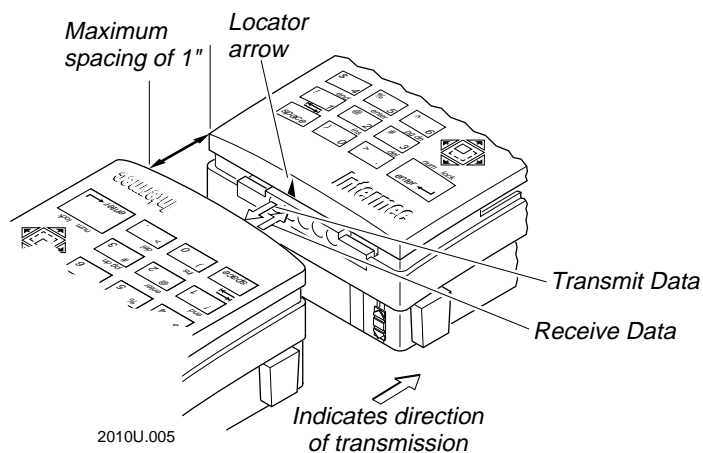
Running Interlnk to Transfer Files

With Interlnk, you can easily transfer files between your reader and a host computer or another reader. You can also make all the drives on one computer appear as if they are physically located on the other, so that you have unrestricted access to the contents of all the drives. You can run programs over the Interlnk connections.

Note: You cannot execute IRL programs over an Interlnk connection. Also, you cannot run Interlnk in an RF network.

Differentiating Between Client and Server

The Interlnk utility consists of two programs: Interlnk and Intersvr. These two programs are designed to be run on separate computers:

- The computer running Interlnk is called the client.

- The computer running Intersvr is called the server.

The difference between client and server is a simple one: the client is the device from which you enter all commands. In this example, the host computer is the client:

Client   *Server*   2010U.097
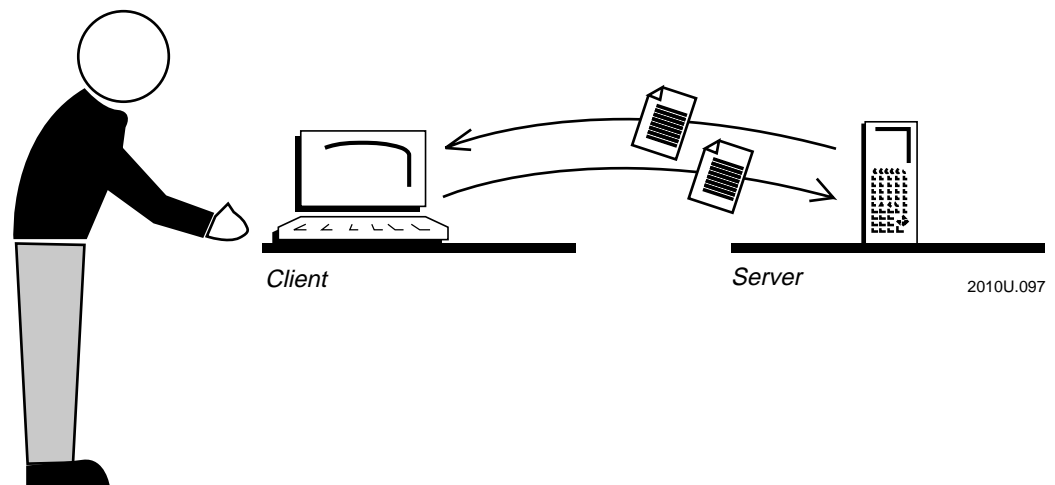
Client   The client is the computer from which you will access drives, directories, files, and programs that are stored on the server. You will type commands on the client's keyboard or keypad to access those drives.

Server   The server is the computer that contains the drives, directories, files, and programs you want to access. The server's drives and printers look as if they are on the client. Intersvr displays the status of the connection between Interlnk and Intersvr on the server's screen.

Sometimes your reader will be the client, and sometimes it will be the server, depending upon the task you are trying to accomplish.

Intermec suggests that you always make the host computer the client because Interlnk requires more conventional memory than Intersvr and your host computer probably has more conventional memory available than your JANUS reader.

Your reader should be the client when:

• You want the drives on the host computer to show up on the reader as if they were physically part of the reader.

• There is an application on the host computer that you want to run on the reader.

Your reader should be the server when:

• You want the drives on the reader to show up on the host computer as if they were physically part of the host computer.

• There is an application on the reader that you want to run on the host computer.

Note: The client cannot access a server's drive that was redirected before Interlnk was started, such as a network drive.

Example of Using InterInk

Suppose the host computer has two disk drives (A and B) and two hard drives (C and D). The J2010 with the PCMCIA Back has five drives: three simulated drives (C, D, and E), one Type I PC card drive (F), and one Type II PC card drive (G).

You want access to the drives on the reader while working at the host. Therefore, the host computer must be the client and the reader must be the server. Run Interlnk on the host computer and run Intersvr on the reader. Instructions for these tasks are included later in this chapter.

Example of Using InterInk

Client
*Host computer
running InterInk*

Server
*Reader running
Intersvr*

*Drives redirected
from the reader*

2010U.002
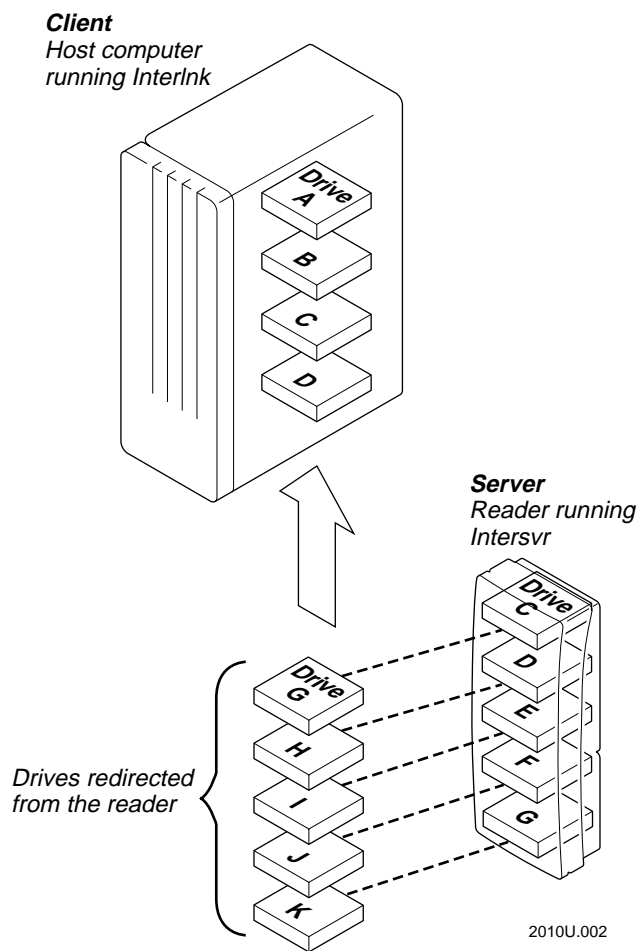
*Note: Interlnk reserves drives E and F for the server's drives A and B, even though the
reader does not have drives A and B.*

Now the reader's drives appear on the host computer, as if they were
physically located on the host computer. The host computer has its original
drives A, B, C, and D, plus drives G, H, I, J, and K.

Drive I on the host computer is really the physical RAM drive E on the reader.
Anything you do to the host computer's drive I affects the reader's drive E.

You can type standard DOS commands on the host computer's keyboard to
access the directories and files in the reader's drives. For example, to display a
list of files located in the root directory of the reader's drive E, type this
command on the host computer:

```
dir i:\
```

To copy a file from a directory on the host computer's drive C to the reader's drive E, type this command on the host computer:

```
copy c:\shared\data\accounts.txt i:\accounts.txt
```

InterInk System Requirements

Your host computer and reader must meet these requirements to run Interlnk and Intersvr:

- A serial port is available on the host computer and reader.

- The host computer is running DOS 3.0 or higher.

- The client has 16K of free memory.

- The server has 130K of free memory.

- The reader is connected to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

Installing InterInk on the Host Computer

You need two files to run Interlnk:

INTERLNK.EXE   The device driver that you load into the client's memory.

INTERSVR.EXE   The program that you run on the server.

You must install those files on the host computer before you can run Interlnk or Intersvr on the host. You can install the files from either the MS-DOS Programs companion disk 2 or the reader's drive D.

To install InterInk on the host computer from companion disk 2

1. On the host computer, make sure that the current working directory is the directory where you want to install the Interlnk files.

2. Insert companion disk 2 into a disk drive on the host computer.

3. Copy INTERLNK.EXE and INTERSVR.EXE from companion disk 2 to the host computer.

To install Interlnk on the host computer from the reader's drive D

1. Connect the reader to the host computer using a 7-wire, null-modem serial cable and either the communications dock or optical link adapter.

2. Make sure that the MODE command is available on the host computer.

3. On the host computer, make sure that the current working directory is the directory where you want to install the Interlnk files.

4. At the reader's DOS prompt, type this command to copy the Interlnk files from the reader's drive D to the host computer:

   ```
   intersvr /rcopy
   ```

   Or scan this bar code:

   |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||

   INTERSVR /RCOPY

   Follow any instructions displayed on the reader. If the host computer locks up after you copy the files, reboot the host.

Making the Host Computer the Client

Follow these instructions to run Interlnk with the host computer as the client. When the host computer is the client, you can access all the reader's drives by typing commands on the host computer's keyboard.

Client

Server

2010U.101
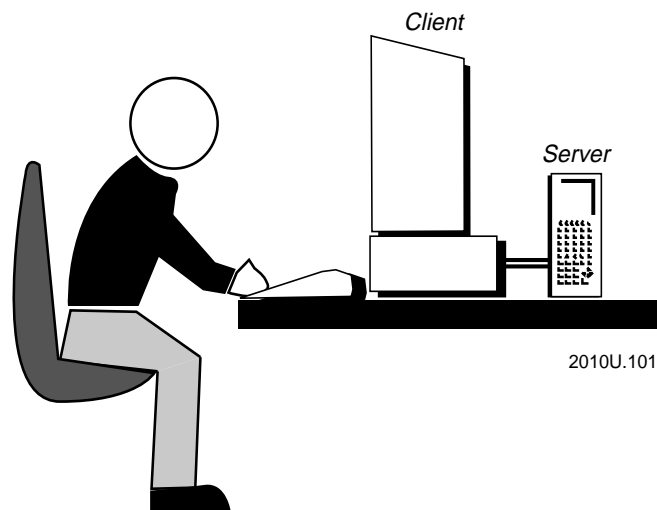
To run Interlnk with the host computer as the client

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Edit the host computer's AUTOEXEC.BAT and CONFIG.SYS files:

   • Add a device command to CONFIG.SYS that specifies the location of INTERLNK.EXE and the number of drives to redirect from the server to the client. (If you do not include the /drives: option, Interlnk redirects three drives and you cannot access all the reader's drives.) For example:

   ```
   device=c:\janus\network\interlnk.exe /drives:7
   ```

   • If you execute the Windows SMARTDRV.EXE on the host computer, remark it out of the AUTOEXEC.BAT or CONFIG.SYS file.

   • If you are not using the host computer's COM1 and you execute the DOS command SHARE.EXE on the host computer, remark out the SHARE command in the AUTOEXEC.BAT or CONFIG.SYS file.

3. At the reader's DOS prompt, type this command to start Intersvr:

   ```
   intersvr
   ```

   Or scan this bar code:

   INTERSVR

   The Interlnk Server Status screen appears, but no information is displayed because the connection has not been made yet.

4. On the host computer, press **Ctrl**-**Alt**-**Del** to reboot and load Interlnk from the CONFIG.SYS file.

   Note: After you modify CONFIG.SYS and reboot your host computer once, you no longer need to reboot to establish a connection. Instead, you can type `interlnk` *at the host computer's DOS prompt.*

5. On the reader, the Interlnk Server Status screen is updated with information about the redirected drives. Use the viewport to view the screen. For help, see "Interpreting the Server's Status Screen" later in this chapter.

You are ready to start using your Interlnk connection. For example, if the client's drive E is redirected to the server's drive C, type this command at the client's DOS prompt:

```
e:
```

Any command you type at the client's drive E prompt will affect the server's (reader's) drive C.

Making the Reader the Client

Follow these instructions to run Interlnk with the reader as the client. When the reader is the client, you can access all the host computer's drives by typing commands on the reader's keypad.

Server

Client

2010U.102
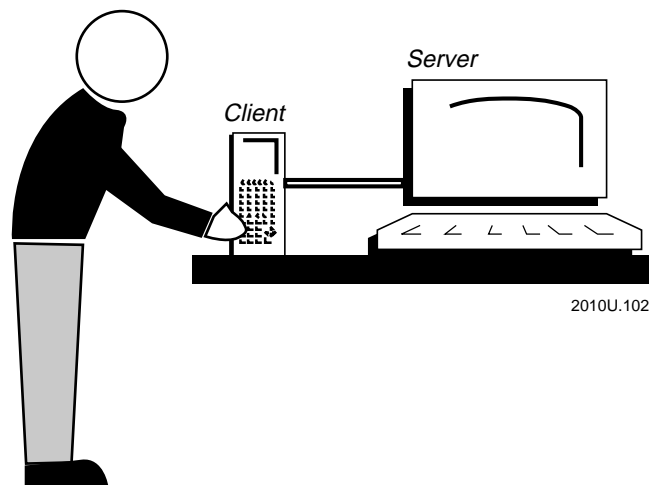
To run Interlnk with the reader as the client

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Start Intersvr by typing this command at the host computer's command prompt:

```
intersvr
```

   If you are not using the host computer's COM1 to connect to the reader, specify the correct port in the command line. For example:

```
intersvr /com2
```

   The Interlnk Server Status screen appears, but no information is displayed because the connection has not been made yet.

3. Press ⌖Ctrl ⌖Alt ⌖↹f ⌖. to warm boot the reader. A command in the reader's CONFIG.SYS file automatically loads Interlnk into the reader's memory.

Caution
Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil
N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

On the host computer, the Interlnk Server Status screen is updated with information about the redirected drives. For help, see "Interpreting the Server's Status Screen" later in this chapter.

You are ready to start using your Interlnk connection. For example, if the client's drive H is redirected to the server's floppy disk drive A, type this command at the client's DOS prompt:

```
h:
```

Or scan this bar code:

H:

All commands you type at the client's drive H prompt affect the server's drive A.

Interpreting the Server's Status Screen

When you start Intersvr, the server displays a status screen that contains two columns of information:

```
 Microsoft Interlnk Server version 1.00


This Computer      Other Computer
   (Server)            (Client)
↑↑↑↑↑↑↑↑↑↑↑↑      ↑↑↑↑↑↑↑↑↑↑↑↑↑↑

     A:     equals     D:
     B:     equals     E:
     C:     equals     F:
     D:     equals     G:
     E:     equals     H:
     LPT3: equals     LPT1


 Transfer: │ Port = Com 1   Speed: │ Alt + F4 = Exit
```

2010U.071

This Computer (Server)   This column lists all the server's drives and printer ports. The screen displays the size of the server's hard disk drives.

Other Computer (Client)   This column lists the drive designation on the client for each server drive.

While the client reads from or writes to the server, "Transfer" flashes at the bottom of the screen and an asterisk (*) appears next to the server drive being accessed. The status bar indicates the baud rate and server port connected to the client.

To use the viewport when the reader is the server

• When the reader is the server, the reader displays only the upper left corner of Intersvr's 25 x 80 status screen.

Viewport icon

Intersvr status screen

2010U.144
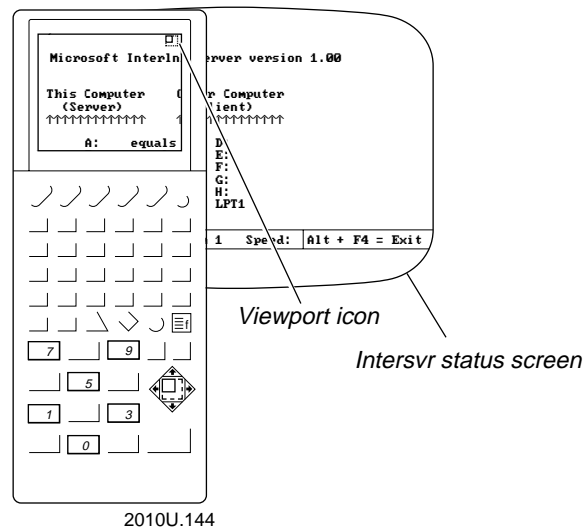
You can use the viewport to see the whole status screen.

For help, see "Moving the Viewport" in Chapter 2 or use the commands on the next page.

Use these viewport movement commands:

To Move the Viewport	Press These Keys	Or Scan This Bar Code
Up	≡f ↑	Viewport Up ‖‖‖‖‖‖‖‖‖‖‖‖ *%/*
Down	≡f ↓	Viewport Down ‖‖‖‖‖‖‖‖‖‖‖ *%+*
Right	≡f →	Viewport Right ‖‖‖‖‖‖‖‖‖‖‖ *.-*
Left	≡f ←	Viewport Left ‖‖‖‖‖‖‖‖‖‖‖ *%-*
To the cursor	≡f ≡f 0	Viewport to Cursor ‖‖‖‖‖‖‖‖‖‖ */-*
To the lower right corner of the display	≡f ≡f 1	Viewport End ‖‖‖‖‖‖‖‖‖‖‖‖ *..%.*
To the upper left corner of the display	≡f ≡f 7	Viewport Home ‖‖‖‖‖‖‖‖‖‖‖‖ *..%/*

Redirecting Drives From the DOS Prompt

From the DOS prompt, you can use the Interlnk command to redirect a client drive to a server drive:

```
interlnk client=server [client=server...]
```

where:

client is the letter of the client's drive to which you want to assign
          another server drive.

server is the letter of the server's drive.

For example, suppose you want to run an application on the host computer that uses data files stored on the reader's drive E. The application explicitly looks on host computer's drive G for the data files. When you start Interlnk, drive G on the client (the host computer) points to drive C on the server (the reader). Therefore, you must redirect the client's drive G to point to the server's drive E. Type this command at the client's DOS prompt:

```
interlnk g=e
```

To cancel the redirection of client drive G, type the command:

```
interlnk g=
```

Note: The client cannot access a server's drive that was redirected before Interlnk was started, such as a network drive.

Exiting InterInk

You can break the connection between Interlnk and Intersvr at any time by pressing these keys on the server:

- If the server is the host computer, press **Alt**-**F4** on the host computer.

- If the server is the reader, press ⓐ ⓕ on the reader.

If you remarked out SHARE.EXE or SMARTDRIVE in the host computer's AUTOEXEC.BAT or CONFIG.SYS, you should restore the commands now.

Restarting InterInk

You can restart the connection between Interlnk and Intersvr by typing this command on the server:

```
intersvr
```

Or scan this bar code:

INTERSVR

If you are not using COM1, specify the COM port you are using.

You are ready to start using your Interlnk connection. If Interlnk will not restart, repeat the steps in "Making the Host Computer the Client" or "Making the Reader the Client" earlier in this chapter.

Running Communications Manager

Communications Manager lets you transmit and receive ASCII files, and request COM port and protocol status. The files for Communications Manager are on the Application companion disk 3:

- CMANAGER.EXE

- CMGR.BAT

- CO001.DAT

Copy the Communications Manager files to the reader's drive C or PC card. For help, see "Running Interlnk to Transfer Files" earlier in this chapter.

You can run Communications Manager by using its menu interface or by typing commands at the DOS prompt. These methods are described next.

Using Communications Manager Menus

To start the Communications Manager application, scan this bar code:

CMGR

Or type this command at the DOS prompt:

```
cmgr [-portph]
```

where you have the option of loading a protocol handler:

port   is the number of the COM port for which you are loading the protocol handler. This is an optional parameter.

ph   is the code for the protocol handler you are loading:

        `i`   Intermec protocol handler
        `p`   PC Standard protocol handler
        `r`   RF protocol handler

For example, to load the PC Standard protocol handler on COM1 and execute Communications Manager, type this command at the DOS prompt and press ⏎ :

```
cmgr -1p
```

Note: When you use Communications Manager with the PC Standard protocol handler, it automatically sets EOR to <CR><LF> and EOF to <SUB> for file transfers.

When you start Communications Manager, the main menu appears. The menu bar contains three menus:

File   Select the File menu to designate which port to communicate through, and to transmit or receive ASCII files. The File menu also has a command to display the software version. You quit Communications Manager by selecting Exit from this menu.

```
 ┌─────────────────────────┐
 │   Communications        │
 │ File  Cfg   Stat        │
 └─────────────────────────┘
```
2010U.047

Cfg   Select the Cfg menu to set the communications protocol for each of the reader's COM ports and define the parameters for each selected protocol. See Chapter 12, "Configuration Command Reference," for a list of the protocols and their parameters.

Stat   Select the Stat menu to view the status of the selected COM port, such as the protocol and parameters being used and whether the port is active or inactive.

The File menu contains these commands:

Port   Lets you select the COM port to communicate through. For help, see "Identifying JANUS COM Ports" earlier in this chapter.

```
 ┌──────────────────────────┐
 │    Communications        │
 │ File  Cfg   Stat         │
 │ Port...                  │
 │ Transmit...              │
 │ Receive...               │
 │ About      ▶             │
 │ Exit                     │
 └──────────────────────────┘
```
2010U.048

Transmit   Transmits the selected file through the designated COM port. A screen displays the status of the transfer.

Receive   Stores the file it receives from the designated COM port under the selected filename. A screen displays the status of the transfer.

About   Displays the software version of Communications Manager.

Exit   Exits Communications Manager.
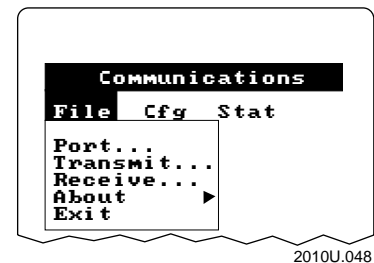
Selecting Menus and Commands

Press ◀ or ▶ to select a menu name from the Communications Manager main menu. Then press ⌷enter↵⌷ to display the commands in the selected menu. In this example, you press ▶ ▶ ⌷enter↵⌷ to display the Stat menu:
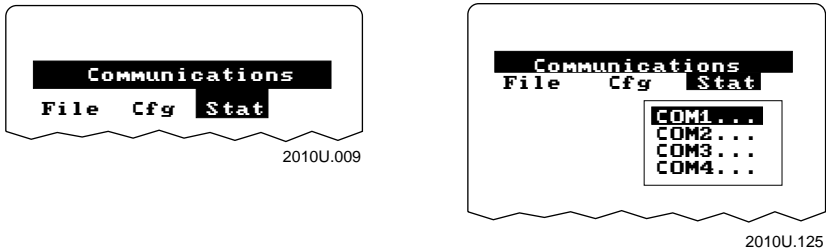
2010U.009

2010U.125

Press ▲ or ▼ to select a command or option from a menu, and then press ⌷enter↵⌷ to execute the command or option.

You can scan bar code labels listed in "Scanning Bar Codes to Select Menu Options" in Appendix C to move the cursor through the communications menus instead of pressing keys on the keypad.

Moving Around the Screen and Filling In Fields

You must move the cursor through the fields on a screen to the OK, Cancel, Next, or Prev buttons.

Task	Description
To move forward through the screen.	Press ▼ or ⌷≡f⌷ ⌷space⌷ .
To move backwards through the screen.	Press ▲ or ⌷≡f⌷ ⌷≡f⌷ ⌷space⌷ .

If the screen contains a list of filenames, press ▼, ▲, ⌷≡f⌷ ⌷space⌷ , or ⌷≡f⌷ ⌷≡f⌷ ⌷space⌷ until the file is highlighted. Then press ⌷enter↵⌷ to select the file.

The screens contain two types of fields where you select or view the options for a parameter:

• In a toggle field, you press ◀ or ▶ to view the options for that field.

• In an entry field, you type a value into the field.

To learn how to enter ASCII control characters into fields, see "Entering ASCII Control Characters" in Appendix C. You can use ASCII control characters for some communications protocol characters.

Exiting Screens and Saving Changes

When you exit a screen, you can save or discard your changes:

Task	Description
To exit a screen and save the changes.	Select OK and press ⌷enter↵⌷.
To exit a screen and discard the changes.	Select Cancel and press ⌷enter↵⌷. Or press ⌷Esc⌷ in any field.

Press ↓, ↑, ⌷≡f⌷ ⌷space⌷, or ⌷≡f⌷ ⌷≡f⌷ ⌷space⌷ to select the OK and Cancel buttons.

Using a Series of Screens to Configure a Parameter

Sometimes the Communications Manager presents a series of screens for one parameter. You must fill in fields or select options on each screen to configure the parameter.

For example, when you configure the User-Defined protocol for COM1, Communications Manager displays five screens of options for the protocol. Here are the first two screens in that series:

2010U.137

2010U.128

You can tell that a screen is part of a series when you see the Next and Prev commands at the bottom of the screen. Next and Prev let you move forward to the next screen or back to the previous screen.
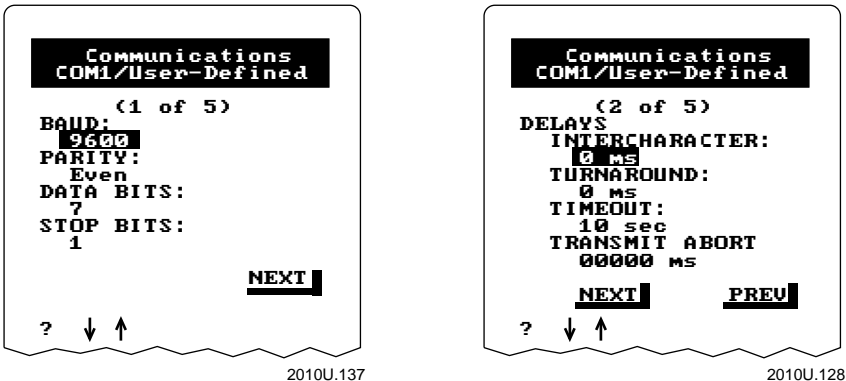
Pressing ⌷enter↵⌷ while the cursor is in any field is the same as choosing Next. As described earlier, you press ↑ or ⌷≡f⌷ ⌷space⌷ to move to the next field in the screen. You press ↓ or ⌷≡f⌷ ⌷≡f⌷ ⌷space⌷ to move to the previous field.

Exiting Communications Manager

To exit Communications Manager, select Exit from the File menu and press ⌷enter↵⌷.

Typing Commands at the DOS Prompt

You can use a DOS command line instead of the menu interface to transmit and receive files. The syntax for the command is:

```
cmgr [-reader_portph] -phost_port -stype -f[path\]file
```

where:

reader_port   is the number of the reader's COM port.

ph   is the name of the protocol handler:

`i`	Intermec protocol handler
`p`	PC Standard protocol handler
`r`	RF protocol handler

host_port   is the number of the host computer's COM port.

type   indicates whether you are transmitting or receiving:

`t`	to transmit
`r`	to receive

path   is the directory for the file you are transmitting or receiving. If you omit the path, the current working directory is used.

file   is the name of the file you are transmitting or receiving.

For example, to load the PC Standard protocol handler on the reader's COM1 and transmit a file called TEST.DAT from the host computer's COM1, type this command at the reader's DOS prompt:

```
cmgr -1p -p1 -st -ftest.dat
```

Downloading Applications Across the Network

You can use binary file transfer (BFT) to download applications to JANUS readers in 900 MHz RF and CrossBar networks. BFT can perform these tasks with or without assistance from the person operating the reader:

• Interrupt any PSK application, reboot the reader, and start the file transfer application (FTA) on the reader

• Transfer binary files (for example, an application) with error detection

• Change the contents of the reader's drive C by loading a new image file

• Run any program on the reader when the transfer or update is complete

Note: The BFT functionality is provided by the file transfer application (FTA.EXE), which is stored on the Application companion disk 3.

Examples of Using BFT

The next two examples illustrate how you can use BFT to update applications on networked JANUS readers by transferring new binary files to the readers.

Example 1: Updating Several JANUS Readers From a Host Computer

*JANUS readers
in warehouse*
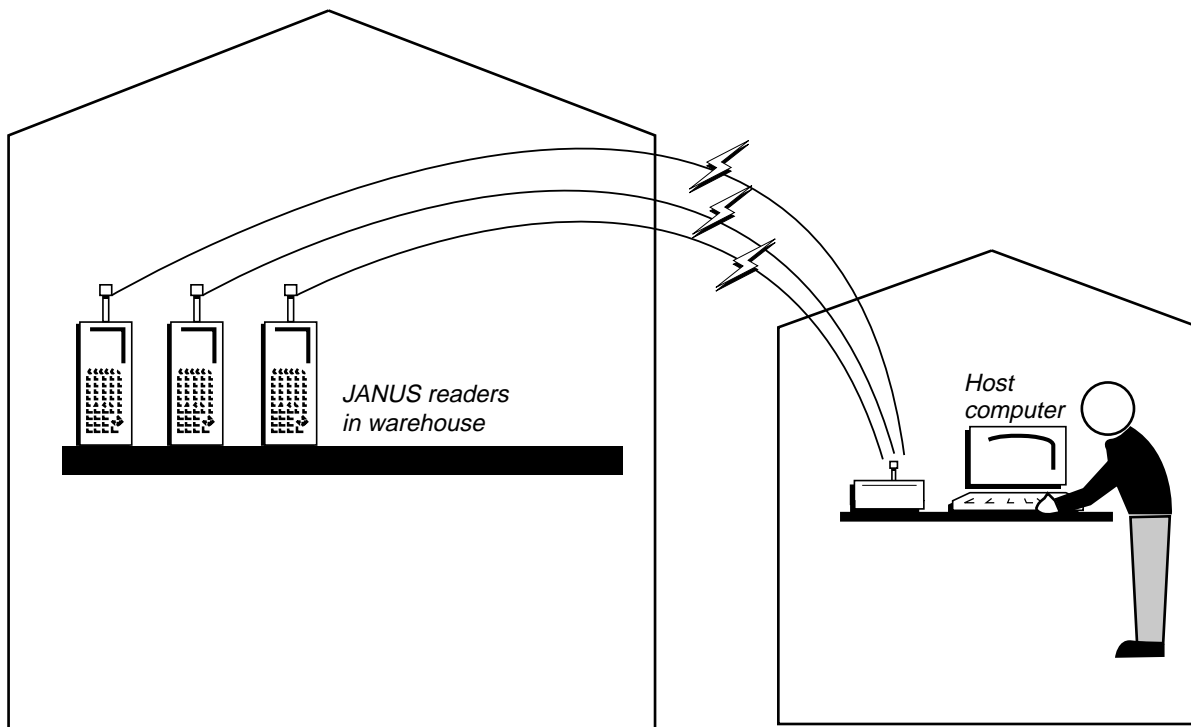
*Host
computer*

2010U.096

From a single host computer, a system administrator uses BFT to download a new version of a data collection application simultaneously (using group queues) to every reader on the RF network in the warehouse while the operators are on their lunch break.

Example 2: Downloading an Executable File From a Host Computer
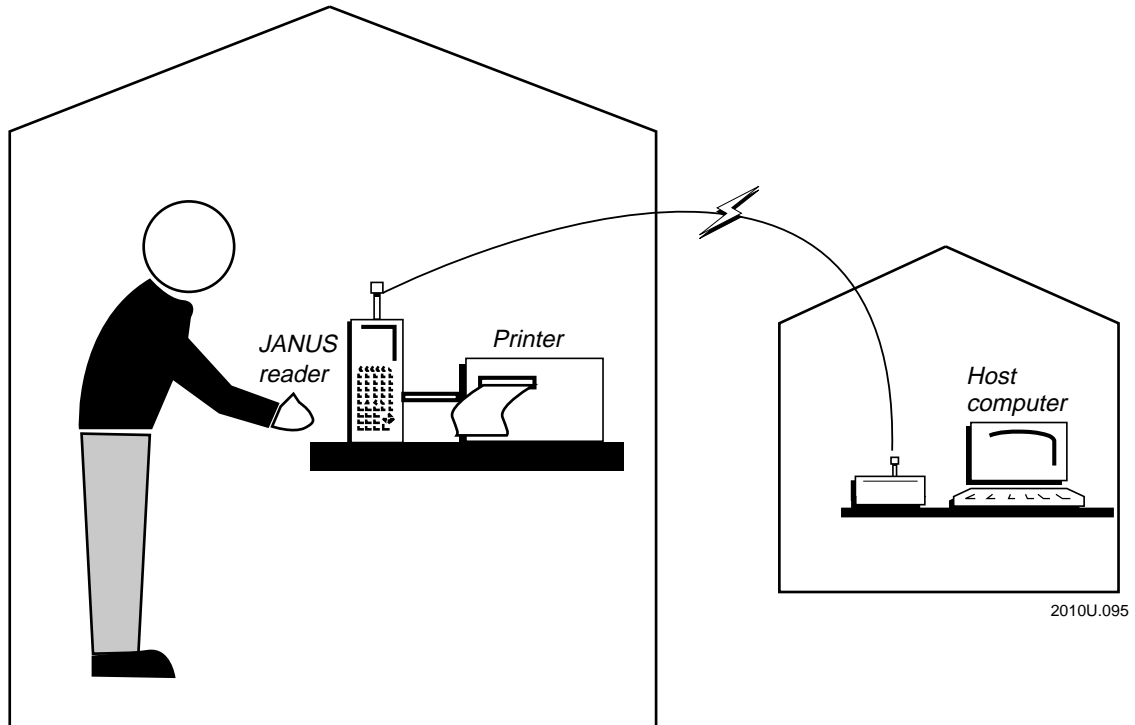
A service technician is using a JANUS reader to diagnose problems with a printer in the RF network. The technician may decide to use a test application that is stored on another computer in the RF network. Using BFT, the technician can download the application to the reader—without walking back to the computer, connecting the reader to the host computer, and using Interlnk to transfer the application.

Examining a Typical BFT Session

A typical BFT session, with the host computer acting as the client and the JANUS reader acting as the server, includes these activities:

*   The host computer and readers are connected with a CrossBar or 900 MHz RF network.

*   The operator starts a BFT-ready PSK application on the reader and either continues working or stops working.

    Note: A BFT-ready PSK application has been programmed to accept the host's Prepare for Reboot command, call a Prepare for Reboot PSK function, and notify the PSK library and host computer when the reader is ready to be rebooted. For help creating BFT-ready PSK applications, see your JANUS PSK reference manual.

*   From the host computer, an administrator starts the Data Collection Manager (DCM) or Interface Software (IS) application that manages the BFT process. This application sends a Prepare for Reboot command to a single reader or a group of readers.

*   The PSK application on the reader accepts the Prepare for Reboot command, optionally performs housekeeping tasks (such as closing files), and sends a Ready For Reboot message to the host. This ensures that the host computer has received all data queued in the controllers, as well as indicates that the reader is ready to be rebooted.

*   The host computer sends a Reboot command to the reader or readers. The reader reboots, and a command in AUTOEXEC.BAT starts FTSERVER.BAT if there is a copy of FTSERVER.BAT on drive C.

    FTSERVER.BAT starts the file transfer application (FTA.EXE). If FTA detects that a host computer rebooted the reader to initiate a BFT session, FTA continues running. Otherwise, it terminates.

*   The host computer can begin sending commands to the FTA:

    *   Host computer may transfer binary files to and from the reader.

    *   Host computer may update the reader's drive C with a new 512K image.

    *   Host computer may set the IM_APPLICATION DOS environment variable to an application on the reader to be run when FTA terminates.

*   When the FTA terminates, the reader executes the command identified by the IM_APPLICATION DOS environment variable.

Preparing the Reader and Host Computer for BFT

To take advantage of BFT, you must set up your reader, host computer, and network as described in this checklist:

❑ Make sure the host computer and readers are connected through a CrossBar or 900 MHz RF network.

To use BFT in a CrossBar network, you must use the Multi-Drop communications protocol. You cannot, for example, use the User-Defined or Polling Mode D communications protocols.

❑ If you use Multi-Drop with BFT, do not set the baud rate higher than 9600 bps.

BFT transmits packets larger than 30 bytes to the reader. If you set the baud rate higher than 9600 bps (for example, 19.2 bps), the reader cannot handle large incoming packets at that speed. An error condition develops: the communications application times out or waits indefinitely on a receive request, and the 9154 Multi-Drop Line Controller's fault light turns on.

❑ If you are using a 9180 Network Controller or 9154 Multi-Drop Line Controller, find out the version of the controller's firmware. You may need to modify the controller's asynchronous host computer parameters if the controller has an older version of firmware:

9180   If the 9180 firmware version is 2.1 or greater, you do not have to adjust the configuration to support BFT. However, if the version is less than 2.1, you must change the asynchronous host computer parameters to 8 data bits, rather than the default 7 data bits.

9154   If the 9154 firmware version is 2.6 or greater, you do not have to adjust the configuration to support BFT. However, if the version is less than 2.5, you must change the asynchronous host computer parameters to 8 data bits, rather than the default 7 data bits.

Note: Intermec does not recommend using Binary File Transfer (BFT) to transfer large files in a CrossBar network with a 9154 Multi-Drop Line Controller.

You can contact your Intermec service representative to learn how to order a firmware upgrade for the 9180 and 9154.

❑ The 9161 Multi-Drop and Port Concentrators do not support BFT.

❑ Create a DCM or IS application that will run on the host computer and communicate with the FTA on the reader. For help creating this application, read your DCM or IS documentation.

❏ Enable the Prepare for Reboot and Reboot commands with the Command Processing command ($+DC) on the reader. These commands allow the reader to respond when the host computer initiates a BFT session. In the reader's default configuration, these commands are enabled. For help, see "Command Processing" in Chapter 12.

❏ Copy FTA.EXE and FTA.INI from the Application companion disk 3 to the reader's drive C. For help adding new files to drive C, see "Adding or Editing Files on Drive C" in Chapter 3.

❏ Run a BFT-ready PSK application on the reader so that when the host computer requests that the reader prepare for reboot, the reader can respond correctly. The PSK application must be programmed to expect the Prepare for Reboot command. For help, see "Prepare for Reboot" in Chapter 11 and your JANUS PSK reference manual.

Differentiating Between Client and Server

BFT is a client/server application, and you must decide which device (host computer or reader) is to be the client or server. The difference between client and server is a simple one: the client is the device from which you enter all commands. In this example, the host computer is the client:

Client   Server   2010U.097
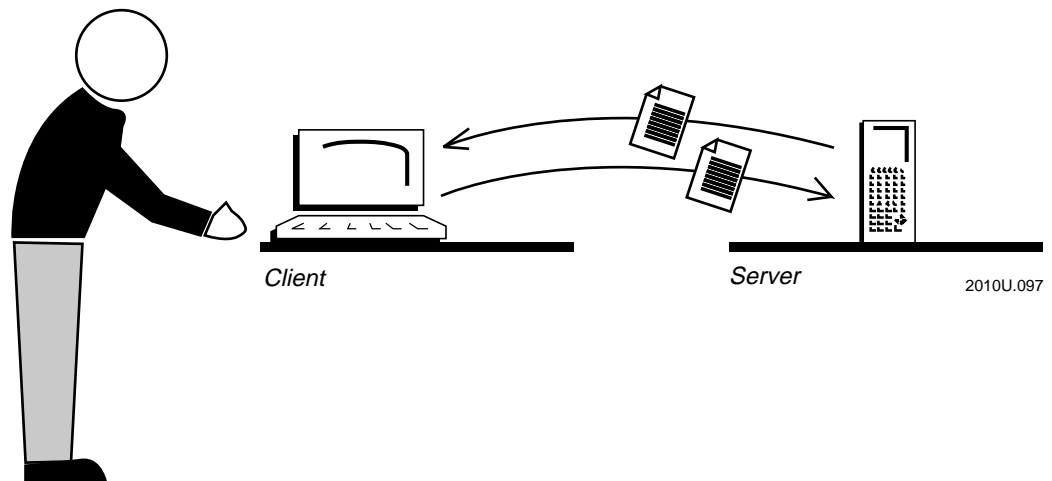
The way you start the FTA on the reader determines whether the reader will be the client or server.

To make the reader the client

1. Type this command at the reader's DOS prompt to start the FTA:

   `fta`

2. Type this command at the FTA prompt to open a BFT session:

   `open`

3. From the reader, type the commands to transfer binary files or update the reader's drive C.

To make the reader the server

There are two ways to make the reader the server:

1. Type this command at the reader's DOS prompt to start the FTA:

   `fta`

2. Type this command at the FTA prompt to make the reader the server:

   `server`

3. From the host computer, type the commands to transfer binary files or update the reader's drive C.

Or,

1. Send the Prepare for Reboot command from the host computer to start the FTA on the reader.

2. When you receive the Ready For Reboot message from the reader, send the Reboot command from the host computer to the reader. This command reboots the reader and opens the BFT session.

3. From the host computer, type the commands to transfer binary files or update the reader's drive C.

Note: Because you cannot display the server's directories from the client, you must already know where each target file is located on the server.

Starting an Application When the FTA Terminates

When the host computer is the client, the host computer can identify an application that will be started automatically on the reader when the FTA is terminated on the reader.

For example, you finish transferring binary files to the reader, close the connection between the host computer and reader, and terminate the FTA on the reader. Next, you may want to restart the PSK application that was running on the reader when the host computer issued the Prepare for Reboot command.

To automatically start an application when the FTA terminates

1. From the host computer, issue a command that sets the reader's DOS environment variable IM_APPLICATION to an application on the reader. For help, see your DCM or IS documentation.

2. Terminate the FTA on the reader. The %IM_APPLICATION% command in the reader's AUTOEXEC.BAT executes, running the specified command on the reader. For help, see "Defining the Startup Files" in Chapter 3.

Using FTA Commands on the Reader

When the reader is the client, you can use these FTA commands:

CHECKHOST	HELP	PUT
CLOSE	LUPGRADE	RUPGRADE
EXIT	OPEN	SERVER
GET		

Typing FTA Commands on the Reader

You can use the FTA commands on the reader by:

*   typing a command at the FTA prompt. (The FTA prompt appears when you run the FTA by typing `fta` at the reader's DOS prompt.)

*   typing one or more commands in a batch file.

*   typing one or more commands on the DOS command line. Use a semicolon (;) between each command. For example, type this command and press ⌨enter↵ to open an FTA session, get a file from the host, and exit the session:

    ```
    e:\> fta o; g filename; e
    ```

    where *filename* is the path and name of the file to be transferred.

Learning the Syntax of FTA Commands

This section describes each FTA command and its syntax. You can abbreviate the command names as shown in the Syntax column of the next table. Also, you do not have to capitalize the commands; the commands are not case sensitive.

FTA Command Descriptions and Syntax

Command	Description	Syntax
CHECKHOST	Checks if the host computer rebooted the reader and is ready to proceed with the reader as the server and the host computer as the client. You can type this command only from the reader's DOS command line.	`ch [port]` where: *port* is the COM port for the connection. If you do not specify a port, the application uses the first port with an active protocol handler.
CLOSE	Terminates the connection with the host computer. You can abbreviate this command as CL.	`c`
EXIT	Terminates the FTA program and returns you to the DOS prompt on the reader.	`e`
GET	Copies a file from the host computer to the reader.	`g hfile [rfile]` where: *hfile* is the path and filename of the file to be transferred from the host computer to the reader. *rfile* is the destination path and filename on the reader. If you do not specify a *rfile* name, the *hfile* name is used.
HELP	Displays a description of the FTA commands, syntax, and parameters.	`h`
LUPGRADE	Upgrades the reader's drive C from the reader. Stands for "local upgrade."	`l file c` where: *file* is the path and filename of the image file on the JANUS reader, and C is the drive to be updated.

FTA Command Descriptions and Syntax (continued)

Command	Description	Syntax
OPEN	Establishes a connection with the host computer.	`o [`*`port`*`]` where: *port* can be the COM port for the connection. If you do not specify a port, the application uses the first port with an active protocol handler. Once a connection is open, you can type other FTA commands or type `E` to exit.
PUT	Copies a file from the reader to the host computer.	`p `*`rfile`*` [`*`hfile`*`]` where: *rfile* is the path and filename of the file to be transferred from the reader to the host. *hfile* can be the destination path and filename on the host. If you do not specify a *hfile* name, the *rfile* name is used.
RUPGRADE	Upgrades the reader's drive C from the host. Stands for "remote upgrade."	`r `*`file`*` c` where: *file* is the path and filename of the image file on the host computer, and C is the drive to be upgraded.
SERVER	Identifies the reader as the server, not the client. You will type all subsequent FTA commands at the host.	`s [`*`port`*`]` where: *port* is the COM port for the connection. If you do not specify a port, the application uses the first port with an active protocol handler.

Editing the FTA Initialization File

The FTA initialization file (FTA.INI) controls how the FTA operates. You may need to modify INI parameters to match the timeouts with the speed of your network. You can use a standard ASCII text editor to edit the file. This table describes the parameters in the default FTA.INI file, which is stored on companion disk 3:

Parameter in FTA.INI	Description
`HostOpenSessionTimeout=10000`	Milliseconds FTA waits for the host to respond to an open session request in which the reader is the client.
`HostStartServerTimeout=10000`	Milliseconds FTA waits for the host to respond to an open session request in which the reader is the server.
`ReceiveRecordTimeout=10000`	Milliseconds FTA waits for the host to send the next data record while downloading a file to the reader.
`StartUploadTimeout=10000`	Milliseconds FTA waits for the host to respond to a request to begin uploading a file from the reader.
`StartDownloadTimeout=10000`	Milliseconds FTA waits for the host to respond to a request to begin downloading a file to the reader.
`HostServerReadTimeout=10000`	Milliseconds FTA waits for the host to send a command to the reader when the host is the client.
`HostClientReadTimeout=65535`	Milliseconds FTA waits for the host to send a command to the reader when the host is the server.
`SendRecordTimeout=10000`	Milliseconds FTA waits for the reader to transmit a record to the host.
`JobRecoverAttempts=1`	Number of times FTA attempts to recover a session with the host after that session has been lost.
`EndTransmitTimeout=65535`	Milliseconds FTA waits for the host to acknowledge that a file upload is complete.
`TransmitResponseDelay=5000`	Milliseconds FTA allows to elapse before it starts to upload a file from the reader to the host after the host sent the command to begin uploading the file.
`ClearChannelTimeout=10000`	Milliseconds FTA waits for data when the communications channel is being cleared.

7

Working With IRL

This chapter introduces Intermec's Interactive Reader Language (IRL) and explains how to use the IRL Desktop, specify the path for IRL files, pause and resume IRL programs, run IRL programs with limited conventional memory, and use the IRL reader commands covered in Chapter 11.

Learning About IRL

Interactive Reader Language (IRL) is a high-level programming language you can use to develop programs for your JANUS reader. IRL Version 4.1 comes with your JANUS reader. IRL features include:

- advanced bar code input capabilities.

- efficient reader power management.

- efficient memory management.

- ease of use for creating programs quickly.

You can create IRL programs using any DOS-based text editor and save the program as an ASCII text file. You can also write IRL programs on a PC with PC-IRL software and download them to the reader using the Polling Mode D protocol.

For help learning how to program in IRL, or how to take advantage of the IRL features that are available only on JANUS readers, see these manuals:

- *IRL Programming Reference Manual*

- *PC-IRL Reference Manual*

Note: *The default filenames for IRL programs and data files include braces {}. For example, you may see these filenames on the reader: {IRL-1}.IRL and {IRL-A}.IRD.*

Using the IRL Desktop

The IRL operating environment on the reader is called the IRL Desktop. The IRL Desktop is a menu-driven application that helps you run, download, transmit, and receive IRL programs.

This section covers these tasks:

- Opening the IRL Desktop
- Closing the IRL Desktop
- Exploring the IRL Desktop User Interface
- Executing Commands in the IRL Desktop
- Running an IRL Program
- Pausing an IRL Program
- Exiting an IRL Program
- Downloading an IRL Program
- Transmitting IRL Files
- Receiving IRL Files
- Clearing IRL Data Files

Opening the IRL Desktop

To open the IRL Desktop, type this command at the DOS prompt and press ⌷enter↵⌷:

```
irl
```

Or scan this bar code:

IRL

You can load a protocol handler or run a program when you start the IRL Desktop by including one or both of these parameters in the command:

```
irl -[portph] [filename]
```

where:

port   is the number of the COM port for which you are loading the protocol handler.

ph   is the code for the protocol handler you want to load:

> `i`   Intermec protocol handler
> `p`   PC Standard protocol handler
> `r`   RF protocol handler

filename   is the name of the IRL program to run.

For example, to load the Intermec protocol handler on COM1 and open the IRL Desktop, type this command at the DOS prompt:

```
irl -1i
```

Or scan this bar code:

||||||||||||||||||||||||||||||||||||||||||||||||||||

IRL -1I

To load the PC Standard protocol handler on COM2, open the IRL Desktop, and immediately begin running the STOCK.IRL program, type this command at the DOS prompt:

```
irl -2p stock.irl
```

Note: If you start an IRL program from the DOS prompt, you will return to the DOS prompt when you exit the program.

Closing the IRL Desktop

To close the IRL Desktop, select Exit from the File menu and press [enter←].

Exploring the IRL Desktop User Interface

When you start the IRL Desktop, the main menu appears. In the menu bar, there are two menus, File and About. The contents of the File menu appear automatically.

File   This menu lets you transfer files, change directories, review file statistics, run an IRL program, and exit the IRL Desktop.

About   This menu displays information about the reader and its configuration, including the amount of RAM and disk space available, the current paths for IRL files, the version of IRL, and the communications protocol configured for each COM port.

The File menu contains these commands:

Run   Runs the IRL program you select.

Resume   Resumes running an IRL program with all the status registers and variables reset to the values from when the program was halted.

Directory   Lists all IRL files in the current directory.

```
            IRL
File   About
Run...
Resume...
Directory...
Change Dir...
File Stats...
Clear Data...
Receive...
Transmit...
Exit...

  ?  ↓ ↑
```

2010U.050

Change Dir   Changes the path for the data files and programs.

File Stats   Indicates if a data file is dimensioned or undimensioned and the number of records entered. If the file is dimensioned, it lists the dimensions.

Clear Data   Deletes all IRL data files with the default filename format: {IRL-0}.IRD, {IRL-A}.IRD to {IRL-Z}.IRD. Does not delete IRL data files with customized names (such as NEW.IRD).

Receive   Receives a file through the designated COM port and stores the file under the selected filename. This command is equivalent to scanning an IRL File, Receive bar code.

Transmit   Transmits the selected file through the designated COM port. This command is equivalent to scanning an IRL File, Transmit bar code.

Exit   Exits the IRL Desktop.

The About menu contains these commands:

Statistics   Displays information about the amount of memory and disk space available, and lists the path for data files and programs.

```
            IRL
File   About
Statistics...
Version...
Ports...
```

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Version   Displays the version of IRL running on the reader.

Ports   Displays the communications protocol configured for each port. If you have not configured a protocol for a port or loaded a protocol handler, the port is not listed.
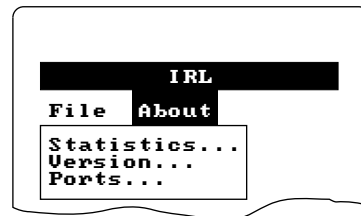
Selecting Menus and Commands

Press ← or → to select a menu name from the IRL Desktop main menu. Then press |enter↵| to display the commands in the selected menu.

Press ↑ or ↓ to select a command from a menu, and then press |enter↵| to execute the command.

You can scan the bar code labels to move the cursor through the IRL Desktop menus instead of pressing keys on the keypad. For help, see "Scanning Bar Codes to Select Menu Options" in Appendix C.

Note: You can press ⟨F1⟩ to display the online help screen for a menu or command.

Moving the Cursor Through the Screen

Some screens list the options for each command or list filenames for you to choose. You need to move the cursor through the fields to the OK and Cancel buttons.

Task	Description
To move forward through the screen.	Press ↓ or ⟨F2⟩.
To move backward through the screen.	Press ↑ or ⟨F3⟩.

If the screen contains a list of filenames, press ↓, ↑, ⟨F2⟩, or ⟨F3⟩ until the file is highlighted. Then press |enter↵| to select the file.

Exiting a Screen

When you exit a screen, you can save or discard your changes.

Task	Description
To exit a screen and save the changes.	Select OK and press |enter↵| .
To exit a screen and discard the changes.	Select Cancel and press |enter↵| . Or press |Esc| .

Usually, you can press ↓, ↑, ⟨F2⟩, or ⟨F3⟩ to select the OK and Cancel buttons. On some screens, such as the Change Directory screen, you must press ⟨F2⟩ or ⟨F3⟩.

Practicing With the IRL Desktop User Interface

You can follow the step-by-step instructions in "Specifying the Path for Programs and Data Files" later in this chapter to become more familiar with the keystrokes required by the IRL Desktop user interface.

Executing Commands in the IRL Desktop

You can execute commands in the IRL Desktop by:

• selecting the command from the IRL Desktop main menu.

• sending the command from the host computer. You must be running a communications application on the host computer, and the IRL Desktop must be open on your reader.

• scanning a bar code label that contains the command. For bar code labels to scan, see the IRL commands in Chapter 11, "Reader Command Reference."

Running an IRL Program

You can start an IRL program using any of the methods described next.

Note: You cannot execute IRL programs over an Interlnk connection.

• At the DOS prompt, type this command to start the IRL Desktop and immediately start running an IRL program:

```
irl [filename]
```

where *filename* is the name of the IRL program to run.

• From the IRL Desktop, choose the Run command in the File menu. The desktop lists the program files in the current directory. Use ♠ and ♦ to select the program you want to run and press [enter ↵].

• When you download an IRL program from the host computer to the reader, append the Run command (//) to the end of the program. The program begins running when the download is complete.

• Using a communications application on the host computer, send the Run command to the reader. The command runs {IRL-1}.IRL, the default program.

• Scan this bar code label with the reader to run {IRL-1}.IRL, the default program:

Run IRL Program

//

The IRL Desktop checks the syntax of the program before it runs the program. If the program contains syntax errors, the reader emits three low pitched beeps and the desktop displays the line number(s) of the errors along with a message describing the error(s). Correct the program and run it again. During a syntax check, OK and Cancel buttons are displayed along with any error messages. Choose OK to continue the syntax check. Choose Cancel to terminate it.

If the IRL Desktop finds no syntax errors, it displays the amount of memory the program and symbol table use, and the amount of memory remaining. Then the program begins executing at the first program statement.

Pausing an IRL Program

You can press Ⓘ/Ⓞ to turn the reader off and place it in Suspend mode while an IRL program is running. When you press Ⓘ/Ⓞ again to turn the reader back on, the IRL program resumes running. You can also exit an IRL program and resume running it later. For help, see "Resuming IRL Programs" later in this chapter.

Exiting an IRL Program

You can exit an IRL program using any of the methods described next.

Note: If you started the IRL program by typing a command at the DOS prompt, you will return to the DOS prompt when you exit the IRL program. Otherwise, if you started an IRL program from inside the IRL Desktop, you will return to the IRL Desktop when you exit the IRL program.

- Include the IRL Exit command (E) with a modifier in the program statements. When IRL reaches the command in the program, the program will exit.

- Send the Exit IRL command (/$) from the host computer.

- Scan this bar code label with the reader:

Exit IRL Program

‖‖‖‖‖‖‖‖‖‖‖‖‖

/$

The program completes any housekeeping functions, such as closing files, and returns to either the IRL Desktop or DOS.

- Press the application break sequence from the reader's keypad to break out of an IRL program that is locked in an infinite loop. For help, see "Breaking Out of an Application" in Chapter 9.

Downloading an IRL Program

To download an IRL program, send a Start of Program (SOP) character followed by the program to be downloaded from the host computer. You can set the SOP character in the reader's configuration. The default is <SI>. For help, see "IRL SOP" in Chapter 12.

Note: When you download a program, the IRL Desktop should be at the main menu, with no commands selected. Also, you must make sure that the appropriate communications protocol has been configured and activated, and that the corresponding protocol handler has been loaded.

The IRL Program, Download command downloads the program you specify from the host computer to the reader. The command renames the program to {IRL-1}.IRL and copies it to the directory specified by the program path. If the program path is on a nonwritable drive, the program is copied to the data path. If there is an {IRL-1}.IRL program already in the directory, it is overwritten. The command also compiles the program without displaying a "Compiling" message. If an error occurs during the compile, an error message appears and control returns to the IRL Desktop.

You can also use PC-IRL, Collect, DCM, DFM, or Interscan to download IRL programs. For help, see the product's manual.

Transmitting IRL Files

You can transmit an IRL program or data file using any of these methods when the IRL Desktop is open:

- Choose the Transmit command from the File menu. A transmit screen lists the program files in the current directory. Use ♠ and ♦ to select the program you want to transmit and press ⏎.

- Send an IRL Transmit file command from the host computer:

  `%%filename`

  where *filename* is the number or letter designation of the file: 0, 1, or any character from A to Z.

- Scan this bar code label with the reader:

  Transmit IRL File

  %%

  A transmit screen lists all of the files. Use ♠ and ♦ to select the program to transmit and press ⏎. For help, see the *IRL Programming Reference Manual.*

Receiving IRL Files

You can receive a file from the host computer and store it under a specified filename using any of these methods when the IRL Desktop is open:

- Choose the Receive command from the File menu.

- Send an IRL Receive file command from the host computer:

    `.%filename`

    where *filename* is 0, 1, or any character from A to Z.

    A receive screen appears. Type the filename to be received and choose OK. For help, see the *IRL Programming Reference Manual.*

- Scan this bar code label with the reader:

Receive IRL File

.%

A receive screen appears. Type the filename to be received and choose OK. For help, see the *IRL Programming Reference Manual.*

Clearing IRL Data Files

You can delete one or all of the IRL data files with default filenames: {IRL-0}.IRD, and {IRL-A}.IRD to {IRL-Z}.IRD. Use any of these methods when the IRL Desktop is open:

- Choose Clear Data from the File menu to delete all IRL data files. A message explains that the default data files will be deleted and shows the directory where the files are located. Choose OK to delete the data files.

- Scan one of these bar code labels with the reader to delete one or all of the IRL data files.

Clear All IRL Data Files

.$

Clear {IRL-0}.IRD

.$0

Note: You can create bar code labels to delete {IRL-A}.IRD to {IRL-Z}.IRD.

If you choose to clear all data files, a message explains that the default data files will be deleted and shows the directory where the files are located. Choose OK to delete the data files.

If you clear one data file, IRL deletes the file without displaying a message or prompt.

- Send an IRL Clear file command from the host computer:

  `.$filename`

  where *filename* is 0 or any character from A to Z. If you do not include a filename, all IRL data files (0, A to Z) are deleted.

Caution
When the clear file command is sent from the host without data, all data is cleared and all files are deleted.

Conseil
Lorsque la commande d'effacement de fichier (clear file) est envoyée de l'hôte sans préciser les données à effacer, toutes les données sont effacées et tous les fichiers sont supprimés.

Specifying the Path for Programs and Data Files

The directory that is current when you open the IRL Desktop becomes the path for your IRL programs and data files. However, when the current drive is C or D, the first writable drive on the reader becomes the path.

If you do not want to use the current directory or first writable drive as the path, you can specify a path for programs and data files. There are several ways to specify the path:

How to Specify the Path	How Long the Path Remains in Effect
You set the IM_IRLPROG and/or IM_IRLDATA environment variables in your AUTOEXEC.BAT file.	This change remains in effect until you reset the path to another value. Each time you boot the reader, AUTOEXEC.BAT sets the path according to the environment variables. *Note: If you do not set the environment variables in AUTOEXEC.BAT, the current directory or firstwritable drive becomes the path when you boot the reader.*
You set the IM_IRLPROG and/or IM_IRLDATA environment variables at the DOS prompt.	This change remains in effect until you reset the path to another value or boot the reader.
You include the path for a data file in the OPEN command.	This change remains in effect for the data file until you modify the OPEN command.
You select the path from the IRL Desktop.	This change remains in effect until you reset the path to another value or boot the reader or exit from the Desktop.

The next sections describe these tasks:

*   Setting the Path With an Environment Variable
*   Including a Data File Path in the OPEN Command
*   Selecting the Path From the IRL Desktop

Setting the Path With an Environment Variable

You can use the IM_IRLPROG and IM_IRLDATA environment variables to set the paths for programs and data files. You can include the environment variables in your AUTOEXEC.BAT file or type them at the DOS prompt.

To set the path for IRL programs with an environment variable

*   Follow this command format:

    ```
    set IM_IRLPROG=[drive:][\directory]
    ```

    where:

    drive   is the letter of the drive where you will store programs.

                    Note: You can set IM_IRLPROG to any drive, even one that you cannot write to.

    directory   is the directory or directories where you will store programs.

    For example:

    ```
    set IM_IRLPROG=e:\sales\programs
    ```

To set the path for IRL data files with an environment variable

*   Follow this command format:

    ```
    set IM_IRLDATA=[drive:][\directory]
    ```

    where:

    drive   is the letter of the drive where you will store data files.

                    Note: If you set IM_IRLDATA to a drive you cannot write to, the reader defaults to the drive that was current when you opened the IRL Desktop. If you cannot write to that drive, IRL uses the reader's first writable drive.

    directory   is the directory or directories where you will store data files.

    For example:

    ```
    set IM_IRLDATA=e:\sales\data
    ```

Including a Data File Path in the OPEN Command

You can specify the path for a data file in an IRL program by declaring the path in the OPEN command for files A through Z. For example:

```
OD"e:\sales\accounts\orders.ird"(10,15)
```

This command creates File D, which is stored as ORDERS.IRD in the E:\SALES\ACCOUNTS directory. To learn more about the OPEN command, see the *IRL Programming Reference Manual*.

Note: You cannot specify a path for File 0 in an IRL program.

Selecting the Path From the IRL Desktop

1. Open the IRL Desktop.

2. Choose Change Dir from the File menu. This Change Directory screen appears.

   The screen displays the current paths for IRL programs and data files. In this example, the path for programs is C:\, and the path for data files is E:\.

   You can use ✦ or ✦ to select Both, Programs Only, and Data Only, but you must use ⓕ₂ or ⓕ₃ to select the OK and Cancel buttons.

   ```
                  IRL
          Change Directory
       Program Path:
         C:\

       Data Path
         E:\

       Modify Path:
         Both
         Program Only
         Data Only

            OK    Cancel

       ?    ↓    ↑
   ```
   2010U.121
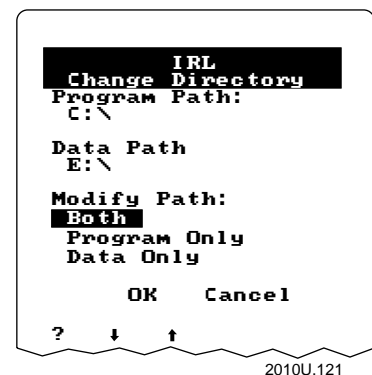
3. Decide if you want to modify one or both of the paths:

For This Task	Press These Keys
Set one path for both programs and data files.	Press ✦ until you select Both, and press [enter←].
Set a path for programs only.	Press ✦ until you select Programs Only, and press [enter←].
Set a path for data files only.	Press ✦ until you select Data Only, and press [enter←].

The second Change Directory screen
appears.

4. Press ⬇ or ⬆ to select the disk drive for the
path.

5. Press ✐ to move to the Directories field,
and then press ⬇ or ⬆ to select the
directory for the path.

If the drive does not contain directories,
(none) appears under the Directories
heading, as shown in the second Change
Directory screen.
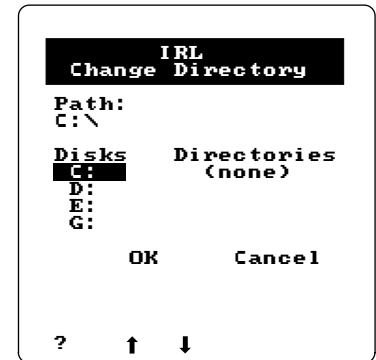
```
        IRL
  Change Directory

Path:
C:\

Disks    Directories
 C:         (none)
 D:
 E:
 G:

         OK    Cancel


 ?    ↑    ↓
```
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6. To exit and save your changes, you must select OK at both Change
Directory screens. Press ✐ until you select the OK button, and then
press ⏎. The first Change Directory screen appears. Again, press ✐ until
you select OK, and then press ⏎.

7. Use the IRL Desktop to perform another task.

Resuming IRL Programs

You can exit an IRL program, perform other functions (such as execute DOS
commands, run other IRL programs, or put the reader in Suspend mode), and
then resume the IRL program exactly where you left off.

Exiting a Program So You Can Resume It Later

You can resume an IRL program if you exit it using one of these methods:

• Execute the IRL Program, Exit (/$) command. You can scan a bar code that
contains the command, or send the command from a host computer.

• Add to your IRL program an Exit command with a D modifier (ED). When
the ED command executes, the program terminates and returns you to the
DOS prompt.

• Press the application break sequence, as described in "Breaking Out of an
Application" in Chapter 9.

You can exit multiple programs that can all be resumed later. IRL creates a
filename.RSM file in the data file path for each program, where *filename* is the
program name. The .RSM file contains information that lets IRL resume the
program exactly where you left off. IRL deletes the .RSM file when you run or
resume the program.

IRL also saves the name of the last program that was exited as described previously into the {LATEST}.RSM file. Every time IRL saves the filename to this file, it overwrites the last filename; therefore, the file always identifies the last IRL program that can be resumed. IRL deletes this file when you run or resume the program.

Resuming a Program From the DOS Prompt

To resume an IRL program from the DOS prompt, use this command:

```
irl [-rX] [filename]
```

where:

-r   is the command that instructs IRL to resume a program. If you do not include the -r, IRL starts the program from the beginning and deletes the .RSM file.

X   is an optional value to be placed in the status register (#0). Make sure there is no space between the -r and *X* value, or the value will not be placed into the status register (#0).

          If you do not specify an *X* value, IRL sets the register to 0. If you supply an invalid value, IRL sets the register to 999999999.

          IRL sets the status register only if you exited the program with the ED command. You determine the significance of this value. For example, you can use it to pass to the IRL program a status of some action taken while the user was in DOS.

filename   is the name of the IRL program to resume running. If you do not specify a *filename* and you do include the -r, IRL resumes the last program exited, as identified in {LATEST}.RSM.

Resuming a Program From the IRL Desktop

Choose the Resume command from the File menu and select a program to resume. Or scan this IRL Program, Resume command ($.) from the IRL Desktop to resume the program identified in the {LATEST}.RSM file:

Resume IRL Program

$.

Freeing Enough Memory to Run an IRL Program

If you see the message "Insufficient memory" when you try to run an IRL program from the IRL Desktop, you do not have enough conventional memory available to run the program and the IRL Desktop.

You may be able to free enough conventional memory to run the program by following the suggestions in "Making More Memory Available on the Reader" in Chapter 3.

You can also use the IRLXDESK utility instead of the IRL Desktop to run the program. IRLXDESK does not provide the IRL Desktop menu environment, so it uses less conventional memory than the IRL Desktop.

To run an IRL program with IRLXDESK

1. Make sure the IRLXDESK.EXE file is on your JANUS reader. You may need to copy the IRLXDESK.EXE file from the Application companion disk 3 to your reader. For help, see "Running Interlnk to Transfer Files" in Chapter 6.

2. If your IRL program requires a protocol handler, you must load it manually. IRLXDESK does not automatically load any protocol handlers. For help, see "Loading and Unloading a Protocol Handler" in Chapter 6.

3. Type this command at the DOS prompt:

   ```
   irlxdesk filename
   ```

   where *filename* is the name of the IRL program you want to run.

IRL Reader Commands

You can use these reader commands only from the IRL Desktop:

- IRL File, Clear
- IRL File, Receive
- IRL File, Transmit
- IRL Program, Download
- IRL Program, Exit
- IRL Program, Resume
- IRL Program, Run

The IRL reader commands are described in Chapter 11, "Reader Command Reference." You can execute these commands by:

- scanning a command from a bar code label.
- choosing a command from a menu in the IRL Desktop by pressing keys on the keypad.
- sending a command from a host computer only when the host is running an application that uses Reader Services.
- executing a command in an IRL program only when the IRL Desktop is running.

8

Preparing the Reader for International Use

This chapter describes how to configure the reader to operate in French, German, Italian, or Spanish. The chapter also explains how to use an international keypad.

Configuring the Reader for a Language

You can configure your JANUS reader to operate in any language that is supported by DOS National Language Support (NLS).

The AUTOEXEC.BAT and CONFIG.SYS startup files on your reader will be changed to support the language you select. Because these files are stored on drive C, a ROM drive resident in flash memory, you must use a special utility, Auto-Loader, to replace them. To learn why drive C requires Auto-Loader, see "Learning How to Change the Contents of Drive C" in Chapter 3.

Follow these steps to configure the reader for a language:

1. Install Auto-Loader on your host computer.

2. Configure the reader for the language with Auto-Loader.

These steps are described in the next sections.

Installing Auto-Loader on Your Host Computer

If you want to use Auto-Loader, you must install Auto-Loader from the Boot Utilities companion disk 1 onto your host computer. Before you start installing Auto-Loader, make sure you have:

*   A copy of companion disk 1, which contains Auto-Loader.

*   DOS 3.3 or higher running on the host computer.

*   COM1 or COM2 serial port available on the host computer.

*   The host's environment space, which is reserved by the SHELL command in CONFIG.SYS, should be at least four times the length of the pathname to which the installation will copy the required files.

Note: If you want the reader to operate in English, you must install Auto-Loader according to the instructions in Chapter 3, "Learning About the Software."

To install Auto-Loader on your host computer

1. Insert companion disk 1 into a disk drive on your host computer.

2. Create the directory where you want to install Auto-Loader. Make that directory your current working directory.

    Do not use the drive C root directory or install Auto-Loader on a pseudo-drive that was created with a third-party file compression software utility.

3. At the DOS prompt on the host computer, type this command:

   source:install [*country*] [*-port*]

   where:

   source   is the disk drive where you inserted companion disk 1.

   country   specifies the country that corresponds to the language the reader will operate in. Type a country name supported by DOS NLS: France, Germany, Italy, or Spain. This parameter is optional; the default is USA.

   port   is the number of the host computer's serial COM port that the reader is connected to. This parameter is optional; the default is COM1.

   Here are two examples:

   - If companion disk 1 is in drive A, the reader is connected to the host computer's COM1, and you want the reader to operate in French, type this command on the host computer:

     a:install france

   - If companion disk 1 is in drive B, the reader is connected to the host computer's COM2, and you want the reader to operate in Italian, type this command on the host computer:

     b:install italy -com2

4. Wait for the installation procedure to finish and follow any instructions on the host computer's display.

The installation creates the C_FILES\COMMON directory that contains the default AUTOEXEC.BAT, CONFIG.SYS, and AUTOINST.BAT startup files. You can edit these startup files before loading them onto the reader. Do not remove or alter clearly commented statements that are required for Auto-Loader.

The installation also creates eight batch files in the directory you created for Auto-Loader. You will use LOADADD, LOADNEW, or LOADLANG to configure the reader to operate in a language. To learn about the other batch files, see "Auto-Loader Batch Files" in Appendix D.

Because the batch files are customized for the drive and directory where they are installed, you must reinstall Auto-Loader to move the files. Also, because the batch files are customized for the language you chose when you installed Auto-Loader, you must reinstall Auto-Loader to switch to another language.

Choosing a Method to Configure a Language

To configure the reader to operate in a language, you must change the contents of the reader's drive C. This section describes three procedures you can follow. The procedure you choose depends on what you expect drive C to contain, as shown in this table:

Contents of Drive C	Follow the Instructions in This Section
Three startup files from C_FILES\COMMON, and all files on drive C	"Using the LOADADD Batch File With the NLS Option"
Three startup files from C_FILES\COMMON, and additional files	"Using the LOADNEW Batch File"
Three startup files from C_FILES\COMMON	"Using the LOADLANG Batch File"

Using the LOADADD Batch File With the NLS Option

The LOADADD batch file adds NLS language support to the three startup files in the C_FILES\COMMON directory, creates an image file that contains those three startup files and all the files currently on the reader's drive C, and then loads the image file onto the reader's drive C. (The startup files currently on drive C are overwritten.)

To update drive C with the three startup files and all files currently on drive C

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Connect the power supply to the communications dock or the optical link adapter.

3. The command you type in Step 5 will copy the default startup files from C_FILES\COMMON to drive C, overwriting the startup files on your reader. If you need to customize the default AUTOEXEC.BAT or CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.

   When Auto-Loader copies the startup files, it adds commands at the end of the startup files to configure the reader to operate in the language you chose when you installed Auto-Loader on your host computer.

4. Make sure your current directory is the one where you installed the Auto-Loader batch files, or make sure that directory is listed in the path statement of your host computer's AUTOEXEC.BAT file.

5. Type this command on the host computer:

   ```
   loadadd nls
   ```

6. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press ⟨Ctrl⟩ ⟨Alt⟩ ⟨≡f⟩ ⟨.⟩ to warm boot the reader and start Interlnk. Auto-Loader begins updating drive C.

7. When the update is complete, the reader reboots automatically. Now you can exit Intersvr on the host computer by pressing **Alt-F4**. You see this message on the host computer:

   ```
   Drive C:  Installation process completed
   ```

8. Interlnk is still loaded in the reader's memory. If you need the conventional memory to run other applications, press ⟨Ctrl⟩ ⟨Alt⟩ ⟨≡f⟩ ⟨.⟩ to warm boot the reader. Because Intersvr is no longer running on the host computer, a warm boot does not cause Interlnk to load itself into the reader's memory.

Using the LOADNEW Batch File

The LOADNEW batch file adds NLS language support to the three startup files in the C_FILES\COMMON directory to the reader's drive C. LOADNEW next copies the three files to the reader's drive C, plus any additional files you specify. All files currently on drive C are erased during this process.

To update drive C with the three startup files plus any additional files

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Connect the power supply to the communications dock or the optical link adapter.

3. Create a working directory on the host computer.

4. Copy all the files you want on drive C to the working directory except for the startup files, which must remain in C_FILES\COMMON.

   If you want to copy files from drive C, you may need to start Interlnk to copy files. For example, if you have PC card drivers installed on drive C, you can copy them off the reader to your working directory. For help, see Chapter 6, "Networking the Reader."

   You can also copy files from the companion disks.

5. The command you type in Step 7 will copy the default startup files from
    C_FILES\COMMON to drive C, overwriting the startup files on your
    reader. If you need to customize the default AUTOEXEC.BAT or
    CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.

    When Auto-Loader copies the startup files, it adds commands at the end of
    the startup files to configure the reader to operate in the language you
    chose when you installed Auto-Loader on your host computer.

6. Make sure your current directory is the one where you installed the Auto-
    Loader batch files, or make sure that directory is listed in the path
    statement of your host computer's AUTOEXEC.BAT file.

7. Type this command on the host computer:

    ```
    loadnew [path\]filename [path\filename path\filename...]
    ```

    where:

    path   is the drive and directory of the file or files to add to the
                  image file and load to the reader.

    filename   is the name of the file or files to add to the image file and load
                  to the reader.

    You can include multiple *path\filename* and *path*.** parameters in the
    command. The *path*.** parameter loads all the files in a directory. For
    example:

    ```
    loadnew c:\janus\data.txt c:\atadrv\*.* c:\data\*.*
    ```

8. Auto-Loader runs Intersvr on the host computer. When you see the
    Interlnk Server Status screen on the host computer, press ⟨Ctrl⟩ ⟨Alt⟩ ≡f . to
    warm boot the reader and start Interlnk. Auto-Loader begins updating
    drive C.

9. When the update is complete, the reader reboots automatically. Now you
    can exit Intersvr on the host computer by pressing **Alt-F4**. You see this
    message on the host computer:

    ```
    Drive C:  Installation process completed
    ```

10. Interlnk is still loaded in the reader's memory. If you need the conventional
    memory to run other applications, press ⟨Ctrl⟩ ⟨Alt⟩ ≡f . to warm boot the
    reader. Because Intersvr is no longer running on the host computer, a warm
    boot does not cause Interlnk to load itself into the reader's memory.

Using the LOADLANG Batch File

The LOADLANG batch file adds NLS language support to the three files in the C_FILES\COMMON directory to the reader's drive C. LOADNEW next copies the three files to the reader's drive C. You cannot specify any additional files for drive C. All files currently on drive C will be erased during this process.

To update drive C with only the three startup files

1. Connect the reader to the host computer through a communications dock or optical link adapter. If you use the communications dock, you must connect the dock to the host computer with a 3-wire (2, 3, and 7) cable for Interlnk to operate properly.

2. Connect the power supply to the communications dock or the optical link adapter.

3. The command you type in Step 5 will copy the default startup files from C_FILES\COMMON to drive C, overwriting the startup files on your reader. If you need to customize the default AUTOEXEC.BAT or CONFIG.SYS, you should do so now in the C_FILES\COMMON directory.

   When Auto-Loader copies the startup files, it will add commands at the end of the files to configure the reader to operate in the language you chose when you installed Auto-Loader on your host computer.

4. Make sure your current directory is the one where you installed the Auto-Loader batch files, or make sure that directory is listed in the path statement of your host computer's AUTOEXEC.BAT file.

5. Type this command on the host computer:

   ```
   loadlang
   ```

6. Auto-Loader runs Intersvr on the host computer. When you see the Interlnk Server Status screen on the host computer, press ⟨Ctrl⟩ ⟨Alt⟩ ⟨≡f⟩ ⟨.⟩ to warm boot the reader and start Interlnk. Auto-Loader begins updating drive C.

7. When the update is complete, the reader reboots automatically. You see this message:

   ```
   DOS NLS SUPPORT
   INSTALLED FOR
   country
   ```

8. You can exit Intersvr on the host computer by pressing **Alt-F4**.

9. Interlnk is still loaded in the reader's memory. If you need the conventional memory to run other applications, press ⟨Ctrl⟩ ⟨Alt⟩ ⟨≡f⟩ ⟨.⟩ to warm boot the reader. Because Intersvr is no longer running on the host computer, a warm boot does not cause Interlnk to load itself into the reader's memory.

Using an International Keypad

You may use one of four international keypads with your JANUS reader:
French, German, Italian, and Spanish.

Each international keypad is an alphanumeric keypad with 52 keys. You use
special keys on the reader's keypad and press key combinations to access all
102 keys that are available on a PC keyboard.

Finding the Special Keys

Make sure you can find these special keys on your international keypad. This
example shows the French keypad.

2010U.061
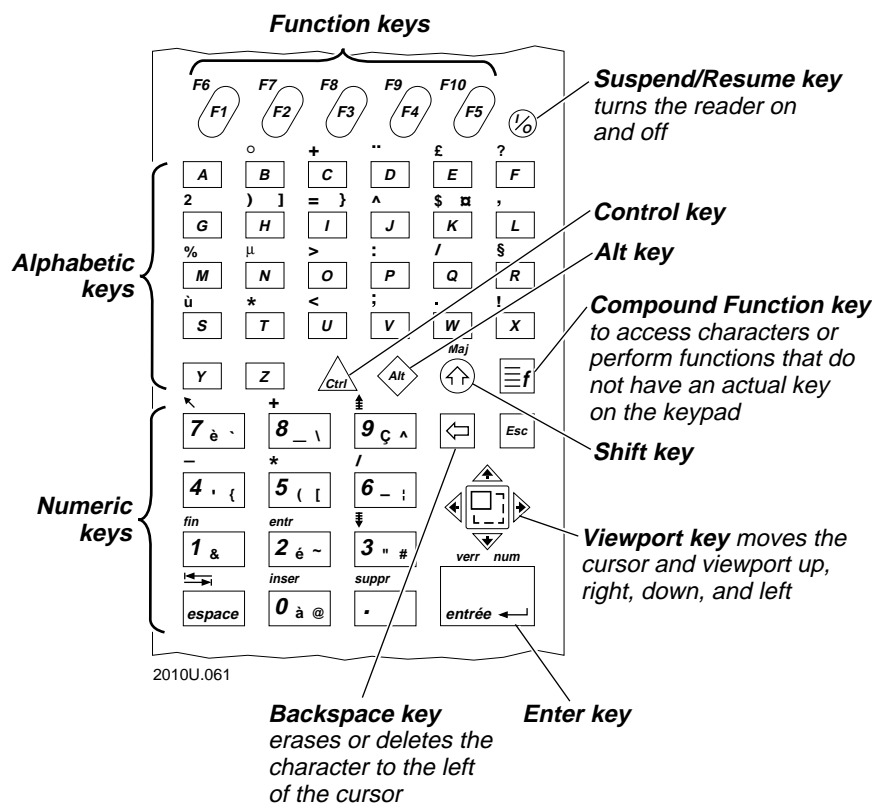
How to Type the Characters Printed on the Keypad

The reader's keypad contains characters that are printed both on the keys and above the keys (on the reader's top cover). This section describes how to type all the characters. For additional help, see "Using the Alphanumeric Keypad" in Chapter 2.

Typing the Characters On and Above the Alphabetic Keys

There are four types of characters and symbols printed on and above the alphabetic keys on an international keypad.

Example from the French keypad

Character	Description	To Type the Character
First	The first character is printed on the key. It is the lowercase version of each alphabetic key.	• Press the key the character appears on.
Second	The second character is printed on the key. It is the uppercase version of each alphabetic key.	1. Press ⇧. 2. Press the key the character appears on.
Third	The third character is the one that appears just above the key on the left side, printed on the top cover of the reader. Some keys, such as Y, do not have a third character.	1. Press ≣f. 2. Press the key the character appears above.
Fourth	The fourth character is the one that appears just above the key on the right side, printed on the top cover of the reader. Some keys, such as Y, do not have a fourth character.	1. Press ◇. 2. Press ≣f. 3. Press the key the character appears above.

To practice using an international keypad, type these characters

$ ¤

K

- To type the lowercase k, press ⌨K.
- To type the uppercase K, press ⬆. Press ⌨K.
- To type a dollar sign ($) on a French keypad, press ⌨≣f. Press ⌨K.
- To type a ¤ character on a French keypad, press ◇Alt. Press ⌨≣f. Press ⌨K.

Typing the Characters On and Above the Numeric Keys

There are four types of characters and symbols printed on and above the numeric keys on an international keypad.
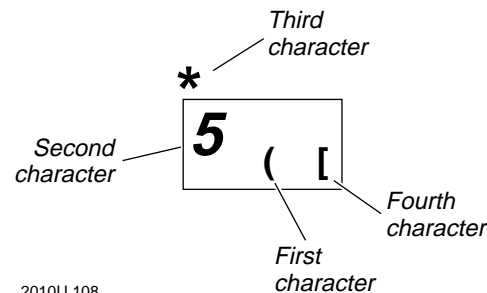
Example from the French keypad   *Example from the Spanish keypad*

2010U.108

Character	Description	To Type the Character
First	The first character is printed in the middle of the key. Every numeric key on the keypad has a first character.	• Press the key the character appears on.
Second	The second character is printed in the upper left corner of the key. Some keys, such as ⌨., do not have a second character.	1. Press ⬆. 2. Press the key the character appears on.
Third	The third character is the one that appears just above the key, printed on the top cover of the reader. Every numeric key on the keypad has a third character.	1. Press ⌨≣f. 2. Press the key the character appears above.
Fourth	The fourth character is printed in the lower right corner of the key. Some keys, such as ⌨1 on a German keypad, do not have a fourth character. The Italian keypad does not have a fourth character on the numeric keys.	1. Press ◇Alt. 2. Press the key the character appears on.

To practice using an international keypad, type these characters

*
5 **(** **[**
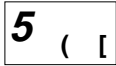
- To type a left parenthesis on a French keypad, press ⬚5⬚.
- To type the number 5 on a French keypad, press ⬆. Press ⬚5⬚.
- To type an asterisk (*) on a French keypad, press ⬚≡f⬚. Press ⬚5⬚.
- To type a left bracket on a French keypad, press ◇Alt◇. Press ⬚5⬚.
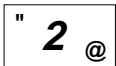
intro
" **2** **@**

- To type the number 2 on a Spanish keypad, press ⬚2⬚.
- To type double quotes (") on a Spanish keypad, press ⬆. Press ⬚2⬚.
- To use the intro function on a Spanish keypad, press ⬚≡f⬚. Press ⬚2⬚.
- To type the @ character on a Spanish keypad, press ◇Alt◇. Press ⬚2⬚.

Typing Diacritical or Accent Marks

You may need to type a special character with a diacritical or accent mark, such as Â, Ã, Ä. You use the ⬚≡f⬚ key to type a diacritical mark and access characters that do not have an actual key on the keypad.

To type a diacritical or accent mark

1. Press ⬚≡f⬚.

2. Press the key the diacritical mark appears above. For example, press ⬚D⬚ on the French keypad to type the ¨ diacritical mark.

3. Press the key or key combination for the character you are modifying. For example, press ⬆ ⬚A⬚ on the French keypad to add the ¨ diacritical mark to the uppercase letter A and type the character Ä.

   Or, to type the diacritical mark only, press ⬚space⬚.

If you try to modify a character to which the diacritical mark does not apply, the reader sounds an error beep and displays the diacritical mark and the incorrect character.

Note: The characters above O and U constitute the 102nd key on a 101/102 enhanced PC keyboard. Both characters produce scan code 56H.

Using the Alt Key

On all versions of the reader's international keypads, the right Alt key is identical to the Alt Gr key on international PC keyboards.

- To enter a right Alt key, press ◇Alt◇.
- To enter a left Alt key, press ⬚≡f⬚ ◇Alt◇.

Capitalizing All Characters

To type all alphabetic characters as uppercase letters, you can press ⇧ before every letter you type, or you can enable the Caps Lock feature.

To enable Caps Lock

Press ▣f ⇧.

To disable Caps Lock

Press ▣f ⇧.

Note: For many DOS NLS languages, you may press ⇧ to disable Caps Lock if it is active. For other DOS NLS languages, pressing ▣f ⇧ does not disable Caps Lock even if it is already active.

Using the Number Pad

You can use the number pad to move the cursor around the screen and to type numbers and mathematical symbols. The reader's number pad is designed to work like the number pad on a regular PC keyboard. If you are programming or using an application that requires the scan code for a character from the PC's number pad, you use the reader's number pad.

For example, you must use the PC's number pad to type a character from the extended ASCII character set. You cannot use the number keys above the alphabetic characters. You must also use the reader's number pad to type characters from the extended ASCII character set.

There are two ways to type numbers and mathematical symbols:

• Use the number keys 0 through 9 with the number pad disabled.

• Use the number keys 0 through 9 with the number pad enabled and the Num Lock turned on.

When you enable the number keypad, only the numbers shown on the keys are available. You cannot access the other characters printed **on** the numeric keys. However, you can always access the third character printed **above** the keys, whether the number keypad is enabled or disabled.

To enable the number pad

Press ≡f ≡f enter↵ .

To turn Num Lock on and off

Press ≡f enter↵ .

With the number pad enabled, you press ≡f enter↵ to toggle back and forth between Num Lock on and off.

To disable the number pad

Press ≡f ≡f enter↵ .

Using DOS Code Pages

All international keypads are translated using an installed DOS code page. DOS code pages contain both the standard ASCII character set and a set of national language characters specific to the language supported by the code page. You can find more information on DOS code pages in any DOS 5.0 manual.

If you installed DOS NLS support for French, German, Italian, or Spanish, you can switch DOS code pages at any time from your DOS NLS language to English, and vice versa.

To switch the DOS code pages on the reader

• Press Ctrl Alt F1 to change to English key translations. This is the default DOS configuration.

• Press Ctrl Alt F2 to change to the key translations based on the code page installed for the reader (French, German, Italian, or Spanish).

Using the French Keypad

Use this illustration and example keypad chart to enter any character on the French keypad.

2010U.020

To Enter	Press the Key(s)
h	H
H	⇧ H
)	☰f H
]	Alt ☰f H
p	P
P	⇧ P
:	☰f P
(	5
5	⇧ 5
* (asterisk)	☰f 5
[	Alt 5
¨ (accent mark)	☰f D space
Ä	☰f D ⇧ A
Maj	☰f ⇧
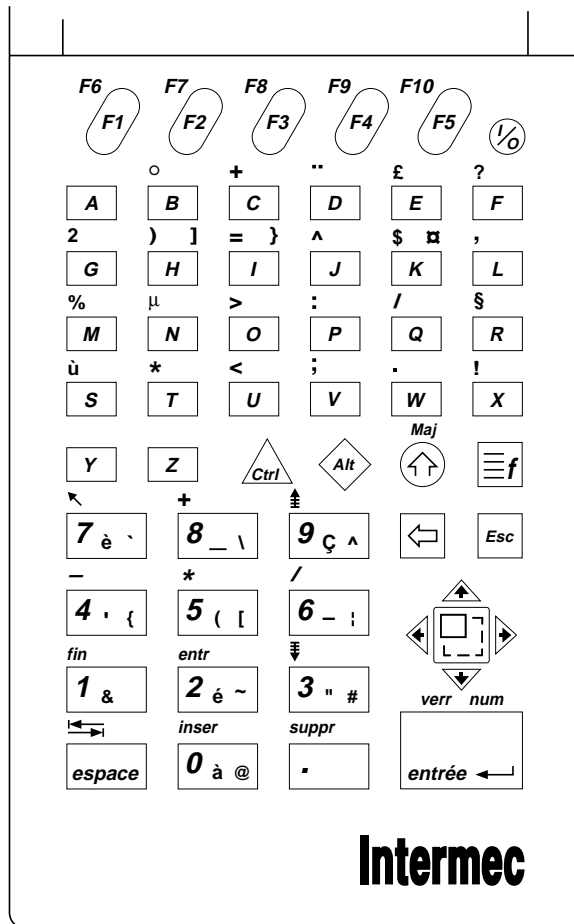
With Caps Lock (Maj) enabled

0 to 9	0 to 9

Using the German Keypad

Use this illustration and example keypad chart to enter any character on the German keypad.
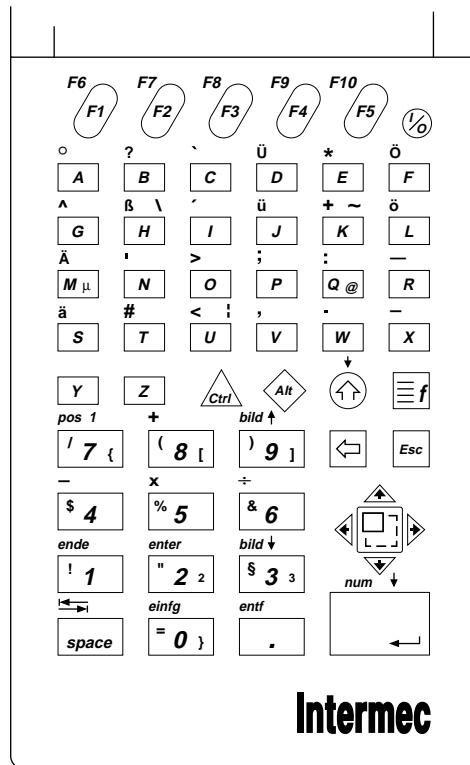
2010U.021

To Enter	Press the Key(s)
k	`K`
K	⇑ `K`
+	☰f `K`
~ (tilde)	◈Alt ☰f `K`
u	`U`
U	⇑ `U`
<	☰f `U`
¦ (pipe)	◈Alt ☰f `U`
8	`8`
(	⇑ `8`
+	☰f `8`
[	◈Alt `8`
` (accent mark)	☰f `C` `space`
È	☰f `C` ⇑ `E`
Caps Lock (↓)	☰f ⇑

Using the Italian Keypad

Use this illustration and example keypad chart to enter any character on the Italian keypad.
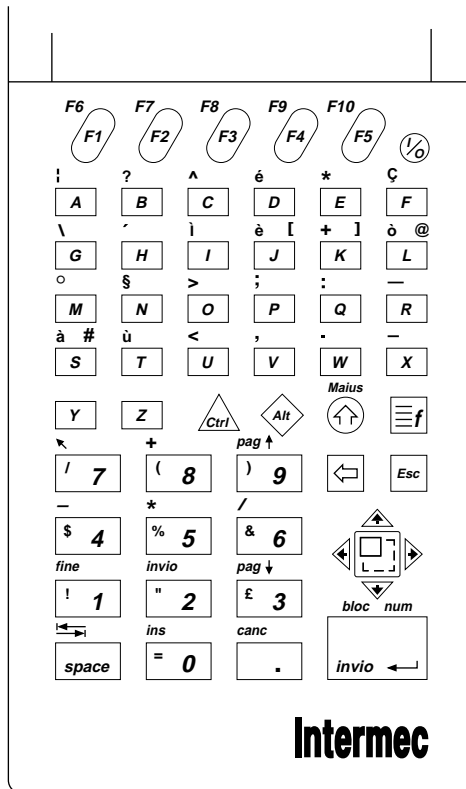
2010U.023

To Enter	Press the Key(s)
k	K
K	⇧ K
+	≡f K
]	Alt ≡f K
s	S
S	⇧ S
à	≡f S
#	Alt ≡f S
5	5
%	⇧ 5
* (asterisk)	≡f 5
' (accent mark)	≡f H space
É	≡f H ⇧ E
Maius	≡f ⇧

Using the Spanish Keypad

Use this illustration and example keypad chart to enter any character on the Spanish keypad.
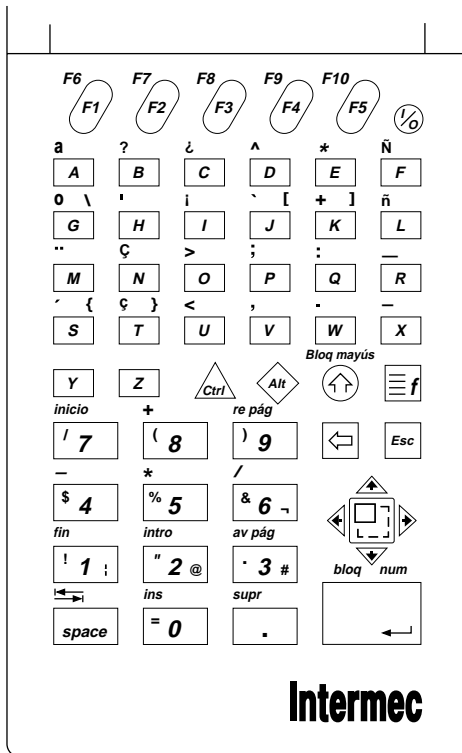
2010U.022

To Enter	Press the Key(s)
k	K
K	⇧ K
+	≡f K
]	Alt ≡f K
t	T
T	⇧ T
ç	≡f T
}	Alt ≡f T
2	2
" (quotation marks)	⇧ 2
intro	≡f 2
@	Alt 2
^ (accent mark)	≡f D space
Û	≡f D ⇧ U
Bioq mayús	≡f ⇧

9

Booting and Resetting the Reader

This chapter describes how to boot and reset the reader, set a password for advanced reader commands, put the reader in Storage mode, dump the contents of conventional memory to a host computer, and load the reader's flash memory.

Booting the JANUS Reader

The bootstrap process for the JANUS reader is similar to the bootstrap process for a PC. However, while you often boot a PC, you seldom boot the reader. The next sections explain how and why you perform these tasks:

• Warm Booting the Reader

• Cold Booting the Reader

Warm Booting the Reader

You may warm boot the reader to run a startup file that has changed. You may also warm boot to start Interlnk.

A warm boot performs a power-on self test (POST) to ensure that the hardware and peripherals are operational, runs CONFIG.SYS and AUTOEXEC.BAT, and displays the DOS prompt. The contents of the physical RAM drive (drive E) remain intact.

Caution
Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil
N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

To warm boot the reader

• Press and release these keys in order:

  ⬨Ctrl ⬨Alt ≡f .
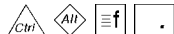
Cold Booting the Reader

You may cold boot the reader to clear conventional memory, break out of an application locked in an infinite loop, or recover from an error condition.

A cold boot invokes the BIOS boot sequence, which verifies that the 256K flash system image is not corrupt, clears all memory, and performs a POST to ensure that the hardware and peripherals are operational. The cold boot initializes system hardware for use by system software, loads the default configuration, runs AUTOEXEC.BAT and CONFIG.SYS, and loads DOS. Because the physical RAM drive is initialized, all files on drive E are lost.

Note: If you need to cold boot the reader, you may be able to save the contents of the RAM drive. For help, see "Saving the Contents of the RAM Drive" in Chapter 10.

Caution
When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil
Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

To cold boot the reader

1. Press ⓘ/ⓞ to turn off the reader.

2. Press ⓕ⁹ - ☐2 - ◀.

3. Press ☐2.

4. Press ⓘ/ⓞ to turn the reader on.

5. Type the password if the reader prompts you to do so. If you fail to enter the correct password after three attempts, the reader resumes normal operation.

6. The Boot Loader menu appears. The Reboot command is already selected. Press ⏎ to execute the Reboot command, which cold boots the reader.

```
         BOOT LOADER
          Reboot
          Password
          Dump
          Load
          Resume
          Storage
          Off
```
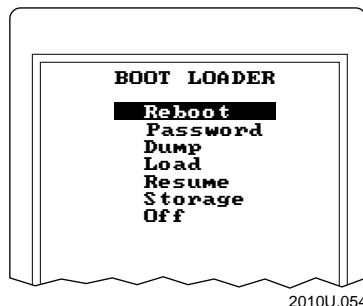
2010U.054

Resetting the Reader

Resetting the reader can involve forcing the reader to turn off, or stopping applications and clearing the reader's conventional memory.

Note: Turning off the reader by pressing Ⓘ/⍥ *does not clear the reader's conventional memory. When you turn the reader back on, it resumes operating just as it was before you put it in Suspend mode.*

Forcing the Reader to Turn Off

If the reader will not turn off when you press Ⓘ/⍥, you can force the reader to turn off by pressing Ⓘ/⍥ - ⑤ - ⬇ . It may take a few seconds before the reader turns off.

Later, when you press Ⓘ/⍥ to turn the reader on, the Boot Loader menu appears. From the menu, you can dump the contents of conventional memory to another computer and/or you can cold boot the reader.

For help, see "Dumping the Reader's 640K Conventional Memory" later in this chapter, and then see "Cold Booting the Reader" earlier in this chapter.

Breaking Out of an Application

If the application you are running becomes locked in an infinite loop, you can break out of that application without cold booting.

The procedure involves setting a flag, called the application break bit, in the reader. Applications check the application break bit when you turn on the reader to determine if they should resume running. If the bit is set to 1, the programs will not resume.

IRL applications automatically check the application break bit. If you are creating your own applications in C or Basic, you should make each application check this bit every time the reader is turned on. See your JANUS PSK reference manual to learn how to check the application bit.

Note: If your C or Basic application is locked in an infinite loop and does not check the application bit, you can cold boot the reader to break out of the application.

To break out of an application

1. Press ⓘ to turn off the reader. If you must force the reader to turn off, see the previous section.
2. Press ⓕ - ☐2 - ◀.
3. Press ☐1 to set the application break bit in the reader.
4. Press ⓘ to turn on the reader.

If the application checks the application break bit, it should take appropriate action when it detects that the bit has been set.

If the application does not check the application break bit, it will resume running. You may have to cold boot the reader to break out of this application. For help, see "Cold Booting the Reader" earlier in this chapter.

Displaying the Boot Loader Menu

The Boot Loader menu appears when you enter a designated key combination, the system flash is corrupt, the BIOS checksums fail, or the reader cannot resume. From the Boot Loader menu, you can perform advanced reader commands, as described later in this section.

To display the Boot Loader menu

1. Press ⓘ to turn off the reader.
2. Press ⓕ - ☐2 - ◀.
3. Press ☐2.
4. Press ⓘ to turn on the reader.

   If you do not press a key within 60 seconds after a screen is displayed, the reader automatically shuts off and you have to start over at Step 1.

5. The reader may prompt you for a password. If so, you must enter the password before you can display the Boot Loader menu.

   Type the password. You are allowed three attempts to type the password correctly. If you fail, the reader does not display the Boot Loader menu. Instead, the reader resumes normal operation.

   Note: The reader is shipped from the factory with the password disabled.

6.   The Boot Loader menu appears.


```
        BOOT LOADER
        Reboot
        Password
        Dump
        Load
        Resume
        Storage
        Off
```

2010U.054
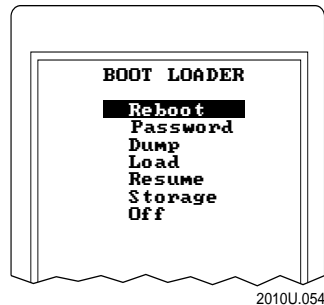
The Boot Loader menu lists seven commands and displays status messages or checksum messages at the bottom of the screen. The commands are:

Reboot   This command lets you cold boot the reader. A cold boot clears conventional memory and destroys all buffered data. For help, see "Cold Booting the Reader" earlier in this chapter.

Password   This command lets you enable or disable a password that all users must enter to display the Boot Loader menu. For help, see "Limiting Access to Advanced Reader Commands" later in this chapter.

Dump   This command lets you transmit the lower 640K of memory out through COM1. You might use this feature when the reader is not functioning and you need to save the contents of conventional memory. For help, see "Dumping the Reader's 640K Conventional Memory" later in this chapter.

Load   This command lets you load the reader's flash memory from a host computer connected to a serial port. You may reload the default flash memory to correct an error condition or you may upgrade the reader's software. For help, see "Loading Flash Memory" later in this chapter.

Resume   This command lets you exit the Boot Loader menu and resume operating as you were before you displayed the Boot Loader menu. For example, if the reader was executing an application, the application continues. If there is a bad checksum or the flash is corrupt, the reader cannot resume. For help, see "Powering Up or Booting the Reader" in Chapter 10.

Storage   This command lets you put the reader in Storage mode, which helps preserve the life of the bridge battery. All data stored in RAM is lost when you enter Storage mode. You should place the reader in Storage mode if you are not going to use it for one week or more. For help, see "Using Storage Mode to Preserve the Bridge Battery" later in this chapter.

Off   This command lets you exit the Boot Loader menu and put the reader into Suspend mode. When you press ⓘ/ⓞ to turn the reader back on, the reader resumes normal operation. For help, see "Turning the Reader On and Off" in Chapter 1.

Limiting Access to Advanced Reader Commands

You can set a password on the reader to limit access to advanced reader commands. Only users who correctly type the password can display the Boot Loader menu and exit from Storage mode.

If you lose or forget the password, call your Intermec service representative.

To set the password

1. Display the Boot Loader menu:

   a. Press ⓘ/ⓞ to turn off the reader.

   b. Press ⓕ³ - │ 2 │ -◀.

   c. Press │ 2 │.

   d. Press ⓘ/ⓞ to turn on the reader.

   e. Type the password if the reader prompts you to do so. If you fail to enter the correct password after three attempts, the reader resumes normal operation.

2. The Boot Loader menu appears. Press ▼ until you highlight Password.


```
        BOOT LOADER
        Reboot
        Password
        Dump
        Load
        Resume
        Storage
        Off
```
2010U.055

3. Press │enter↵│. The PASSWORD screen appears.


```
          PASSWORD

     Please Type

     Password *****


     Enter to Continue
     ESC   to Quit
```
2010U.079
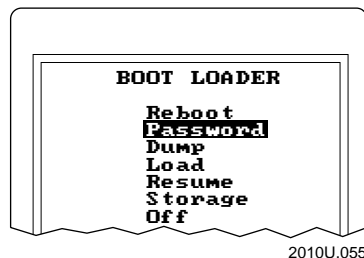
4. Type the new password and press ⌷enter↵⌷ . Your password can contain up to seven characters.

5. Type the new password again for verification and press ⌷enter↵⌷ .

    If you type the password incorrectly, you receive an error message and you need to repeat Steps 4 and 5.

6. Select Resume from the Boot Loader menu.

    The reader resumes operating. You will be prompted for this password when you attempt to display the Boot Loader menu or exit Storage mode.

To disable the password

1. Display the Boot Loader menu. For help, see the previous set of steps.

2. At the Boot Loader menu, press ◆ until you highlight Password.

3. Press ⌷enter↵⌷ . The PASSWORD screen appears.

4. Press ⌷enter↵⌷ twice without typing any other characters. This action disables the password by creating a null password.

5. Select Resume from the Boot Loader menu.

Using Storage Mode to Preserve the Bridge Battery

If you are not going to use the reader for one week or more, you must put it in Storage mode to preserve the life of the lithium bridge battery. While the reader is in Storage mode, the NiCad battery pack must be removed; otherwise, the reader slowly drains the battery pack and bridge battery.

⚠ **CAUTION**

Caution
All data in conventional memory will be lost when you put the reader in Storage mode.

Conseil
Toutes les données dans la mémoire conventionelle perdront lorsque vous mettez le lecteur en mode de stockage.

To put the reader in Storage mode

1. Display the Boot Loader menu:

    a. Press ⓘ/ⓞ to turn off the reader.

    b. Press ⟨F9⟩ - ☐ 2 - ◀.

    c. Press ☐ 2.

    d. Press ⓘ/ⓞ to turn on the reader.

    e. Type the password if the reader prompts you to do so. If you fail to enter the correct password after three attempts, the reader resumes normal operation. You will be prompted for this password again when you exit Storage mode.

2. The Boot Loader menu appears. Press ⬇ until you highlight Storage.


```
   BOOT LOADER
   Reboot
   Password
   Dump
   Load
   Resume
   Storage
   Off
```

2010U.056
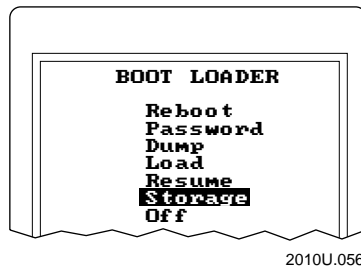
3. Press ⟨enter↵⟩. The reader goes into Storage mode and shuts off.

4. Remove the NiCad battery pack. For help, see "Removing the Battery Pack" in Chapter 2.

    The reader does not enter Storage mode until you remove the battery pack.

To exit Storage mode

1. Install the reader's NiCad battery pack. For help, see "Installing the Battery Pack" in Chapter 2.

2. Press ⓘ/ⓞ to turn on the reader.

3. Type the password if the reader prompts you to do so. The Boot Loader menu appears.

4. From the Boot Loader menu, select Reboot.

```
        BACKUP BATTERY

      Backup Battery
         Tests Good

    Storage Mode is On

        Please Press
    Enter to Continue
        Esc to Go Off
```

2010U.030
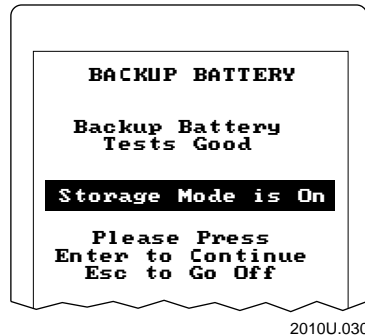
The reader begins rebooting, displays the BACKUP BATTERY screen, and asks if you want to exit Storage mode.

5. Press |enter↵| to exit Storage mode, continue booting the reader, and return to the DOS prompt.

    Note: If you press |Esc| the reader remains in Storage mode. Immediately remove the battery pack, as described in Chapter 2.

Dumping the Reader's 640K Conventional Memory

If you cannot resume the reader, you may need to cold boot the reader or load flash memory to resolve the error condition. However, all data in conventional memory will be lost when you perform either of these tasks.

You can save the contents of the reader's 640K conventional memory by dumping it to a host computer. The host computer must be running a communications program that can receive and store the data from the reader's memory.

To dump the reader's 640K conventional memory to a host computer

1. Connect the reader to a host computer using the optical link adapter or the communications dock. The reader transmits and receives data at 4800 baud, no parity, 8 data bits, and 1 stop bit.

2. Run a communications program, such as Crosstalk, that saves data on the host computer. This program is not provided with the reader.

3. Display the Boot Loader menu:

    a. Press ⓘ to turn off the reader.

    b. Press Ⓕ³ - | 2 | - ◀ .

    c. Press | 2 |.

    d. Press ⓘ to turn on the reader.

    e. Type the password if the reader prompts you to do so. If you fail to enter the correct password after three attempts, the reader resumes normal operation.

4. The Boot Loader menu appears. Press ✦ until you select Dump, and then press |enter ↵| .

```
         BOOT  LOADER
          Reboot
          Password
          Dump
          Load
          Resume
          Storage
          Off
```
2010U.057
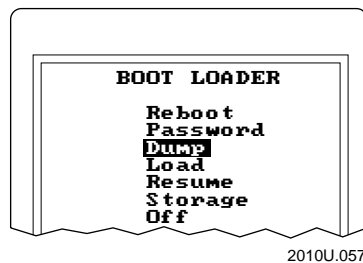
    The reader dumps data from low memory (640K and below) through COM1 to the host computer.

    The data is transmitted in Intel hexadecimal object file format.

5. A record counter on the reader display counts the data as it is transmitted to the host computer. The record counter stops updating when the reader is finished downloading the data.

6. Choose your next step. You can cold boot the reader by choosing the Reboot command and pressing |enter ↵| . Then you can use the reader.

    If you dumped the 640K because the Boot Loader menu displayed the "Bad BIOS Checksum" error message or because the flash memory is corrupted, you must load the flash memory now. For help, see the next section, "Loading Flash Memory."

Loading Flash Memory

You can download all of the reader's flash memory from a host computer if the Boot Loader menu displays the "Bad BIOS Checksum" error message, if the flash memory is corrupted, or if you need to upgrade the reader's software.

Loading flash memory replaces:

* drive C, the 512K ROM drive resident in flash memory.

* drive D, the 2MB ROM drive.

* the 256K flash system image.

Also, because you will reboot the reader near the end of this process, the contents of the physical RAM drive (drive E) will be destroyed.

Caution
When you load the reader's flash memory, all data in conventional memory will be lost.

Conseil
Lorsque vous chargez la mémoire flash du lecteur, vous perdez toutes les données de la mémoire conventionnelle.

To load the reader's flash memory

1. Decide if you want to save the contents of conventional memory. If so, you must perform the steps in the previous section, "Dumping the Reader's 640K Conventional Memory," now.

2. Decide if you want to save any files on drives C and E, such as customized startup files, applications, or configuration files. If so, you must copy the files to a PC card, another reader, or a host computer now. For help, see "Running Interlnk to Transfer Files" in Chapter 6.

3. Connect the reader to a host computer using an optical link adapter or communications dock. Use a null modem RS-232 cable to attach the accessory to the host computer. This cable is the same one you would use for Interlnk.

4. Connect a power supply to the communications dock or optical link adapter.

5. Press Ⓘ/Ⓞ to turn on the reader.

6. If the Boot Loader menu does not appear, follow these steps to display it:

    a. Press ⊚ to turn off the reader.

    b. Press ⊘ - ⬚2 - ◀.

    c. Press ⬚2.

    d. Press ⊚ to turn on the reader.

    e. Type the password if the reader prompts you to do so. If you fail to enter the correct password after three attempts, the reader resumes normal operation.

7. At the Boot Loader menu, press ⬇ until you select Load.

```
        Boot Loader
         Reboot
         Password
         Dump
         Load
         Resume
         Storage
         Off
```
2010U.058
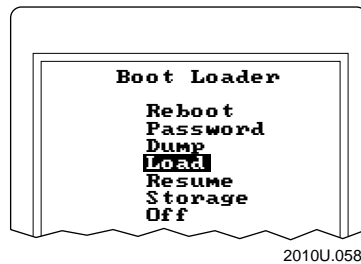
8. Press ⌷enter↵⌷ to execute the Load command.

9. Insert companion disk 1 into a disk drive on the host computer.

10. On your host computer, type the Upgrade command as follows:

    `source:\upgrade /com_port source: destination:`

    where:

    source　　　is the disk drive on the host computer where you inserted the Boot Utilities companion disk 1.

    com_port　　is the number of the serial COM port on the host computer that the reader is connected to.

    destination　is the drive on the host computer that you are using as a temporary work space while installing the loader and flash files. The drive must have at least 3.5MB of free disk space.

    For example, if the disk is inserted in the host's drive A, the host's drive C is your temporary work space, and the reader is connected to the host's COM1, type this command on the host computer and press ⌷enter↵⌷:

    `a:\upgrade /com1 a: c:`

    The upgrade program begins executing. It takes a little over 10 minutes to update or upgrade all of the reader's flash memory.

11. Press any key to skip the online instructions about checking connections to the reader and putting the reader in Load mode. You already performed those tasks. The online instructions are provided for users who do not have these printed instructions.

12. When the upgrade program finishes, it indicates the upgrade was successful. Press any key to return to the DOS prompt on your host computer. The files are deleted from the temporary work space on the host computer.

13. After you return to the DOS prompt on your PC, the reader displays the message, "System Has Reset, Please Reboot." Choose Reboot from the Boot Loader menu and press ⏎ to cold boot the reader.

⚠ **CAUTION**

Caution
When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil
Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

14. Reload any files or programs you had on drives C and E. For help, see "Learning How to Change the Contents of Drive C" in Chapter 3.

    Note: If you are upgrading to a new version of software, do not reload the startup files and drivers you used for the previous release.

15. If the reader operates in a language other than English, you must configure the reader to use that language. Use Auto-Loader as described in Chapter 8, "Preparing the Reader for International Use."

10

Troubleshooting

This chapter describes how to solve problems that may arise when you operate the reader.

How to Use This Chapter

If you have a problem operating the reader, read this chapter for a solution. For easy reference, problems are grouped into these topics:

• Powering Up or Booting the Reader

• Operating the Reader

• Saving the Contents of the RAM Drive

• Networking or Communicating With the Reader

• Running IRL Programs

• Using PC Cards

• Using DOS Commands and Applications

• Using MakeDisk and PutDisk

• Scanning Bar Code Labels

• Problems With the NiCad Battery Pack

• If Your Applications Refer to Specific Drive Letters

• Upgrading Flash Cards for JANUS 2.1 Software

Caution
There are no user-serviceable parts inside the reader. Opening the unit will void the warranty and may cause damage to the internal components.

Conseil
La reader ne contient pas de pièces révisibles par l'utilisateur. Le fait d'ouvrir l'unité annule la garantie et peut endommager les pièces internes.

If you send the reader in for service, it is your responsibility to save the reader applications, data, and configuration. Intermec is responsible only for ensuring that the keypad and other hardware features match when replacing your unit.

Powering Up or Booting the Reader

This table lists problems that may occur when you turn on, turn off, or boot the reader.

Problem	Solution
When you press ⊙ to turn on the reader, nothing happens or the reader immediately turns itself off.	Make sure the NiCad battery pack is installed correctly and the yellow battery pack locks are locked tightly.
	The NiCad battery pack may be discharged. Replace the battery pack with a spare charged battery pack, or charge the battery pack and try again.
When you turn on the reader, the power management software displays an error message.	An error occurred and the reader cannot resume operating. You can turn the reader off without losing data, provided there is sufficient battery power. The next time you turn on the reader, the error sequence repeats and the Boot Loader menu appears.
	If you reboot the reader, you will lose all the data in the reader's 640K conventional memory. You can save the contents of conventional memory and reload the system flash. For help, see "Dumping the Reader's 640K Conventional Memory" and "Loading Flash Memory" in Chapter 9.
When you turn on the reader, this screen appears:	You removed the NiCad battery pack while the reader was turned off. The reader has been configured to prompt you when it is turned back on to determine if you also exchanged or modified the memory card in the Type I PC card drive.
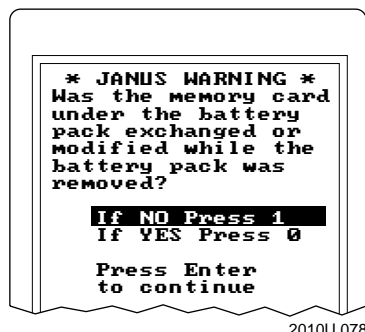
When you turn on the reader, this screen appears:

```
  * JANUS WARNING *
Was the memory card
under the battery
pack exchanged or
modified while the
battery pack was
removed?

  If NO Press 1
  If YES Press 0

  Press Enter
  to continue
```

2010U.078

You removed the NiCad battery pack while the reader was turned off. The reader has been configured to prompt you when it is turned back on to determine if you also exchanged or modified the memory card in the Type I PC card drive.

If the memory card has been changed in any way since the reader was last on, press ⬚0 to reset the Type I PC card drive, which helps protect data from being corrupted. Otherwise, you can press ⬚1 to continue without resetting the Type I PC card drive.

For help, see "Configuring the Reader to Reset the Type I Drive" in Chapter 4.

Powering Up or Booting the Reader (continued)

Problem

When you turn on or cold boot the reader, the Boot Loader menu appears. The menu may not list all the Boot Loader commands, and the screen may include a status message. For example:

```
        BOOT LOADER

        Dump
        Load
        Storage
        Off

   Bad BIOS Checksum
   Please Load BIOS
```

2010U.181
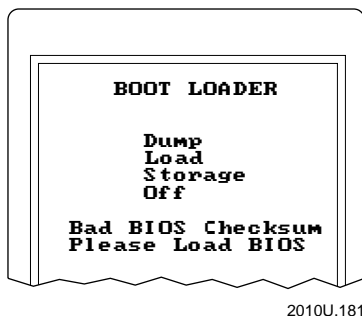
Solution

The bootstrap checks the system flash when doing a resume or cold boot. If the system flash is corrupt or there are bad checksum error messages, it brings up the Boot Loader menu. Read the status messages at the bottom of the menu:

- If you see "Bad BIOS Checksum" or a message that indicates that the system flash is corrupt, save the contents of conventional memory and reload the system flash. For help, see "Dumping the Reader's 640K Conventional Memory" and "Loading Flash Memory" in Chapter 9.

- If you see "Bad Saved State," the reader may have been in Storage mode. Press enter↵ to reboot. If you are prompted to exit Storage mode, press enter↵ again.

  You may also see the "Bad Saved State" message if you press the (I/O) button to suspend the reader while it is booting. Press enter↵ to reboot the reader. You may be able to save the contents of the RAM drive. For help, see "Saving the Contents of the RAM Drive" later in this chapter.

Caution
When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil
Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

During a warm boot, the reader cannot finish booting and displays an error message.

If you press a key (especially Ctrl, Alt, ⇧ or ≡f) while the reader is booting, you may see the message, "XX Keyboard Error, Press F1 or F2," where XX is a status code such as FA. Press F2 to exit the error screen and the reader continues booting.

Caution
Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil
N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

Powering Up or Booting the Reader (continued)

Problem	Solution

When the reader finishes booting, an icon remains on at the top of its display.

Contact your Intermec service representative. When the reader boots, the CPU starts all power cycles and turns all icons (except for Battery) on and off. The icons turn off very quickly as the reader passes a series of bootstrap code checks. Any icon that remains on indicates where the bootstrap code failed.

Other Boot Loader menu messages may look like this:

```
▲                    ⬓ ⬜

       Boot Loader
         Reboot
         Password
         Dump
         Load
         Resume
         Storage
         Off


   Power-On Override
   Okay To Resume
```
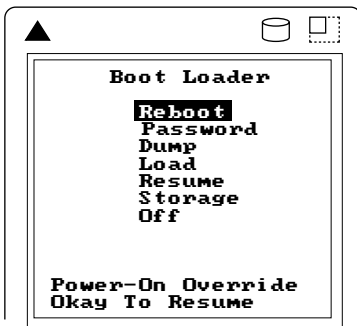
20X0A.001

If you see "Bad Saved State," the device may have been in Storage mode. Press |enter↵| to reboot. If you are prompted to exit Storage mode, press |enter↵| again.

You may also see the "Bad Saved State" message if you press Ⓘ/○ to suspend the device while it is booting. Press |enter↵| to reboot the device. You may be able to save the contents of the physical RAM drive.

Other self-explanatory messages may display on bottom of the Boot Loader menu.

For messages in the following group, choose Reboot on the Boot Loader menu and press |enter↵| .

- "System Has Reset
   Please Reboot"

- "Bad CMOS Checksum, Errors
   Please Reboot"

- "DRAM Check Failed
   Please Reboot"

For the messages in the following group, choose Resume or Reboot on the Boot Loader menu and press |enter↵| .

- "Keypad Fault Found
   Okay to Resume"

- "Power-On Override
   Okay to Resume"

- "Power-Off Timeout, Errors
   Okay to Resume"

- "Power-Off Forced
   Okay to Resume"

Operating the Reader

This table lists problems that may occur when you operate the reader. For example, if you have problems entering or scanning data, some solutions are listed in the table.

Problem	Solution
You cannot remember the password to access the Boot Loader menu.	Contact your Intermec service representative.
When you try to start IC.EXE, the reader displays an error message indicating that there is not enough memory available to run the Configuration Manager.	If the Configuration Manager TSR is unloaded when you start IC.EXE, the reader automatically loads the TSR for you. If there is not enough conventional memory available for the TSR, the reader displays an error message. Make sure at least 50K of memory is available. For help, see "Making More Memory Available on the Reader" in Chapter 3.
You want to return to the default configuration.	Follow the instructions in "Restoring the Reader's Default Configuration" in Chapter 5.
You see one of these error messages when you try to run an application: • "File Not Found" • "Not ready reading drive X. Abort, Retry, Fail?"	If you developed an application that refers to a specific drive letter, make sure the drive letter is correct. If the drive is not correct, you can change the application to refer to the new drive letters or to use a relative path instead of an absolute path. You can also use the DOS SUBSTITUTE command, as described in "If Your Applications Refer to Specific Drive Letters" later in this chapter. *Note: Some drive letters on the JANUS reader were changed with software version 2.10.*
While writing to a PC card in the Type II PC card drive, you turn off the reader, pull out the card, modify the card, insert it back in the reader, and turn on the reader.	The reader will continue to write to the PC card when you turn it back on. The file you were writing to is out of sequence. Your PC card may be corrupted. If you cannot access data on the card, you may need to format it.

Operating the Reader (continued)

Problem	Solution
While writing to a PC card in the Type II PC card drive, you turn off the reader, pull out the card, and turn on the reader without a card.	You have interrupted the write process. You will lose the data you were writing to the PC card.

You cannot tell if the numeric keypad is enabled or disabled.

You can check if the numeric keypad is enabled or disabled by pressing ⇧ and a number. For example, press ⇧ │5│ and see what appears on the reader's display:

Display	Indicates This State
%	The number pad is disabled.
5	The number pad is enabled with Num Lock on.
blank	The number pad is enabled with Num Lock off.

You scan a reader command, such as Backlight On, and nothing happens.

The reader commands are disabled. Scan the Enable Override command shown below to temporarily enable all of the reader commands. You can also enable or disable reader commands with IC.EXE. For help, see "Command Processing" in Chapter 12.

Enable Override

|||||| |||| ||||| |||| ||| |||| |||

$+DC3

When you run an application, the reader scrolls at line 25 and uses Automatic Viewport Movement mode regardless of the way you configured these parameters.

If you want the reader to scroll at another line or use Manual Viewport Movement mode while running an application, you must explicitly set those parameters in the application. You can use, for example, PSK functions.

The reader decodes a bar code label in a symbology other than the label's actual symbology.

Try scanning the bar code label again. Make sure you scan the entire label.

To ensure that the reader can operate quickly and efficiently, you should enable only the bar code symbologies that you are going to scan. If you enable multiple symbologies, the reader may on rare occasions decode a bar code according to the wrong symbology and produce erroneous results.

Operating the Reader (continued)

Problem	Solution

Problem

The user application is not receiving the bar code input properly.

Solution

Reader Services may have been unloaded. The reader cannot decode bar code labels unless Reader Services are loaded.

Verify that the IF EXIST D:\RDG.BAT CALL D:\RDG.BAT command is in AUTOEXEC.BAT, and then warm boot the reader to reload Reader Services.

If you cannot load Reader Services, you may have assigned too much conventional memory to the physical RAM drives. For help, see "Deciding How Much Memory to Use for RAM Drives" in Chapter 3.

Caution
Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil
N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

You cannot scan bar code labels.

See "Scanning Bar Code Labels" later in this chapter.

You see this message, "Configuration Manager TSR is not loaded."

You typed `cfgmgr -d` to unload the Configuration Manager TSR from memory, but it has already been unloaded. No action is required.

You see this message, "Configuration Manager TSR already loaded."

You typed `cfgmgr` to load the Configuration Manager TSR into memory, but it has already been loaded. No action is required.

Operating the Reader (continued)

Problem	Solution
The Battery icon appears at the top of the reader display.	The reader displays the Battery icon when the NiCad battery pack has approximately 15 to 45 minutes of power left. If you are using a J2010, replace the battery soon.
	For a JANUS 2010 with RF Back, you should immediately replace or recharge the battery pack because you will soon lose RF communications.

Caution
When the Battery icon appears, save your data and replace the battery pack as soon as possible.

Conseil
Quand l'icône de la pile apparaît, enregistrez vos données et remplacez le jeu de piles aussitôt que possible, sinon vous pourriez perdre des données.

Problem	Solution
You see all these symptoms:	The NiCad battery pack charge is critically low.
• The Battery icon remains on.	Save your data. Replace the battery pack with a spare charged battery pack, charge the battery pack, or attach an external power supply.
• The reader chirps every 5 seconds for 1 minute and then turns off.	
• The reader double-beeps when you enter or scan data, and double-clicks when you press any key.	The laser scanner (or wand) and RF communications are turned off 15 seconds after the first chirp.
You see all these symptoms:	Keep a charged NiCad battery pack installed in the reader. You can also attach an external power supply. Save all your data and back up all the files that are on drive E.
• The Battery icon is not displayed.	
• The reader chirps every 15 seconds for 1 minute and then turns off.	Reset the date and time to clear the low backup battery icon if the device experienced a deep discharge of the backup battery.
• The reader double-beeps when you enter or scan data, and double-clicks when you press any key.	Contact your Intermec service representative to replace the lithium bridge battery.
• The Backup Battery screen appears each time you turn the reader on.	

Problem

The reader appears to be locked up and you cannot enter data.

Solution

Press ⓘ to turn off the reader. If the reader will not turn off, see the next problem in this table for help. Press ⓘ to turn on the reader. If the reader displays the Boot Loader menu with the message "Bad Saved State," press ⏎ to cold boot the reader. You may be able to save the contents of the physical RAM drive. For help, see "Saving the Contents of the RAM Drive" later in this chapter.

Caution

When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil

Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

The reader appears to be locked up or is beeping every 10 seconds. When you press ⓘ to turn off the reader, it does not turn off.

Press ⓘ - ⑤ - ⬇ to turn off the reader. It may take a few seconds before the reader turns off. When you press ⓘ to turn on the reader, it displays the Boot Loader menu.

Read the status messages at the bottom of the menu. If the messages tell you to resume, choose Resume from the Boot Loader menu. If the messages tell you to reboot, choose Reboot from the Boot Loader menu to cold boot the reader. You may be able to save the contents of the physical RAM drive. For help, see "Saving the Contents of the RAM Drive" later in this chapter.

Caution

When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil

Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

Operating the Reader (continued)

Problem

Solution

The reader displays the
Boot Loader menu.

The reader displays the Boot Loader menu in response to several
error conditions:

- You turned off the reader (by pressing ⊙ or removing the
  NiCad battery pack) while the reader was performing a
  warm boot.

- You removed and replaced a discharged NiCad battery pack,
  instead of inserting a charged battery pack.

- You ran an application on the reader that masks the non-
  maskable interrupt (NMI). While this is acceptable on a PC, it is
  not acceptable on a reader.

- There may be another problem with the reader.

Read the status messages at the bottom of the menu. If the messages
tell you to resume, choose Resume from the Boot Loader menu. If
the messages tell you to reboot, choose Reboot from the Boot
Loader menu to cold boot the reader. You may be able to save the
contents of the physical RAM drive. For help, see "Saving the
Contents of the RAM Drive" later in this chapter.

Caution
***When the reader performs a cold boot, all files on the physical
RAM drive are destroyed.***

Conseil
***Lorsque le lecteur effectue un amorçage à froid, tous les
fichiers présents sur le lecteur de la mémoire RAM physique
sont supprimés.***

You need to cold boot the reader and
you want to save the contents of
drive E, the physical RAM drive.

For help, see "Saving the Contents of the RAM Drive" later in this
chapter.

Operating the Reader (continued)

Problem

All the files on drive E have been erased.

Solution

The contents of drive E, the physical RAM drive, are destroyed when you perform these tasks:

- You cold boot the reader.

- You load the reader's flash memory.

- You put the reader in Storage mode.

- You execute CONFIG.SYS after changing the command that creates the RAM drive.

- You turn off the reader (by pressing Ⓘ/Ⓞ or removing the NiCad battery pack) while the reader is performing a warm boot.

- You removed and replaced a discharged NiCad battery pack, instead of inserting a fully charged battery pack.

- You run an application on the reader that masks the non-maskable interrupt (NMI). While this is acceptable on a PC, it is not acceptable on a reader.

You must restore or copy your files to drive E.

Saving the Contents of the RAM Drive

When you cold boot the reader, the contents of drive E, the physical RAM drive, are normally destroyed. You may be able to save the contents of the RAM drive by using this procedure.

To save the contents of the physical RAM drive

1. From the Boot Loader menu, choose Reboot.

Caution
When the reader performs a cold boot, all files on the physical RAM drive are destroyed.

Conseil
Lorsque le lecteur effectue un amorçage à froid, tous les fichiers présents sur le lecteur de la mémoire RAM physique sont supprimés.

2. Press ⎡Esc⎤ as soon as you see the RAM memory test message:

    ```
    BIOS Ver x.xxx
    Copyright 1992-199x
    All Rights Reserved

    00120K RAM Passed
    ```

    Note: You must press ⎡Esc⎤ before the memory counter reaches 00640K RAM Passed.

3. The reader continues booting. At the DOS prompt, enter this command:

    ```
    dir e:
    ```

    If the contents of drive E are displayed, you can continue using the reader. If the contents of drive E are destroyed, you must restore or copy your files to drive E.

Networking or Communicating With the Reader

This table lists problems that may occur when the reader is communicating with another device.

Note: If you have problems with your RF network, see your JANUS RF documentation.

Problem	Solution
Communications problems occur only when you connect the optical link adapter to a reader and no external power source is attached.	The reader may not be in good contact with the optical link adapter. Inspect the spring contacts and contact surfaces on the optical link adapter for signs of corrosion or contamination. If necessary, clean the contacts with a cotton swab and an alcohol-based solvent. Other solvents may damage the plastic housing.
The communications application cannot communicate.	Verify that the reader and the other device are using the same communications protocol and parameter settings. If they do not match, change them and restart the communications application.
	Make sure the reader's optical port, communications dock, and optical link adapter are clear of foreign material. Wipe the optical port window with a damp cloth to remove any material that may be blocking the light from the LEDs.
	You may need to reset the UART FIFO control register. For help, see "Specifying a Value for the FIFO Control Register" in Chapter 6.
You attempt to load PHIMEC, and the reader displays the message, "Comm port not available."	The PHIMEC protocol handler has not been loaded into memory. You attempted to load PHIMEC to a COM port other than COM1 or COM2.
	Load the protocol handler again, specifying COM1 or COM2. For help, see "Loading and Unloading a Protocol Handler" in Chapter 6.
When you use the Multi-Drop protocol and 19.2 bps baud rate, the communications application times out or waits indefinitely on a receive request, and the 9154 Multi-Drop Line Controller's fault light turns on.	The packets are too large (over 30 bytes) for the JANUS reader to handle at the 19.2 bps baud rate. Lower the baud rate to 9600 bps.

Networking the Reader (continued)

Problem	Solution
The communications application seems to stop executing or lock up.	The reader may have lost its connection with the communications dock, optical link adapter, or other device.

Verify that the reader is still connected to the other device. Make sure all the cables are firmly connected to each device. If you are using a communications dock, make sure the reader is placed correctly in the reader slot.

If the reader was disconnected, restart the communications application. If it is still locked up, warm boot the reader.

Check the communications protocol you configured and make sure you specified timeouts.

Caution
Do not press any keys while the reader is performing a warm boot or you may lose data.

Conseil
N'appuyez pas sur des touches pendant que le lecteur se réamorce, sinon vous pouvez perdre des données.

You experience problems with the reader display when you run terminal emulation (TE) on the reader. For example, the prompt disappears after you run a program.

When you run TE on the reader, the CONFIG.SYS file loads ANSI.SYS. ANSI.SYS interacts with IM_DISP.EXE, causing unpredictable effects on the reader's display.

Remark out IM_DISP.EXE in the AUTOEXEC.BAT file while you use TE. For help editing AUTOEXEC.BAT, see "Learning How to Change the Contents of Drive C" in Chapter 3.

You may experience problems with your RF network, such as:

• The RF option is not listed in the Com menu of IC.EXE.

• The RF protocol handler (RFPH) did not load correctly.

• The Connect icon turns off.

If you have any problems with your RF network, see your JANUS RF documentation.

Running IRL Programs

When an IRL error occurs, the reader beeps and displays an error message. Press ⌷enter⌷ to clear the message and continue. The types of error messages are:

Receive error   This error occurs when the reader is receiving a message or protocol characters from the host.

Transmit error   This error occurs when the reader is transmitting a message or protocol characters to the host.

Syntax error   This error occurs when the reader is performing a syntax check on a program before running the program. If a program statement is invalid, the error message lists the program statement and the problem. Edit the program for syntax errors and run it again.

Runtime error   This error occurs when the reader is executing a program. The program ignores nonfatal errors. If it is a fatal error, the reader exits the program and returns to the IRL Desktop or DOS prompt.

This table lists the error beep sequences and their meanings:

Sequence	Meaning
Three low beeps	Syntax or compile error
Low beep, high beep, low beep	Nonfatal runtime error
Three high beeps	Fatal runtime error

Note: The JANUS reader does not beep to indicate transmit or receive errors.

The next table lists problems that may occur when you run IRL programs on the reader.

Problem	Solution
The reader displays "Executing..." on power up or prompts you for data on power up.	An IRL Program is running. Type or scan this Exit IRL Program command: Exit IRL Program */S*
There is not enough memory to run your IRL program.	You need to free more conventional memory or run the program without running the IRL Desktop. For help, see "Freeing Enough Memory to Run an IRL Program" in Chapter 7.
When you try to start the IRL Desktop, the reader displays an error message indicating that there is not enough memory available to run the Configuration Manager.	If the Configuration Manager TSR is unloaded when you start the IRL Desktop, the reader automatically loads the TSR for you. If there is not enough conventional memory available for the Configuration Manager TSR, the reader displays an error message. Make sure at least 50K of memory is available.
The reader is locked up in an IRL program.	Perform the application break sequence, as described in "Breaking Out of an Application" in Chapter 9.
You are having problems trying to download an IRL program.	Make sure you have performed all these steps: • You configured the communications protocol correctly on the reader and host. For help, see "Configuring the Communications Protocols" in Chapter 6. • You activated the communications protocol. For help, see "Activating One Communications Protocol" in Chapter 6. • You loaded the protocol handler. For help, see "Loading and Unloading a Protocol Handler" in Chapter 6. • You are in the IRL Desktop, at the main menu, with no commands selected.
You have trouble running an IRL program with Interlnk.	You cannot run an IRL program over an Interlnk connection.

Using PC Cards

This table lists problems that may occur when you use PC cards in the JANUS reader. For help, see Chapter 4, "Using PC Cards in the Reader."

Problem	Solution
You are trying to access the reader's PC card drive and you see the message, "Invalid media type reading drive X. Abort, Retry, Fail?"	Press ⒜ to abort. The reader cannot read the PC card in the drive. Use the CARDINFO utility to verify the type of card you are using (ATA, flash, I/O, or SRAM). Check the reader's CONFIG.SYS file. Make sure you have the correct drivers installed for the type of card you are using. Format the PC card.
You are trying to access the reader's PC card drive and you see the message, "Not ready reading drive X. Abort, Retry, Fail?"	Press ⒭ to try again. If you see the message again, press ⒜ to abort. The reader cannot read the PC card in the drive. Use the CARDINFO utility to verify the type of card you are using (ATA, flash, I/O, or SRAM). Check the reader's CONFIG.SYS file. Make sure you have the correct drivers installed for the type of card you are using. Format the PC card. You may also see this message if you are using the Substitute command and you do not have a PC card in each PC card drive. Insert a PC card in each drive and try using the Substitute command again.
You try to access the reader's PC card drive and you see the message, "Bad command or filename."	Check the command you entered and make sure it is a valid command. Try entering the command again.
You access the PC card in the PC card drive and the reader locks up frequently.	The PC card may not be formatted correctly. If you formatted the PC card on your PC or host computer, try formatting the card in the reader's PC card drive. You can also use the CARDINFO utility to verify the current format and status of the card.

Using PC Cards (continued)

Problem	Solution
You hear the reader sound a single low tone beep when you insert a PC card in the PC card drive.	The reader cannot read the card in the PC card drive. You need to format the card. For help, see "Configuring, Formatting, and Using PC Cards" in Chapter 4.

If you followed all the instructions to format a flash PC card and the reader still does not recognize the card, you may need to install two other flash card drivers. You need to install the MTAA.EXE and MTAB.EXE drivers to use AMD Type A or B flash cards.

Copy the two drivers from the Application companion disk 3 to drive C on the reader (using Auto-Loader or MakeDisk/PutDisk). Edit the CONFIG.SYS file and add these lines after the line that installs the MTI2P.EXE driver:

```
device=c:\mtaa.exe
device=c:\mtab.exe
```

After you place the revised CONFIG.SYS file on the reader's drive C, boot the reader and try to format the flash card again.

| You delete files from a 512K flash card and it does not appear that there is any additional space available on the card. | If you are using a 512K flash card with an MS-Flash file format, the card is formatted as a WORM (Write Once Read Many) drive. A 512K flash card does not have room for more than one separately erasable block of memory. You can delete individual files using the DOS delete command, but the memory the files were using is not available to be used again. To reclaim the memory from deleted files, you need to erase the entire card and then reformat the card. |

Note: Intermec recommends using flash cards that store 1MB or more of data.

| You try to format a flash PC card with the MCFORMAT utility and you see the message, "You must erase X: before creating a new partition." | If a flash card has been formatted before, you must erase the card before you can format it. Use the MCFORMAT utility and select option ⎡3⎤ from the MCFORMAT main menu to erase a flash card. |

If you erase the flash card and still see this message when you try to format the card or the card will not format, check CONFIG.SYS. Make sure the flash card drivers are installed. Once the flash card drivers are active in CONFIG.SYS, try erasing the flash card. Then format the card.

Using PC Cards (continued)

Problem	Solution
You try to load APM_4M.EXE or IPM_4M.EXE and you see the message, "CS PM already loaded."	You cannot load APM_4M and IPM_4M at the same time. If you see this message, one of the utilities is already loaded. Load APM_4M only for I/O cards; otherwise use IPM_4M.

Check the AUTOEXEC.BAT file to see which utility is loaded. If you are loading the wrong one, edit the AUTOEXEC.BAT file or load the utility from the DOS prompt. For help, see "Drivers in AUTOEXEC.BAT" in Chapter 4.

After you load your Novell network software, you use a network PC card and run an application that does not work properly after making a system call.

Your Novell network software may have modified the COMSPEC environment variable to add a drive specifier to the path. However, DOS needs COMSPEC to find the COMMAND.COM file, which must be loaded for DOS to execute system commands. The reader uses ROM DOS, which expects COMSPEC to be set to:

```
comspec=command
```

To eliminate this problem, run the INITENV utility before you log onto a NetWare server. INITENV.EXE is on the reader's drive C and Application companion disk 3. Create a login batch file similar to this one:

```
@echo off
c:\initenv
f:\login %1 %2
set comspec=command
```

Use the new login file instead of your Novell login file when you log the reader onto the server. If you do not run INITENV.EXE before logging in, your DOS environment table will be corrupted and cause your JANUS application to fail. You can set COMSPEC correctly to fix part of the problem, but you must boot the reader to clear embedded garbage characters from the environment table.

To check COMSPEC, type set and press [enter ↵]. All environment variables are displayed. If COMSPEC was set to anything other than COMMAND, it has been changed by the login process.

Using DOS Commands and Applications

This table lists problems that may occur when you run DOS-based applications on the reader.

Problem	Solution
The reader displays a "Write Fault Error Writing Device PRN" message.	A <DLE> or Ctrl-P was entered into the reader. There may be a conflict because <DLE> is both the Intermec command override command and the DOS printer redirection command. Press △Ctrl P to turn off console echo to the printer and then press A to abort. For help, see "Command Override" in Chapter 11.
The reader is locked up in an application.	Perform the application break sequence, as described in "Breaking Out of an Application" in Chapter 9.
There is not enough memory to load a program.	You need to free conventional memory. For help, see "Making More Memory Available on the Reader" in Chapter 3.
The reader locks up when running Auto-Loader and you cannot reboot the reader.	Use the Boot Loader menu to reload the system flash memory. For help, see "Loading Flash Memory" in Chapter 9.
You have trouble running an IRL program over an Interlnk connection.	You cannot run an IRL program over an Interlnk connection.
The reader locks up just after the DOS boot banner message appears when you finish updating drive C with Auto-Loader.	Press **Alt-F4** on the host computer and then warm boot the reader. A lockup occurs when both these conditions are true: • An active Intersvr connection to the JANUS reader exists when the reader reboots. The reader's default CONFIG.SYS file installs Interlnk automatically when the reader is connected to COM1 of the host computer and the host is running Intersvr. • The reader's CONFIG.SYS and AUTOEXEC.BAT install a combination of device drivers, DOS options, TSRs, and applications that absorb the majority of available conventional memory. When both conditions exist, there is not enough space for your software configuration to coexist with the Interlnk device driver. The reader attempts to allocate memory that is not available, and a lockup may occur. To prevent the lockup, press **Alt-F4** on the host computer or break the serial connection between the reader and host computer before the reader reaches the DOS initialization step of the warm boot. When you exit Intersvr on the host computer or break the serial connection, the Interlnk device driver will not detect INTERSVR.EXE, and Interlnk will not be loaded into the reader's memory.

Using DOS Commands and Applications (continued)

Problem	Solution
You see this message when you try to use Interlnk: "Install Interlnk, add the following line to your CONFIG.SYS file and reboot..."	DO NOT follow the instructions in the error message. You do not have to modify the reader's CONFIG.SYS file. Instead, follow the instructions in "Running Interlnk to Transfer Files" in Chapter 6. To run Interlnk on the reader, you connect the reader to a host computer, execute Intersvr on the host, and warm boot the reader. The reader's default CONFIG.SYS file installs automatically when the reader is connected to a host computer that is running Intersvr.

A DOS command does not work.

These DOS commands are not supported on the reader:

DOSSHELL.*	MONEY.BAS
DOSSWAP.EXE	MONO.*
DRIVER.SYS	MSHER.COM
EGA.*	NIBBLE.BAS
EGAMONO.GRB	REMLINE.BAS
FDISK.EXE	UNFORMAT.COM
GORILLA.BAS	VGA.*
HERC.*	VGAMONO.GRB

You cannot access a drive while using Interlnk.

Interlnk does not redirect network drives, CD-ROM drives, or any other device that uses a redirection interface.

These commands do not work with Interlnk:

CHKDSK	FORMAT	UNDELETE
DISKCOMP	MIRROR	UNFORMAT
DISKCOPY	SYS	

You do not have the MS-DOS Programs companion disk 2 and need to use Interlnk.

If you do not have companion disk 2, which contains the Interlnk files, you can install Interlnk to the host from the reader.

Connect the reader and host computer with a 7-wire null modem cable when installing Interlnk. The MODE command must be available on the host where you are installing Interlnk.

Type this command on the reader:

```
intersvr /rcopy
```

The command copies the Interlnk files to the host computer.

Using DOS Commands and Applications (continued)

Problem	Solution
The host computer locks up after you type this command on the reader: `intersvr /rcopy`	When the Interlnk files are downloaded to the host computer, the host computer may lock up. Reboot the host computer.
The reader does not boot after you modified the CONFIG.SYS file.	Correct the error in CONFIG.SYS. Use Auto-Loader, BFT, or MakeDisk and PutDisk to load the new CONFIG.SYS onto the reader. Boot the reader. The reader should boot with the corrected CONFIG.SYS file.
The reader locks up when you use Interlnk and list a directory (DIR) on one of the reader's ROM drives.	Edit the host computer's AUTOEXEC.BAT or CONFIG.SYS file and remove or remark out Windows SMARTDRIVE.

You see this message when you use Interlnk/Intersvr to copy files between the reader and the host computer:
 	
`Not reading writing drive X`
 	
`Abort, Fail, Retry`
	Press $\boxed{R}$ to Retry and continue copying the files. You may have a problem copying files if you use the DOS version (utilities from your PC) of Interlnk and Intersvr on the JANUS reader. Intermec modified the Interlnk and Intersvr utilities to work with the JANUS reader. The Intermec version of these utilities is provided on the reader's Drive D and on the MS-DOS Programs companion disk 2. Use the Interlnk and Intersvr utilities provided with your reader to transfer and copy files.
	
	If your files were not copied correctly, try the procedure again using the Interlnk and Intersvr utilities provided with your reader.

Using MakeDisk

This table lists messages that you may see when you use MakeDisk to create a new image file for drives C or D.

Message	Explanation/Solution
A source path has been specified that contains no files.	You cannot attempt to create an image file from a source directory that contains no files. MakeDisk will not let you create an empty drive image.
An invalid path and/or file name has been specified for the image file.	MakeDisk was unable to create the image file based on the "`/o=[path\filename]`" argument given. This error can be caused by either an invalid path name (for example, a path that doesn't exist or a "not ready" drive), or a *path\filename* that contains characters that DOS does not recognize as valid characters for filenames.
An invalid path name has been specified.	MakeDisk could not find the source directory path you specified on the command line. Please specify a valid subdirectory for the "`/s=[path]`" argument.
• Corrupt BPB in suffix: Unable to create a drive image. • Corrupt suffix: Unable to create a drive image.	If either of these messages persist after further attempts, it may indicate a corrupted MAKEDISK.EXE file. Get a fresh copy of MAKEDISK.EXE from the Boot Utilities companion disk.
Drive full: Unable to write a complete image file to the output drive. Remove some files or specify a different output path and file name.	The drive where the image file is being written has insufficient free space available to contain the entire image file.
ERROR, unknown or incomplete command, or too many characters: [*bad command line argument shown here*].	You have entered a command line argument that MakeDisk does not recognize (as shown in the error message). Run MakeDisk again with the command line argument corrected.
Insufficient memory, unable to create a complete image file. Try again after removing device drivers, TSRs, or other applications that are occupying conventional memory.	There is not enough conventional DOS memory available on the computer running MakeDisk to complete the MakeDisk process. You may need to unload (terminate) some applications, device drivers, or TSRs in order to free the needed memory. Another approach is to reduce the number of nested subdirectories in the longest directory chain below your source directory.
Invalid drive letter specified. Please specify either drive C or D only.	MakeDisk will only create image files for drives C and D on your 4MB JANUS device.

Using MakeDisk (continued)

Message	Explanation/Solution
Makedisk was unable to complete the drive image. Try again.	You may receive this message for several types of general faults such as: • One or more of the files in the source directory could not be accessed. This could indicate a corrupt file or a bad disk. • A network error occurred when DOS attempted to retrieve a remote file. • DOS was unable to read the source directory for any number of reasons.
Please specify a source path where your drive image can get its files from.	Enter a valid subdirectory name where your source files reside that will be used to create the drive image. (This is the `/s=[path]` argument).
The root directory can only contain [*n*] files; your source files exceed this count. Place some of your root files in a subdirectory as an alternative.	Your source directory (first level) contains more than the maximum number of files and/or subdirectories permitted for the target drive's root directory. One approach to solve this is to place some of the first-level files in a subdirectory below your source directory.
The system has too many files open; unable to create a drive image. Increase the 'FILES=' setting in your CONFIG.SYS file or terminate other applications that may be running.	MakeDisk needs to open several files during the image file creation process, but is unable to do so. You may need to terminate other applications or close some files in order to complete the MakeDisk process.
Your source files would create a [*n*] byte image file which is [*n*] bytes in excess of drive [`C:` or `D:`]'s capacity.	The total size of the files and subdirectories in your source directory, including the overhead space required to emulate a DOS compatible drive, exceeds the storage capacity of the JANUS drive you have targeted.

Using PutDisk

This table lists messages that you may see when you use PutDisk to load a new image file to drives C or D.

Message	Explanation/Solution
Attempt to allocate memory failed, unable to proceed.	This indicates that there is not enough conventional DOS memory available for PutDisk to complete the flash update process. You may need to unload (terminate) some applications, device drivers, or TSR programs to free the needed memory.
Attempted to upgrade a ROM drive, unable to proceed.	PutDisk has determined that the target JANUS drive is comprised of ROM (read-only memory, which cannot be written to by PutDisk) instead of flash memory. Other kinds of system faults can lead PutDisk to make this determination in error, such as a flash programming voltage fault or address decoding problems.
Attempted upgrade in a RAM region, unable to proceed.	PutDisk has determined that the target JANUS drive is comprised of RAM (random access memory, which cannot support a non-volatile drive) instead of flash memory. Other kinds of system faults can lead PutDisk to make this determination in error, such as faulty flash memory or address decoding problems. You may need technical support to solve this type of error.
Cannot upgrade an unsupported drive.	Attempts to update a JANUS drive other than C or D are unsupported. Restart PutDisk, and specify the drive `/d=[drvletter]` as either C or D.
• Fault has occurred during attempt to erase flash memory. • Fault has occurred during attempt to write flash memory.	If either of these messages persist after retrying PutDisk with a fresh battery or charging source, it may indicate a flash memory hardware failure on the JANUS device.
Image checksum failed comparison with checksum of received data.	This may indicate that the flash memory update was incomplete. You will need to restart PutDisk using the same image file.
Image file error: Drive image file is larger than the drive's BPB capacity.	The size of the drive image file is larger than is declared valid by the formatting portion of the image file. You will have to reconstruct the drive image file by using the MakeDisk utility.
Image file error: Drive image file is larger than the flash media capacity.	The size of the image file is larger than the targeted drive's flash memory on the JANUS device. You must reduce the total file content (total size) of the drive image file by rebuilding it with the MakeDisk utility using fewer or smaller files.

Using PutDisk (continued)

Message	Explanation/Solution
Image file error: Drive image file is too small to be valid.	You have attempted to write an image file to a JANUS drive that is smaller than the minimum permitted size for an image file. The minimum image file size is unique for each JANUS drive (for example, the image file may target a JANUS drive other than the one you attempted to write it to).
Image file error: Drive image type is not compatible with reader's DOS version.	You have attempted to write a drive image intended for a 1MB JANUS device to a 4MB JANUS device, or vice versa.
Image file error: Image is not compatible with the specified drive.	If the image file you attempted to write to drive C, was created for drive D, it must only be written to drive D.
Image file error: Received image data has exceeded the specified image file size.	This generally indicates a communications error or a DOS file I/O error. You should retry PutDisk to see if the problem persists. If the problem is related to the use of Intersvr/Interlnk or a remote drive that is networked using another method, you need to determine if a communications problem exists before proceeding.
• Image file error: Unrecognized drive image type. • Image file error: Drive image contains an invalid or unsupported BPB.	These messages indicate that the image file you attempted to write to a JANUS drive is either corrupt, or is an invalid image file format for the JANUS device. Build a fresh image file using the MakeDisk utility.
Image file not found.	PutDisk was unable to find the image file you specified on the command line as the `/i=[imagefile]` argument.
Power management fault has occurred on reader.	PutDisk attempts to cooperate with JANUS power management processes; however, rare circumstances may cause a temporary fault. The best remedy for this problem is to reboot the JANUS device after PutDisk completes. If a flash update was not completed due to this fault, restart PutDisk after rebooting.
Reader's programming voltage failed during flash operation.	This message will likely occur if the battery level is borderline. You will need to restart PutDisk after installing a fresh battery or connecting the JANUS device to a charging source. If the drive being updated was drive C, it is unlikely that you will be able to reboot to the MS-DOS prompt; but you may be able to continue by rerunning PutDisk from the current MS-DOS session (without rebooting). If this method fails, you will need to enter the boot screen and use LOADER.EXE to update the JANUS drive C.

Using PutDisk (continued)

Message	Explanation/Solution
Reader's programming voltage has failed operational limits.	The flash programming voltage source has exceeded the acceptable current limit. This may be due to other PC Cards that use flash programming voltage. Retry PutDisk after removing all PC Cards other than SRAM cards.
Specified image file path is not valid.	This error can be caused by either an invalid path name (for example, a path that doesn't exist or a "not ready" drive), or a path\filename that contains characters that DOS does not recognize as valid characters in filenames.
The reader's battery is too low to proceed with flash operations.	You must install a fresh battery or connect the JANUS device to either a charger via the optical link adapter or a communications dock before proceeding with the flash update.
Unable to activate Reader's A20 signal.	This may indicate either a conflict with other software that controls the A20 signal, or a hardware problem on the JANUS device. Try using PutDisk again, after terminating any suspect applications or utility programs. Another alternative is to enter the boot screen and attempt the use of LOADER.EXE to update the drives C or D.
Unable to activate reader's programming voltage, cannot proceed.	This message indicates that flash memory cannot be updated due to flash programming voltage problems. If the problem persists after installing a fresh battery or connecting the JANUS device to a charging source, there may be a hardware problem that requires service.
Unable to assert PM control due to concurrent PM host running on reader.	In this context, PM refers to protected mode which is used to access the extended memory regions assigned to the flash memory for JANUS drives. If another application is running that uses PM, it will likely introduce a conflict with PutDisk. You need to terminate (or uninstall) the application that is causing the conflict. Programs in this category include DOS extenders and EMM386 (which is not supported on the JANUS device).
Unable to engage reader's programming voltage, cannot proceed.	This may indicate a conflict with another process or device that uses flash programming voltage. Remove any PC Cards (other than SRAM cards) from the JANUS device.
Unable to resume flash drive upgrade; must be restarted.	PutDisk was unable to continue the flash update process that was interrupted with a power-down suspend/resume cycle. You need to restart PutDisk. First attempt to rerun PutDisk in the current MS-DOS session. If this fails, you will need to reboot to the MS-DOS prompt before restarting PutDisk. If the target drive was C and the JANUS device will no longer boot to the MS-DOS prompt, you will need to enter the boot screen and use LOADER.EXE to update drive C.

Using PutDisk (continued)

Message

Upgrade failed, but original drive contents have been preserved.

Explanation/Solution

This message may be displayed in conjunction with another specific fault message showing the cause of PutDisk interruption. It means that although the drive update was attempted, the original files on the target drive have not been altered and are therefore safe to use.

Scanning Bar Code Labels

Read this section if you cannot scan bar codes with the reader.

You cannot see a red light when aiming at a wall. You may be too far from the wall. Move within 2 feet of the wall and test the scanner again. Or test the scanner by pointing it at the floor.

The reader powers on but the scanner light does not. If the reader powers off after a timeout, you may turn on the reader and find that the scanner does not work. The scanner may not be securely connected to the reader. Turn off the reader and check the connection. Disconnect and reconnect the scanner by pushing it into the reader firmly, and then retest the scanner.

The scanner will not register the bar code label you are trying to scan. Make sure you aim the beam so it crosses the entire label in one pass. If your scanner still will not register the scan, it may mean that you did not enable the symbology of the bar code. For help, see "Choosing the Symbologies the Reader Will Decode" in Chapter 5.

If you still have trouble with the scanner or wand, perform these checks:

• Inspect the print quality of the bar code. Try scanning a bar code label that you know scans. Compare the two bar code labels. You may need to replace the label that cannot be scanned.

• Make sure the reader is turned on. Press Ⓘ/O to turn the reader on.

• You try to scan a bar code label and the scanner or wand turns off or will not turn on. If the reader is chirping every 5 seconds and the Battery icon is displayed, you have a low NiCad battery pack. You must turn off the reader and replace the battery pack.

• You scan a bar code label that contains a valid configuration command, but the reader beeps and displays an error message such as, "Bad command or filename." Make sure the Configuration Manager TSR is loaded into memory. If it is not loaded, you cannot scan configuration commands. Type `cfgmgr` and press ⏎ to load Configuration Manager and rescan the bar code label.

- You scan a bar code label to enter data at the DOS prompt, but the reader beeps and displays an error message such as, "Bad command or filename." Make sure the application that is expecting the data is running. If necessary, start the application and scan the bar code again.

- Try using another scanner or wand.

- Scan the bar code again, but vary the scanning angle and distance.

- Clean the scanning window of the laser scanner with a solution of ammonia and water. Wipe dry. Do not allow abrasive material to touch the window.

- Use IC.EXE to verify that the reader is configured to read the bar code symbology you are scanning.

20° Angle

2010U.175

- Use IC.EXE to verify that the correct scanner type is enabled on the reader. For help, see the "Scanner Devices" command in Chapter 12.

- Verify that the command IF EXIST D:\RDG.BAT CALL D:\RDG.BAT is executed from the AUTOEXEC.BAT file. If the command is not executed, the reader cannot decode bar code labels.

- The SCANNER.INI file contains configuration information for each type of scanner device. The SCANNER.INI file must remain on drive D. If SCANNER.INI is not on drive D, you cannot configure the Scanner Devices (SS) parameter to any value except "All compatible scanners." Any attempt to do so will generate an error:
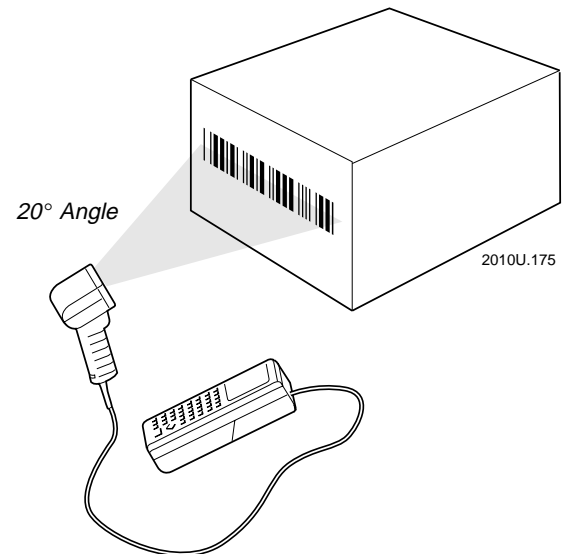
When You Do This	Result
You use IC.EXE to configure the Scanner Devices parameter.	"All compatible scanners" is the only value you can choose for the parameter.
You scan or type a configuration command that sets the Scanner Devices parameter to any other value.	The reader sounds an error beep.
You load a configuration file (such as JANUS.INI) that sets the Scanner Devices parameter to any other value.	The reader displays an error message and none of the changes in the INI file are implemented.

Problems With the NiCad Battery Pack

Follow these guidelines to avoid problems with the NiCad battery pack and the reader:

- Always turn the reader off **before** you remove the NiCad battery pack.

- Periodically clean the NiCad battery pack contacts to maintain good contact with the reader. Use a cotton swab and some rubbing alcohol to clean the gold contacts on the end of the battery pack.

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Battery contact (6)

- If the battery pack appears to lose its charge capacity, discharge the battery pack using a battery charger or communications dock before charging it. If the battery pack still does not hold a charge, try using a new, fully charged battery pack in the reader.
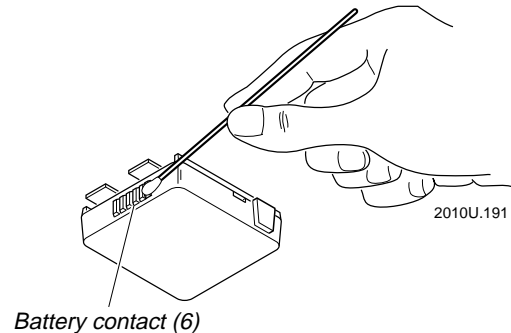
  It is not necessary to discharge the battery pack every time you charge it. Only discharge the battery pack when you notice problems. For help, see the accessory quick reference guides.

- If the JL2010 optical link adapter fails to charge the battery pack when connected to a power supply, inspect the spring contacts and contact surfaces on the optical link adapter for signs of corrosion or contamination. If necessary, clean the battery charging contacts with a cotton swab and some rubbing alcohol. Other solvents may damage the plastic housing on the optical link adapter.

2010U.077

Battery charging contact (2)
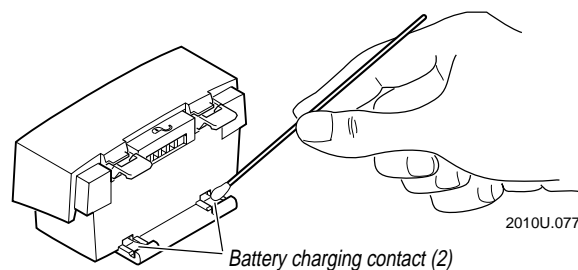
The next table lists problems that the NiCad battery pack may cause.

Problems With the NiCad Battery Pack

Problem	Solution
When you press Ⓘ/⑁ to turn on the reader, nothing happens or the reader immediately turns itself off.	Make sure the battery pack is installed correctly and the yellow battery pack locks are locked tightly.

The NiCad battery pack may be discharged. Replace the battery pack with a spare charged battery pack, or charge the battery pack and try again. |
| The Battery icon appears at the top of the reader display. | The reader displays the Battery icon when the NiCad battery pack has approximately 15 to 45 minutes of power left. If you are using a J2010, replace the battery pack soon.

If you are using a JANUS 2010 with RF Back, you should immediately replace or recharge the battery pack because you will soon lose RF communications. |

Caution
When the Battery icon appears, save your data and replace the battery pack as soon as possible.

Conseil
Quand l'icône de la pile apparaît, enregistrez vos données et remplacez le jeu de piles aussitôt que possible, sinon vous pourriez perdre des données.

Problem	Solution
You see all these symptoms:

• The Battery icon remains on.

• The reader chirps every 5 seconds for 1 minute and then turns off.

• The reader double-beeps when you enter or scan data, and double-clicks when you press any key. | The NiCad battery pack charge is critically low.

Save your data. Replace the battery pack with a spare charged battery pack, charge the battery pack, or attach an external power supply.

The laser scanner (or wand) and RF communications are turned off 15 seconds after the first chirp. |

Problems With the NiCad Battery Pack (continued)

Problem

You see all these symptoms:

- The Battery icon is not displayed.

- The reader chirps every 15 seconds for 1 minute and then turns off.

- The reader double-beeps when you enter or scan data, and double-clicks when you press any key.

- The Backup Battery screen appears each time you turn the reader on.

Solution

Keep a charged NiCad battery pack installed in the reader. You can also attach an external power supply. Save all your data and back up all the files that are on drive E.

Reset the date and time to clear the low backup battery icon if the device experienced a deep discharge of the backup battery.

Contact your Intermec service representative to replace the lithium bridge battery.

11

Reader Command Reference

This chapter is an alphabetical listing of the reader commands that you can use while operating the reader. Reader commands, such as Backlight On, allow you to perform a task on the reader.

Using Reader Commands

A reader command causes the reader to perform a task. For example, you can turn the backlight on to easily view the reader's display when you are working in a dimly lit environment. You can execute reader commands by:

• scanning a command from a Code 39 or Code 93 bar code label.

• pressing keys on the keypad and choosing a command from an IC.EXE or IRL Desktop menu.

• sending a command from a host computer.

• executing a command in an IRL program.

You will find the purpose and syntax for each reader command in this chapter.

Note: You can send reader commands from a host computer only when the reader is running an application that uses Reader Wedge TSR. You can also execute reader commands in an IRL program and applications using Reader Services.

You can group reader commands together (concatenate) into one string. For example, the command to turn the backlight on is %.1, and the command to raise the beep volume is $+BV9. Use this next command to group the two reader commands together and download them from a host computer:

```
%.1$+BV9
```

To create a bar code label, you can add start and stop codes:

Backlight On / Raise Beep Volume

%.1$+BV9

The reader executes concatenated commands in the order in which they appear in the command string. If one of the commands is incorrect, the reader sounds three low beeps and processes any valid commands up to the invalid command. All other data in the remainder of the string is ignored.

Backlight On and Off

Purpose: Turns the backlight on to easily view the reader display in dimly lit
                      environments.

From Host: Not supported

Keypad: 1.   Press ⊞f - ◇Alt◇, and then release both keys to enter Control mode.

                      2.   Press ⏎enter↵ to turn the backlight on or off.

                      3.   Press Esc to exit Control mode.

IRL Command: Z"%.1"

Scan: Backlight On

                      |||||||||||||||||||||||||

                      %.1

Purpose: Turns the backlight off.

From Host: Not supported

Keypad: 1.   Press ⊞f - ◇Alt◇, and then release both keys to enter Control mode.

                      2.   Press ⏎enter↵ to turn the backlight on or off.

                      3.   Press Esc to exit Control mode.

IRL Command: Z"%.0"

Scan: Backlight Off

                      |||||||||||||||||||||||||

                      %.0

                      Note: You can use the command %. to toggle the backlight on and off.

Backspace

Purpose:	Deletes the last character from the current data record. If there is no data in the buffer, the reader sounds three low beeps.
From Host:	Not supported
Keypad:	⇦ or ≡f .
IRL Command:	Not supported
Scan:	Backspace

‖‖‖‖‖‖‖‖‖

-+

Change Configuration

Purpose:	This command must precede any configuration command parameter. If you enter a valid string, the reader configuration parameters are modified and the reader sounds a high beep. For help on the configuration parameters, see Chapter 12, "Configuration Command Reference."
	Note: You no longer need to use the Exit Configuration command ($-) after a Change Configuration command, but it is allowed for backward compatibility.
From Host:	$+*command*
Keypad:	Not supported
IRL Command:	Z"$+*command*"
Scan:	Change Configuration

‖‖‖‖‖‖‖‖‖

$+

Enter a configuration command or scan a bar code label containing a configuration command. For example, enter the command BV0 to turn the beep volume off.

Clear

Purpose: Deletes the entire data record you are accumulating.

From Host: Not supported

Keypad: Not supported

IRL Command: Not supported

Scan: Clear

‖‖‖‖‖‖‖‖‖‖‖‖‖‖

- -

Command Override

Purpose: Causes the character that follows it to be treated as data. Command override allows you to use control characters in preambles, postambles, data strings, and configuration command strings.

From Host: `<DLE>`

Keypad: ⟨Ctrl⟩ ⟨P⟩

The key sequence ^P (Ctrl P) is also the ASCII Data Link Exception character (DLE). ^P causes the character that follows it to be received as data, even if it is a protocol character. To interpret a Command Override command from the host, the command must be preceded by DLE.

For example, when ^P^P^M is sent from the host, it is interpreted as ^P^M, where ^P is acknowledged allowing the next command (^M) to be interpreted as data and passed on to the application. When ^P^M is sent from the host, it is interpreted as ^M, the display is not affected and the Carriage Return command is executed.

IRL Command: Z"^P"

Scan: Command Override

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<DLE>

The JANUS 2010 reader uses Ctrl-P as the Command Override command; however, the DOS printer redirection command (Ctrl-P) is also supported on the reader. This dual purpose may cause some conflicts.

If you have Reader Services loaded and scan the bar code label <DLE>, the first scan is interpreted as a reader command. The next <DLE> entered causes a Ctrl-P to be entered into the expanded key buffer. DOS takes this Ctrl-P and enables printer redirection.

If no printer is connected, all subsequent entries cause an error and the next message is displayed:

```
Write fault error writing device PRN
Abort, Retry?
```

DOS shuts off the printer echo for the duration of the error, which allows it to display the error. As long as the printer echo has been requested (by entering a Ctrl-P), DOS turns the printer echo back on after the critical error is corrected. To exit the critical error, press △Ctrl △P to turn off the console echo to the printer, and then press △A to abort.

Enter

Purpose:	Enters the current data record or completes the entry of a command. If no data exists, a null string is entered.
From Host:	Not supported
Keypad:	enter ↵
IRL Command:	Not supported
Scan:	Enter

Enter

‖‖‖‖‖

**

Enter and Exit Accumulate Mode

Accumulate mode is used to accumulate all scanned data in the reader's data buffer. When you exit Accumulate mode, the accumulated data is "entered" as a data record. The buffer is cleared by one of these commands:

- Exit accumulate command
- Enter command
- Clear command
- Any type of reset

Up to 250 characters can be held in the buffer. If the data record count exceeds 250 characters, the last bar code read is rejected and the reader sounds an error beep.

Purpose: Enters Accumulate mode. If you press any keys when using the Enter Accumulate command, the keystrokes are accumulated as data.

From Host: Not supported

Keypad: Not supported

IRL Command: Not supported

Scan: Enter Accumulate Mode

‖‖‖‖‖‖‖‖

+/

Purpose: Exits Accumulate mode and transmits the current data record. If no data has been accumulated, an empty data record is entered.

From Host: Not supported

Keypad: Not supported

IRL Command: Not supported

Scan: Exit Accumulate Mode

‖‖‖‖‖‖‖‖

-/

IRL File, Clear

Purpose:	Deletes one or all of the IRL data files that have default filenames: {IRL-0}.IRD, and {IRL-A}.IRD through {IRL-Z}.IRD. For help, see "Clearing IRL Data Files" in Chapter 7.

Note: You can use this command only from the IRL Desktop.

From Host: .$*filename*

where *filename* is 0 or any character from A to Z. If you do not include a filename, all IRL data files (0, A to Z) are deleted.

⚠️
CAUTION

Caution
When the clear file command is sent from the host without data, all data is cleared and all files are deleted.

Conseil
Lorsque la commande d'effacement de fichier (clear file) est envoyée de l'hôte sans préciser les données à effacer, toutes les données sont effacées et tous les fichiers sont supprimés.

Keypad: In the IRL Desktop, choose File and then choose Clear Data.

IRL Command: Not supported

Scan: Scan one of these bar codes:

Clear All IRL Data Files

|||||||||||||||||||||||

.$

Clear {IRL-0}.IRD

|||||||||||||||||||||||

.$0

Note: You can create bar code labels to delete {IRL-A}.IRD through {IRL-Z}.IRD.

If you choose to clear all data files, a message explains that the default data files will be deleted and shows the directory where the files are located. Choose OK to delete the data files. If you clear one data file, IRL deletes the file without displaying a message or prompt.

IRL File, Receive

Purpose: Accepts a file from the host and saves it under the specified filename. If the filename is not included, the reader displays the Receive screen, which lets you select a COM port and filename. For help, see "Receiving IRL Files" in Chapter 7.

Note: You can use this command only from the IRL Desktop.

From Host: *.%filename*

Keypad: In the IRL Desktop, choose File and then choose Receive.

IRL Command: Not supported

Scan: Receive IRL File

.%

IRL File, Transmit

Purpose: Sends the specified file to the host. If the filename is not included, the reader displays the Transmit screen, which lists all .IRL and .IRD files in the current directory. For help, see "Transmitting IRL Files" in Chapter 7.

Note: You can use this command only from the IRL Desktop.

From Host: *%%filename*

Keypad: In the IRL Desktop, choose File and then choose Transmit.

IRL Command: Not supported

Scan: Transmit IRL File

%%

IRL Program, Download

Purpose: Downloads the program you specify from the host computer to the reader. For help, see "Downloading an IRL Program" in Chapter 7.

The command renames the program to {IRL-1}.IRL and copies it to the directory specified by the IM_IRLPROG path in your AUTOEXEC.BAT file. If the program path is on a nonwritable drive, the program is copied to the data path. If there is an {IRL-1}.IRL program already in the directory, it is overwritten. If the command detects an error, an error message appears and control returns to the IRL Desktop.

To download an IRL program, send a Start of Program (SOP) character followed by the program to be downloaded from the host computer. You can set the <SOP> character in the reader's configuration. The default is <SI>. For help, see the "IRL SOP" command in Chapter 12.

You can also use PC-IRL, Collect, DCM, DFM, or Interscan to download IRL programs. For help, see the product's manual.

Note: You can use this command only from the IRL Desktop.

From Host: <SOP>

Keypad: Not supported

IRL Command: Not supported

Scan: Not supported

IRL Program, Exit

Purpose: Exits the IRL program that is running. For help, see "Exiting an IRL Program" in Chapter 7.

From Host: /$

Keypad: Press the application break sequence. For help, see "Breaking Out of an Application" in Chapter 9.

IRL Command: Not supported

Scan: Exit IRL Program

‖‖‖‖‖‖‖‖‖‖‖‖

/$

IRL Program, Resume

Purpose: Starts running the program named in the {LATEST}.RSM file exactly where the program left off when it was halted or exited. For help, see "Resuming IRL Programs" in Chapter 7.

Note: You can use this command only from the IRL Desktop.

From Host: $.

Keypad: In the IRL Desktop, choose File and then choose Resume.

IRL Command: Not supported

Scan: Resume IRL Program

‖‖‖‖‖‖‖‖‖‖

$.

IRL Program, Run

Purpose: Runs the default IRL program {IRL-1}.IRL. For help, see "Running an IRL Program" in Chapter 7.

Note: You can use this command only from the IRL Desktop.

From Host: / /

Keypad: In the IRL Desktop, choose File and then choose Run.

IRL Command: Not supported

Scan: Run IRL Program

‖‖‖‖|‖|‖|‖‖‖‖

//

Laser On and Off

The Laser On and Off commands are the same as pulling and releasing the scanner trigger. This command is valid on a JANUS 2010 only when you have a laser scanner connected to the reader's scanner port.

After a Laser On command, the scanner operates differently depending on the Scanner mode and Scanner Trigger configuration settings:

• If you configure the reader to use One-Shot Scanner mode and level triggering, the scanner automatically turns off after a good read of a bar code label, or after the scanner timeout period elapses.

• If you configure the reader to use Automatic Scanner mode and level triggering, the scanner remains on after a good read of a bar code label. You use the Scanner Timeout command or the Laser Off command to turn off the scanner.

Note: Intermec does not recommend that you use a Laser On or Off command with the Scanner Trigger command set to edge triggering.

Purpose: The Laser On command is the same as pulling the scanner trigger.

From Host: / .

Keypad: Not supported

IRL Command: Z"/."

Scan: Not supported

Purpose: The Laser Off command is the same as releasing the scanner trigger. Its effect is described above.

From Host: / %

Keypad: Not supported

IRL Command: Z"/%"

Scan: Not supported

Prepare for Reboot

Purpose: Causes the PSK library to notify the BFT-ready PSK application that the host wants to reboot the system and establish a BFT session. The PSK application accepts the Prepare for Reboot command and sends a Ready for Reboot message to the host. For help, see "Downloading Applications Across the Network" in Chapter 6.

From Host: ..+%1   Prepare for Reboot

                      ..+%0   Cancel the Prepare for Reboot command

Keypad: Not supported

IRL Command: Not supported

Scan: Not supported

Reboot

Purpose: Causes the JANUS reader to warm boot and establish a binary file transfer
(BFT) session with a host computer. The host must have already sent a Prepare
for Reboot command and the BFT-ready PSK application has responded with a
Ready for Reboot message. For help, see "Downloading Applications Across
the Network" in Chapter 6.

From Host: ..%$1   Reboot

..%$0   Cancel the Reboot command

Keypad: Not supported

IRL Command: Not supported

Scan: Not supported

Viewport Movement

You can display one section of a PC-size screen on the reader's smaller display.
You will only see 16 lines and 20 characters of data at one time. However, you
can use the reader's display as a viewport to move around and see the entire
screen. By moving the viewport, you use the reader's virtual display of 25 lines
by 80 characters—the same size as a PC screen.

You can use the viewport movement commands described in this section to
move the viewport in the virtual display.

*Note: To use the display as a viewport, you must configure the reader's display size to
25 x 80. For help, see the "Display Setup" command in Chapter 12.*

Viewport Down

Purpose: Moves the viewport down one step in the virtual display, except when it is already at the bottom line or row. You can set the number of lines the viewport moves up or down in a single step. For help, see the "Viewport Movement Steps" command in Chapter 12.

From Host: Not supported

Keypad: ▤f ⬇

IRL Command: Z"%+"

Scan: Viewport Down

|||█|||||||||||███|

%+

Viewport Up

Purpose: Moves the viewport up one step in the virtual display, except when it is already at the top line or row. You can set the number of lines the viewport moves up or down in a single step. For help, see the "Viewport Movement Steps" command in Chapter 12.

From Host: Not supported

Keypad: ▤f ⬆

IRL Command: Z"%/"

Scan: Viewport Up

||█|||||||||||███|

%/

Viewport Left

Purpose:	Moves the viewport one step to the left in the virtual display, except when it is already at the first column. You can set the number of columns the viewport moves left or right in a single step. For help, see the "Viewport Movement Steps" command in Chapter 12.
From Host:	Not supported
Keypad:	≡f ◀
IRL Command:	Z"%-"

Scan:

Viewport Left

|| **|| | | | |||| |||**

%-

Viewport Right

Purpose:	Moves the viewport one step to the right in the virtual display, except when it is already at the last column. You can set the number of columns the viewport moves left or right in a single step. For help, see the "Viewport Movement Steps" command in Chapter 12.
From Host:	Not supported
Keypad:	≡f ▶
IRL Command:	Z".-"

Scan:

Viewport Right

|| **|||| ||||| ||| ||||**

.-

Viewport End

Purpose: Moves the viewport to the lower right corner of the virtual display.

From Host: Not supported

Keypad: �{f} ⌐f   1

IRL Command: Not supported

Scan: Viewport End

..%.

Viewport Home

Purpose: Moves the viewport to the upper left corner (home position) of the virtual display.

From Host: Not supported

Keypad: ⌐f ⌐f   7

IRL Command: Not supported

Scan: Viewport Home

..%/

Viewport Page Down

Purpose:	Moves the viewport down one page in the virtual display. A page is 16 lines by 20 characters—the reader's display size.
From Host:	Not supported
Keypad:	≣f ≣f 3
IRL Command:	Not supported
Scan:	Viewport Page Down

‖‖‖‖‖ ‖‖‖ ‖‖‖‖‖ ‖ ‖ ‖‖‖‖ ‖‖‖

..%-

Viewport Page Up

Purpose:	Moves the viewport up one page in the virtual display. A page is 16 lines by 20 characters—the reader's display size.
From Host:	Not supported
Keypad:	≣f ≣f 9
IRL Command:	Not supported
Scan:	Viewport Page Up

‖‖‖‖‖ ‖‖‖ ‖‖‖‖ ‖ ‖‖‖ ‖ ‖‖‖

..%+

Viewport to Cursor

Purpose: Moves the viewport to the cursor's position. This command may not work if you are using the reader in Graphics mode.

From Host: Not supported

Keypad: `≡f` `≡f` `0`

IRL Command: Not supported

Scan: Viewport to Cursor

/-

Cursor to Viewport

Purpose: Moves the cursor to the viewport. If there is no cursor position available in the viewport, the reader will sound an error beep. This command does not work on applications that have different definitions for cursor movement.

From Host: Not supported

Keypad: `≡f` `≡f` `5`

IRL Command: Not supported

Scan: Cursor to Viewport

..%%

12

Configuration Command Reference

This chapter is an alphabetical list of all the configuration commands supported on the reader.

Using Configuration Commands

A configuration command changes the way the reader operates. For example, you can change the Beep Volume and make the reader beep very loud in a noisy environment. You can execute configuration commands by:

• scanning a command from a Code 39 or Code 93 bar code label.

• choosing a command from a menu by pressing keys on the keypad.

• sending a command from a host computer.

• executing a command in an IRL program or applications using Reader Services.

Note: You can send configuration commands from a host computer only when the application is programmed to accept the command syntax.

You can find the following information about each configuration command in this chapter:

• Command description and purpose

• Default setting

• Command syntax and options

• Bar code labels you can scan to set or change each command

The configuration commands are listed alphabetically by command name. For a list of bar code symbology, communications, or operations commands, use the next table, "Configuration Commands Listed by Category." If you want to look up a command by its syntax, see the "Configuration Commands by Syntax" list in Appendix A.

Note: For help about the radio frequency (RF) configuration commands, see the JANUS 900 MHz Radio Frequency Quick Reference Guide.

Configuration Commands Listed by Category

This chapter lists the configuration commands in alphabetical order. Use this next list to find the configuration commands you may need to set for bar code symbologies, communications, and operations.

Configuration Commands Listed by Category (continued)

Operations

Entering Variable Data in a Configuration Command

You can enter variable data for many of the configuration commands. For example, you can set the End of File (EOF) character to any ASCII character. You need to follow these general instructions to enter variable data.

To enter variable data in a configuration command

1. Scan a bar code label with this syntax:

    `+/$+command`

    where:

    `+/`   is the syntax for the Enter Accumulate Mode command.

    `$+`   is the syntax for the Change Configuration command.

    command   is the syntax for the command you want to change.

    For example, the command syntax for EOF is FA*data*. To change the EOF configuration, scan this bar code:

    Enter Accumulate Mode / Change Configuration / Set EOF

    +/$+FA

2. Scan a bar code label from the "Full ASCII Bar Code Chart" in Appendix C. To set EOF to SOH (Start of Heading), scan this label:

    SOH

    <SOH>

3. Scan the Exit Accumulate Mode bar code label to update the reader's configuration:

    Exit Accumulate Mode

    -/

Address, Multi-Drop

Purpose: Defines the address of the communications port when you are using the Multi-Drop communications protocol. Each multi-drop address has unique POL and SEL characters that are automatically set when you configure the address. For help, see "POL and SEL Combinations for Multi-Drop Protocol" in Appendix C.

Note: You must select the communications port and protocol before you can set the parameters to define that protocol. For help, see the "Communications Protocol, Configure" command later in this chapter.

Default: A

Syntax: HC*data*

where *data* can be A through Z or 0 through 5.

Scan: 1. Scan this bar code:

Enter Accumulate Mode / Change Address

+/$+HC

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode

-/

AFF (Affirmative Acknowledge)

Purpose: Enables or disables the handshake event that is an affirmative acknowledge to a message. You must enable both AFF and NEG to have a valid configuration.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see the "Communications Protocol, Configure" command later in this chapter.

Default: Disabled

Syntax: PG*data*

where *data* can be any ASCII character.

Scan: To disable AFF, scan this bar code:

Disable AFF

||||||| || ||| ||||| |||| ||| |||

$+PG

Or: To set AFF to an ASCII character:

1. Scan this bar code:

    Enter Accumulate Mode / Set AFF

    ||||| ||| ||||| ||| |||| |||| ||| |||

    +/$+PG

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

    Exit Accumulate Mode

    ||||| ||||| ||| ||||

    -/

Automatic Shutoff

Purpose: Defines the maximum length of time the reader remains on when there is no activity. When you do not use the reader for the length of time set for this command, the reader automatically shuts off and goes into Suspend mode. The reader also goes into a suspend state when you press Ⓘ/O to turn the reader off. When you press Ⓘ/O to turn the reader on again, the reader resumes exactly where it left off and all reader memory is saved.

Note: The timeout interval is reset when there is data in the transmit or receive buffer of the radio, or when the radio is trying to recover a lost RF connection. Other factors that may effect the interval being reset are input data from a scanner or keyboard, a low battery condition, AC power connection, or an IRL receive command that has not completed properly. When the timeout interval is reset, it must be counted down again.

Power Management Tip: You should use the Automatic Shutoff feature to preserve the NiCad battery pack's power.

Note: If the reader is in a communications dock or a power supply is connected to the reader through an optical link adapter, automatic shutoff is disabled.

Default: 1 minute

Syntax: EZ*data*

Acceptable values for *data* are:

0M	Disabled (always on)
1M-60M	Shutoff time in minutes
15S	15 seconds

Scan: To set the timeout to 15 seconds, scan this bar code:

Set Automatic Shutoff to 15 Seconds

$+EZ15S

Or: To set the timeout in minutes:

1. Scan this bar code:

Enter Accumulate Mode / Set Automatic Shutoff

+/$+EZ

Automatic Shutoff (continued)

2. Scan a numeric value for *data* from these bar codes:

|| ||||| |||| ||||
0

|| ||||| ||| ||||
1

|| ||||| ||| ||||
2

|| ||||| ||| |||
3

|| ||||| ||| ||||
4

|| ||||| ||| ||||
5

|| ||||| ||| ||||
6

|| ||||| ||| ||||
7

|| ||||| ||| ||||
8

|| ||||| ||| ||||
9

3. Scan this bar code:

Timeout in Minutes
|| ||||||| || ||||
M

4. Scan this bar code:

Exit Accumulate Mode
|| ||||| |||||| ||||| |||
-/

Baud Rate

Purpose:	Sets the baud rate for the selected communications port on the reader. The baud rate must match the baud rate of the device (for example, the host computer) that the reader is communicating with.

For Polling Mode D protocol, you must set the baud rate to 1200 or higher. For Multi-Drop protocol, you must set the baud rate to 2400 or higher.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see the "Communications Protocol, Configure" command later in this chapter.

Default: 9600 baud

Syntax: IA*data*

Acceptable values for *data* are:

0	110 baud
1	300 baud
2	600 baud
3	1200 baud
4	2400 baud
5	4800 baud
6	9600 baud
7	19200 baud
8	38400 baud

Scan: One of these bar codes:

110 Baud

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

$+IA0

300 Baud

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

$+IA1

600 Baud

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

$+IA2

1200 Baud

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

$+IA3

2400 Baud

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

$+IA4

4800 Baud

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

$+IA5

Baud Rate (continued)

9600 Baud

||||||||||||||||||||||||||||||
$+IA6

19200 Baud

||||||||||||||||||||||||||||||
$+IA7

38400 Baud

||||||||||||||||||||||||||||||
$+IA8

Beep Duration

Purpose: Defines the low and high beep duration of the default reader beeps. There are two types of beeps:

- Low beep
- High beep

Default: 50 ms for both the low and high beep

Syntax: BD*data*

Acceptable values for *data* are from 1 to 60000 ms (60 seconds).

Scan: 1. Scan this bar code:

Enter Accumulate Mode / Change Beep Duration

||||||||||||||||||||||||||||||
+/$+BD

2. Scan a numeric value for *data* in milliseconds from these bar codes:

||||||||||||||
0

||||||||||||||
1

||||||||||||||
2

||||||||||||||
3

||||||||||||||
4

||||||||||||||
*5

|||||||||||||||
6

|||||||||||||||
7

|||||||||||||||
8

|||||||||||||||
9

3. Scan one of these bar codes to set the duration for the low or high beep:

Low Beep
|||||||||||||||
L

High Beep
|||||||||||||||
H

4. Scan this bar code:

Exit Accumulate Mode
|||||||||||||||
-/

Beep Frequency

Purpose: Defines the individual frequencies of the default reader beeps. There are two types of beeps:

- Low beep
- High beep

Default: 1000 Hz for the low beep
2000 Hz for the high beep

Syntax: BF*data*

Acceptable values for *data* are from 20 to 20,000 Hz (20 KHz).

Note: If you set the frequency outside the range of 100 Hz to 10,000 Hz, the beeps are inaudible.

Beep Frequency (continued)

Scan:

1. Scan this bar code:

   Enter Accumulate Mode / Change Beep Frequency

   ‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

   +/$+BF

2. Scan a numeric value for *data* in Hz from these bar codes:

   ‖‖‖‖‖‖‖‖‖‖   ‖‖‖‖‖‖‖‖
   0   *1*

   ‖‖‖‖‖‖‖‖   ‖‖‖‖‖‖‖‖
   2   *3*

   ‖‖‖‖‖‖‖‖   ‖‖‖‖‖‖‖‖
   4   *5*

   ‖‖‖‖‖‖‖‖   ‖‖‖‖‖‖‖‖
   6   *7*

   ‖‖‖‖‖‖‖‖   ‖‖‖‖‖‖‖‖
   8   *9*

3. Scan one of these bar codes to set the frequency for the low or high beep:

   Low Beep   High Beep

   ‖‖‖‖‖‖‖‖   ‖‖‖‖‖‖‖‖
   L   *H*

4. Scan this bar code:

   Exit Accumulate Mode

   ‖‖‖‖‖‖‖‖‖‖‖‖

   -/

Beep Volume

Purpose:	Adjusts the volume of the reader's audio signals. For a list of all the beep sounds and audio signals, see "Understanding the Reader's Audio Signals" in Chapter 2. Set the beep volume according to operator preference and work environment.
Default:	Normal
Syntax:	BV*data*

Acceptable values for *data* are:

0   Off
1   Quiet
2   Normal
3   Loud
4   Very loud
8   Lower volume
9   Raise volume

Scan: One of these bar codes:

Off
|||||| ||| ||||| || ||||| |||| |||
$+BV0

Quiet
|||||| ||| |||| ||| || ||||| ||| |||
$+BV1

Normal
|||||| ||| |||| ||| || ||||| ||| |||
$+BV2

Loud
|||||| ||| |||| ||| || ||||| ||| |||
$+BV3

Very Loud
|||||| ||| ||||| || |||||| ||| |||
$+BV4

Or: Scan one of these bar codes repeatedly to achieve the desired volume:

Raise Beep Volume
|||||| ||| |||| ||| || ||||| ||| |||
$+BV9

Lower Beep Volume
|||||| ||| |||| ||| || ||||| ||| |||
$+BV8

Codabar

Purpose:	Enables or disables decoding of Codabar symbology. Codabar is a self-checking, discrete symbology that has these 16 characters in its set: 0 to 9, dollar sign ($), colon (:), slash (/), period (.), plus (+), and minus (-). Codabar is commonly used in libraries, blood banks, and air-parcel express applications. The American Blood Commission (ABC) Codabar requires that you retain the start/stop code digits when processing a Codabar symbol. As a result, configuration CD10 is an illegal configuration.
Default:	Standard Codabar, ABCD Start/Stop Transmitted
Syntax:	CD*data*

Acceptable values for *data* must be two digits, corresponding to:

Digit	Value	Description
First	0	Disabled
	1	ABC
	2	Standard
	3	Concatenated
Second	0	Discard Start/Stop
	1	ABCD Enabled, Start/Stop Transmitted
	2	DC1-DC4 Enabled, Start/Stop Transmitted

Scan: One of these bar codes:

Disabled, Discard Start/Stop

$+CD00

ABC, ABCD Start/Stop

$+CD11

ABC, DC1-DC4 Start/Stop

$+CD12

Standard, Discard Start/Stop

$+CD20

Standard, ABCD Start/Stop

$+CD21

Standard, DC1-DC4 Start/Stop

$+CD22

Concatenated, Discard Start/Stop

|||||| | ||| ||||| |||| |||| |||| |||| |||
$+CD30

Concatenated, ABCD Start/Stop

|||||| | ||| || ||||| |||| |||| |||| ||| |||
$+CD31

Concatenated, DC1-DC4 Start/Stop

|||||| | ||| || | ||||| |||| |||| |||| ||| |||
$+CD32

Code 11

Purpose:	Enables or disables decoding of Code 11 symbology. Code 11 is a very high density, discrete numeric bar code. It is most extensively used in labeling telecommunications components and equipment.
Default:	Enabled with two check digits
Syntax:	CG*data*

Acceptable values for *data* are:

0   Disabled
1   Code 11 enabled with one check digit
2   Code 11 enabled with two check digits

Scan: One of these bar codes:

Disable Code 11

||||||| | ||| || | ||| |||| ||| ||| |||
$+CG0

Code 11 Enabled With One Check Digit

||||||| | ||| || | ||| |||| |||| ||| |||
$+CG1

Code 11 Enabled With Two Check Digits

||||| | ||| || | ||| |||| |||| ||| |||
$+CG2

Code 16K

Purpose:	Enables or disables decoding of Code 16K symbology. Code 16K is a two-dimensional (stacked rows), ultra-high density bar code. It is based on Code 128 and is used widely to label unit-dose packaging for the healthcare industry.
Default:	Standard
Syntax:	CP*data*

Acceptable values for *data* are:

0   Disabled
1   Standard Code 16K enabled
2   Code 16K enabled with Function Code 1

When you enable Code 16K with Function Code 1, the reader decodes the bar code label and checks for a Function Code 1 in the first data character position. If a Function Code 1 is the first character, the reader substitutes this Code 16K symbology identifier string for the Function Code 1 character:

`]K1`

Scan: One of these bar codes:

Disable Code 16K

$+CP0

Standard Code 16K Enabled

$+CP1

Code 16K Enabled With Function Code 1

$+CP2

Code 2 of 5

Purpose: Enables or disables decoding of Code 2 of 5 symbology. Code 2 of 5 uses the bars to encode information and the spaces to separate the individual bars. This code is discrete and self-checking. You can only enable Code 2 of 5 if the Interleaved 2 of 5 (I 2 of 5) code is disabled. If you enable I 2 of 5, Code 2 of 5 is automatically disabled.

Default: Disabled

Syntax: CC*data*

where *data* consists of three digits as follows:

First digit:	0	Code 2 of 5, 3 Bar Start/Stop
	1	Code 2 of 5, 2 Bar Start/Stop
Second and third digits:	00	Disable Code 2 of 5
	01-32	Label Length

Scan: To disable Code 2 of 5, scan this bar code:

Disable Code 2 of 5

$+CC000

Or: To enable Code 2 of 5:

1. Scan one of these bar codes:

Code 2 of 5, 3 Bar Start/Stop

+/$+CC0

Code 2 of 5, 2 Bar Start/Stop

+/$+CC1

Code 2 of 5 (continued)

2. Scan a two-digit numeric value to set the label length (01-32) from these bar codes.

||||||||||||||||||
0

||||||||||||||||||
1

||||||||||||||||||
2

||||||||||||||||||
3

||||||||||||||||||
4

||||||||||||||||||
5

||||||||||||||||||
6

||||||||||||||||||
7

||||||||||||||||||
8

||||||||||||||||||
9

3. Scan this bar code:

Exit Accumulate Mode

||||||||||||||||||
-/

Code 39

Purpose: Enables or disables decoding of Code 39 symbology. Code 39 is discrete, variable length, and self-checking. The character set is uppercase A to Z, 0 to 9, dollar sign ($), period (.), slash (/), percent (%), space ( ), plus (+), and minus (-).

There are three types of ASCII the reader decodes:

- Code 39 non-full ASCII
- Code 39 full ASCII
- Code 39 mixed-full ASCII

Code 39 non-full ASCII   Non-full ASCII uses a one-character encoding scheme. For example, you encode the data "SAMPLE" as follows:

|||||||||||||||||||||||||||||||||||
SAMPLE

This label decodes as *SAMPLE*.

Code 39 full ASCII   Full ASCII uses a two-character encoding scheme to extend the character set to 128 characters. You use the dollar sign ($), slash (/), percent (%), or plus (+) followed by an uppercase letter to represent one of the characters in the extended set. You must encode lowercase letters as a plus sign (+) followed by their uppercase equivalents. For a list of ASCII characters and their Code 39 representations, see the "Full ASCII Table" in Appendix C.

Use Code 39 full ASCII to enter ASCII control characters or lowercase characters as data. You should also enable Code 39 full ASCII to use ASCII command characters.

For example, you encode the data "sample" in Code 39 full ASCII as follows:

|||||||||||||||||||||||||||||||||||||||||
+S+A+M+P+L+E

In Code 39 non-full ASCII, this label decodes as *+S+A+M+P+L+E*. In Code 39 full ASCII, this label decodes as *sample.*

Code 39 mixed-full ASCII   Use mixed-full ASCII when printers encode the same label two different ways. For example, if you have a bar code with the data $%a, some printers encode the data as follows:

/D/E+A

In the "Full ASCII Table" in Appendix C, /D represents $ and /E represents %. If you configure the reader for Code 39 full ASCII, the reader decodes the data as $%a because there are three valid full ASCII character pairs to represent the data.

Other printers encode the data $%a as:

$%+A

The $ and % are valid Code 39 characters in the non-full ASCII character set. However, the reader will not decode this label if it is configured for full ASCII, because the data is not represented by valid full ASCII character pairs. To decode the label correctly, you need to configure the reader for mixed-full ASCII.

When you configure the reader for Code 39 mixed-full ASCII, the reader will decode both of the labels above as $%a.

Mixed-full ASCII interprets any valid full ASCII character pairs that appear in the label, but does not require that all data be encoded with a valid full ASCII character pair. If you are uncertain how your labels are encoded, configure the reader for mixed-full ASCII, which decodes all valid Code 39 labels.

If you configure the reader for Code 39 full ASCII, you should check for Code 39 mixed-full ASCII. Mixed-full ASCII does not apply when you configure the reader for non-full ASCII.

Note: The interpretive text shown under bar code labels does not always accurately reflect the data that is encoded in the label. The interpretive text represents how the label should be decoded.

Use this table to help configure your reader.

Code 39 Option	Bar Code Label	Decodes
Non-full ASCII	$%+A /D/E+A	$%+A /D/E+A
Full ASCII	$%+A /D/E+A	No decode $%a
Mixed-full ASCII	$%+A /D/E+A	$%a $%a

Default:　Enable Code 39 Full ASCII with no check digit (111)

Syntax:　CB*data*

Acceptable values for *data* must be three digits, corresponding to:

First digit:	0	Disabled
	1	Enabled with no check digit
	2	Enabled with check digit
	3	HIBC (Health Industry Bar Code)
	4	With AIAG check digit
Second digit:	0	Discard check digit
	1	Transmit check digit
Third digit:	0	Code 39 non-full ASCII
	1	Code 39 full ASCII
	2	Code 39 mixed-full ASCII

Note: Selecting HIBC Code 39 automatically sets the configuration to non-full ASCII with the check digit transmitted.

Scan:　To disable Code 39:

Disable Code 39

$+CB0

Code 39 (continued)

Or: To enable Code 39:

1. Scan this bar code:

Enter Accumulate Mode / Enable Code 39

||||||||||||||||||||||||

+/$+CB

2. Scan one of these bar codes to set the first digit:

Without a Check Digit

||||||||||||||

1

With a Check Digit

||||||||||||

2

HIBC Code 39

||||||||||||

3

With AIAG Check Digit

||||||||||||

4

3. Scan one of these bar codes to set the second digit:

Discard Check Digit

||||||||||||

0

Transmit Check Digit

||||||||||||

1

4. Scan one of these bar codes to set the third digit:

Code 39 Non-Full ASCII

||||||||||||

0

Code 39 Full ASCII

||||||||||||

1

Code 39 Mixed-Full ASCII

||||||||||||

2

5. Scan this bar code:

Exit Accumulate Mode

||||||||||||

-/

Code 49

Purpose: Enables or disables decoding of Code 49 symbology. Code 49 is a multirow symbology for high data density. The last character in each row is used for row checking and the last two characters of the symbol are used for overall checking.

Function codes designate where to place the predefined data string in a Code 49 label. Whenever a reader encounters a function code, it replaces the function code with the defined string before transmitting the data to the workstation. A single Code 49 symbol may contain several different variable length data fields. Function Code 1 (F1) identifies a data system. Function Code 2 (F2) indicates the end of a data field.

Default: Code 49 Enabled, Function Code 1 disabled, Function Code 2 set to CR LF, and Function Code 3 disabled.

Syntax: CJ*data*   Code 49
CK*data*   Function Code 1
CL*data*   Function Code 2
CM*data*   Function Code 3

Acceptable values for *data* are:

Code 49:   0   Disabled
1   Enabled

Function Code 1:   Any two ASCII characters.

Function Code 2:   Any four ASCII characters

Function Code 3:   Any two ASCII characters

Scan: One of these bar codes:

Disable Code 49

$+CJ0

Enable Code 49

$+CJ1
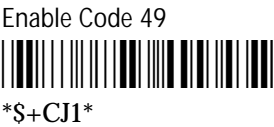
Code 49 (continued)

Scan: To disable any of the function codes, scan one of these bar codes:

Disable Function Code 1

||||||||||||||||||||||||||||||

$+CK

Disable Function Code 2

||||||||||||||||||||||||||||||

$+CL

Disable Function Code 3

||||||||||||||||||||||||||||||

$+CM

Or: To set one of the function codes to a character string:

1. Scan one of these bar codes:

    Enter Accumulate Mode / Set Function Code 1

    ||||||||||||||||||||||||||||||

    +/$+CK

    Enter Accumulate Mode / Set Function Code 2

    ||||||||||||||||||||||||||||||

    +/$+CL

    Enter Accumulate Mode / Set Function Code 3

    ||||||||||||||||||||||||||||||

    +/$+CM

2. Scan any character from the "Full ASCII Bar Code Chart" in Appendix C.
    You can define two characters each for Function Codes 1 and 3, and four
    characters for Function Code 2.

3. Scan this bar code:

    Exit Accumulate Mode

    ||||||||||||||||||||

    -/

Code 93

Purpose:	Enables or disables decoding of Code 93 symbology. Code 93 is a variable length, continuous symbology that uses four element widths. It complements Code 39.
Default:	Enabled
Syntax:	CF*data*

Acceptable values for *data* are:

0   Disabled
1   Enabled

Scan: One of these bar codes:

Disable Code 93

||||| |||| ||| ||| |||| |||| ||| |||| |||
$+CF0

Enable Code 93

||||| |||| ||| ||| |||| |||| ||| |||| |||
$+CF1

Code 128

Purpose:	Enables or disables decoding of Code 128 symbology. Code 128 is a very high density alphanumeric symbology that supports the extended ASCII character set. It is a variable length, continuous code that uses multiple element widths.
Default:	Standard
Syntax:	CH*data*

Acceptable values for *data* are:

0   Disabled
1   Standard Code 128
2   UCC/EAN Code 128

Code 128 (continued)

Scan: One of these bar codes:

Disable Code 128

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

$+CH0

Enable Standard Code 128

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

$+CH1

Enable UCC/EAN Code 128

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖

$+CH2

Notes: If you configure Standard Code 128, the reader will not decode Function Code 1 characters in the first position of a bar code label. Any subsequent Function Code 1 characters are translated to the ASCII GS character as a separator for variable length fields.

If you configure UCC/EAN Code 128, the reader will decode a bar code label as Standard Code 128 unless one of the first two characters are a start character and a Function Code 1. In this case, the bar code label is processed as follows:

1. The Function Code 1 character is not transmitted.

2. The three symbology ID characters,]C1, are transmitted.

3. The remaining Code 128 characters are decoded as Standard Code 128.

Command Processing

Purpose: Command processing allows you to disable or enable reader commands. For example, you can disable the Backlight command. There are two ways to enable or disable reader commands:

•   Use the Command Processing configuration command described here.

•   Use the Reader Commands option on the Op menu in IC.EXE.

If you want to disable or enable several commands, it is easier to use IC.EXE. For help, see Chapter 5, "Configuring the Reader."

Default: All reader commands enabled

Syntax: DC*data*

Acceptable values for *data* are:

0	Disable all reader commands
1	Enable all reader commands
2	Disable override
3	Enable override
*command*0	Disable reader command
*command*1	Enable reader command

The override option is a temporary setting that allows you to enable all the reader commands for as long as you need them. When you want to return to the previous setting, you disable the override.

Note: If you disable all the reader commands ($+DC0), you cannot change the reader's configuration or exit from an IRL program. To enable the reader commands again, you can use IC.EXE or edit the configuration (.INI) file.

Scan: To enable all the reader commands or override the current settings, scan one of these bar codes:

Disable All Reader Commands

$+DC0

Enable All Reader Commands

$+DC1

Disable Override

$+DC2

Enable Override

$+DC3

Or: To disable or enable specific reader commands, perform these steps:

1. Scan this bar code:

Enter Accumulate Mode / Command Processing

+/$+DC

Command Processing (continued)

2. Scan the bar code to disable or enable one reader command.

    Note: If there are two bar codes for a reader command, you must scan them in order, left to right.

Backspace

||||||||||||||||

-

(continued)

||||||||||||||||

+

Backlight

||||||||||||||||

%.

Change Configuration

||||||||||||||||

$+

Clear

||||||||||||||||

-

(continued)

||||||||||||||||

-

Enter Accumulate Mode

||||||||||||||||

+

(continued)

||||||||||||||||

/

Exit Accumulate Mode

||||||||||||||||

-

(continued)

||||||||||||||||

/

IRL File, Clear

||||||||||||||||

.$

IRL File, Receive

||||||||||||||||

.%

IRL File, Transmit

||||||||||||||||

%%

IRL Program, Download

||||||||||||||||

<SI>

IRL Program, Exit
||▌█▌|||||▌█▌
/

(continued)
||▌█▌|||||▌█▌
/

IRL Program, Resume
||▌█▌|||▌█▌█▌
$.

IRL Program, Run
||▌█▌||||||||▌█▌
//

Laser Off
||▌█▌||||||||▌█▌
/%

Laser On
||▌█▌||||▌█▌█▌
/.

Viewport Down
||▌█▌||||||||▌█▌
%+

Viewport Up
||▌█▌||||||||▌█▌
%/

Viewport Left
||▌█▌||||▌█▌▌█▌
%-

Viewport Right
||▌█▌▌█▌▌█▌▌█▌
.-

Viewport End
||▌█▌▌█▌▌█▌|||▌█▌█▌
..%.

Viewport Home
||▌█▌▌█▌▌█▌||||||▌█▌
..%/

Viewport Page Down
||▌█▌▌█▌▌█▌||||▌█▌█▌
..%-

Viewport Page Up
||▌█▌▌█▌▌█▌|||||||▌█▌
..%+

Viewport to Cursor
||▌█▌||||▌█▌▌█▌
/-

Cursor to Viewport
||▌█▌▌█▌▌█▌||||||▌█▌
..%%

Alternate Key Code Entry
||▌█▌▌█▌▌█▌|▌█▌
..

Multiple-Read Labels
||▌█▌▌█▌▌█▌▌█▌
* *

Command Processing (continued)

Prepare for Reboot

||||| ||| ||||| ||| || ||| |||

..+%

Reboot

| |||| |||| ||||| | ||| | ||| |||

*..%$ *

Set Clock

||||||| | |||| |||

/+

> *Note: To disable or enable Command Override or the Enter key, see the next section, "Disabling or Enabling Command Override and Enter."*

3. Scan one of these bar codes:

Disable the Command

|||||| ||||| |||

0

Enable the Command

||||| ||| |||

1

4. Repeat Steps 2 and 3 to disable or enable another reader command.

> *Note: You can accumulate up to 250 characters in the buffer. If the data accumulated exceeds 250 characters, you will hear an error beep and the reader will reject the last bar code read.*

5. Scan this bar code:

Exit Accumulate Mode

|||| |||| |||| ||| |||

-/

Disabling or Enabling Command Override and Enter

Purpose: You can use the Command Processing configuration command to disable or enable two additional reader commands: Command Override and Enter. You can also use IC.EXE to disable or enable these two commands. For help, see Chapter 5, "Configuring the Reader."

Default: Command Override and Enter enabled

Syntax: DC<command>*data*

Acceptable values for *data* are:

0 Disable command
1 Enable command

Scan: To disable or enable Command Override, scan one of these bar codes:

Disable Command Override

$+DC<DLE>0

Enable Command Override

$+DC<DLE>1

Or: To disable or enable Enter, scan one of these bar codes:

Disable Enter

$+DC<CR>0

Enable Enter

$+DC<CR>1

Defining the Reader Commands

Chapter 11, "Reader Command Reference" describes all the reader commands that you can enable or disable with Command Processing, except Alternate Key Code Entry and Multiple-Read Labels. These two commands are described next.

Alternate Key Code Entry

If you enable the Alternate Key Code Entry command, you can use each key's four-digit hexadecimal key code value in bar code labels to select options, enter data, and move around in IC.EXE, Communications Manager, and the IRL Desktop. For example, you can scan this label to move the cursor to the right in IC.EXE:

Cursor Right

|||||||||||||||||||||||||||||||||||||||||

..4DE0

If you disable the Alternate Key Code Entry command, the reader will interpret the hexadecimal key code value as regular data rather than as a code for a specific key or action. For help, see "Scanning Bar Codes to Select Menu Options" in Appendix C.

Multiple-Read Labels

A bar code label that has a space as the first character after the start code is a multiple-read label. The reader stores a multiple-read label in the buffer until you execute a command to transmit the label or scan a regular label. A regular bar code label is executed as soon as you scan it. If you use Command Processing, IC.EXE, or another method to disable multiple-read labels, the reader processes the bar code label as a regular label and reads and decodes the space as data.

Syntax: \<Start Code\>\<SP\>*data*\<Stop Code\>

Example: Multiple-read bar code label

||||||||||||||||||||||||||||

,A

Communications Dock Port

Purpose: Sets the SELPORT signal on the reader's COM1, which selects the port on the communications dock through which the reader will communicate. When SELPORT is set to 0, the reader communicates through the dock's network port. When SELPORT is set to 1, the reader communicates through the dock's auxiliary port. You use the Communications Dock Port command only when the reader is in the communications dock.

Default: Network

Syntax: IP*data*

Acceptable values for *data* are:

0   Network port
1   Auxiliary port

Scan: One of these bar codes:

Network Port

||||||||||||||||||||||||||||||||

$+IP0

Auxiliary Port

||||||||||||||||||||||||||||||||

$+IP1

Communications Port, Choose Scanner or COM2

Purpose: Configures the modular connector at the top of the reader to be a scanner port or a COM2 port and assigns all subsequent communications protocol configurations to that port.

You can also configure the port as scanner or COM2 with IC.EXE.

For help setting serial communications parameters such as baud rate and parity for COM2, see "Configuring the Communications Protocols" in Chapter 6.

Note: You must use the COM2 port hardware adapter (Part No. 061799) to use the scanner port as COM2.

Communications Port, Choose Scanner or COM2 (continued)

Default: Scanner

Syntax: IX*data*

Acceptable values for *data* are:

0 Scanner
1 COM2

Scan: This bar code to change from scanner to COM2:

Set Scanner Port to COM2

||||||||||||||||||||||||||||||||||||

$+IX1

Because you changed the function of the scanner port, you cannot scan a command to change from COM2 to scanner.

Communications Port, Select COM Port

Purpose: All subsequent communications protocol configuration changes are assigned to the COM port you select in this command. After you select the COM port, you need to configure and activate the communications protocol, load the protocol handler, set the UART FIFO control register, and connect the device. For help, see "Configuring the Reader for Communications" in Chapter 6.

Note: Intermec recommends that you do not designate any JANUS port as COM3. Because COM1 and COM3 share an Interrupt Request (IRQ), you cannot use COM1 if you use COM3.

Default: COM1

Syntax: IS*data*

Acceptable values for *data* are:

1 COM1
4 COM4

Scan: Scan one of these bar codes:

COM1

||||||||||||||||||||||||||||||||||||

$+IS1

COM4

||||||||||||||||||||||||||||||||||||

$+IS4

Communications Port, UART Restore

Purpose: Defines the hex value used to restore the COM1 or COM2 UART FIFO control register when you suspend and resume the reader while a communications application is running.

To learn if you must set this value and to calculate which value to enter for this parameter, see "Specifying a Value for the FIFO Control Register" in Chapter 6.

Note: If your application uses UART 16x550 mode to its fullest extent, you need to investigate what setting is appropriate.

Default: 00

Syntax: For COM1: IV*data*

For COM2: IW*data*

Acceptable values for *data* are:

00   0 Hex
XX   Two characters representing the hex value that the UART FIFO control register is set to when the reader is turned on.

Scan: To set the hex value default, scan one of these bar codes:

COM1: 0 Hex

||█|█|| | ||| ||█ ██| ███||█ ███|| ███| |██

$+IV00

COM2: 0 Hex

||█|█| | ||| ||█ ██ ██|||█ ███|| ██| |██

$+IW00

Or: To set the hex value:

1. Scan one of these bar codes:

For COM1:

Enter Accumulate Mode / Change Hex Value

||█|█|||||||||| ||| ||█ ██| ███| ██

+/$+IV

For COM2:

Enter Accumulate Mode / Change Hex Value

||█|█||||||||||| ||| ||█ ██ ██| |█| ██

+/$+IW

Communications Port, UART Restore (continued)

    2.   Scan two bar codes for *data* from the "Full ASCII Bar Code Chart" in Appendix C. For help on which two bar codes to scan, see "Specifying a Value for the FIFO Control Register" in Chapter 6.

    3.   Scan this bar code:

Exit Accumulate Mode

||||||||||||||||||||||||

-/

Communications Protocol

Communications Protocol determines how the reader communicates with the host through the DTE interface of the selected communications port. You can configure a different communications protocol for each communications port. Even if you use the same protocol, you must configure each communications port separately. You can also configure a different protocol for each communications port.

Before configuring a protocol, you need to select the communications port. For help, see the "Communications Port, Select COM Port" command earlier in this chapter.

To configure the communications protocol

    1.   Configure the protocol.

    2.   Activate the protocol.

After you activate the protocol, you need to load the protocol handler, set the UART FIFO control register, and connect the device. For help, see "Configuring the Reader for Communications" in Chapter 6.

Configure

Purpose: Configures the communications protocol for the selected communications port. The reader assigns all subsequent protocol configuration changes to the selected communications protocol. Next, set the parameters, such as baud rate or data bits, for the communications protocol.

Note: You cannot reconfigure some of the protocol characters for User-Defined if User-Defined is active. If User-Defined is the active protocol, set the active protocol to **None***. Once you configure User-Defined protocol, reactivate the protocol.*

Here are the parameters you can set for each communications protocol:

Multi-Drop protocol parameters

- Baud rate, parity, and data bits
- Transmit abort timeout
- Address, multi-drop

PC Standard protocol parameters

- Baud rate, parity, data bits, and stop bits

Point-to-Point protocol parameters

- Baud rate, parity, data bits, and stop bits
- Flow control
- Intercharacter delay, turnaround delay, and timeout delay
- Transmit abort timeout

Note: If you use User-Defined or Point-to-Point protocol, you should only set the Timeout Delay command if the baud rate is 9600 or lower. You should disable Timeout Delay if the baud rate for either of these protocols is set to 19200 or higher.

Polling Mode D protocol parameters

- Baud rate
- Flow control
- Transmit abort timeout

User-Defined protocol parameters

- Baud rate, parity, data bits, and stop bits
- Flow control and LRC
- Intercharacter delay, turnaround delay, and timeout delay
- Transmit abort timeout
- SOM, EOM (required)
- AFF, NEG, POL, REQ, RES, SEL

Note: You must set AFF and NEG together. If you set REQ, you must also set AFF and NEG.

Communications Protocol (continued)

You use the following characters with IRL and Communications Manager. These parameters are not directly supported by the Intermec protocol handler.

- EOF, EOR, and records per block

- IRL parameters: BAK, End, EOP, PAK, PSS, Run, and SOP

If you want to configure the reader for User-Defined Multi-Drop protocol, select User-Defined protocol. For help, see the "Communications Protocol, Multi-Drop, User-Defined" command later in this chapter.

Note: If you use User-Defined or Point-to-Point protocol, you should only set the Timeout Delay command if the baud rate is 9600 or lower. You should disable Timeout Delay if the baud rate for either of these protocols is set to 19200 or higher.

Default:	Point-to-Point
Syntax:	PS*data*

Acceptable values for *data* are:

0   User-Defined
1   Point-to-Point
2   Polling Mode D
3   Multi-Drop
7   PC Standard

Scan: One of these bar codes:

User-Defined

||||||||||||||||||||||||||||||||

$+PS0

Point-to-Point

||||||||||||||||||||||||||||||||

$+PS1

Polling Mode D

||||||||||||||||||||||||||||||||

$+PS2

Multi-Drop

||||||||||||||||||||||||||||||||

$+PS3

PC Standard

||||||||||||||||||||||||||||||||

$+PS7

Activate

Purpose: Activates the communications protocol and the communications port you selected. Each port can only have one active protocol at a time.

Note: The reader cannot use the active protocol to communicate until you load the corresponding protocol handler. For help, see "Configuring the Reader for Communications" in Chapter 6.

Default: Point-to-Point

Syntax: PA*data*

Acceptable values for *data* are:

0 User-Defined
1 Point-to-Point
2 Polling Mode D
3 Multi-Drop
7 PC Standard
9 None

Scan: One of these bar codes:

User-Defined Protocol

||||||| ||| ||||||||| |||| |||| ||||
$+PA0

Point-to-Point Protocol

||||||| | ||| || |||||||| ||| |||| ||||
$+PA1

Polling Mode D Protocol

||||||| | ||| ||||||||| ||| || ||||
$+PA2

Multi-Drop Protocol

||||||| | ||| || |||||| ||| |||| |||| ||||
$+PA3

PC Standard Protocol

||||||| | ||| || |||||| ||| |||| ||||
$+PA7

No Protocol

||||||| | ||| || |||||| ||| |||| ||||
$+PA9

Multi-Drop, User-Defined

Purpose: Multi-Drop, User-Defined is an option of User-Defined protocol. You must set the POL and SEL characters to define a unique device address. For help, see "POL and SEL Combinations for Multi-Drop Protocol" in Appendix C.

Note: You must select User-Defined protocol before you can enable Multi-Drop, User-Defined protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter. To activate Multi-Drop, User-Defined protocol, select User-Defined in the configuration command Communications Protocol, Activate.

Default: Disabled

Syntax: PM*data*

Acceptable values for *data* are:

0   Disabled
1   Enabled

Scan: One of these bar codes:

Disable Multi-Drop, User-Defined

||||||||||||||||||||||||||||||

$+PM0

Enable Multi-Drop, User-Defined

||||||||||||||||||||||||||||||

$+PM1

Data Bits

Purpose: Sets the number of data bits the reader uses when communicating with another device (i.e., host computer).

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: 7

Syntax: II*data*

Acceptable values for *data* are:

7   7 data bits
8   8 data bits

Scan: One of these bar codes:

7 Data Bits

$+II7

8 Data Bits

$+II8

Decode Security

Purpose: Defines the security level to use when decoding bar codes. When you select a
lower decode security level, the reader can decode bar codes with poorer print
quality.

*Note: Only use the low parameter as a temporary solution until you can improve the
bar code label print quality.*

Default: Moderate

Syntax: CS*data*

Acceptable values for *data* are:

0   Low
1   Moderate
2   High

Scan: One of these bar codes:

Low Decode Security

$+CS0

Decode Security (continued)

Moderate Decode Security

||||||||||||||||||||||||||||||||

$+CS1

High Decode Security

||||||||||||||||||||||||||||||||

$+CS2

Display Backlight Timeout

Purpose: Defines the amount of time the backlight remains on. The backlight timeout setting significantly affects the reader's battery life. If you set a longer backlight timeout value, you will use the power in the NiCad battery pack at a faster rate.

Default: 10 seconds

Syntax: DF*data*

Acceptable values for *data* are:

00   Disabled
01 - 60   Timeout in seconds

Scan: To disable the backlight timeout, scan this bar code:

Disable Backlight Timeout

||||||||||||||||||||||||||||||||

$+DF00

Or: To set the backlight timeout:

1. Scan this bar code:

   Enter Accumulate Mode / Set Backlight Timeout

   ||||||||||||||||||||||||||||||||

   +/$+DF

2. Scan a two-digit numeric value for *data* from these bar codes.

|||||||||||||||
0

|||||||||||||||
1

|||||||||||||||
2

|||||||||||||||
3

|||||||||||||||
4

|||||||||||||||
5

|||||||||||||||
6

|||||||||||||||
7

|||||||||||||||
8

|||||||||||||||
9

3. Scan this bar code:

Exit Accumulate Mode
|||||||||||||||
-/

Display Contrast

Purpose: Defines the contrast (light or dark) of the characters against the reader display.

Default: 3 (maximum contrast)

Syntax: DJ*data*

Acceptable values for *data* are 0 (light) to 7 (dark).

Scan: One of these bar codes:

0 - Light

||||||||||||||||||||||||||||

$+DJ0

1

||||||||||||||||||||||||||||

$+DJ1

2

||||||||||||||||||||||||||||

$+DJ2

3 - Maximum Contrast

||||||||||||||||||||||||||||

$+DJ3

4

||||||||||||||||||||||||||||

$+DJ4

5

||||||||||||||||||||||||||||

$+DJ5

6

||||||||||||||||||||||||||||

$+DJ6

7 - Dark

||||||||||||||||||||||||||||

$+DJ7

Lighter

||||||||||||||||||||||||||||

$+DJ8

Darker

||||||||||||||||||||||||||||

$+DJ9

Display Mode, IRL

Purpose: Determines how IRL displays and handles data. The reader has two IRL display modes: buffered and transparent.

Buffered Display A buffered display formats the display text with a full block character and a Carriage Return Line Feed (CR LF) after each data record. When you run an IRL program, the CR LF is actually executed before the next IRL prompt.

Transparent Display A transparent display does not add a CR LF after each data record. Scanned data records are concatenated together. Autowrap and autoscroll features are disabled. When the cursor gets to the end of a line, it does not wraparound. When the cursor reaches the bottom of the display, it does not scroll up. You must include control codes in the IRL program to format the display and move the cursor around. For example, you can use a CR LF sequence to move down one display line or to scroll the display after the last line. Error messages are not displayed.

Default: Buffered

Syntax: DM*data*

Acceptable values for *data* are:

0 Buffered
1 Transparent

Scan: One of these bar codes:

Buffered Display Mode

|||||||| | ||| || |||| |||||| ||| ||| |||
$+DM0

Transparent Display Mode

|||||| | ||| || ||||| ||||||| ||| || ||||
$+DM1

Display Setup

Purpose: Defines the number of lines and columns in the display image, the Video mode, at what line the display scrolls, and the character height. The reader's video modes are used in the same way as on a PC.

The reader's display size is 16 lines or rows by 20 characters. You can use the display as a viewport to the reader's virtual display of 25 lines by 80 characters. If you select the 25 x 80 display size, you can set the Video mode, character height, and scroll line; otherwise, those parameters are preset to match the display size. For help, see "How to Use the Reader's Display" in Chapter 2.

Note: If you are working at the DOS prompt, Intermec recommends that you set the display size to 25 x 80 or you may see inconsistent display results.

While you run an application, the reader reverts to Automatic Viewport Movement mode and scrolls at line 25 unless your application sets these values. When you exit the application, the reader restores your previous configuration values.

Default: *First digit:*   Display size 25 lines by 80 characters (25 x 80)
Second digit: Video mode 3 (normal character width, Color mode)
Third digit: Scrolls at line 16
Fourth digit: Normal character height

Syntax: DS*data*

Acceptable values for *data* are four digits corresponding to:

First digit: 0   25 x 80 (lines by characters)
1   16 x 20
2   8 x 20
3   16 x 10
4   8 x 10

Second digit: 0   Video mode 0 (double character width, monochrome)
1   Video mode 1 (double character width, color)
2   Video mode 2 (normal character width, monochrome)
3   Video mode 3 (normal character width, color)

Third digit: 0   Scroll at line 25
1   Scroll at line 16
2   Scroll at line 8

Fourth digit: 0   Normal character height
1   Double character height

Note: The JANUS reader display is a monochrome display. In Color Video mode, the display supports gray scales. Existing applications may have a more readable display by using either Monochrome or Color mode.

Scan: One of these bar codes to set the display options:

Note: When you scan a label that changes the Video mode, the screen goes blank. To activate the screen, begin entering data or press ⌨enter↵ *if you are at the DOS prompt.*

25 x 80, Video Mode 2, Scroll at Line 25, Normal Character Height

||||||| | ||| || |||| ||||| ||| |||| |||| ||||| |||| |||

$+DS0200

25 x 80, Video Mode 2, Scroll at Line 25, Double Character Height

||||||| | ||| || |||| ||||| ||| |||| |||| ||||| |||| |||

$+DS0201

25 x 80, Video Mode 2, Scroll at Line 16, Normal Character Height

||||||| | ||| || |||| ||||| ||| |||| |||| ||||| |||| |||

$+DS0210

25 x 80, Video Mode 2, Scroll at Line 8, Double Character Height

||||||| | ||| || |||| ||||| ||| |||| |||| ||||| |||| |||

$+DS0221

25 x 80, Video Mode 3, Scroll at Line 25, Normal Character Height

||||||| | ||| || |||| ||||| ||| |||| |||| ||||| |||| |||

$+DS0300

25 x 80, Video Mode 3, Scroll at Line 25, Double Character Height

||||||| | ||| || |||| ||||| ||| |||| |||| ||||| |||| |||

$+DS0301

25 x 80, Video Mode 3, Scroll at Line 16, Normal Character Height

||||||| | ||| || |||| ||||| ||| |||| |||| ||||| |||| |||

$+DS0310

25 x 80, Video Mode 3, Scroll at Line 8, Double Character Height

||||||| | ||| || |||| ||||| ||| |||| |||| ||||| |||| |||

$+DS0321

Display Setup (continued)

25 x 40, Video Mode 0, Scroll at Line 25, Normal Character Height

||||||||||||||||||||||||||||||||||||||||||||

$+DS0000

25 x 40, Video Mode 0, Scroll at Line 25, Double Character Height

||||||||||||||||||||||||||||||||||||||||||||

$+DS0001

25 x 40, Video Mode 0, Scroll at Line 16, Normal Character Height

||||||||||||||||||||||||||||||||||||||||||||

$+DS0010

25 x 40, Video Mode 0, Scroll at Line 8, Double Character Height

||||||||||||||||||||||||||||||||||||||||||||

$+DS0021

25 x 40, Video Mode 1, Scroll at Line 25, Normal Character Height

||||||||||||||||||||||||||||||||||||||||||||

$+DS0100

25 x 40, Video Mode 1, Scroll at Line 25, Double Character Height

||||||||||||||||||||||||||||||||||||||||||||

$+DS0101

25 x 40, Video Mode 1, Scroll at Line 16, Normal Character Height

||||||||||||||||||||||||||||||||||||||||||||

$+DS0110

25 x 40, Video Mode 1, Scroll at Line 8, Double Character Height

||||||||||||||||||||||||||||||||||||||||||||

$+DS0121

16 x 20 (lines by characters)

||||||||||||||||||||||||||||||||

$+DS1

8 x 20 (lines by characters)

||||||||||||||||||||||||||||||||||

\$+DS2

16 x 10 (lines by characters)

||||||||||||||||||||||||||||||||||

\$+DS3

8 x 10 (lines by characters)

||||||||||||||||||||||||||||||||||

\$+DS4

EOF (End of File)

Purpose: Defines the end of file character for the communications port when transmitting a file from the reader.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter. The configured option may be overridden when you use certain communications protocols. The EOF will not be overridden when you use User-Defined protocol.

Default: Disabled

Syntax: FA*data*

where *data* can be any ASCII character.

Scan: To disable EOF, scan this bar code:

Disable EOF

|||||||||||||||||||||||||||||||

\$+FA

EOF (End of File) (continued)

Or: To set EOF to an ASCII character:

1. Scan this bar code:

   Enter Accumulate Mode / Set EOF

   |||||||||||||||||||||||||||||||

   +/$+FA

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

   Exit Accumulate Mode

   |||||||||||||||||||||||

   -/

EOM (End of Message)

Purpose: Attaches an EOM to the end of a data block to indicate the end of data transmission to and from a reader. You can disable the EOM transmit and receive characters, define EOM transmit and receive to the same characters, or define EOM transmit and receive to different characters.

                Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: EOM Transmit and Receive are set to CR (0DH) and LF (0AH) (carriage return line feed)

Syntax:
PF	Disable EOM transmit and receive
PF*data*	Enable EOM transmit and receive
PI	Disable EOM transmit only
PI*data*	Enable EOM transmit only
PJ	Disable EOM receive only
PJ*data*	Enable EOM receive only

            where *data* can be one or two ASCII characters.

Scan: To disable EOM, scan one of these bar codes:

Disable EOM Transmit and Receive

|||||||||||||||||||||||||||||||
$+PF

Disable EOM Transmit Only

|||||||||||||||||||||||||||||||
$+PI

Disable EOM Receive Only

|||||||||||||||||||||||||||||||
$+PJ

Or: To set EOM Transmit and Receive to the same ASCII character:

1. Scan this bar code:

    Enter Accumulate Mode / Enable EOM Transmit and Receive

    |||||||||||||||||||||||||||||||||||||
    +/$+PF

2. Scan one or two bar codes for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

    Exit Accumulate Mode

    ||||||||||||||||||||||
    -/

Or: To set EOM Transmit and Receive to different ASCII characters:

Note: You can enable an EOM Transmit character and disable the EOM Receive character, or vice versa.

1. Scan this bar code to set the EOM Transmit character:

    Enter Accumulate Mode / Enable EOM Transmit Only

    |||||||||||||||||||||||||||||||||||||
    +/$+PI

2. Scan one or two bar codes for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

EOM (End of Message) (continued)

3. Scan this bar code:

Exit Accumulate Mode

|||||||||||||||||||||||

-/

4. Scan this bar code to set the EOM Receive character:

Enter Accumulate Mode / Enable EOM Receive Only

|||||||||||||||||||||||||||||||

+/\$+PJ

5. Scan one or two bar codes for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

6. Scan this bar code:

Exit Accumulate Mode

|||||||||||||||||||||||

-/

EOR (End of Record)

Purpose:	Attaches an EOR to the end of every record of a file transmit.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

The configured option may be overridden when you use certain communications protocols. EOR will not be overridden when you use User-Defined protocol.

Default: Disabled

Syntax: FB*data*

where *data* can be one or two ASCII characters.

Scan: To disable EOR, scan this bar code:

Disable EOR

||||||| || ||| || ||||| |||| || ||||

$+FB

Or: To set the EOR character to an ASCII character(s):

1. Scan this bar code:

Enter Accumulate Mode / Set EOR

|||||||| ||||||||| ||| ||| |||| || ||||

+/$+FB

2. Scan one or two bar codes for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode

|||||||| ||||| ||||

-/

Flow Control

Purpose: Regulates the data transmission through the communications port. The reader is a DTE device.

Clear To Send/Request To Send (CTS/RTS) is a hardware signal flow control. The reader sets RTS high when it is ready to transmit. The reader checks CTS when it tries to transmit data.

XON/XOFF response causes the reader to respond to XON/XOFF characters received while transmitting. XON/XOFF control specifies that the reader transmits XON/XOFF characters to control the incoming data flow. XON/XOFF response and control specify that the reader responds to and transmits XON/XOFF characters.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: None

Syntax: IL*data*

Acceptable values for *data* are:

0   None
1   CTS checking/RTS control
2   XON/XOFF response
3   XON/XOFF control
4   XON/XOFF response and control

Scan: One of these bar codes:

No Flow Control

|||||||||||||||||||||||||||||||||
$+IL0

CTS Checking/RTS Control

|||||||||||||||||||||||||||||||||
$+IL1

XON/XOFF Response

|||||||||||||||||||||||||||||||||
$+IL2

XON/XOFF Control

|||||||||||||||||||||||||||||||||
$+IL3

XON/XOFF Response and Control

|||||||||||||||||||||||||||||||||
$+IL4

Intercharacter Delay

Purpose: Defines the amount of time the reader waits before sending each character to the host. It modifies outgoing data only by slowing the speed of transmission. A character delay can be useful when the reader is communicating with a controller through a modem using full-duplex operation.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: 0 sec

Syntax: ID*data*

Acceptable values for *data* are:

0	0 ms
1	1 ms
2	2 ms
3	5 ms
4	10 ms
5	20 ms
6	50 ms
7	100 ms

Scan: One of these bar codes:

Intercharacter Delay, 0 ms

$+ID0

Intercharacter Delay, 1 ms

$+ID1

Intercharacter Delay, 2 ms

$+ID2

Intercharacter Delay, 5 ms

$+ID3

Intercharacter Delay, 10 ms

$+ID4

Intercharacter Delay, 20 ms

$+ID5

Intercharacter Delay, 50 ms

$+ID6

Intercharacter Delay, 100 ms

$+ID7

Interleaved 2 of 5

Purpose: Enables or disables decoding of Interleaved 2 of 5 (I 2 of 5) symbology. I 2 of 5 is a high-density, self-checking, continuous numeric symbology. It is mainly used in inventory distribution and the automobile industry.

Enabling I 2 of 5 automatically disables Code 2 of 5.

Default: Variable length with a check digit

Syntax: CA*data*

Acceptable values for *data* are:

0	Disabled
2-32	Fixed length (even number only)
97	Variable length without a check digit
98	Case code (6 or 14) with a check digit
99	Variable length with a check digit

Caution
Using the variable length without a check digit configuration option can cause substitution errors.

Conseil
Des erreurs de substitution peuvent survenir si vous utilisez la longueur variable sans option de vérification de configuration de chiffres.

Scan: One of these bar codes:

Disable Interleaved 2 of 5

$+CA0

Enable Variable Length Without a Check Digit

$+CA97

Enable Variable Length With a Check Digit

$+CA99

Enable Interleaved 2 of 5, Case Code

||||||| ||| || ||||| |||| ||| ||| |||| ||| ||||

$+CA98

Or: To set Interleaved 2 of 5 to a fixed length:

1. Scan this bar code:

Enter Accumulate Mode / Set Fixed Length

|||||||||||||||||||| ||| || |||| |||| ||| ||||

+/$+CA

2. Scan a numeric value for *data* from these bar codes. (Use even numbers
    2-32 only)

|||||||| ||| |||| |||||||| ||| ||||
0   *1*

|||||||| ||| |||| |||||||| |||| ||||
2   *3*

|||||||| ||| |||| ||||||| |||| ||||
4   *6*

|||||||| ||| ||||
8

3. Scan this bar code:

Exit Accumulate Mode

|||||||| |||| ||| ||||

-/

Internal Drive Reset After Battery Change

Purpose: Defines how the reader operates the Type I PC card drive after you change the NiCad battery pack. If a PC card is installed when you replace the battery pack, the reader cannot determine if the PC card has also been replaced. For help, see "Configuring the Reader to Reset the Type I Drive" in Chapter 4.

There are three options:

Reset card   If a PC card is installed, resets the Type I PC card drive every time you replace the NiCad battery pack.

Do not reset card   Does not reset the Type I PC card drive when you replace the battery pack. If you do change the PC card, you need to reboot the reader.

Prompt for reset   If a PC card is installed, prompts you to reset the Type I PC card drive each time you replace the battery pack.

Default: Do not reset card

Syntax: ES*data*

Acceptable values for *data* are:

0   Reset card
1   Do not reset card
2   Prompt for reset

Caution
If you set the "Do not reset card" option, you must reboot the reader after changing a PC card or you may lose data.

Conseil
Si vous réglez l'option "Do not reset card," vous devez réinitialiser le lecteur après avoir changé une carte PC ou vous risquez de perdre des données.

Scan:　　　　　　One of these bar codes:

Reset Card

|||||||||||||||||||||||||||||

$+ES0

Do Not Reset Card

|||||||||||||||||||||||||||||

$+ES1

Prompt for Reset

|||||||||||||||||||||||||||||

$+ES2

IRL BAK (Bad Program Acknowledge)

Purpose:　　　　The reader sends a BAK to indicate that it cannot successfully download an IRL program.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default:　　　　BEL

Syntax:　　　　ZB*data*

where *data* can be any ASCII character.

Scan:　　　　　　To disable BAK, scan this bar code:

Disable BAK

|||||||||||||||||||||||||||||

$+ZB

Or:　　　　　　To set BAK to an ASCII character:

1.　Scan this bar code:

Enter Accumulate Mode / Set BAK

|||||||||||||||||||||||||||||||||||

+/$+ZB

IRL BAK (Bad Program Acknowledge) (continued)

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode

||||||||||||||||||||

-/

IRL End Program Block

Purpose: Indicates the last block of an IRL program when you download a program to the reader.

Note: You must select the communications port and protocol before you set the parameters to define that protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: SO (shift out)

Syntax: XD*data*

where *data* can be any ASCII character.

Scan: To disable IRL End Program Block, scan this bar code:

Disable IRL End Program Block

||||||||||||||||||||

$+XD

Or: To set IRL End Program Block to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / IRL End Program Block

||||||||||||||||||||

+/$+XD

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode

||█||||█||||||||█

-/

IRL EOP (End of Program)

Purpose: An EOP indicates the end of an IRL program block when you download a
program to the reader.

*Note: You must select the communications port and protocol before you set the
parameters to define that protocol. For help, see the "Communications Protocol,
Configure" command earlier in this chapter.*

Default: SYN (synchronous idle)

Syntax: XB*data*

where *data* can be any ASCII character.

Scan: To disable EOP, scan this bar code:

Disable EOP

||█|||||||||||█████||█|██

$+XB

Or: To set EOP to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set EOP

||█||||||||||||█|||||█████|█|██

+/$+XB

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in
Appendix C.

3. Scan this bar code:

Exit Accumulate Mode

||█||||█|||||||█

-/

IRL PAK (Program Acknowledge)

Purpose: The reader sends this character to the host computer to acknowledge an IRL program that it has received.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: RS (record separator)

Syntax: ZA*data*

where *data* can be any ASCII character.

Scan: To disable PAK, scan this bar code:

Disable PAK

$+ZA

Or: To set the PAK to an ASCII character:

1. Scan this bar code:

    Enter Accumulate Mode / Set PAK

    +/$+ZA

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

    Exit Accumulate Mode

    -/

IRL PSS (Program Statement Separator)

Purpose: Separates individual IRL program statements from each other.

Note: Do not define PSS as the same character used for EOM. You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: CR (carriage return)

Syntax: XE*data*

where *data* can be any ASCII character.

Scan: To disable PSS, scan this bar code:

Disable PSS

||||||||||||||||||||||||||||||

$+XE

Or: To set the PSS to an ASCII character:

1. Scan this bar code:

    Enter Accumulate Mode / Set PSS

    ||||||||||||||||||||||||||||||||

    +/$+XE

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

    Exit Accumulate Mode

    ||||||||||||||||||

    -/

IRL Run

Purpose: Designates the end of an IRL program download and causes the reader to execute the program. The Run command takes the place of the last EOP character in the downloaded program.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: DC2

Syntax: XC*data*

where *data* can be any ASCII character.

Scan: To disable IRL Run, scan this bar code:

Disable IRL Run

$+XC

Or: To set IRL Run to an ASCII character:

1.   Scan this bar code:

   Enter Accumulate Mode / Set IRL Run

   +/$+XC

2.   Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3.   Scan this bar code:

   Exit Accumulate Mode

   -/

IRL SOP (Start of Program)

Purpose: Defines the beginning of an IRL program download from the host computer.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: SI (shift in)

Syntax: XA*data*

where *data* can be any ASCII character.

Scan: To disable SOP, scan this bar code:

Disable SOP

$+XA

Or: To set SOP to an ASCII character:

1. Scan this bar code:

    Enter Accumulate Mode / Set SOP

    +/$+XA

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

    Exit Accumulate Mode

    -/

Key Code Look-Up Table

Purpose: You can remap up to 20 scanned characters to a keystroke equivalent.

Default: 102-key PC keyboard (no modifications)

Syntax: WM*data*

where *data* can be any ASCII character.

Scan: To reset the look-up table to the default setting, scan this bar code:

Clear Key Code Look-Up Table

||||||||||||||||||||||||||||||||

$+WN

Or: To modify any scanned character, complete these steps:

1.   Scan this bar code:

Modify Key Code Look-Up Table

||||||||||||||||||||||||||||||||||

+/$+WM

2.   Scan a bar code for *data* for the key you want to redefine. Use the "Full ASCII Bar Code Chart" in Appendix C.

Note: Enclose the redefined character and ASCII value in quotes to prevent the reader from interpreting the option as a reader or configuration command (see the example).

3.   Find the four-digit hexadecimal value for the key you want to assign. For help, see "Key Codes" in Appendix C.

4.   Scan a bar code for each digit using the "Full ASCII Bar Code Chart" in Appendix C.

5.   Scan this bar code:

Exit Accumulate Mode

|||||||||||||||||||||

-/

Example: You want to redefine the uppercase letter A to the [(left square bracket). In the Full ASCII Table, the hex value for [is 5B. To redefine A, enter this command:

```
$+WM"A1A5B"
```

You can also change the Key Code Look-Up Table in IC.EXE.

To redefine A to [in IC.EXE

1. From the Op menu in IC.EXE, select Key Codes.
2. Select Redefine.
3. Press ⇧ ⓐ.
4. Press ⬇ to move to the next field.
5. To enter the hexadecimal value for [, press 1 A 5 B.
6. Press enter↵.
7. Exit IC.EXE and save your changes.

Keypad Caps Lock

Purpose: Turns the caps lock on and off. With the caps lock turned on, all alphabetic characters you type on the keypad will be uppercase or capital letters. By default, the reader turns the caps lock off when you boot the reader.

Default: Caps lock off

Syntax: KA*data*

Acceptable values for *data* are:

0   Caps lock off
1   Caps lock on

Scan: One of these bar codes:

Caps Lock Off

|||█|||| || ||||█ |██ ||█ ||| █|█
$+KA0

Caps Lock On

|||█|||| || ||█|█ |██ ||█ ||| █|||█
$+KA1

Keypad Clicker

Purpose: Enables or disables the keypad clicks. The reader sounds a click each time you press a key or decode a two-dimensional symbology.

Default: Enabled

Syntax: KC*data*

Acceptable values for *data* are:

0   Disable keypad clicker
1   Enable keypad clicker

Scan: One of these bar codes:

Disable Keypad Clicker

||||||||||||||||||||||||||||||||

$+KC0

Enable Keypad Clicker

||||||||||||||||||||||||||||||||

$+KC1

Keypad Ctrl Key Functions

Purpose: Defines the functionality of the Control (△Ctrl) key.

Default: All Ctrl key functions enabled

Syntax: KB*data*

Acceptable values for *data* are:

0   Enable Ctrl key
1   Prohibit Ctrl-Alt-Del sequence (warm reboot)
2   Prohibit Ctrl key combinations

Scan: One of these bar codes:

Enable Ctrl Key

||||||||||||||||||||||||||||||||

$+KB0

Prohibit Ctrl-Alt-Del

||||||||||||||||||||||||||||||

$+KB1

Prohibit Ctrl Key Combinations

||||||||||||||||||||||||||||||

$+KB2

Keypad, Numeric

Purpose: Defines the ability to enable the numeric keypad from the reader keypad as described in Chapter 2, "Learning How to Use the Reader." You can set the reader to simulate the numeric keypad on a 102-key PC keyboard. Press ≣f ≣f enter↵ to enable the reader's number pad. You can use the Keypad, Numeric command to prohibit the use of the numeric keypad if you want to avoid inadvertently enabling the number pad.

Default: Permit entering number pad

Syntax: KD*data*

Acceptable values for *data* are:

0   Prohibit entering number pad
1   Permit entering number pad

Scan: One of these bar codes:

Prohibit Entering Number Pad

||||||||||||||||||||||||||||||

$+KD0

Permit Entering Number Pad

||||||||||||||||||||||||||||||

$+KD1

LRC

Purpose: The Longitudinal Redundancy Check character is an error-checking character that you can append to transmitted and received blocks of data.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: Disabled

Syntax: IF*data*

Acceptable values for *data* are:

0   LRC disabled
1   LRC enabled

Scan: One of these bar codes:

Disable LRC

|||||||||||||||||||||||||||||||||||
$+IF0

Enable LRC

|||||||||||||||||||||||||||||||||||
$+IF1

MSI

Purpose: Enables or disables decoding of MSI symbology. MSI code is similar to Plessey code. MSI code includes a start pattern, data characters, one or two check digits, and a stop pattern.

Default: Disabled

Syntax: CN*data*

Acceptable values for *data* are:

First digit:	0	Disabled
	1	No check digits
	2	1 modulus 10 check digit
	3	2 modulus 10 check digit

| *Second digit:* | 0 | Discard check digit |
| | 1 | Transmit check digit |

Scan: One of these bar codes:

Disable MSI

||||||||||||||||||||||||||||||||||||

$+CN00

MSI Without Check Digits

||||||||||||||||||||||||||||||||||||

$+CN10

MSI With 1 Modulus 10 Check Digit, Discard Check Digit

||||||||||||||||||||||||||||||||||||

$+CN20

MSI With 1 Modulus 10 Check Digit, Transmit Check Digit

||||||||||||||||||||||||||||||||||||

$+CN21

MSI With 2 Modulus 10 Check Digits, Discard Check Digits

||||||||||||||||||||||||||||||||||||

$+CN30

MSI With 2 Modulus 10 Check Digits, Transmit Check Digits

||||||||||||||||||||||||||||||||||||

$+CN31

NEG (Negative Acknowledge)

Purpose: Indicates a negative acknowledgment to a transmitted message. You must enable both NEG and AFF to have a valid configuration.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: Disabled

Syntax: PH*data*

where *data* can be any ASCII character.

Scan: To disable NEG, scan this bar code:

Disable NEG

$+PH

Or: To set NEG to an ASCII character:

1. Scan this bar code:

   Enter Accumulate Mode / Set NEG

   +/$+PH

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

   Exit Accumulate Mode

   -/

Parity

Purpose: Sets the parity of the selected communications port. The reader uses parity for error checking in data transmissions.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: Even

Syntax: IB*data*

Acceptable values for *data* are:

0 No parity
1 Even parity
2 Odd parity
3 Mark parity
4 Space parity

Scan: One of these bar codes:

No Parity

||||||| ||| ||| |||| |||| ||| ||| |||||
$+IB0

Even Parity

|||||| |||| ||| |||| |||| ||| ||| ||||
$+IB1

Odd Parity

|||||| |||| ||| |||| |||| ||| ||| ||||
$+IB2

Mark Parity

|||||| |||| ||| |||| |||| ||| ||| ||||
$+IB3

Space Parity

|||||| |||| ||| |||| |||| ||| ||| ||||
$+IB4

Plessey

Purpose:	Enables or disables decoding of Plessey symbology. Plessey code is pulse-width modulated. It includes a start character, data characters, an eight-bit cyclic check digit, a termination bar, and usually a reverse start character. The code is continuous and not self-checking. You need to configure two parameters for Plessey code: Start Code and Check Digit.
Default:	Disabled
Syntax:	CI*data*

Acceptable values for *data* are:

00   Disabled
10   Plessey with reverse start code
30   Transmit check digit
31   Discard check digit

Scan: To disable Plessey:

Disable Plessey

$+CI00

Or: To set Plessey, complete these steps:

1. Scan this bar code:

   Plessey With Reverse Start Code

   $+CI10

2. Scan one of these bar codes to transmit or retain the check digit:

   Transmit Check Digit

   $+CI30

   Discard Check Digit

   $+CI31

POL

Purpose: Solicits or requests data from a polled device.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: Disabled

Syntax: HB*data*

where *data* can be any ASCII character.

Scan: To disable POL, scan this bar code:

Disable POL

||||||||||||||||||||||||||||||

$+HB

Or: To set POL to an ASCII character:

1. Scan this bar code:

    Enter Accumulate Mode / Set POL

    ||||||||||||||||||||||||||||||

    +/$+HB

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

    Exit Accumulate Mode

    ||||||||||||||||||||

    -/

Postamble

Purpose: Sets the postamble that is appended to any data you scan with the reader. Common postambles include cursor controls such as tabs or carriage return line feeds.

Note: A postamble is not added to scanned data when you run IRL programs.

Default: <CR>

Syntax: AE*data*

Acceptable values for *data* are up to 25 ASCII characters. If you enter the AE command without *data,* the postamble is disabled. You must enclose the *data* within quotation marks if the *data* is a reserved word, such as a reader configuration command (see the example).

Scan: To disable the postamble, scan this bar code:

Disable Postamble

|||||||||||||||||||||||||||||

$+AE

Or: To set the postamble to an ASCII character string:

1. Scan this bar code:

Enter Accumulate Mode / Set Postamble

|||||||||||||||||||||||||||||||

+/$+AE

2. Scan a value for *data* from the "Full ASCII Bar Code Chart" in Appendix C. The postamble can be from 1 to 25 characters.

3. Scan this bar code:

Exit Accumulate Mode

|||||||||||||||||||

-/

Example: You want to set the postamble to the letters "BV," which also represents the Beep Volume configuration command. Enter the postamble by scanning this bar code:

Set Postamble to BV

||||||| ||| |||||||||| ||||||||||| ||||||||||| ||||||||||||||

$+AE"BV"

If you omit the quotation marks, the reader interprets the command as two commands: AE to set the postamble to no characters, and BV to change the beep volume.

Preamble

Purpose: Sets the preamble that precedes any data you scan with the reader. Common preambles include a data location number or an operator number.

Note: A preamble is not added to scanned data when you run IRL programs.

Default: Disabled

Syntax: AD*data*

Acceptable values for *data* are up to 25 ASCII characters. When you enter the AD command without *data*, the preamble is disabled. You must enclose the *data* within quotation marks if the *data* is a reserved word, such as a reader configuration command (see the example at the end of this section).

Scan: To disable the preamble, scan this bar code:

Disable Preamble

|||||| |||||||||| |||| ||||| |||| |||

$+AD

Or: To set the preamble to an ASCII character string:

1.   Scan this bar code:

Enter Accumulate Mode / Set Preamble

|||||||||||||||||||||||||||||||||||

+/$+AD

2.   Scan a value for *data* from the "Full ASCII Bar Code Chart" in Appendix C. The preamble can be from 1 to 25 characters.

Preamble (continued)

3. Scan this bar code:

Exit Accumulate Mode

||█||█||██||||||█||██

-/

Example: You want to set the preamble to the letters "BV," which also represents the Beep Volume configuration command. Enter the preamble by scanning this bar code:

Set Preamble to BV

||█████||||██||█|██|██|██||||██|██|██||██|█████||||██|██|█

$+AD"BV"

If you omit the quotation marks, the reader interprets the command as two commands: AD to set the preamble to no characters, and BV to change the beep volume.

Records Per Block

Purpose: Defines the maximum number of data records transmitted per block of data. Usually files are transmitted record by record. This configuration allows you to transmit multiple records per data block. A block of data is transmitted during a single transmission, like an individual data record is normally.

Note: The configured option may be overridden when you use certain communications protocols. Records Per Block will not be overridden when you use User-Defined protocol.

You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: 1 record transmitted per block

Syntax: FC*data*

Acceptable values for *data* are:

0 All records are transmitted in one block
01-99 Records transmitted per block

Scan: To have all records transmitted in one block, scan this bar code:

All Records = 1 Block

|| ||| | | || || ||| ||| ||| ||| |||

$+FC0

Or: To set the records per block:

1. Scan this bar code:

Enter Accumulate Mode / Set Number of Records Per Block

||| || | | | || || || || ||| ||| || |||

+/$+FC

2. Scan a two-digit numeric value for *data* from these bar codes:

|| ||||| ||| |||
0

|| |||| ||| ||||
1

|| ||||| ||| |||
2

|| |||| ||| ||||
3

|| |||| ||| |||
4

|| |||| |||| |||
5

|| |||| ||| |||
6

|| ||||| ||| |||
7

|| |||| ||| |||
8

|| |||| ||| |||
9

3. Scan this bar code:

Exit Accumulate Mode

|| ||||| |||| | ||| |||

-/

REQ (Request for Acknowledge)

Purpose: Enables or disables a request for a repeat handshake event. If you enable REQ, you must also enable AFF and NEG to have a valid configuration.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: Disabled

Syntax: PD*data*

where *data* can be any ASCII character.

Scan: To disable REQ, scan this bar code:

Disable REQ

||||||||||||||||||||||||||

$+PD

Or: To set REQ to an ASCII character:

1. Scan this bar code:

    Enter Accumulate Mode / Set REQ

    |||||||||||||||||||||||||||||

    +/$+PD

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

    Exit Accumulate Mode

    ||||||||||||||||||

    -/

RES (Reset)

Purpose:	Enables or disables a reset event.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: Disabled

Syntax: PC*data*

where *data* can be any ASCII character.

Scan: To disable RES, scan this bar code:

Disable RES

|||||||| | ||| || ||||| ||| ||| ||||

$+PC

Or: To set RES to an ASCII character:

1. Scan this bar code:

   Enter Accumulate Mode / Set RES

   ||||||||||||||| ||| ||||| ||| ||| ||||

   +/$+PC

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

   Exit Accumulate Mode

   |||| ||||| ||| |||

   -/

Scan Ahead

Purpose: Enables or disables scan ahead. If you enable this parameter, you can scan a number of labels that are held in a stack until the reader can process the data. If you disable this parameter, the reader processes each label you scan before you can scan the next label.

Default: Disabled

Syntax: SD*data*

Acceptable values for *data* are:

0   Disabled (scan one label at a time)
1   Enabled (scan many labels at a time)

Scan: One of these bar codes:

Disable Scan Ahead

||||||| | ||||| ||||| |||| ||| ||||| |||
$+SD0

Enable Scan Ahead

||||||| | ||||| |||||| ||| |||| ||| |||
$+SD1

Scanner Devices

Purpose: Identifies the type of scanner you have connected to the JANUS 2010 reader. The reader can optimize the scanning performance by using the scanner you define in this command.

Note: You only need to set the Scanner Devices command when you use the COM2 port as a scanner input port. When you select a specific scanner, other scanners may not function properly.

Default: All compatible scanners (including wands)

Syntax:	SS*data*

Acceptable values for *data* are:

0   All compatible scanners
1   146x CCD scanners
2   1500 laser scanner
3   151x laser scanners
4   1545 laser scanner
5   Compatible Symbol scanners (with reverse polarity enabled)
6   155x laser scanners

Scan: One of these bar codes:

All Compatible Scanners

||||||| |||| | ||| |||| |||| || |||| |||
$+SS0

146x CCD Scanners

||||||| |||| | ||| |||| |||| || |||| |||
$+SS1

1500 Laser Scanner

||||||| |||| | ||| |||| |||| || |||| |||
$+SS2

151x Laser Scanners

||||||| |||| | ||| |||| |||| || |||| |||
$+SS3

1545 Laser Scanner

||||||| |||| | ||| |||| |||| || |||| |||
$+SS4

Compatible Symbol Scanners

||||||| |||| | ||| |||| |||| || |||| |||
$+SS5

155x Laser Scanners

||||||| |||| | ||| |||| |||| || |||| |||
$+SS6

Scanner Mode

Purpose: Defines how the scanner operates when the trigger is pulled. There are two types of modes:

•   One-Shot mode requires you to pull the trigger each time you want to scan a bar code. Once you scan a bar code, the scanner turns off.

•   Automatic mode allows you to pull the trigger once and scan a series of bar codes. When you release the trigger, the scanner turns off. To scan the same bar code more than once, you must release the trigger or scan a different bar code before attempting a second scan.

Scanner Mode (continued)

Default: One-Shot mode

Syntax: SB*data*

Acceptable values for *data* are:

0   One-Shot mode
1   Automatic mode

Scan: One of these bar codes:

Enable One-Shot Mode

||||||||||||||||||||||||||||||||||

$+SB0

Enable Automatic Mode

||||||||||||||||||||||||||||||||||

$+SB1

Scanner Redundancy

Purpose: Defines the number of scans (voting) the scanner takes of the same label that must decode correctly for a good read of the label. Voting allows the reader to decode the same bar code multiple times during a single-trigger event, and to compare the decoded information a specific number of times before signaling a good read. There are three options:

Low   Allows the reader to accept the first good read, which speeds up reader performance. This setting is recommended when scanning good quality bar codes.

Normal   The reader decodes the bar code a minimum number of times in each trigger event.

High   The reader scans and decodes the bar code a maximum number of times in each trigger event. The specific number of comparisons depends on each bar code symbology. The high setting is recommended when scanning poor quality labels that may cause substitution errors.

For example, when you scan Code 39 labels and the scanner redundancy is set to normal, two successive matching decodes in a single-trigger event are required. When scanner redundancy is set to high, three successive matching decodes in a single-trigger event are required.

Default:	Normal
Syntax:	SR*data*

Acceptable values for *data* are:

0   None
1   Normal
2   High

Scan: One of these bar codes:

None

‖‖‖‖‖ ‖ ‖‖ ‖ ‖‖‖‖ ‖‖‖‖ ‖‖ ‖‖‖ ‖‖‖

$+SR0

High

‖‖‖‖‖ ‖ ‖‖‖ ‖ ‖‖‖‖ ‖‖‖‖ ‖‖ ‖‖‖ ‖‖‖

$+SR2

Normal

‖‖‖‖‖ ‖ ‖‖‖ ‖‖ ‖‖‖‖ ‖‖‖‖ ‖‖ ‖‖‖ ‖‖

$+SR1

Scanner Timeout

Purpose:	Defines the maximum length of time the scanner stays on following each trigger pull.
Default:	Disabled (no timeout)
Syntax:	SA*data*

Acceptable values for *data* are:

0   Disabled
1-60   Shutoff time in seconds

Scan: 1.   Scan this bar code:

Enter Accumulate Mode / Change Scanner Timeout

‖‖‖‖‖‖‖‖‖‖‖‖ ‖ ‖‖‖ ‖‖‖‖ ‖‖‖ ‖ ‖‖‖

+/$+SA

Scanner Timeout (continued)

2. Scan a numeric value for *data* from these bar codes:

|||||||||||||||||||
0

|||||||||||||||||||
1

|||||||||||||||||||
2

|||||||||||||||||||
3

|||||||||||||||||||
4

|||||||||||||||||||
5

|||||||||||||||||||
6

|||||||||||||||||||
7

|||||||||||||||||||
8

|||||||||||||||||||
9

3. Scan this bar code:

Exit Accumulate Mode

|||||||||||||||||||
-/

Scanner Trigger

Purpose: Scanner trigger allows you to set level triggering or edge triggering.

- With level triggering, you pull the trigger and the laser turns on and stays on until you release the trigger.

- In edge triggering, you pull the trigger and the laser turns on and stays on. When you pull the trigger a second time, the laser turns off. Simply releasing the trigger does not turn the laser off. If the laser is left on, the scanner timeout turns the laser off.

Default: Level triggering

Syntax: SC*data*

Acceptable values for *data* are:

0   Level triggering
1   Edge triggering

Scan: One of these bar codes:

Enable Level Triggering

||||||| ||| || |||||| ||| ||| |||

$+SC0

Enable Edge Triggering

||||||| ||| || |||||| ||| ||| |||

$+SC1

SEL (Select)

Purpose: Defines the character that requests permission for the controller to send data to the polled device.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: Disabled

Syntax: HA*data*

where *data* can be any ASCII character.

Scan: To disable SEL, scan this bar code:

Disable SEL

||||||| ||| || ||| ||||| ||| |||

$+HA

Or: To set SEL to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set SEL

|||||||| ||||| ||| ||| ||| ||||| ||||| |||| |||

+/$+HA

SEL (Select) (continued)

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode

||||||||||||||||||||

-/

SOM (Start of Message)

Purpose: SOM is the first character in a message sent to or received from the host computer.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: Disabled

Syntax: PE*data*

where *data* can be any ASCII character.

Scan: To disable SOM, scan this bar code:

Disable SOM

||||||||||||||||||||

$+PE

Or: To set SOM to an ASCII character:

1. Scan this bar code:

Enter Accumulate Mode / Set SOM

||||||||||||||||||||

+/$+PE

2. Scan a bar code for *data* from the "Full ASCII Bar Code Chart" in Appendix C.

3. Scan this bar code:

Exit Accumulate Mode

||█||█|██||||||█||||██||

-/

Stop Bits

Purpose: Sets the number of stop bits on the communications port.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: 1 stop bit

Syntax: IC*data*

Acceptable values for *data* are:

1   1 stop bit
2   2 stop bits

Scan: One of these bar codes:

1 Stop Bit

||█|||||||||██|||██|█|██|██|██|███||█|███

$+IC1

2 Stop Bits

||█||||||||||██|█|██|██|███||███||███||

$+IC2

Timeout Delay

Purpose: Defines the length of time the reader waits between characters when receiving a message. When the timeout expires, an I/O error occurs.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

If you are using User-Defined or Point-to-Point protocol, you should only set the Timeout Delay command if the baud rate is 9600 or lower. You should disable Timeout Delay if the baud rate for either of these protocols is set to 19200 or higher.

Default: 10 sec

Syntax: IE*data*

Acceptable values for *data* are:

0	5 ms
1	100 ms
2	500 ms
3	2 sec
4	10 sec
5	20 sec
6	40 sec
7	60 sec
8	No timeout

Scan: One of these bar codes:

No Timeout Delay

$+IE8

Timeout Delay, 5 ms

$+IE0

Timeout Delay, 100 ms

$+IE1

Timeout Delay, 500 ms

$+IE2

Timeout Delay, 2 sec

$+IE3

Timeout Delay, 10 sec

$+IE4

Timeout Delay, 20 sec

||||||| ||| ||||| |||| |||| ||| ||||

$+IE5

Timeout Delay, 40 sec

||||||| ||| ||||| |||| |||| ||| ||||

$+IE6

Timeout Delay, 60 sec

||||||| ||| ||||| |||| ||| ||| ||||

$+IE7

Transmit Abort Timeout

Purpose: Defines the length of time the reader waits to receive a message if one of the following conditions is true:

- CTS is continuously false for the timeout period.

- XOFF condition does not change within the timeout period.

- POL not received (polling protocol) within the timeout period.

Transmit Abort Timeout is similar to the Timeout Delay configuration, but it only applies to the three conditions listed above.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: Disabled

Syntax: IH*data*

Acceptable values for *data* are:

0   Disabled
1-65000   Timeout in ms

Scan: To disable Transmit Abort Timeout, scan this bar code:

Disable Transmit Abort Timeout

||||||| ||| ||| ||||| |||| |||| ||| ||| ||||

$+IH0

Transmit Abort Timeout (continued)

Or: To set a timeout value:

1. Scan this bar code:

Enter Accumulate Mode / Change Transmit Abort Timeout

||||||||||||||||||||||||||||||||||

+/$+IH

2. Scan a numeric value of one to five digits for *data* from these bar codes:

||||||||||| *0*	||||||||||| *1*
||||||||||| *2*	||||||||||| *3*
||||||||||| *4*	||||||||||| *5*
||||||||||| *6*	||||||||||| *7*
||||||||||| *8*	||||||||||| *9*

3. Scan this bar code:

Exit Accumulate Mode

||||||||||||||||||||||

-/

Turnaround Delay

Purpose: Defines the length of time the reader waits to respond after receiving data from the host computer.

Note: You must select the communications port and protocol before you set the parameters that define the protocol. For help, see the "Communications Protocol, Configure" command earlier in this chapter.

Default: 0 sec

Syntax: IG*data*

Acceptable values for *data* are:

0	0 ms
1	1 ms
2	2 ms
3	5 ms
4	10 ms
5	20 ms
6	50 ms
7	100 ms

Scan: One of these bar codes:

No Turnaround Delay

$+IG0

Turnaround Delay, 1 ms

$+IG1

Turnaround Delay, 2 ms

$+IG2

Turnaround Delay, 5 ms

$+IG3

Turnaround Delay, 10 ms

$+IG4

Turnaround Delay, 20 ms

$+IG5

Turnaround Delay, 50 ms

$+IG6

Turnaround Delay, 100 ms

$+IG7

UPC/EAN

Purpose: Enables or disables the decoding of Universal Product Code (UPC)/European Article Numbering (EAN) symbology. UPC/EAN are fixed length, numeric, continuous symbologies that use four element widths. A reader that is configured to decode EAN bar codes can decode UPC, but the reverse is not true. UPC code is a subset of EAN code.

To define the UPC/EAN symbology, you set up to seven digits. The fifth, sixth, and seventh digits are optional. To set the sixth digit, you must set the fifth digit. To set the seventh digit, you must set all seven digits.

Default:
First digit:	UPC-A/EAN-13 enabled
Second digit:	UPC-E enabled
Third digit:	EAN-8 enabled
Fourth digit:	Supplementals allowed
Fifth digit:	Transmit check digit
Sixth digit:	Transmit number system digit
Seventh digit:	Retain leading zero for UPC-A

Syntax: CE*data*

where *data* must be 4 to 7 digits selected from this list:

First digit:	0	UPC-A/EAN-13 disabled
	1	UPC-A/EAN-13 enabled
	2	UPC-A only enabled
Second digit:	0	UPC-E disabled
	1	UPC-E enabled
Third digit:	0	EAN-8 disabled
	1	EAN-8 enabled
Fourth digit:	0	Supplementals are not allowed
	1	Supplementals are allowed
Fifth digit:	0	Discard check digit
	1	Transmit check digit
Sixth digit:	0	Discard number system digit
	1	Transmit number system digit
Seventh digit:	0	Discard the leading zero for UPC-A
	1	Retain the leading zero for UPC-A

Scan: To disable UPC/EAN, scan this bar code:

Disable UPC/EAN
||||||||||||||||||||||||||||||||||||||||||||||||
\$+CE000000

Or: To enable UPC/EAN:

1. Scan this bar code:

   Enter Accumulate Mode / Enable UPC/EAN
   ||||||||||||||||||||||||||||||||
   +/\$+CE

2. Scan one of these bar codes to set the first digit:

   Disable UPC/EAN-13   Enable UPC/EAN-13
   ||||||||||||||||| |||||||||||||||||
   0   *1*

   Enable UPC-A Only
   |||||||||||||||||
   2

3. Scan one of these bar codes to set the second digit:

   Disable UPC-E   Enable UPC-E
   ||||||||||||||||| |||||||||||||||||
   0   *1*

4. Scan one of these bar codes to set the third digit:

   Disable EAN-8   Enable EAN-8
   ||||||||||||||||| |||||||||||||||||
   0   *1*

5. Scan one of these bar codes to set the fourth digit:

Supplementals Not Allowed

||||||||||||||||||||

0

Supplementals Allowed

||||||||||||||||||||

1

6. (Optional) Scan one of these bar codes to set the fifth digit:

Discard Check Digit

||||||||||||||||||||

0

Transmit Check Digit

||||||||||||||||||||

1

7. (Optional) Scan one of these bar codes to set the sixth digit:

Discard Number System Digit

||||||||||||||||||||

0

Transmit Number System Digit

||||||||||||||||||||

1

Note: If you discard the number system digit, one leading digit is discarded from UPC-A, UPC-E, and EAN-8, and two leading digits are discarded from EAN-13.

8. (Optional) Scan one of these bar codes to set the seventh digit:

Discard Leading Zero for UPC-A

||||||||||||||||||||

0

Transmit Leading Zero for UPC-A

||||||||||||||||||||

1

Note: This option applies only when you enable UPC-A/EAN-13.

9. Scan this bar code:

Exit Accumulate Mode

||||||||||||||||||||

-/

Viewport Movement Keys

Purpose: Allows you to use the compound function and arrow keys to move the viewport around the virtual display. You must set the Display Setup command to 25 x 80 to use the reader's viewport. For help, see the "Display Setup" command earlier in this chapter.

Default: Enabled

Syntax: DV*data*

Acceptable values for *data* are:

0 Disable viewport movement keys
1 Enable viewport movement keys

Scan: One of these bar codes:

Disable Viewport Movement Keys

$+DV0

Enable Viewport Movement Keys

$+DV1

Viewport Movement Mode

Purpose: Enables Manual or Automatic Viewport Movement mode. In Manual mode, you manually move the viewport around the reader's virtual display. In Automatic mode, the viewport automatically follows the cursor around the reader's virtual display.

You must set the Display Setup command to 25 x 80 to use the reader's viewport. For help, see the "Display Setup" command earlier in this chapter.

Note: While you run an application, the reader reverts to Automatic Viewport Movement mode and scrolls at line 25 unless your application sets these values. When you exit the application, the reader restores your previous configuration values.

Default: Enable Automatic Viewport Movement mode

Viewport Movement Mode (continued)

Syntax: DZ*data*

Acceptable values for *data* are:

0   Enable Manual Viewport Movement mode
1   Enable Automatic Viewport Movement mode

Scan: One of these bar codes:

Enable Manual Viewport Movement Mode

|||||||||||||||||||||||||||||||

$+DZ0

Enable Automatic Viewport Movement Mode

|||||||||||||||||||||||||||||||

$+DZ1

Viewport Movement Steps

Purpose: Defines the number of horizontal and vertical steps the viewport moves when you enter a viewport up, down, right, or left command. The horizontal steps are the number of characters the viewport moves left or right. The vertical steps are the number of lines or rows the viewport moves up or down. You must set the Display Setup command to 25 x 80 before you can move the viewport. For help, see the "Display Setup" command earlier in this chapter.

Default: 10 horizontal steps and 9 vertical steps

Syntax: DY*data*

Acceptable values for *data* are:

1-20H   1 to 20 horizontal steps or characters
1-9V   1 to 9 vertical steps or lines

Scan: To define the number of steps:

1. Scan this bar code:

Enter Accumulate Mode / Viewport Movement Steps

|||||||||||||||||||||||||||||||

+/$+DY

2. Scan a one or two-digit numeric value for *data* from these bar codes:

|||||||||||||||
0

|||||||||||||||
1

|||||||||||||||
2

|||||||||||||||
3

|||||||||||||||
4

|||||||||||||||
5

|||||||||||||||
6

|||||||||||||||
7

|||||||||||||||
8

|||||||||||||||
9

3. Scan one of these bar codes to set the horizontal or vertical step:

Horizontal Step
|||||||||||||||
H

Vertical Step
|||||||||||||||
V

4. Scan this bar code:

Exit Accumulate Mode
|||||||||||||||
-/

A

Reader Specifications

This appendix lists the reader's physical and environmental specifications, and describes the types of memory available in the reader. It also lists the reader's default configuration and provides a configuration command reference list in alphabetical order by command syntax.

Physical and Environmental Specifications

You can use the tables in this section to find technical information about these features and options:

- Reader Dimensions
- Power Specifications
- Temperature Specifications
- Humidity Specifications
- Display
- Memory
- Data Communications
- Cables for Data Communications
- Keypad Options
- Symbologies

Reader Dimensions

Length   8.0 inches (20.3 cm)

Width   3.3 inches (8.4 cm)

Depth   1.8 inches (4.6 cm)

Weight   18 ounces (510 g) without the NiCad battery pack

Power Specifications

Primary   Sealed 1200 mAh NiCad battery pack

Backup   90 mAh rechargeable lithium bridge battery

Temperature Specifications

You need to operate and store the reader within the temperature ranges listed in this table.

Type of Operation	Fahrenheit Temperature Range	Celsius Temperature Range
Charging the battery pack	+50°F to +104°F	+10°C to +40°C
Operating the reader	-4°F to +122°F	-20°C to +50°C
Storing the reader:		
With the battery pack installed	-4°F to +95°F	-20°C to +35°C
Without the battery pack installed	-4°F to +140°F	-20°C to +60°C

Humidity Specifications

You need to operate and store the reader within the noncondensing humidity percentages listed next.

Type of Humidity	Humidity Range
Operating humidity	10% to 90% relative humidity
Storage humidity	10% to 90% relative humidity

Display

- CGA compatible
- 16 lines x 20 columns, backlit LCD display
- 25 lines by 80 columns, virtual display with viewport feature

Memory

- 512K ROM drive resident in flash memory (drive C)
- 2MB ROM (drive D)
- 1MB battery-backed RAM
- Type I PC card drive supports Type I PC cards for additional storage
- Optional Type II PC card drive supports Type I and II PC cards for additional storage and I/O expansion

Data Communications

- Infrared serial communications port interface
- RS-232C, RS-422, RS-485
- Protocols: Multi-Drop, PC standard, Polling Mode D, User-Defined

Cables for Data Communications

Use these cables with the JL2010 Optical Link Adapter to connect the reader to a host computer or other device.

Cable	PC Connector	Part Number
3-wire, null modem	DB25 port connector	047569
5-wire, null modem	DB9 port connector	059167
7-wire, null modem	DB25 port connector	048693

Use these cables with the JD2010 Communications Dock to connect the reader to a host computer or other device.

Cable	PC Connector	Part Number
3-wire, null modem	DB25 port connector	052477
3-wire, null modem	DB9 port connector	047569
7-wire, null modem	DB25 port connector	048668
7-wire, null modem	DB9 port connector	048693

Note: When you run Interlnk with the reader connected to a host computer through the communications dock, you must use a 3-wire cable.

Keypad Options

- Full alphanumeric keypad with 54 keys available in English, French, German, Italian, and Spanish
- Large numeric keypad with 36 keys available in English
- Terminal emulation keypads for IBM 3270 and 5250

Symbologies

- Codabar
- Code 39
- Interleaved 2 of 5
- Code 11
- Code 49
- MSI
- Code 16K
- Code 93
- Plessey
- Code 2 of 5
- Code 128
- UPC/EAN

Default Configuration

The next table shows the reader's default configuration. You can use the Interactive Configuration application (IC.EXE) to set the reader to the default configuration. For help, see "Restoring the Reader's Default Configuration" in Chapter 5.

Bar Code Symbologies

Parameter	Default
Codabar	Standard, ABCD start/stop transmitted
Code 11	Enabled with two check digits
Code 16K	Standard
Code 2 of 5	Disabled
Code 39	Full ASCII Code 39 enabled with no check digit
Code 49	Enabled, Function Codes 1 and 3 disabled, Function Code 2 set to CR LF
Code 93	Enabled
Code 128	Standard
Interleaved 2 of 5	Variable length with a check digit
MSI	Disabled
Plessey	Disabled
UPC/EAN	UPC-A/EAN-13 enabled, UPC-E and EAN-8 enabled, supplementals allowed, transmit check digit, transmit number system digit, and retain leading zero for UPC-A

Communications

Parameter	Default
Address, Multi-Drop	A
AFF (Affirmative Acknowledge)	Disabled
Baud Rate	9600
Communications Dock Port	Network
Communications Port, Choose Scanner or COM2	Scanner
Communications Port, Select COM Port	COM1

Communications (continued)

Parameter	Default
Communications Port, UART Restore	
for COM1	00 Hex
for COM2	00 Hex
Communications Protocol	
Configure	Point-to-point
Activate	Point-to-point
User-Defined Multi-Drop	Disabled
Data Bits	7
EOF (End of File)	Disabled
EOM (End of Message)	Transmit and receive characters set to CR and LF
EOR (End of Record)	Disabled
Flow Control	None
Intercharacter Delay	0 seconds
IRL BAK (Bad Program Acknowledge)	BEL
IRL End Program Block	SO (shift out)
IRL EOP (End of Program)	SYN (synchronous idle)
IRL PAK (Program Acknowledge)	RS (record separator)
IRL PSS (Program Statement Separator)	CR (carriage return)
IRL Run	DC2 (device control 2)
IRL SOP (Start of Program)	SI (shift in)
LRC (Longitudinal Redundancy Check)	Disabled
NEG (Negative Acknowledge)	Disabled
Parity	Even
POL (Polling)	Disabled
Records Per Block	1 record transmitted per block
REQ (Request for Acknowledge)	Disabled
RES (Reset)	Disabled
SEL (Select)	Disabled
SOM (Start of Message)	Disabled
Stop Bits	1
Timeout Delay	10 seconds
Transmit Abort Timeout	Disabled
Turnaround Delay	0 seconds

Operations

Parameter	Default
Automatic Shutoff	1 minute
Beep Duration	50 milliseconds for low and high beep
Beep Frequency	1000 Hz for low beep, 2000 Hz for high beep
Beep Volume	Normal
Command Processing	All reader commands enabled
Decode Security	Moderate
Display Backlight Timeout	10 seconds
Display Contrast	3 (maximum contrast)
Display Mode, IRL	Buffered
Display Setup	25 x 80, Video mode 3, scroll at line 16, normal character height
Internal Drive Reset	Do not reset card in internal drive
Key Code Look-Up Table	102-key PC keyboard (no modifications)
Keypad Caps Lock	Caps lock off
Keypad Clicker	Enabled
Keypad Ctrl Key Functions	All Ctrl functions enabled
Keypad, Numeric	Permit entering numeric keypad
Postamble	<CR>
Preamble	Disabled
Scan Ahead	Disabled
Scanner Devices	All compatible scanners
Scanner Mode	One-Shot mode
Scanner Redundancy	Normal
Scanner Timeout	Disabled (no timeout)
Scanner Trigger	Level triggering
Viewport Movement Keys	Enabled
Viewport Movement Mode	Automatically follow the cursor
Viewport Movement Steps	10 horizontal steps and 9 vertical steps

900 MHz RF Communications

Parameter	Default
Acknowledgment Delay	100 milliseconds
Broadcast Receipt	Enabled
Channel Allow	All channels are excluded from the search pattern.
Channel Select	924 MHz
Device Address	0 (turned off)
Duty Cycle Percent	30%
Duty Cycle Period	1 second
Loopback	Disabled
Network ID	Channel search disabled
Repeat Count	0 (no repeaters)
Retry Limit	0 (optimized setting)
RF Protocol	Enabled
RFNC Address (RF Network Controller)	RFNC 0

Note: For help on the RF configuration commands, see the JANUS 900 MHz Radio Frequency Quick Reference Guide *(Part No. 060207).*

Configuration Commands by Syntax

The next table lists all of the configuration commands that are available on J2010 readers. It lists the configuration commands in alphabetic order by syntax.

Note: For help on the RF configuration commands, see the JANUS 900 MHz Radio Frequency Quick Reference Guide *(Part No. 060207).*

Syntax	Command	For Help, See Page
AD*data*	Preamble	12-79
AE*data*	Postamble	12-78
BD*data*	Beep Duration	12-12
BF*data*	Beep Frequency	12-13
BV*data*	Beep Volume	12-15
CA*data*	Interleaved 2 of 5 Code (I 2 of 5)	12-58
CB*data*	Code 39	12-21
CC*data*	Code 2 of 5 (2 of 5)	12-19
CD*data*	Codabar	12-16
CE*data*	UPC/EAN	12-96
CF*data*	Code 93	12-27
CG*data*	Code 11	12-17
CH*data*	Code 128	12-27
CI*data*	Plessey	12-76
CJ*data*	Code 49	12-25
CK*data*	Code 49 Function Code 1	12-25
CL*data*	Code 49 Function Code 2	12-25
CM*data*	Code 49 Function Code 3	12-25
CN*data*	MSI	12-72
CP*data*	Code 16K	12-18
CS*data*	Decode Security	12-43
DC*data*	Command Processing	12-28
DF*data*	Display Backlight Timeout	12-44
DJ*data*	Display Contrast	12-46

Configuration Commands by Syntax (continued)

Syntax	Command	For Help, See Page
DM*data*	Display Mode, IRL	12-47
DS*data*	Display Setup	12-48
DV*data*	Viewport Movement Keys	12-99
DY*data*	Viewport Movement Steps	12-100
DZ*data*	Viewport Movement Mode	12-99
ES*data*	Internal Drive Reset	12-60
EZ*data*	Automatic Shutoff	12-9
FA*data*	EOF (End of File)	12-51
FB*data*	EOR (End of Record)	12-55
FC*data*	Records Per Block	12-80
HA*data*	SEL (Select)	12-89
HB*data*	POL	12-77
HC*data*	Address, Multi-Drop	12-7
IA*data*	Baud Rate	12-11
IB*data*	Parity	12-75
IC*data*	Stop Bits	12-91
ID*data*	Intercharacter Delay	12-57
IE*data*	Timeout Delay	12-92
IF*data*	LRC (Longitudinal Redundancy Check)	12-72
IG*data*	Turnaround Delay	12-95
IH*data*	Transmit Abort Timeout	12-93
II*data*	Data Bits	12-42
IL*data*	Flow Control	12-56
IP*data*	Communications Dock Port	12-35
IS*data*	Communications Port, Select COM Port	12-36
IV*data*	Communications Port, UART Restore (for COM1)	12-37
IW*data*	Communications Port, UART Restore (for COM2)	12-37
IX*data*	Communications Port, Choose Scanner or COM2	12-35
KA*data*	Keypad Caps Lock	12-69

Configuration Commands by Syntax (continued)

Syntax	Command	For Help, See Page
KB*data*	Keypad Ctrl Key Functions	12-70
KC*data*	Keypad Clicker	12-70
KD*data*	Keypad, Numeric	12-71
NM02*data*	RF Loopback	See RF guide
NM03*data*	RF Broadcast Receipt	See RF guide
PA*data*	Communications Protocol, Activate	12-41
PC*data*	RES (Reset)	12-83
PD*data*	REQ (Request for Acknowledge)	12-82
PE*data*	SOM (Start of Message)	12-90
PF*data*	EOM (End of Message)	12-52
PG*data*	AFF (Affirmative Acknowledge)	12-8
PH*data*	NEG (Negative Acknowledge)	12-74
PI*data*	Transmit EOM (End of Message) Only	12-52
PJ*data*	Receive EOM (End of Message) Only	12-52
PM*data*	Communications Protocol, User-Defined Multi-Drop	12-42
PS*data*	Communications Protocol, Configure	12-38
R*channel data*	RF Channel Allow	See RF guide
RF*data*	RF Protocol	See RF guide
RH*data*	RF Device Address	See RF guide
RL*data*	RF Retry Limit	See RF guide
RM*data*	RF Acknowledgment Delay	See RF guide
RT*data*	RFNC (RF Network Controller) Address	See RF guide
RU*data*	RF Repeat Count	See RF guide
RV*data*	RF Channel Select	See RF guide
RW*data*	RF Network ID	See RF guide
RX*data*	RF Duty Cycle Period	See RF guide
RY*data*	RF Duty Cycle Percent	See RF guide
SA*data*	Scanner Timeout	12-87
SB*data*	Scanner Mode	12-85

Configuration Commands by Syntax (continued)

Syntax	Command	For Help, See Page
SC*data*	Scanner Trigger	12-88
SD*data*	Scan Ahead	12-84
SR*data*	Scanner Redundancy	12-86
SS*data*	Scanner Devices	12-84
WM*data*	Key Code Look-Up Table	12-68
XA*data*	IRL SOP (Start of Program)	12-67
XB*data*	IRL EOP (End of Program)	12-63
XC*data*	IRL Run	12-66
XD*data*	IRL End Program Block	12-62
XE*data*	IRL PSS (Program Statement Separator)	12-65
ZA*data*	IRL PAK (Program Acknowledge)	12-64
ZB*data*	IRL BAK (Bad Program Acknowledge)	12-61

Types of Memory Used in the Reader

The JANUS reader uses the types of memory described in this section. Memory in the reader is similar to that of a PC in some ways, and very different in other ways. One major difference is that the reader uses memory to simulate disk drives. This memory map shows how the reader uses memory.

Address	Contents	Description
FFFFFF E00000	No Physical Memory	End of 386SX Address Space
C00000	**APPLICATION DISK Drive D**	2MB Flash
880000	Unused Address Space No Physical Memory	(3.5MB)
800000	**USER FLASH Drive C**	512K Flash
400000	No Physical Memory	(4MB)
110000	**3MB DRAM Extended Memory** Contains 256K Drive E:	HIMEM is included in this 3MB
100000	**HIMEM, 64K MS-DOS 6.2 Loaded**	1MB Real Mode Boundary
FFFFF FFFF0	**RESET VECTOR (10H Bytes)**	Bootstrap Vector 10H ASIC BANKED
F2000	**BIOS & PM** (56K)	BIOS Flash, Shadowed
F0000	**INT13/19** (4K, 8K allowed)	
E0000	BIOS Extensions (64K)	BIOS Extensions, Shadowed
D0000	Scanner/Decodes (64K)	Upper memory block
C0000	PC Card Window (64K)	Can be used for optional upper memory

Memory Map (continued)

Address	Contents	Description
B8000	VIDEO Memory (32K)	Video SRAM, DRAM Masked Out
A0000	Reader Services and Configuration Manager Code and Data (95k)	32K BANKED Bootstrap ROM
9A800	BIOS Extension Data (22K)	End of 640K DRAM
16AA0	**Conventional Memory** (527K)	User Memory *Note: This area also contains any additional needed drivers.*
700	MS-DOS and PC card Data and Drivers (89K)	Includes MS-DOS data and IO.SYS, POWER, HIMEM, SRAMDISK, CS, CSALLOC, MTSRAM, MTDDRV, CARD_SR, and COMMAND.COM stub.
0	BIOS GDT MS-DOS Data Area BIOS Data Area Vector Table	Reserved for BIOS/MS-DOS (1.8K)

Conventional Memory (0 Through 640K)

Your 4MB JANUS device has 4MB of battery-backed dynamic RAM. The first 640K is conventional memory and is virtually the same as that of a PC. You can use this memory to run applications. The MS-DOS 6.2 operating system loads at 0 (zero) and works up, followed by the statements and drivers in the CONFIG.SYS file, then COMMAND.COM, TSR (terminate and stay resident) programs, and commands in the AUTOEXEC.BAT file, just like a PC.

Upper Memory Area

The area between the 640K and 1024K is known as the upper memory area. The upper memory area is physically composed of a 256K flash ROM chip (system flash) and the video memory chip under the DRAM memory. Like a PC, this area contains the BIOS and video buffers. The upper memory area also contains PC card memory and Intermec JANUS driver software. The 384K upper memory area maps just above 640K conventional memory.

RAM Drive
Part of extended memory is configured as a RAM drive (drive E) on the 4MB JANUS device. The default CONFIG.SYS file loads HIMEM.SYS and uses the SRAMDISK.SYS device driver to create the RAM drive.

You can use the RAM drive to store files just like a disk drive on your PC. File access is usually faster on a RAM drive than a physical disk drive. Unlike a PC, the JANUS device saves any files on the RAM drive during a warm boot. However, the JANUS device clears any files on the RAM drive on a cold boot.

The RAM drive uses 256K of extended memory. If you are not using a PC card, Intermec recommends that you use the RAM drive for data files that you save or update frequently. The RAM drive is not as secure as a PC card since the drive is erased when you cold boot the JANUS device (unless you press $\boxed{Esc}$ during memory test).

Extended Memory
The JANUS device is initially configured with 2.75MB of extended memory available, which is allocated for use by Intermec applications (IC.EXE and IRL). To remove the RAM drive and use the available extended memory, you need to change or delete the SRAMDISK statement in the CONFIG.SYS file. You can also use extended memory for overlay memory.

The JANUS device provides extended memory for control and access to RAM above 1MB. The extended memory conforms to XMS specification 2.0. The HIMEM.SYS driver initializes and manages extended memory. HIMEM.SYS looks at all the memory in the system and takes control of everything above 1024K. You must load all drivers in extended memory through the HIMEM.SYS interface. If a driver is not compatible with HIMEM.SYS, you cannot load it in high memory.

Some applications may require you to exclude memory from HIMEM.SYS management, leaving some extended memory available. If this is necessary, you should reconfigure the RAM drive (E) to use the available extended memory. DOS drivers must check in with HIMEM.SYS for their memory assignments within the XMS managed by HIMEM.SYS. Currently, the RAM drive uses the XMS interface through HIMEM.SYS.

Expanded Memory
When you install more than 1MB of memory on a PC, it can be used as expanded memory and is a way for the system to access memory beyond the 1MB barrier. To use expanded memory on a PC, you need an expanded memory board and an expanded memory manager.

Expanded memory is not available on 4MB JANUS devices.

High Memory Area (HMA)

The high memory area (HMA) is a 64K block of memory, starting 16 bytes below the 1024K mark, and is the first 64K of extended memory.

Since HMA can only hold one item, the first program that requests HMA uses it, regardless of the size of the program. The DOS=HIGH statement in CONFIG.SYS loads MS-DOS into high memory.

User Flash Memory

User flash memory contains the 512K ROM drive C. It is mapped to 800000H. Drive C is similar to the hard drive C on your PC and contains the MS-DOS startup files, CONFIG.SYS, and AUTOEXEC.BAT.

Since drive C is a ROM drive that resides in flash memory, you cannot write files to this drive as you would on your PC. You must use the Auto-Loader or MakeDisk and PutDisk to modify the startup files or change other files on drive C.

Application Flash Memory

Application flash memory is the 2MB ROM drive D. It is mapped to C00000H. DOS files and utilities are stored on drive D.

B
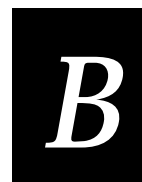
Reader Keypad Charts

This appendix provides a keypad chart that shows how to enter all characters on an alphanumeric and large numeric keypad.

Using the Reader Keypad Charts

These charts list the keystroke sequences for entering all 102 PC characters or keys on the JANUS 2010's alphanumeric (English version) and large numeric keypad.

English (U.S.) Alphanumeric Keypad

Use this keypad chart to enter any character or function on the alphanumeric keypad (English version). For help, see "Using the Alphanumeric Keypad" in Chapter 2.
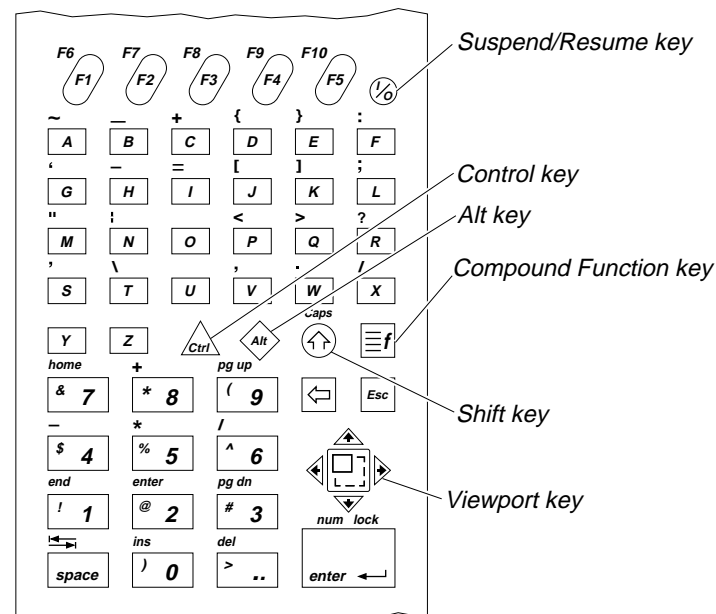
2010U.115

English (U.S.) Alphanumeric Keypad

To Enter	Press the Key(s)	To Enter	Press the Key(s)
resume/suspend	[I/O]	viewport to cursor	[≡f] [≡f] [0]
enter	[enter↵] or [≡f] [2]	cursor to viewport	[≡f] [≡f] [5]
a to z	[A] to [Z]	F1 to F5	[F1] to [F5]
A to Z	[↑] [A] to [↑] [Z]	F6 to F10	[≡f] [F1] to [≡f] [F5]
0 to 9	[0] to [9]	F11	[≡f] [≡f] [F1]
space	[space]	F12	[≡f] [≡f] [F2]
. (period)	[.] or [≡f] [W]	tab	[≡f] [space]
backspace	[⇐]	backtab	[↑] [≡f] [space]
escape	[Esc]	~ (tilde)	[≡f] [A]
compound function	[≡f]	_ (underline)	[≡f] [B]
right ctrl	[Ctrl]	+	[≡f] [C] or [≡f] [8]
left ctrl	[≡f] [Ctrl] or [≡f] [≡f] [Ctrl]	{	[≡f] [D]
right alt	[Alt]	}	[≡f] [E]
left alt	[≡f] [Alt] or [≡f] [≡f] [Alt]	: (colon)	[≡f] [F]
right shift	[↑]	' (left single quote)	[≡f] [G]
left shift	[≡f] [≡f] [↑]	- (dash)	[≡f] [H] or [≡f] [4]
caps lock	[≡f] [↑]	=	[≡f] [I]
cursor up	[↑]	[	[≡f] [J]
cursor down	[↓]	]	[≡f] [K]
cursor left	[←]	; (semicolon)	[≡f] [L]
cursor right	[→]	" (quotation marks)	[≡f] [M]
viewport up	[≡f] [↑]	¦ (pipe)	[≡f] [N]
viewport down	[≡f] [↓]	<	[≡f] [P]
viewport left	[≡f] [←]	>	[≡f] [Q]
viewport right	[≡f] [→]	?	[≡f] [R]
viewport end	[≡f] [≡f] [1]	' (right single quote)	[≡f] [S]
viewport home	[≡f] [≡f] [7]	\	[≡f] [T]
viewport page up	[≡f] [≡f] [3]	, (comma)	[≡f] [V]
viewport page down	[≡f] [≡f] [3]	. (period)	[≡f] [W] or [.]

English (U.S.) Alphanumeric Keypad (continued)

To Enter	Press the Key(s)
/	▤f x or ▤f 6
! (exclamation point)	⇑ 1
@	⇑ 2
#	⇑ 3
$	⇑ 4
%	⇑ 5
^	⇑ 6
&	⇑ 7
* (asterisk)	⇑ 8 or ▤f 5
(	⇑ 9
)	⇑ 0
insert	▤f 0
delete	▤f .

To Enter	Press the Key(s)
end	▤f 1
enter	▤f 2 or enter↵
page down	▤f 3
- (dash)	▤f 4 or ▤f H
* (asterisk)	▤f 5 or ⇑ 8
/	▤f 6 or ▤f X
home	▤f 7
+	▤f 8 or ▤f C
page up	▤f 9
scroll lock	▤f ▤f F3
pause	▤f ▤f F4
print screen	▤f ▤f F5
ctrl break	Ctrl ▤f ▤f F4

Note: You can use the ⇑ 0 to ⇑ 9 key combinations shown above only when the number pad is disabled. For help, see "Using the Number Pad" in Chapter 2.

English (U.S.) Alphanumeric Keypad (continued)

To Use the Number Pad	Press the Key(s)
Enable the number pad	⧉f ⧉f enter↵
Turn Num Lock on and off	⧉f enter↵
Disable the number pad	⧉f ⧉f enter↵

With Num Lock Turned On		With Num Lock Turned Off	
To Enter	**Press the Key(s)**	**To Enter**	**Press the Key(s)**
0 to 9	0 to 9	end	1
space	space or ⇧ space	cursor down	2
. (period)	.	page down	3
end	⇧ 1	cursor left	4
cursor down	⇧ 2	cursor right	6
page down	⇧ 3	home	7
cursor left	⇧ 4	cursor up	8
cursor right	⇧ 6	page up	9
home	⇧ 7	insert	0
cursor up	⇧ 8	delete	.
page up	⇧ 9	space	space or ⇧ space
insert	⇧ 0	0 to 9	⇧ 0 to ⇧ 9
delete	⇧ .	. (period)	⇧ .

English (U.S.) Alphanumeric Keypad (continued)

To Use Control Mode	Press the Key(s)
1. Enter Control mode	≡f - ◇Alt
2. Adjust the display	see the next table
3. Exit Control mode	Esc

To Adjust the Display	Press the Key(s)
Make the display contrast darker	⬆
Make the display contrast lighter	⬇
Turn the display backlight on or off	enter ←
Change the scroll line to line 8	8
Change the scroll line to line 16	6
Change the scroll line to line 25	5
Change the characters to normal height	3
Change the characters to double height	9
Use automatic viewport movement	2
Use manual viewport movement	1
Make the beep volume quieter	◀
Make the beep volume louder	▶

Note: You can use Control mode to adjust the display at the DOS prompt or when you run an application. For help, see "Adjusting the Display From the DOS Prompt" in Chapter 2.

Large Numeric Keypad

Use this keypad chart to enter any character or function on the large numeric keypad (English version). For help, see "Using the Large Numeric Keypad" in Chapter 2.

2010U.004

Large Numeric Keypad

To Enter	Press the Key(s)	To Enter	Press the Key(s)
resume/suspend	[I/O]	K	[⇑] [≡f] [D]
enter	[enter↵] or [≡f] [≡f] [⇐]	L	[⇑] [≡f] [E]
0 to 9	[0] to [9]	M	[⇑] [≡f] [F]
space	[space]	N	[⇑] [≡f] [G]
. (period)	[.]	O	[⇑] [≡f] [7]
a to g	[A] to [G]	P	[⇑] [≡f] [8]
h	[≡f] [A]	Q	[⇑] [≡f] [9]
i	[≡f] [B]	R	[⇑] [≡f] [4]
j	[≡f] [C]	S	[⇑] [≡f] [5]
k	[≡f] [D]	T	[⇑] [≡f] [6]
l	[≡f] [E]	U	[⇑] [≡f] [1]
m	[≡f] [F]	V	[⇑] [≡f] [2]
n	[≡f] [G]	W	[⇑] [≡f] [3]
o	[≡f] [7]	X	[⇑] [≡f] [space]
p	[≡f] [8]	Y	[⇑] [≡f] [0]
q	[≡f] [9]	Z	[⇑] [≡f] [.]
r	[≡f] [4]	tab	[→▮]
s	[≡f] [5]	backtab	[⇑] [→▮]
t	[≡f] [6]	right ctrl	[Ctrl]
u	[≡f] [1]	left ctrl	[≡f] [Ctrl] or [≡f] [≡f] [Ctrl]
v	[≡f] [2]	right alt	[Alt]
w	[≡f] [3]	left alt	[≡f] [Alt] or [≡f] [≡f] [Alt]
x	[≡f] [space]	right shift	[⇑]
y	[≡f] [0]	left shift	[≡f] [≡f] [⇑]
z	[≡f] [.]	caps lock	[≡f] [⇑]
A to G	[⇑] [A] to [⇑] [G]	compound function	[≡f]
H	[⇑] [≡f] [A]	backspace	[⇐]
I	[⇑] [≡f] [B]	escape	[Esc]
J	[⇑] [≡f] [C]	cursor up	⬆

Large Numeric Keypad (continued)

To Enter	Press the Key(s)	To Enter	Press the Key(s)
cursor down	↓	>	[⇑] [.]
cursor left	←	<	[≣f] [≣f] [space]
cursor right	→	, (comma)	[≣f] [≣f] [A]
viewport up	[≣f] ↑	' (apostrophe)	[≣f] [≣f] [B]
viewport down	[≣f] ↓	" (quotation marks)	[≣f] [≣f] [C]
viewport left	[≣f] ←	[	[≣f] [≣f] [D]
viewport right	[≣f] →	]	[≣f] [≣f] [E]
viewport end	[≣f] [≣f] [≣f] [1]	_ (underline)	[≣f] [≣f] [F]
viewport home	[≣f] [≣f] [≣f] [7]	¦ (pipe)	[≣f] [≣f] [G]
viewport page up	[≣f] [≣f] [≣f] [9]	; (semicolon)	[≣f] [≣f] [→⎸]
viewport page down	[≣f] [≣f] [≣f] [3]	enter	[≣f] [≣f] [⇦] or [enter←]
viewport to cursor	[≣f] [≣f] [≣f] [0]	end	[≣f] [≣f] [1]
cursor to viewport	[≣f] [≣f] [≣f] [5]	=	[≣f] [≣f] [2]
F1 to F5	[F1] to [F5]	page down	[≣f] [≣f] [3]
F6 to F10	[≣f] [F1] to [≣f] [F6]	- (dash)	[≣f] [≣f] [4]
F11	[≣f] [≣f] [F1]	* (asterisk)	[≣f] [≣f] [5] or [⇑] [8]
F12	[≣f] [≣f] [F2]	/	[≣f] [≣f] [6]
: (colon)	[≣f] [→⎸]	home	[≣f] [≣f] [7]
\	[≣f] [⇦]	+	[≣f] [≣f] [8]
! (exclamation point)	[⇑] [1]	page up	[≣f] [≣f] [9]
@	[⇑] [2]	insert	[≣f] [≣f] [0]
#	[⇑] [3]	delete	[≣f] [≣f] [.]
$	[⇑] [4]	scroll lock	[≣f] [≣f] [F3]
%	[⇑] [5]	pause	[≣f] [≣f] [F4]
^	[⇑] [6]	print screen	[≣f] [≣f] [F5]
&	[⇑] [7]	ctrl break	[Ctrl] [≣f] [≣f] [F4]
* (asterisk)	[⇑] [8] or [≣f] [≣f] [5]	?	[≣f] [≣f] [≣f] [→⎸]
(	[⇑] [9]	` (left single quote)	[≣f] [≣f] [≣f] [A]
)	[⇑] [0]	~ (tilde)	[≣f] [≣f] [≣f] [B]

Large Numeric Keypad (continued)

To Enter	Press the Key(s)		To Enter	Press the Key(s)
+	≡f ≡f ≡f C		- (dash)	≡f ≡f ≡f F
{	≡f ≡f ≡f D		/	≡f ≡f ≡f G
}	≡f ≡f ≡f E			

Note: You can use the ⇑ 0 to ⇑ 9 key combinations shown above only when the number pad is disabled. For help, see "Using the Number Pad" in Chapter 2.

To Use the Number Pad	Press the Key(s)
Enable the number pad	≡f ≡f enter↵
Turn Num Lock on and off	≡f enter↵
Disable the number pad	≡f ≡f enter↵

With Num Lock Turned On

To Enter	Press the Key(s)
0 to 9	0 to 9
space	space or ⇑ space
. (period)	.
end	⇑ 1
cursor down	⇑ 2
page down	⇑ 3
cursor left	⇑ 4
cursor right	⇑ 6
home	⇑ 7
cursor up	⇑ 8
page up	⇑ 9
insert	⇑ 0
delete	⇑ .

With Num Lock Turned Off

To Enter	Press the Key(s)
end	1
cursor down	2
page down	3
cursor left	4
cursor right	6
home	7
cursor up	8
page up	9
insert	0
delete	.
space	space or ⇑ space
0 to 9	⇑ 0 to ⇑ 9
. (period)	⇑ .

Large Numeric Keypad (continued)

To Use Control Mode	Press the Key(s)
1. Enter Control mode	≡f – Alt
2. Adjust the display	see the next table
3. Exit Control mode	Esc

To Adjust the Display	Press the Key(s)
Make the display contrast darker	↑
Make the display contrast lighter	↓
Turn the display backlight on or off	enter↵
Change the scroll line to line 8	8
Change the scroll line to line 16	6
Change the scroll line to line 25	5
Change the characters to normal height	3
Change the characters to double height	9
Use automatic viewport movement	2
Use manual viewport movement	1
Make the beep volume quieter	←
Make the beep volume louder	→

Note: You can use Control mode to adjust the display at the DOS prompt or when you run an application. For help, see "Adjusting the Display From the DOS Prompt" in Chapter 2.

C

Configuration and Full ASCII Charts

This appendix includes reference tables you can use when configuring communications protocols and the key code look-up table on the reader. It also contains a full ASCII chart and charts of Code 39 bar code labels that you can scan with the JANUS 2010 reader.

Entering ASCII Control Characters

You may need to enter ASCII control characters to configure these parameters in IC.EXE or the Communications Manager screens:

• Preambles and postambles. You can include ASCII control characters in postambles and preambles.

• Protocol characters, such as EOR and EOM. For some communications protocols, you must set the protocol character to an ASCII control character.

To enter ASCII control characters for preambles and postambles

1. Decide which ASCII control character you want to set for the preamble or postamble. Use the next table to find the character and the escape sequence.

ASCII Control Character		Escape Sequence	
\	Backslash	\\	
BEL	Bell	\a	
BS	Backspace	\b	
CR	Carriage Return	\r	
FF	Form Feed	\f	
HT	Horizontal Tab	\t	
LF	Line Feed	\n	
Other ASCII control characters		\x$hh$	where hh is the two-digit hexadecimal number for the ASCII control character.

If the table does not include the ASCII control character, you must use the "Full ASCII Table" later in this appendix to identify the two-digit hexadecimal number for the control character.

2. Use IC.EXE to configure a preamble or postamble. Move the cursor to the field for the preamble or postamble. For help using IC.EXE, see Chapter 5, "Configuring the Reader."

3. Type the characters you identified in Step 1. Here are two examples:

- You find Carriage Return (CR) Line Feed (LF) in the "Entering ASCII Control Characters for Preambles and Postambles" table. The CR is \r and the LF is \n. You type this value:

  \r\n

- You find ETX in the "Full ASCII Table" and learn that 03 is the two-digit hex number for ETX. You type \x followed by the hex number:

  \x03

  Note: If you type the hex number for an ASCII character above 7F hex (128 decimal), the reader displays the extended ASCII character instead of its numeric value in the dialog box.

To enter ASCII control characters for protocol characters

1. Decide which ASCII control character you want to set for the protocol character. Use the next table to find the character and the key sequence.

2. Use IC.EXE or Communications Manager to configure a communications protocol. Move the cursor to the field for the protocol character. For help using IC.EXE, see Chapter 5, "Configuring the Reader." For help using Communications Manager, see Chapter 6, "Networking the Reader."

3. Press the key sequence you identified in Step 1. For example, to enter the ASCII character STX, press ⟨Ctrl⟩ ⟨B⟩. The word <STX> appears in the field.

   Note: To disable a protocol character, move the cursor to the space next to the protocol character and press ⟨⇐⟩.

Entering ASCII Control Characters for Protocol Characters

ASCII Control Character	Key Sequence	ASCII Control Character	Key Sequence
ACK	Ctrl F	FF	Ctrl L
BEL	Ctrl G	FS	Ctrl F1
BS	Ctrl H	GS	Ctrl F2
CAN	Ctrl X	HT	Ctrl I
CR	Ctrl M	LF	Ctrl J
DC1	Ctrl Q	NAK	Ctrl U
DC2	Ctrl R	NUL	Ctrl F5
DC3	Ctrl S	RS	Ctrl F3
DC4	Ctrl T	SI	Ctrl O
DLE	Ctrl P	SO	Ctrl N
EM	Ctrl Y	SOH	Ctrl A
ENQ	Ctrl E	STX	Ctrl B
EOT	Ctrl D	SUB	Ctrl Z
ESC	Alt A	SYN	Ctrl V
ETB	Ctrl W	US	Ctrl F4
ETX	Ctrl C	VT	Ctrl K

Note: *IRL does not use these key sequences for the ASCII control characters FS, GS, RS, US, and NUL. The Interactive Configuration application (IC.EXE) and Communications Manager do use them.*

Configuration Options for User-Defined Protocol

User-Defined protocol supports 24 different configurations. The six key parameters that determine the User-Defined configuration are POL, SEL, RES, REQ, AFF, and NEG. The next table lists all the valid combinations for these six User-Defined protocol parameters. The most common User-Defined configurations have been named and are listed first in the table.

User-Defined Configuration	POL	SEL	RES	REQ	AFF	NEG
User-Defined Point-to-Point protocol	—	—	—	—	—	—
ACK/NAK protocol	—	—	—	—	X	X
ACK/NAK protocol with timeout	—	—	—	X	X	X
One-character solicitation with handshake	X	—	—	X	X	X
User-Defined Polling Mode D protocol	X	X	X	X	X	X
Unnamed protocol	—	—	X	—	—	—
Unnamed protocol	—	—	X	—	X	X
Unnamed protocol	—	—	X	X	X	X
Unnamed protocol	—	X	—	—	—	—
Unnamed protocol	—	X	—	—	X	X
Unnamed protocol	—	X	—	X	X	X
Unnamed protocol	—	X	X	—	—	—
Unnamed protocol	—	X	X	—	X	X
Unnamed protocol	—	X	X	X	X	X
Unnamed protocol	X	—	—	—	—	—
Unnamed protocol	X	—	—	—	X	X
Unnamed protocol	X	—	X	—	—	—
Unnamed protocol	X	—	X	—	X	X
Unnamed protocol	X	—	X	X	X	X
Unnamed protocol	X	X	—	—	—	—
Unnamed protocol	X	X	—	—	X	X
Unnamed protocol	X	X	—	X	X	X
Unnamed protocol	X	X	X	—	—	—
Unnamed protocol	X	X	X	—	X	X

X   Means the parameter is set to a character.

—   Means the parameter is disabled.
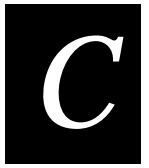
POL and SEL Combinations for Multi-Drop Protocol

To configure User-Defined Multi-Drop protocol, you use POL and SEL character combinations. You must assign the POL and SEL protocol characters in a predetermined combination. The following table lists the device address and the corresponding POL and SEL combinations. When you configure Multi-Drop protocol, you select the device address and then the reader automatically sets the predefined POL and SEL combination listed for that address.

Device Address	POL	SEL	Device Address	POL	SEL
A	FS	GS	Q	<	=
B	RS	US	R	>	?
C	SP	!	S	@	A
D	"	#	T	B	C
E	$	%	U	D	E
F	&	'	V	F	G
G	(	)	W	H	I
H	*	+	X	J	K
I	'	-	Y	L	M
J	.	/	Z	N	O
K	0	1	0	P	Q
L	2	3	1	R	S
M	4	5	2	T	U
N	6	7	3	V	W
O	8	9	4	X	Y
P	:	;	5	Z	[

Key Codes

Use the key codes to redefine scanned characters to a keystroke equivalent. Find each key's four-digit hexadecimal value in the Key Code table. You can use the key code in an application or to change the reader's key code look-up table. For help, see the "Key Code Look-Up Table" in Chapter 12.

Key   Lists each key on a standard 102 key PC keyboard.

Normal   Lists the key code value for each key.

Shift   Lists the key code value for the Shift key plus the key.

Control   Lists the key code for the Control key plus the key.

Alt   Lists the key code for the Alt key plus the key.

For example, the key code for ⇧ Ａ (an uppercase letter A) is 1E41. The key code for ◇ Ａ is 1E00.

Key Code Table

Key	Normal	Shift	Control	Alt
F1	3B00	5400	5E00	6800
F6	4000	5900	6300	6D00
F11	8500	8700	8900	8B00
F2	3C00	5500	5F00	6900
F7	4100	5A00	6400	6E00
F12	8600	8800	8A00	8C00
F3	3D00	5600	6000	6A00
F8	4200	5B00	6500	6F00
Scroll Lock	—	—	—	—
F4	3E00	5700	6100	6B00
F9	4300	5C00	6600	7000

Key Code Table (continued)

Key	Normal	Shift	Control	Alt
Pause	—	—	0000	—
F5	3F00	5800	6200	6C00
F10	4400	5D00	6700	7100
Print Screen	—	—	7200	—
A	1E61	1E41	1E01	1E00
B	3062	3042	3002	3000
C	2E63	2E43	2E03	2E00
D	2064	2044	2004	2000
E	1265	1245	1205	1200
F	2166	2146	2106	2100
G	2267	2247	2207	2200
~ `	2960	297E	—	2900
H	2368	2348	2308	2300
_ –	0C2D	0C5F	OC1F	8200
I	1769	1749	1709	1700
+ =	0D3D	0D2B	—	8300
J	246A	244A	240A	2400
{ [	1A5B	1A7B	1A1B	1A00
K	256B	254B	250B	2500
}]	1B5D	1B7D	1B1D	1B00

Key Code Table (continued)

Key	Normal	Shift	Control	Alt
L	266C	264C	260C	2600
: ;	273B	273A	—	2700
M	326D	324D	320D	3200
N	316E	314E	310E	3100
O	186F	184F	180F	1800
P	1970	1950	1910	1900
Q	1071	1051	1011	1000
R	1372	1352	1312	1300
S	1F73	1F53	1F13	1F00
" '	2827	2822	—	2800
T	1474	1454	1414	1400
| \\	2B5C	2B7C	2B1C	2B00
U	1675	1655	1615	1600
V	2F76	2F56	2F16	2F00
< ,	332C	333C	—	3300
W	1177	1157	1117	1100
> .	342E	343E	—	3400
X	2D78	2D58	2D18	2D00
? /	352F	353F	—	3500
Y	1579	1559	1519	1500

Key Code Table (continued)
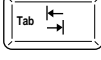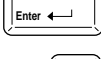
Key	Normal	Shift	Control	Alt
Z	2C7A	2C5A	2C1A	2C00
(right) Ctrl	—	—	—	—
(left) Ctrl	—	—	—	—
(right) Alt	—	—	—	—
(left) Alt	—	—	—	—
(right) Shift	—	—	—	—
(left) Shift	—	—	—	—
Caps Lock	—	—	—	—
& 7	0837	0826	—	7E00
Home	47E0	47E0	77E0	9700
7 Home	4700	4737	7700	See Note
* 8	0938	092A	—	7F00
+	4E2B	4E2B	9000	4E00
8 ⇑	4800	4838	8D00	See Note
(9	0A39	0A28	—	8000
PgUp	49E0	49E0	84E0	9900
9 PgUp	4900	4939	8400	See Note
(backspace) ⇐	0E08	0E08	0E7F	0E00
Esc	011B	011B	011B	0100
$ 4	0534	0524	—	7B00

Key Code Table (continued)

Key	Normal	Shift	Control	Alt
–	4A2D	4A2D	8E00	4A00
4 ⇦	4B00	4B34	7300	See Note
% 5	0635	0625	—	7C00
*	372A	372A	9600	3700
5	4C00	4C35	8F00	See Note
^ 6	0736	075E	071E	7D00
/	E02F	E02F	9500	A400
6 ⇨	4D00	4D36	7400	See Note
(left arrow) ⇦	4BE0	4BE0	73E0	9B00
⇧	48E0	48E0	8DE0	9800
! 1	0231	0221	—	7800
End	4FE0	4FE0	75E0	9F00
1 End	4F00	4F31	7500	See Note
@ 2	0332	0340	0300	7900
Enter	E00D	E00D	E00A	A600
2 ⇩	5000	5032	9100	See Note
# 3	0433	0423	—	7A00
PgDn	51E0	51E0	76E0	A100
3 PgDn	5100	5133	7600	See Note

Key Code Table (continued)

Key	Normal	Shift	Control	Alt
⬇	50E0	50E0	91E0	A000
⮕	4DE0	4DE0	74E0	9D00
Space	3920	3920	3920	3920
Tab	0F09	0F00	9400	A500
) 0	0B30	0B29	—	8100
Ins	52E0	52E0	92E0	A200
0 Ins	5300	5230	9200	—
. Del	5300	532E	9300	—
Enter	1C0D	1C0D	1C0A	1C00
Num Lock	—	—	—	—

*Note: You use a numeric keypad to enter these key code values by pressing the Alt key plus a three-digit number from 0-255. You must enable the number pad (with Num Lock turned **on**) on the reader to enter these hexadecimal key codes. For help, see "Using the Number Pad" in Chapter 2.*

Full ASCII Table

This table lists the ASCII characters and their binary, hexadecimal, and Code 39 equivalents.

Full ASCII Table

Binary[0]	Hex[1]	Dec[2]	C39[3]	Char[4]	Binary[0]	Hex[1]	Dec[2]	C39[3]	Char[4]
00000000	00	00	%U	NUL	00100000	20	32	SP	SP[5]
00000001	01	01	$A	SOH	00100001	21	33	/A	!
00000010	02	02	$B	STX	00100010	22	34	/B	"
00000011	03	03	$C	ETX	00100011	23	35	/C	#
00000100	04	04	$D	EOT	00100100	24	36	/D	$
00000101	05	05	$E	ENQ	00100101	25	37	/E	%
00000110	06	06	$F	ACK	00100110	26	38	/F	&
00000111	07	07	$G	BEL	00100111	27	39	/G	'
00001000	08	08	$H	BS	00101000	28	40	/H	(
00001001	09	09	$I	HT	00101001	29	41	/I	)
00001010	0A	10	$J	LF	00101010	2A	42	/J	*
00001011	0B	11	$K	VT	00101011	2B	43	/K	+
00001100	0C	12	$L	FF	00101100	2C	44	/L	,
00001101	0D	13	$M	CR	00101101	2D	45	/M	-
00001110	0E	14	$N	SO	00101110	2E	46	/N	.
00001111	0F	15	$O	SI	00101111	2F	47	/O	/
00010000	10	16	$P	DLE	00110000	30	48	/P[6]	0
00010001	11	17	$Q	DC1	00110001	31	49	/Q	1
00010010	12	18	$R	DC2	00110010	32	50	/R	2
00010011	13	19	$S	DC3	00110011	33	51	/S	3
00010100	14	20	$T	DC4	00110100	34	52	/T	4
00010101	15	21	$U	NAK	00110101	35	53	/U	5
00010110	16	22	$V	SYN	00110110	36	54	/V	6
00010111	17	23	$W	ETB	00110111	37	55	/W	7
00011000	18	24	$X	CAN	00111000	38	56	/X	8
00011001	19	25	$Y	EM	00111001	39	57	/Y	9
00011010	1A	26	$Z	SUB	00111010	3A	58	/Z	:
00011011	1B	27	%A	ESC	00111011	3B	59	%F	;
00011100	1C	28	%B	FS	00111100	3C	60	%G	<
00011101	1D	29	%C	GS	00111101	3D	61	%H	=
00011110	1E	30	%D	RS	00111110	3E	62	%I	>
00011111	1F	31	%E	US	00111111	3F	63	%J	?

Full ASCII Table (continued)

Binary[0]	Hex[1]	Dec[2]	C39[3]	Char[4]	Binary[0]	Hex[1]	Dec[2]	C39[3]	Char[4]
01000000	40	64	%V	@	01100100	64	100	+D	d
01000001	41	65	A	A	01100101	65	101	+E	e
01000010	42	66	B	B	01100110	66	102	+F	f
01000011	43	67	C	C	01100111	67	103	+G	g
01000100	44	68	D	D	01101000	68	104	+H	h
01000101	45	69	E	E	01101001	69	105	+I	i
01000110	46	70	F	F	01101010	6A	106	+J	j
01000111	47	71	G	G	01101011	6B	107	+K	k
01001000	48	72	H	H	01101100	6C	108	+L	l
01001001	49	73	I	I	01101101	6D	109	+M	m
01001010	4A	74	J	J	01101110	6E	110	+N	n
01001011	4B	75	K	K	01101111	6F	111	+O	o
01001100	4C	76	L	L	01110000	70	112	+P	p
01001101	4D	77	M	M	01110001	71	113	+Q	q
01001110	4E	78	N	N	01110010	72	114	+R	r
01001111	4F	79	O	O	01110011	73	115	+S	s
01010000	50	80	P	P	01110100	74	116	+T	t
01010001	51	81	Q	Q	01110101	75	117	+U	u
01010010	52	82	R	R	01110110	76	118	+V	v
01010011	53	83	S	S	01110111	77	119	+W	w
01010100	54	84	T	T	01111000	78	120	+X	x
01010101	55	85	U	U	01111001	79	121	+Y	y
01010110	56	86	V	V	01111010	7A	122	+Z	z
01010111	57	87	W	W	01111011	7B	123	%P	{
01011000	58	88	X	X	01111100	7C	124	%Q	|
01011001	59	89	Y	Y	01111101	7D	125	%R	}
01011010	5A	90	Z	Z	01111110	7E	126	%S	~
01011011	5B	91	%K	[	01111111	7F	127	%T[7]	n[8]
01011100	5C	92	%L	\					
01011101	5D	93	%M	]					
01011110	5E	94	%N	^					
01011111	5F	95	%O	_					
01100000	60	96	%W	`					
01100001	61	97	+A	a					
01100010	62	98	+B	b					
01100011	63	99	+C	c					

Notes:

0   Bit positions are 76543210.
1   Hexadecimal value
2   Decimal value
3   Code 39 character(s)
4   ASCII character
5   SP is the SPACE character.
6   The Code 39 characters /P through /Y may be interchanged with the numbers 0 through 9.
7   May be interchanged with %X or %Y or %Z.
8   n is the DELETE character.

Full ASCII Control Characters Table

Control Character	Definition	Control Character	Definition
ACK	Acknowledgment	FF	Form Feed
BEL	Bell	FS	File Separator
BS	Backspace	GS	Group Separator
CAN	Cancel	HT	Horizontal Tab
CR	Carriage Return	LF	Line Feed
DC1	Device Control 1 (XON)	NAK	Negative Acknowledge
DC2	Device Control 2	NUL	Null, or all zeroes
DC3	Device Control 3 (XOFF)	RS	Record Separator
DC4	Device Control	SI	Shift In
DEL	Delete	SO	Shift Out
DLE	Data Link Escape	SOH	Start of Heading
EM	End of Medium	SP	Space
ENQ	Enquiry	STX	Start of Text
EOT	End of Transmission	SUB	Substitute
ESC	Escape	SYN	Synchronous Idle
ETB	End Transmission Block	US	Unit Separator
ETX	End of Text	VT	Vertical Tab

Full ASCII Bar Code Chart

The charts in this section list the Code 39 bar code label for each ASCII character. To use these bar code labels, you must configure the JANUS reader to use Code 39 in Full ASCII mode. For help, see "Code 39" in Chapter 12.

Control Characters

ACK	BEL	BS
$F	*$G*	*$H*

CAN	CR	DC1
$X	*$M*	*$Q*

DC2	DC3	DC4
$R	*$S*	*$T*

DEL	DLE	EM
%T	*$P*	*$Y*

ENQ	EOT	ESC
$E	*$D*	*%A*

ETB	ETX	FF
$W	*$C*	*$L*

FS	GS	HT
%B	*%C*	*$I*

Control Characters (continued)

LF

$J

NAK

$U

NUL

%U

RS

%D

SI

$O

SO

$N

SOH

%A

STX

$B

SUB

$Z

SYN

$V

US

%E

VT

$K

Symbols and Punctuation Marks

! (exclamation point)

/A

" (quotation marks)

/B

#

/C

$

/D

%

/E

&

/F

' (apostrophe)

/G

(

/H

)

/I

* (asterisk)

/J

+

/K

- (dash)

/M

Symbols and Punctuation Marks (continued)

/	=	. (period)
|||||||||||||	|||||||||||||	|||||||||||||
/O	*%H*	*/N*

, (comma)	: (colon)	; (semicolon)
|||||||||||||	|||||||||||||	|||||||||||||
/L	*/Z*	*%F*

?	<	>
|||||||||||||	|||||||||||||	|||||||||||||
%J	*%G*	*%I*

@	[	]
|||||||||||||	|||||||||||||	|||||||||||||
%V	*%K*	*%M*

~ (tilde)	^	_ (underline)
|||||||||||||	|||||||||||||	|||||||||||||
%S	*%N*	*%O*

\	` (left single quote)	¦ (pipe)
|||||||||||||	|||||||||||||	|||||||||||||
%L	*%W*	*%Q*

{	}	Space
|||||||||||||	|||||||||||||	|||||||||||
%P	*%R*	* *

Numbers

0

0

1

1

2

2

3

3

4

4

5

5

6

6

7

7

8

8

9

9

Uppercase Letters

A

A

B

B

C

C

D

D

E

E

F

F

G

G

H

H

I

I

J

J

K

K

L

L

Uppercase Letters (continued)

M

M

N

N

O

O

P

P

Q

Q

R

R

S

S

T

T

U

U

V

V

W

W

X

X

Y

Y

Z

Z

Lowercase Letters

a

+A

b

+B

c

+C

d

+D

e

+E

f

+F

g

+G

h

+H

i

+I

Lowercase Letters (continued)

j

+J

k

+K

l

+L

m

+M

n

+N

o

+O

p

+P

q

+Q

r

+R

s

+S

t

+T

u

+U

v

+V

w

+W

x

+X

y

+Y

z

+Z

Scanning Bar Codes to Select Menu Options

You can scan the next bar code labels to select options and move around in these menu applications:

- Interactive Configuration application (IC.EXE)

- Communications Manager

- IRL Desktop

The bar codes in this section use the four-digit hexadecimal key code value for each key. You can create your own bar codes for every key by using the same syntax. For help, see "Creating Your Own Key Code Bar Code Labels" later in this appendix.

Enter	Esc
‖‖‖‖‖‖‖‖‖‖‖‖‖‖	‖‖‖‖‖‖‖‖‖‖‖‖‖‖
..1C0D	*..011B*

Cursor Up	Cursor Down
‖‖‖‖‖‖‖‖‖‖‖‖‖‖	‖‖‖‖‖‖‖‖‖‖‖‖‖‖
..48E0	*..50E0*

Cursor Left	Cursor Right
‖‖‖‖‖‖‖‖‖‖‖‖‖‖	‖‖‖‖‖‖‖‖‖‖‖‖‖‖
..4BE0	*..4DE0*

Page Up	Page Down
‖‖‖‖‖‖‖‖‖‖‖‖‖‖	‖‖‖‖‖‖‖‖‖‖‖‖‖‖
..49E0	*..51E0*

Home	End
‖‖‖‖‖‖‖‖‖‖‖‖‖‖	‖‖‖‖‖‖‖‖‖‖‖‖‖‖
..47E0	*..4FE0*

Insert	Delete
‖‖‖‖‖‖‖‖‖‖‖‖‖‖	‖‖‖‖‖‖‖‖‖‖‖‖‖‖
..52E0	*..53E0*

Tab

||||||| ||||| ||||| ||| |||||| ||| ||| ||| |||

..0F09

Backtab

||||||| ||||| ||||| ||| |||||| ||| ||| ||| |||

..0F00

Backspace

||||||| ||||| ||||| ||| |||||| ||| ||| ||| |||

..0E08

F1

||||||| ||||| ||||| ||| |||| ||| ||| ||| |||

..3B00

Creating Your Own Key Code Bar Code Labels

You can use each key's four-digit hexadecimal value to:

- insert the value into the keypad buffer to use in IC.EXE, Communications Manager, or IRL Desktop.

- redefine scanned characters to a keystroke equivalent to modify the reader's key code look-up table.

You can create your own bar code label for each key by using this syntax:

..data

where *data* is the four-digit hexadecimal key code value. Use the Key Code Table to find each key's four-digit hexadecimal value. For help, see "Key Codes" earlier in this appendix.

For example, the hexadecimal value for the uppercase letter B is 3042. Use this syntax to create a bar code label:

..3042

Create this bar code label:

B

||||||| ||||| ||||| ||||| ||||| ||||| ||| |||

..3042

D

Software Utility Reference

This appendix describes Interlnk, INTERLNK.EXE, INTERSVR.EXE, POWER.EXE, and the Auto-Loader batch files.

InterInk

With Interlnk, you can easily transfer files between your reader and a host computer or another reader. You can also make all the drives on one computer appear as if they are physically located on the other, so that you have unrestricted access to the contents of all the drives.

The device running Interlnk is the client and is used to enter commands. The device responding to commands is the server. For help installing and running Interlnk, see "Running Interlnk to Transfer Files" in Chapter 6.

The command to begin running Interlnk is:

Syntax: `interlnk [client:=][server:]`

where:

client   specifies the letter of the client drive that is redirected to a drive on the server. The drive must be one that was redirected when you started Interlnk.

server   specifies the letter of the drive on the Interlnk server that is redirected. The drive must be one listed under *This Computer (Server)* in the Interlnk Server Status screen.

Notes: **Installing the INTERLNK.EXE Device Driver**   You must load the INTERLNK.EXE device driver into memory before you can use the Interlnk command. For help, see the next section.

Displaying the Status   To display Interlnk's current status, type the command on the client without including the *client:=server:* parameter.

Canceling Redirection on a Drive   To cancel redirection of a client drive to a server drive, specify only the client drive and the equal sign (=) in the Interlnk command.

Examples: To redirect drive F and G on the client to drive D and E on the server:

`interlnk f=d g=e`

To cancel the redirection of client drive G:

`interlnk g=`

INTERLNK.EXE

This device driver redirects requests for operations on Interlnk drives or printer ports to Intersvr drives or printer ports. You must load this device driver in the CONFIG.SYS file of the device running Interlnk (the client).

Add a command to the client's CONFIG.SYS that follows this syntax:

Syntax:
```
device=[drive:][path\]interlnk.exe [/drives:n]
        [/noprinter] [/com[:][n | address]] [/auto]
        [/noscan] [/low ] [/baud:rate][/v]
```

where:

drive:path   specifies the location of the INTERLNK.EXE file

/drives:*n*   specifies the number of drives to redirect:

     0   to redirect printers only
     1   to redirect one drive
     2   to redirect two drives
     3   to redirect three drives (default) and so on.

/noprinter   specifies not to redirect printers. By default, Interlnk redirects all available printer ports.

/com:*n*
/com:*address*   identifies the serial COM port that is connected to the server by specifying either the number (*n*) or address (*address*) of the port.

If you omit *n* and *address*, Intersvr searches all serial ports and uses the first port that it finds connected to the client. If you specify the /com switch, the server searches only for serial ports. By default, all serial ports are scanned.

/auto   loads the INTERLNK.EXE device driver in memory only if the client can establish a connection with the server when the client starts up. By default, Interlnk is loaded even if the client cannot establish a connection with the server.

/noscan   loads the INTERLNK.EXE device driver in memory, but prevents a connection between client and server from being established. By default, the client tries to establish a connection with the server as soon as you load INTERLNK.EXE.

/low   loads the INTERLNK.EXE device driver into conventional memory even if upper memory is available.

/baud:*rate*   sets a maximum baud rate for serial communication. Type 9600, 19200, 38400, 57600, or 115200. The default is 115200.

/v   prevents conflicts with a computer's timer. Include this switch if you have a serial connection between computers and one of them stops running when you use Interlnk to access a drive or printer port.

Notes: **Position of the Interlnk Command in the** CONFIG.SYS **File**   The position of the device command that loads INTERLNK.EXE in the CONFIG.SYS can affect pre-existing drive assignments.

For example, suppose your computer includes a floppy disk drive (A), two hard disk drives (C and D), and two RAM drives (E and F). If you load the INTERLNK.EXE device driver before creating the RAM drives and you choose to redirect three drives, Interlnk assigns letters E, F, and G to the redirected drives, and letters H and I to the RAM drives. To prevent this situation from happening, load INTERLNK.EXE last in your CONFIG.SYS file.

Calculating the Number of Drives to Redirect   When you add the INTERLNK.EXE command to the host computer's CONFIG.SYS, you should set the /drives option to at least seven drives. The reader contains five default drives (C, D, E, F, G), and Interlnk assumes two more (A and B). If you specify fewer than seven drives, Interlnk will not redirect all the reader's drives. You need more than seven drives if the reader contains more than one physical RAM drive.

Saving Memory   The Interlnk device driver loads all of its code into memory. You can save memory by specifying the /noprinter or /com switch. If you specify the /noprinter switch, the Interlnk program does not load code that redirects printers. If you specify the /com switch, the program does not load code that supports parallel ports. Intermec recommends using the /noprinter and /com switches when INTERLNK.EXE is loaded on the reader.

Using a Serial Mouse With Microsoft Windows   If you are using a serial mouse with Microsoft Windows, specify the /com switch to designate a COM port other than the one the mouse is using.

DOS Version   Some features of DOS may not be available to the client computer if you are running a different DOS version on your Interlnk server. For example, if you have large partitions on the server and are running DOS 3.0 on the client, the partitions are not available to the client because DOS 3.0 does not support them.

Running an Application Located on the Server   If you use Interlnk to run an application located on the server, make sure the application is configured for the computer you have designated as the client.

Limitations   These commands do not work on devices running Interlnk:

CHKDSK	FORMAT	UNDELETE
DISKCOMP	MIRROR	UNFORMAT
DISKCOPY	SYS	

Interlnk does not redirect network, CD-ROM drives, or any other device that uses a redirection interface. For example, you cannot access a network drive that was redirected before Interlnk was started.

Examples: If the Interlnk files are located in the INTERLNK directory on the host computer's drive C and you need to specify seven drives so that drives C through G on the reader will be redirected, add this line to the CONFIG.SYS file on the reader:

```
device=c:\interlnk\interlnk.exe /drives:7
```

If the Interlnk files are located in the root directory on drive D of the reader, you used the serial port to connect to another computer, and you want to start Interlnk without having the printers redirected, add this line to the CONFIG.SYS file on the reader:

```
device=d:\interlnk.exe /com /noprinter /drives:7
```

To make Interlnk use a non-standard COM port whose address is 3F8, add this line to your CONFIG.SYS file on the reader:

```
device=d:\interlnk.exe /com:3F8 /drives:7
```

Intersvr

Interlnk is loaded on the device designated as the client. The device running Intersvr is called the server. The server responds to commands typed on the client. When you run Intersvr in conjunction with Interlnk, it provides serial file transfer capability through redirected drives, and printing through redirected printer ports. For help installing and running Intersvr, see "Running Interlnk to Transfer Files" in Chapter 6.

Type this command to begin running Intersvr:

Syntax:
```
intersvr [drive:] [/x=drive:] [/com:n | address]
        [/baud:rate][/b][/v]
```

where:

drive: specifies the letter of a drive to be redirected. By default, all drives are redirected.

/x=*drive*   specifies a drive that is not redirected. By default, all drives are redirected.

/com:*n*   identifies the serial COM port that is connected to the
/com:*address*   server by specifying either the number (*n*) or address (*address*) of the port.

                              If you omit *n* and *address*, Intersvr searches all serial ports and uses the first port that it finds connected to the client. If you specify the /com switch, the server searches only for serial ports. By default, all serial ports are scanned.

/baud:*rate*   sets a maximum serial baud rate. Type 9600, 19200, 38400, 57600, or 115200. The default is 115200.

/b   displays the Interlnk Server Status screen in black and white. Use this switch if you are having problems reading your monochrome monitor.

/v   prevents conflicts with a computer's timer. Specify this switch if you have a serial connection between computers and one of them stops running when you use Interlnk to access a drive or printer port.

Notes: **Specifying the Order of Drives**   Interlnk redirects drives in the order you specify. The first server drive specified is redirected to the first available client drive, the second server drive specified is redirected to the second available client drive, and so forth.

Copying the Files From the Reader   If you do not have companion disk 2, which contains the Interlnk and Intersvr files, you can copy the files from the reader. You need to connect the host computer to the reader using a 7-wire, null-modem serial cable, and the Mode command must be available on the host computer where you are installing Interlnk. To copy the files to the host computer, type this command on the reader:

```
intersvr /rcopy
```

Using a Serial Mouse With Microsoft Windows   If you are using a serial mouse with Microsoft Windows, and you start Intersvr while Windows is running, specify the /com switch to designate a COM port other than the one the mouse is using.

Using InterInk in a Task-Switching or Multitasking Environment   If you start Intersvr in a task-switching or multitasking environment, task-switching and key combinations that switch you out of your current task are disabled. To restore these functions, quit the server.

Limitations   These commands do not work on the device running Intersvr:

CHKDSK	FORMAT	UNDELETE
DISKCOMP	MIRROR	UNFORMAT
DISKCOPY	SYS	

Interlnk does not redirect network, CD-ROM drives, or any other device that uses a redirection interface. For example, you cannot access a network drive that was redirected before Interlnk was started.

Examples: If you have two computers and each contains drives A, B, and C, you can start Intersvr and direct server drive C to client drive D, and A to E, and B to F, by typing this command on the server:

```
intersvr c: a: b:
```

To redirect all server drives except drive A and use COM4 to connect to the client, type this command on the server:

```
intersvr /x=a /com4
```

POWER.EXE

POWER.EXE lets you adjust the reader's power management at the DOS prompt. It provides power-saving features and an application program interface (API) that applications can use. POWER.EXE works through the Advanced Power Management (APM) interface. IRL programs and programs that use Reader Services do not require POWER.EXE.

To change the level of power management, type this command at the reader's DOS prompt:

Syntax:

```
[drive:][path]power.exe [adv[:max | reg | min] | std | off][/low]
```

where:

drive:path   specifies the location of the POWER.EXE file.

adv:max
adv:reg
adv:min   conserves the reader's power when applications and hardware devices are idle. Performance may be affected if an application is active instead of idle. Use max for maximum power conservation. Use reg to balance power conservation with performance. Use min (default) if performance is not satisfactory with max or reg.

std off   conserves the reader's power. Use std to conserve power by using only the power management features of your hardware. Use off to turn off POWER.EXE. If POWER.EXE is off, the date is not updated when you turn off the reader. If you use your own APM interface, it should be able to update the date each time the reader is turned on and the date has changed.

low   loads POWER.EXE into conventional memory, even if the upper memory area is available. By default, POWER.EXE is loaded into upper memory if it is available.

Notes: To display the current power setting, type the command:

```
power
```

You can view the power settings screen with the viewport or use Interlnk to view the settings on the host.

POWER.EXE is embedded in the software and is set by default to adv:min. The JANUS 2010 has its own power management for maximum efficiency.

POWER.EXE gives you an estimate of the amount of NiCad power is left in the reader's battery pack. This estimate is accurate to + or - 10 %. The accuracy of the estimate depends upon variables such as the temperature and age of the battery pack. You may find that POWER.EXE performs differently for each battery pack. For example, when POWER.EXE indicates that the battery life is at 20%, the battery pack is getting low and you need to replace it soon.

Auto-Loader Batch Files

When you install Auto-Loader onto your host computer, eight batch files are copied to your host computer. You will use these batch files to change the contents of drive C on the reader:

- LOAD_USA.BAT or LOADLANG.BAT
- LOADADD.BAT
- LOADC.BAT
- LOADIMG.BAT
- LOADNEW.BAT
- LOADXIMG.BAT
- MAKE_USA.BAT or MAKELANG.BAT
- MAKENEW.BAT

Note: The LOADC.BAT file is a master batch file called by the other batch files.

This section covers these topics:

- Learning How to Use Auto-Loader
- Moving the Batch Files
- Using an External Power Supply
- How to Use Each Batch File

Learning How to Use Auto-Loader

Follow either of these methods to create an image file, which contains the files you want on the reader's drive C, and then load it onto the reader:

- Use LOAD_USA, LOADLANG, LOADADD, or LOADNEW to create and load the image file in a single step.
- Use MAKE_USA, MAKELANG, or MAKENEW to create the image file and store it on a host computer. Then use LOADIMG or LOADXIMG to load the image file onto the reader. This two-step method helps you create an image file to be loaded onto multiple JANUS readers.

For more help, see these chapters:

Chapter 3, "Learning About the Software"   Describes how to install Auto-Loader, explains why you must use special utilities to change drive C, and includes instructions for executing the commonly used batch files.

Chapter 8, "Preparing the Reader for International Use"   Describes how to use Auto-Loader to configure the reader to operate in a DOS National Language Support (NLS) language: French, German, Italian, or Spanish.

Moving the Batch Files

The batch files are customized for the drive and directory where you installed them. To move the batch files, you must reinstall Auto-Loader. For help, see "Installing Auto-Loader on Your Host Computer" in Chapter 3.

Using an External Power Supply

When you use Auto-Loader, you must connect an external power supply to the communications dock or optical link adapter. Auto-Loader uses MakeDisk and PutDisk software. Because PutDisk requires an external power supply, Auto-Loader also requires an external power supply.

Caution
The reader should be powered by an AC power source when you use the PutDisk command in case the battery pack goes low while the flash is being erased. If the power goes down when using PutDisk, the reader locks up and the system flash must be reloaded from the Boot Loader menu and you will lose data.

Conseil
Il faut alimenter le lecteur par une source de courant AC lors de l'exécution de la commande PutDisk dans le cas où le jeu de piles s'affaiblit pendant l'effacement du flash. Si le courant est coupé lors de l'exécution de PutDisk, le lecteur se verrouille, le flash système doit être rechargé du menu d'amorçage (Boot Loader) et vous perdez des données.

Using LOAD_USA

LOAD_USA creates an image file that contains only the three startup files in the C_FILES\COMMON directory: AUTOEXEC.BAT, AUTOINST.BAT, and CONFIG.SYS. Then LOAD_USA loads the image file onto drive C, deleting all the files currently on drive C.

Here is the syntax for LOAD_USA:

```
load_usa
```

Note: If you installed Auto-Loader for a DOS NLS country, the LOAD_USA batch file is not installed.

Using LOADLANG

LOADLANG creates an image file that contains only the three startup files in the C_FILES\COMMON directory. Then LOADLANG loads the image file onto drive C, deleting all the files currently on drive C.

The LOADLANG command also edits AUTOEXEC.BAT and CONFIG.SYS to support the DOS NLS language you specified when you installed Auto-Loader. For help, see Chapter 8, "Preparing the Reader for International Use."

Here is the syntax for LOADLANG:

```
loadlang
```

Note: If you installed Auto-Loader for a DOS NLS country, the LOADLANG batch file is installed instead of the LOAD_USA batch file.

Using LOADADD

LOADADD adds or replaces files on the reader's drive C without overwriting all of the files of drive C. You can also use LOADADD to configure the reader to operate in a DOS NLS language.

There are two LOADADD commands:

* `loadadd nls`

* `loadadd path\filename [path\filename path\filename...]`

  where:

  path   is the drive and directory of the file to load.

  filename   is the name of the file to load.

  You can specify more than one file or use *path**.* to load all the files from a directory.

The next tables describe how the two LOADADD commands work depending on the information you include in the command and whether you installed Auto-Loader for a DOS NLS country.

Command: `loadadd nls`

DOS NLS Support	Description
No	• Creates an image file that contains the three startup files in C_FILES\COMMON and all files currently on drive C.
	• Loads the image file onto the reader's drive C.
	• Overwrites only the startup files on drive C.
Yes	• Creates an image file that contains the three startup files in C_FILES\COMMON and all files currently on drive C.
	• Appends commands to AUTOEXEC.BAT and CONFIG.SYS to support the DOS NLS language.
	• Loads the image file onto the reader's drive C.
	• Overwrites only the startup files on drive C.

Command: `loadadd path\filename [path\filename...]`

DOS NLS Support	Description
No	• Creates an image file that contains files you specify in the command and all files currently on drive C.
	• Loads the image file onto the reader's drive C.
	• Overwrites files on drive C only if the command contains a file with the same name.
Yes	• Creates an image file that contains files you specify in the command, all files currently on drive C, and the three startup files in C_FILES\COMMON unless you specify startup files in the command.
	• Appends commands to AUTOEXEC.BAT and CONFIG.SYS to support the DOS NLS language.
	• Loads the image file onto the reader's drive C.
	• Overwrites files on drive C only if the command contains a file with the same name.

Using LOADIMG

LOADIMG loads the image file that you specify on the command line onto the reader's drive C. LOADIMG overwrites all files currently on drive C.

You must have created the image file already with the MAKENEW, MAKE_USA, LOADADD, LOADNEW, LOADLANG, or LOAD_USA. You may have renamed the image file from its default name, NEWDRV_C\DRIVEC.IMG.

LOADIMG is useful when you are loading an image file onto multiple JANUS readers.

Here is the syntax for LOADIMG:

```
loadimg path\filename
```

where:

path   is the drive and directory of the image file to load.

filename   is the name of the image file to load.

Using LOADNEW

LOADNEW creates an image file that contains any files you include in the command line. If you do not specify startup files in the command line, LOADNEW adds the three default startup files in C_FILES\COMMON to the image file. Then LOADNEW loads the image file onto the reader's drive C, deleting all the files currently on drive C.

If you specified a DOS NLS country when you installed Auto-Loader on the host computer, LOADNEW appends commands to the AUTOEXEC.BAT and CONFIG.SYS files to support that DOS NLS language.

Here is the syntax for LOADNEW:

```
loadnew path\filename [path\filename path\filename...]
```

where:

path   is the drive and directory of the file to load.

filename   is the name of the file to load.

You can specify more than one file or use *path**.* to load all the files from a directory.

Using LOADXIMG

LOADXIMG loads the default image file, NEWDRV_C\DRIVEC.IMG, onto the reader's drive C. LOADXIMG overwrites all files currently on drive C.

You must have created the image file already with the MAKENEW, MAKE_USA, LOADADD, LOADNEW, LOADLANG, or LOAD_USA commands.

LOADXIMG is useful when you are loading an image file onto multiple JANUS readers. Here is the syntax for LOADXIMG:

```
loadximg
```

Using MAKE_USA

MAKE_USA creates an image file that contains only the three startup files in C_FILES\COMMON. No other files are included in the image file.

You must use LOADXIMG or LOADIMG to load the image file onto the reader's drive C. The Make commands offer the advantage of allowing you to create an image file on the host that you can use to update multiple readers.

Here is the syntax for MAKE_USA:

```
make_usa
```

Note: If you installed Auto-Loader for a DOS NLS country, the MAKE_USA batch file is not installed.

Using MAKELANG

MAKELANG creates an image file that contains only the three startup files in C_FILES\COMMON. No other files are included in the image file.

The MAKELANG command also edits AUTOEXEC.BAT and CONFIG.SYS to support the DOS NLS language you specified when you installed Auto-Loader. For help, see Chapter 8, "Preparing the Reader for International Use."

You must use LOADXIMG or LOADIMG to load the image file onto the reader's drive C. The Make commands offer the advantage of allowing you to create an image file on the host that you can use to update multiple readers.

Here is the syntax for MAKELANG:

```
makelang
```

Note: If you installed Auto-Loader for a DOS NLS country, the MAKELANG batch file is installed instead of the MAKE_USA batch file.

Using MAKENEW

MAKENEW creates an image file that contains any files you include in the command line. If you do not specify startup files in the command line, MAKENEW adds the three default startup files in C_FILES\COMMON to the image file.

If you specified a DOS NLS country when you installed Auto-Loader on the host computer, MAKENEW appends commands to the AUTOEXEC.BAT and CONFIG.SYS files to support that DOS NLS language.

You must use LOADXIMG or LOADIMG to load the image file onto the reader's drive C. The Make commands offer the advantage of allowing you to create an image file on the host that you can use to update multiple readers.

Here is the syntax for MAKENEW:

```
makenew path\filename [path\filename path\filename...]
```

where:

path   is the drive and directory of the file to include in the image file.

filename   is the name of the file to include in the image file.

You can specify more than one file or use *path**.* to load all the files from a directory.

G

Glossary

Accumulate mode
Operating mode in which the reader stores scanned information in the reader's data buffer until the reader receives an enter command.

acknowledgment delay
Specifies the maximum amount of time that may elapse before the controller determines that a device did not receive the message.

AFF
Affirmative Acknowledge character. This character enables or disables the handshake event that is an affirmative acknowledge to a message.

alphanumeric keypad
The alphanumeric keypad is an all-purpose keypad with 52 keys. Although the keypad is smaller than a regular PC keyboard, you use special keys on the reader's keypad and press key combinations to access all 102 keys that are available on a PC keyboard. The alphanumeric keypad is available in English, French, German, Italian, and Spanish.

application break bit
A flag in the reader that an application checks when you turn on the reader. If the bit is not set to 1, the application will resume running. If the bit is set to 1, the application will not resume. You press the application break sequence to set the application break bit.

application break sequence
A series of keys you press to stop an application from resuming after you turn the reader off and then on again. Usually you use these keys when an application is locked up and you do not want to cold boot the reader to clear the memory.

Application companion disk
One of the disks that Intermec ships with your JANUS reader. This disk contains applications such as Communications Manager and IRLXDESK.EXE. This disk also contains PC card drivers and utilities that control the reader's operation, prepare the reader to use the different types of PC cards, customize the reader to use the PC card software, and provide you with helpful tools.

ASCII
American Standard Code for Information Interchange. A standard 7-bit code almost always transmitted with a parity bit for a total of 8 bits per character.

ASCII control character
One of the first 32 characters (0 through 31 in decimal representation) in the ASCII character set. Each of these characters has a standard control function, such as backspace or carriage return.

ATA flash PC card
A type of memory PC card that provides additional disk storage space, not more executable conventional memory, on a JANUS reader.

audio signals
The reader has a beeper and a clicker that produce audio signals that indicate reader status. You can change the beep volume and enable or disable the keypad clicker with configuration commands.

Auto-Loader
A DOS utility used to change the contents of drive C. You can also use it to configure the reader to operate in any language supported by DOS NLS (National Language Support). You run Auto-Loader on a host computer connected to the reader's COM1 port.

Automatic mode
See Scanner mode.

automatic shutoff
A reader configuration feature that defines the maximum length of time the reader stays on when there is no activity. At automatic shutoff, the contents of reader memory are saved and the reader resumes where it left off when it is turned on again.

backlight
A light built into the reader display to make it easier to view the reader display in dimly lit environments.

backup battery
See lithium bridge battery.

BAK
Bad Program Acknowledgment character. This character is sent from the reader to indicate that the IRL program received from the host could not be successfully compiled.

bar code density
Number of data characters that can be represented in a linear unit of measure. Often expressed in characters per inch.

bar code label
A label that contains a bar code symbol.

bar code symbology
A scheme for encoding data as bar code. Code 39, Interleaved 2 of 5, and Codabar are examples of different symbologies.

battery pack
See NiCad battery pack.

baud rate
The number of discreet conditions or signal events per second. In RS-232 and RS-422/485 systems, baud rate is the same as bits per second (bps).

binary file
A file that contains a sequence of 8-bit data characters or executable code. Compare to ASCII text file. Binary files require special software for transmission. See also binary file transfer.

binary file transfer (BFT)
The process or method for transmitting a binary file (such as an executable file) from one computer device to another.

boot
Usually means to invoke a bootstrap process, which involves building up a system from some simple preliminary instructions or information.

Boot Loader menu
The menu on the reader used to reboot the reader, to dump the reader's RAM, to reload or upgrade the reader's software, or to use Storage mode.

Boot Utilities companion disk
One of the disks that Intermec ships with your JANUS reader. This disk contains the files you need to load or upgrade the reader's system software. This disk also contains the README.DOC, a text file that describes important information about the reader that was unavailable when this manual was published. This disk also contains a batch file, INSTALL.BAT, that you can use to install Auto-Loader onto a host computer.

bps
Bits per second. The unit of measure used to describe the rate of data transmission. For example, 1200 bits per second means that there are 1200 data bits transmitted per second.

BRU
Base radio unit. A device that transmits messages over radio frequency (RF) waves between a controller and data collection devices.

CGA
Abbreviation for Color/Graphics Adapter. CGA is a video adapter board.

check character
A character included within a message for the purpose of performing a check to ensure the accuracy of the message.

check digit
A character included in a bar code whose value is used to do a mathematical check on the value of the decoded bar code to retain accuracy.

client
The computer from which you will access drives, directories, files, and programs that are stored on the server. See also server.

Codabar
A self-checking, discrete bar code symbology that has these 16 characters in its set: 0 to 9, dollar sign ($), colon (:), slash (/), period (.), plus (+), and dash (-). Codabar is commonly used in libraries, blood banks, and air-parcel express applications. The American Blood Commission (ABC) Codabar requires that you retain the start/stop code digits when processing a Codabar symbol. The maximum density for a Codabar symbol is 12.8 characters per inch.

Code 2 of 5 (2 of 5)
A discrete, self-checking code for encoding numeric data only. The bars encode information and the spaces separate individual bars. It can achieve densities of 15 characters per inch.

Code 11
A very high density, discrete, numeric bar code developed by Intermec. The character set includes the numbers 0 through 9 and the dash character (-). Each character is represented by a standalone group of three bars with two included spaces. This code is not self-checking. One or two check digits provide data security. Code 11 is most extensively used in labeling telecommunications components and equipment. Its maximum density is 15 characters per inch.

Code 128
A very high density alphanumeric symbology that supports the extended ASCII character set. It is a variable length, continuous code that uses multiple element widths. Code 128's high density makes it useful when printing data in a limited space. Its maximum density is 12.1 alphanumeric characters per inch or 24.2 numeric characters per inch.

Code 16K
A two-dimensional (stacked rows), ultra-high density bar code symbology. It is based on Code 128 and is used widely to label unit-dose packaging for the health care industry.

Code 39
A discrete, variable length, and self-checking bar code symbology. The character set is uppercase A to Z, 0 to 9, dollar sign ($), period (.), slash (/), percent (%), space ( ), plus (+), and dash (-). Code 39 can be extended to the full 128 ASCII character set by use of a two-character encoding scheme (see full ASCII). Its maximum density is 9.8 characters per inch.

Code 49
A multirow symbology for high data density. The last character in each row is used for row checking and the last two characters of the symbol are used for overall checking. The character set includes all 128 ASCII characters. Its maximum density is 93.3 alphanumeric characters per inch or 154.3 numeric characters per inch.

Code 93
A variable length, continuous bar code symbology using four element widths. It can be used interchangeably with Code 39 when higher density printing is required. The character set is the same as Code 39. Its maximum density is 14.8 characters per inch.

cold boot

One of two ways to boot the reader; compare to warm boot. A cold boot invokes the BIOS boot sequence, which verifies that the 256K flash system image is not corrupt, clears all memory, and performs a complete power-on self test (POST) to ensure that the hardware and peripherals are operational. The cold boot initializes the system hardware for use by system software, loads the default configuration, runs AUTOEXEC.BAT and CONFIG.SYS, and loads DOS. Because the physical RAM drive is initialized, all files on drive E are lost. You may cold boot the reader to clear the reader's conventional memory, break out of an application that is locked in an infinite loop, or recover from an error condition.

COM port

Commonly used short form of communications port. Locations from which data can be passed into and out of the reader. COM ports offer serial communications, which means that data is transmitted one bit at a time over a single line from one computer to another.

Communications Manager

An application on the reader that lets you transmit and receive files, and see the status of the reader's COM port. This application is available on the Application companion disk 3.

communications protocol

A set of rules or standards designed to enable computers to connect with each other and exchange data. An example of a communications protocol is Point-to-Point protocol.

Communications Utilities

Transmit and receive functions that you can call with PSK functions or software interrupts. Included in the Reader Services programs.

Compound Function key

The Compound Function key is a special key on the JANUS keypad. You use the ⬚f key to access characters or perform functions that do not have an actual key on the keypad. When you press ⬚f, the key is held in a buffer and the Compound Function key icon appears on the reader's display. Once you press a key other than ⬚f, the key combination is entered into the reader and the icon disappears from the display.

configuration

The selected parameters that determine the operating characteristics of an electronic device.

configuration command
A configuration command changes the way the reader operates. You can enter a configuration command by typing on the keypad, by scanning a bar code label, or by sending a command from the host computer.

configuration file
A configuration file is an ASCII text file that contains settings for some or all of the reader's configuration parameters.

Configuration Manager
A Reader Services program on the reader that maintains the reader's current configuration file, ensures that the reader operates according to that configuration, and lets you change the configuration file.

Control mode
A reader mode you use to temporarily change some of the display parameters at the DOS prompt or when running an application. The parameters are reset when you boot the reader.

conventional memory
The reader has 4MB of battery-backed dynamic RAM. The first 640K is conventional memory and is virtually the same as that of a PC. You can use this memory to run applications.

cursor keypad
A set of keys on the reader that allows you to move the cursor around the screen.

data bits
The number of bits the reader uses when communicating with another device (i.e., host computer). Generally set at seven or eight.

default configuration
The values set for each configuration parameter when the reader is shipped.

device
Any physical item that is attached to a computer. A terminal, a printer, a reader, and a controller are all devices.

device driver
A software component that controls an external device. For example, a PC card device driver controls how the reader accesses the PC card.

DLE
The ASCII Data Link Exception character. It causes the character that follows it to be received as data, even if it is a protocol character. It allows for the use of control characters in preambles, data strings, and configuration command strings.

DOS code pages
A code page is a table that relates binary character codes used by a program to keys on the keypad or to characters on the display. All international keypads are translated using an installed DOS code page that contains the standard ASCII character set and a set of national language characters specific to the language the code page supports.

downline
When devices are connected to a computer, they are connected in a "line." Downline is a direction relative to the computer. If more than one computer is connected in a line, the upline computers usually handle data processing and the downline computers usually handle data collection and sometimes some data preprocessing. Contrast with upline.

DRAM
Abbreviation for dynamic random access memory. A type of RAM that stores information in integrated circuits containing capacitors. Since capacitors lose their charge over time, DRAM boards include logic to recharge, or "refresh," the RAM chips continuously. Since their internal circuitry is simple, DRAMs are more commonly used than static RAMs, even though they are slower. DRAM can hold approximately four times as much data as a static RAM chip of the same complexity. The reader has 4MB of battery-backed DRAM.

drive
An electromechanical device that reads from and writes to disks. The three types of common disk drives are floppy disk drives, hard disk drives, and PC card drives.

driver
See device driver.

EAN
European Article Numbering. International standard bar code for retail food packages corresponding to the Universal Product Code (UPC) in the United States. A reader that is configured to decode EAN bar codes can decode UPC, but the reverse is not true. UPC code is a subset of EAN code.

edge triggering
A scanner trigger configuration that makes the laser turn on after you pull the trigger and stay on until you pull it a second time. Simply releasing the trigger does not turn the laser off. If the laser is left on, the scanner timeout turns the laser off. Contrast with level triggering.

EMM
Expanded Memory Manager. Software that makes expanded memory available to EMS-compatible DOS programs.

end device
The device in the data collection system that collects and inputs data.

environment variable
A specification in a program that defines an operating parameter, such as the command path.

EOF
End of File character. Attached to the last record transmitted in a block of records and after the End of Record (EOR), if the EOF character field is enabled.

EOM
End of Message character. Sent at the end of reader and host messages. The transmitted and received EOM characters can be defined separately.

EOP
End of Program block character. Sent by the host after a block of IRL program statements to tell the reader that another block of IRL statements is coming.

EOR
End of Record character. Attached to the end of every record transmitted by the polled device if the EOR character field is enabled.

error message
A message from a device or program advising the user of an error that requires intervention to solve. For example, if you receive the error message "Error, incorrect number of parameters" while creating a drive image with MakeDisk, you should verify that the command line is correct and then try again.

extended memory
System memory above 4MB. The reader is initially configured with 3MB of extended memory available, which is allocated for use by Intermec applications (IC.EXE and IRL). The reader provides extended memory for control and access to RAM above 4MB. The extended memory conforms to XMS specification 2.0. Extended memory is initialized and managed by the HIMEM.SYS driver.

extended memory manager
Software that makes extended memory available to DOS programs. For example, you must run an extended memory manager such as HIMEM.SYS on the reader to create and use a physical RAM drive.

FIFO control register (FCR)
First in/first out control register. The FCR contains a hex value that controls how the UART buffer operates. You may need to configure the JANUS to restore a hex value for the FCR in case you turn off the reader while running a communications application that uses UART 16x550 mode.

fixed length
Characteristic of a bar code symbology in which the number of characters per symbol is predetermined. Opposite of variable length.

flash PC card
A type of memory PC card that provides additional disk storage space, not more executable conventional memory, on the reader. Flash cards retain their data without the use of a backup battery.

flash ROM drive
Drives C and D on the reader are ROM drives that are implemented in flash memory. Flash ROM drives are upgradeable, but have limited write capability. Both drives use a file allocation table (FAT) type format.

flow control
A method for controlling the flow of data between the reader and the serial port. It stops the transmitting device from sending data when the receiving device buffer fills up and starts it again when the buffer empties. Flow control can be done through software (XON/XOFF) or hardware (CTS/RTS).

full ASCII
An operating mode that sets the reader to properly decode Code 39 or Code 93 labels containing data that includes any of the 128 ASCII characters.

Graphics mode
One of two display modes on the reader. When the reader is set to use
Graphics mode, you see a 128 x 160 pixel display size. You can use the reader's
CGA display as a viewport to move around and see a 200 x 640 pixel virtual
display. Contrast with Text mode.

handshake event
A communications event that signifies the completion of a data block
transmission. The exchange signifies either an affirmative acknowledge (AFF)
or a negative acknowledge (NEG). The handshake event is enabled by defining
the AFF character to be other than NULL. Some computers use the characters
XON and XOFF as handshaking characters.

HIBC
Health Industry Bar Code standard. A modified version of Code 39 that has 43
characters, uses the Modulus 43 check character, and reserves some character
combinations for special usage.

high memory area (HMA)
HMA is a 64K block of memory, starting 16 bytes below the 1024K mark, and is
the first 64K of extended memory. Since HMA can only hold one item, the first
program that requests HMA uses it, regardless of the size of the program.

home
The viewport's home position is the upper left corner of the reader's virtual
display.

horizontal reading angle
The horizontal angle of a reader's laser scanner to a bar code label. The
optimum horizontal reading angle is near zero degrees.

host computer
A PC or other computer connected to the JANUS reader. Also called the host.

human-readable
A character printed in a font that can be read by a human, as opposed to bar
code symbology that can only be read by a machine.

image file
An image file contains all the files you want to load onto the reader's ROM
drives. Because ROM drives are implemented in flash memory, you can use
DOS commands to read from drive C or D, but you must use special utilities to
write to drive to them.

input/output (I/O) PC card
A type of PC card, such as a modem card, that can be used to connect the reader to another device for communications. I/O cards comply with PCMCIA Standard 2.1.

Input Manager
A Reader Services program that you use as an interface for all data input and output from the reader's COM ports, scanner, and keypad. The Input Manager handles all power management tasks during data input and output.

Interactive Configuration application (IC.EXE)
A menu-driven application that lets you view the reader's current configuration, modify parameters, create configuration files, and configure the reader with any configuration file.

intercharacter delay
Amount of time between transmitting successive characters.

Interleaved 2 of 5 Code (I 2 of 5)
A high-density, self-checking, continuous numeric bar code symbology. A bar code developed by Intermec that encodes the digits 0 through 9. The name Interleaved 2 of 5 is derived from the method used to encode two characters. In this symbol, two characters are paired, using bars to represent the first character and the interleaved spaces to represent the second character. Each character has two wide elements and three narrow elements, for a total of five elements. It is mainly used in inventory distribution and the automobile industry. It can achieve a maximum density of 7.8 characters per inch.

InterInk
A DOS communications program on the reader that you use to access the drives on a host computer as if they were on the reader, and vice versa.

Intersvr
A companion application to Interlnk that runs on the computer that acts as the server while Interlnk runs on the computer that is the client.

IRL (Interactive Reader Language)
A high-level programming language developed by Intermec for the JANUS reader.

IRL Desktop
The IRL operating environment on the JANUS reader is called the IRL Desktop. This application lets you use the reader to transmit, receive, and clear data files, and to download and run IRL programs.

IRQ
Interrupt request. Hardware lines over which devices such as the reader's input/output ports, the keypad, and disk drivers can send request-attention signals (commonly called "interrupts"). IRQs suspend current operations, save current work, and transfer control to a routine called an interrupt handler, which causes a specific set of instructions to be carried out by the computer's microprocessor.

keypad buffer
An area of memory that saves a limited number of operator keystrokes.

keypad clicker
A feature that makes the reader produce an audible click every time a key is pressed. This feature can be enabled or disabled with the Keypad Clicker configuration command.

large numeric keypad
One of the keypads available on the reader. The large numeric keypad has 34 keys and is available in English. The number keys are larger to make it easier to enter a lot of numeric data. See also alphanumeric keypad.

laser scanner
An optical bar code reading device that uses a low energy laser light beam to examine a spatial pattern, one part after another. It then generates analog or digital signals corresponding to the pattern. Laser scanners are often used in mark sensing, pattern recognition, character recognition, and bar code recognition. The laser scanner converts bar code symbols to electrical signals for input to a bar code reader decoder for processing and subsequent output through a data communications interface.

level triggering
A scanner trigger configuration that makes the laser turn on after you pull the trigger and stay on until you release the trigger. Contrast with edge triggering.

lithium bridge battery
The reader contains a lithium bridge battery that is designed to back up the RAM and clock while you remove a discharged NiCad battery pack and insert a charged battery pack. The lithium battery will provide backup battery power for up to 72 hours.

logical COM4

Logical COM4 is the communications port for RF communications in a JR2020. This COM port is different from COM4, which is the Type II PC card drive when it contains a modem card. Accessing an RF network through logical COM4 does not conflict with accessing a serial communications network through COM4.

LRC

Longitudinal redundancy check character. This character is an error-checking character that is optionally appended to transmitted blocks of data and optionally checked on received blocks of data.

MakeDisk

One of two programs you can use to change the contents of the ROM drives. MakeDisk creates an image file containing the files you want on a ROM drive. You can run MakeDisk on a host computer, on the reader's PC card drive, or on the reader's RAM drive.

memory cards

See PC cards.

Modulus 43 check character

Check character derivation method for Code 39.

modem card

A Type II PC card that converts one form of a signal to another, which is suitable for transmission over communications circuits, typically from digital to analog and then from analog to digital.

MS-DOS Programs companion disk

One of the disks that Intermec ships with your JANUS reader. This disk contains commands and device drivers. Some of these commands and drivers are already installed on the reader. This disk also contains applications, such as INTERLNK.EXE, MakeDisk, and PutDisk.

MSI code

Similar to Plessey code. MSI code includes a start pattern, data characters, one or two check digits, and a stop pattern. It is fixed length, continuous, and non self-checking. This code is used to mark retail shelves for inventory reordering. The character set is 0 to 9 plus additional symbols.

Multi-Drop address
The address of the COM port when you are using Multi-Drop communications protocol. Each Multi-Drop address has unique POL and SEL characters that are automatically set when you configure the address.

Multi-Drop protocol
Communications protocol similar to Polling Mode D, used when connecting multiple readers to a port concentrator. In Multi-Drop, each reader on the line must be assigned a unique POL and SEL character. Due to timeout parameters, the baud rate must be 2400 or higher.

multiple-read label
A bar code label that has a space as the first character after the start code. The reader stores a multiple-read label in the buffer until you execute a command to transmit the label or scan a regular label. Contrast with regular label.

NEG
Negative Acknowledgment character. Indicates a negative acknowledgment to a solicitation event or a data transmission event.

network
A collection of devices that can store and manipulate electronic data, interconnected in such a way that their users can store, retrieve, and share information with each other.

NiCad battery pack
Provides the main power source to operate the reader. The battery pack contains rechargeable nickel-cadmium (NiCad) battery cells.

NLS
National Language Support. A DOS feature that provides country-specific information and character set (code page) switching for international language support.

nonvolatile
Refers to memory that is saved when power is lost or turned off.

null modem cable
A cable that connects two computers and allows transmission of data between them without requiring a modem.

number pad
A set of keys on the reader that allows you to move the cursor around the screen and to type numbers and mathematical symbols. The reader's number pad is designed to work like the number pad on a regular PC keyboard.

One-Shot mode
See Scanner mode.

optical serial port
The reader's COM1 is an optical serial port. You can communicate through COM1 using a communications dock, optical link adapter, or another reader if you align the two readers' receive and transmit signals on their optical serial ports.

PAK
Program Acknowledgment character. Sent from the reader when the received IRL program compiles with no errors.

parameter
See configuration command.

parity
A system for encoding characters with odd or even bar code patterns. Parity provides a self-checking feature in bar codes and other data transmission techniques. Even parity characters have an odd number of binary ones in their structure.

PC card
A PC card is similar to a floppy disk. You can use Type I or II memory PC cards and Type II expansion PC cards. Memory cards provide additional disk storage space, not more executable conventional memory. Expansion cards (also called I/O cards) allow you to connect the reader to I/O devices. PC cards were previously called PCMCIA cards.

PCMCIA
Personal Computer Memory Card International Association. This group of manufacturers has defined a set of hardware and software standards for memory and expansion PC cards that are available for personal computers.

PC Standard communications protocol
A communications protocol that handles data transfer on a character-by-character basis or by either filling a receive buffer or transmitting a buffer of data. This protocol is designed to be compatible with the standard PC BIOS functions. The one exception is that the PC Standard protocol can buffer data that is received to avoid losing characters if a program has not checked for data recently.

physical RAM drive
See RAM drive.

Plessey Code
A fixed length, continuous, and not self-checking bar code symbology. Plessey code is pulse-width modulated. It includes a start character, data characters, an eight-bit cyclic check digit, a termination bar, and usually a reverse start character.

Point-to-Point protocol
Point-to-Point is an unsolicited protocol in which the reader transmits data whenever it has something to transmit. The data is followed by a CR LF as the EOM characters. The reader is always in a receiving state and does not wait for select commands. This protocol does not perform any error checking or acknowledgment handshaking. Point-to-Point protocol is typically used to connect the reader to a CRT terminal or host computer.

POL
Poll character. Sent by the host to request reader data. For User-Defined Multi-Drop protocol, you must define a unique character for each reader on a data line.

Polling Mode D
Polling Mode D is a communications protocol that requires the host computer to ask the reader for data it might have (polling) and to request to send data to the reader (selecting). Polling Mode D is used to connect multiple devices to a single multiport controller. PC-IRL uses this protocol.

POST
Power-on self test. This test runs when you warm or cold boot the reader. The test ensures that the reader's hardware and peripherals are operational.

postamble
A field of data that is sent after the data in a message. It is typically used to tag transactions from the bar code reader for rapid processing by the host, and it expands the data field (record) length. Similar to the preamble.

power management
Software and procedures that extend the life of a reader's NiCad battery pack and lithium bridge battery.

preamble
Predefined data that is automatically appended to the beginning of entered data. Similar to postamble.

protocol character
See ASCII control character.

protocol handler
A protocol handler provides communications services that let a reader send data to other devices by transmitting and receiving data as specified by the communications protocol. The basic reader can use PHIMEC and PHPCSTD. RF readers can also use RFPH.

PSK
JANUS Programmer's Software Kit. A library of software functions for creating applications on the JANUS.

PSS
Program Statement Separator character. The PSS indicates the end of an IRL program statement. It separates individual IRL program statements from one another in a block of IRL program statements. PSS must not be defined the same as the EOM.

PutDisk
One of two programs you can use to change the contents of the ROM drives. PutDisk places an image file created with MakeDisk on the reader. You can run PutDisk only on the reader.

RAM
Random access memory. Memory that can be written into, or read, by locating any data address.

RAM drive
A disk drive that exists only in your reader's extended memory. You create, read, write, and delete files on a RAM drive the same way you can on a hard disk drive. RAM drives are faster than hard disk drives because the contents of a RAM drive are, by definition, always resident in RAM. The contents are destroyed when you cold boot the reader.

reader command
A reader command causes the reader to perform a task. You can enter a reader command by typing on the keypad, by scanning a bar code label, or by sending a command from the host computer.

Reader Services
A collection of programs on the reader that decode bar codes, process data input and output, configure the reader, and handle power management.

reader-to-reader
A method of communicating between two readers. By placing two readers so the receive signal on one reader aligns with the transmit signal on the other reader, and the transmit signal on the first reader aligns with the receive signal on the other reader, you can achieve direct communications between the two readers. For this type of communications, the readers should be no more than 1 inch apart.

records per block
The maximum number of data records transmitted per block of data. A block of data is transmitted during a single transmission event.

regular label
A bar code label that takes the form of <start code data stop code>. A regular bar code label is executed as soon as you scan it. Contrast with multiple-read label.

remark out
When you add a REM statement (short for REMark) at the beginning of a command line in a batch file, DOS treats the line as a remark instead of as a command. Any statement beginning with the characters REM will be ignored by the command processor. Typically, users will remark out device drivers in AUTOEXEC.BAT and CONFIG.SYS startup files.

REQ
Request for Acknowledgment character. Sent by the reader to the host to request a retransmission of an acknowledgment to a reader message.

RES
Reset character. Sent by the reader to end communications with the host. The RES character enables or disables the reset event, or resets the data transmission event to the solicitation event.

resume
When you press ⓘⁱ⁄ᵒ to turn the reader back on, the reader resumes exactly where it was when you turned it off. If a program was running when you turned off the reader, the program continues running from the same point when you turn the reader back on.

RF data collection system
Radio frequency data collection system in which the individual components communicate with each other by radio signals.

RFPH
The RF protocol handler, which enables a JANUS device to communicate as an end device in an RF network. RFPH lets the reader transmit and receive data as specified by the RF communications protocol.

ROM
Read only memory. Usually a small memory that contains often-used instructions, such as microprograms or system software. ROM is programmed during memory fabrication and cannot be reprogrammed.

ROM drive
A read-only memory drive. Drives C and D are ROM drives implemented in flash memory on the reader.

Scanner mode
Defines how the scanner operates when the trigger is pulled. There are two types of modes: One-Shot or Automatic. One-Shot mode requires you to pull the trigger each time you want to scan a bar code. Once you scan a bar code, the scanner turns off. Automatic mode allows you to pull the trigger once and scan a series of bar codes. When you release the trigger, the scanner turns off. To scan the same bar code more than once, you must release the trigger or scan a different bar code before attempting a second scan.

scanner timeout
Maximum time the laser is on. The laser will automatically turn off if timeout occurs before the trigger is released.

SEL
Select character. The character that requests permission for the controller to send data to the polled device.

serial communications
With serial communications, data is transmitted one bit at a time over a single line from one computer to another. Often serial communications link host computers to terminals and PCs to printers.

serial communications parameters
Parameters that control serial communications from one computer to another, such as baud rate and parity.

server
The computer that contains the drives, directories, files, and programs you want to access. See also client.

SOM
Start of Message character. The first character in messages sent to or received from the host.

SOP
Start of Program Block character. Sent by the host at the beginning of a block of IRL program statements.

spotting beam
An aiming feature of a laser scanner. A small beam of light briefly shines on the object being scanned, allowing the operator to position the scanner correctly for a good read.

SRAM drive
Static RAM. See RAM drive.

SRAM PC card
A type of memory PC card that provides additional disk storage space, not more executable conventional memory, on the reader. An SRAM card has a lithium battery to back up data for the life of the battery.

stop bits
A bit that signals the end of a character. One of the serial communications parameters.

Storage mode

A power management mode on the reader that lets you preserve the life of the lithium bridge battery. Place the reader in Storage mode if you will not use the reader for 1 week or more. While the reader is in Storage mode, the NiCad battery pack must be removed; otherwise, the reader slowly drains the battery pack and bridge battery. All data in conventional memory is lost when the reader enters Storage mode.

Suspend mode

The mode the JANUS reader enters when you press Ⓘ/Ⓞ to turn off the reader. In Suspend mode, the reader saves all memory and turns off the power to most hardware, including the CPU.

symbology

See bar code symbology.

Text mode

One of two display modes on the reader. By default, the reader uses Text mode and you can set the display size to 25 x 80, 16 x 20, 8 x 20, 16 x 10, and 8 x 10. If your application only recognizes DOS mode, you must use a display size of 25 x 80 or 25 x 40. The other display sizes are not DOS standard and are for use with custom applications. Text mode also supports two character attributes: blinking and reverse video. Contrast with graphics mode.

timeout

A defined time allowed for an event after which an alternative action is taken.

timeout delay

The time the reader waits between received characters before an I/O (input/output) error occurs.

TSR program

Terminate and stay resident program. A DOS program that remains loaded in conventional memory after you have terminated it. You must explicitly unload the TSR if you want to free the conventional memory it is using.

UART buffer

Universal Asynchronous Receiver/Transmitter buffer. The UART buffer contains bytes of data being sent or received by the reader. The FIFO control register controls how the UART buffer operates.

UPC/EAN Code

A fixed length, numeric, continuous bar code symbology that uses four element widths. A reader that is configured to decode EAN bar codes can decode UPC, but the reverse is not true. UPC code is a subset of EAN code. It is a numeric, 12-digit bar code symbology used extensively in retail, particularly the grocery industry. The character set is 0 to 9. Its maximum character density is 13.8 numeric characters per inch.

upline

A device that is at the computer end of a connection between a computer and a device is referred to as being upline. When devices are connected to a computer, they are connected in a "line." Upline is a direction relative to the device, in contrast to downline.

upper memory area

The area between the 640K and 1024K. The upper memory area is physically composed of a 256K flash ROM chip (system flash) and the video memory chip. Like a PC, this area contains the BIOS and video buffers. On the reader, the upper memory area also contains PC card memory and ROM DOS.

User-Defined protocol

A custom communications protocol that can be modified to meet specific host requirements. For example, you can configure User-Defined to act like a Point-to-Point protocol, except that it requires an LRC and an acknowledgment from the receiver. You can also define the communications characters such as SOM, POL, or SEL, or disable these characters by setting them to null.

vertical reading angle

The vertical angle of a reader's laser scanner to a bar code label. The optimum vertical reading angle is near 20 degrees.

viewport

A method for viewing a full PC-size screen (25 x 80) with the reader's 16 x 20 display. You will only see 16 lines and 20 characters of data at one time. Use the reader's display as a viewport to move around and see the entire screen.

virtual display

A PC-size screen (25 x 80) accessible through the reader's smaller display for applications that need to be PC compatible. You can see 16 rows and 20 characters of the virtual display at one time. By moving the viewport, you use the reader's virtual display of 25 lines by 80 characters—the same size as a PC screen.

Virtual Wedge
A Reader Services feature that lets the reader decode bar codes, making the reader functionally equivalent to a wedge reader connected to a PC.

volatile
Refers to memory that is not saved when power is lost or turned off.

warm boot
One of two ways to boot the reader; compare to cold boot. A warm boot performs the power-on self test (POST) to ensure that the hardware and peripherals are operational, runs CONFIG.SYS and AUTOEXEC.BAT, and displays the DOS prompt. The contents of both conventional memory and the physical RAM drive (drive E) remain intact. You may warm boot the reader to execute startup files, such as AUTOEXEC.BAT, that have changed. You may also warm boot to start Interlnk.

wedge reader
A bar code reader that connects to a PC. The wedge lets you scan bar code and enters the data into the PC as if it were typed at the keyboard.

XON/XOFF
A type of software flow control for communications between digital devices. It stops the host from sending data when the device buffer fills up (XOFF) and starts it again when the buffer empties (XON).

I
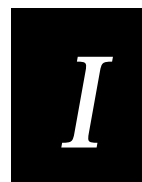
Index

Symbols

⟨I/O⟩ key, *See* Suspend/Resume key
⟨Alt⟩ key, *See* Alt key
⟨Ctrl⟩ key, *See* Ctrl key
⟨⇧⟩ key, *See* Shift key
⟨≡f⟩ key, *See* Compound Function key
◄, ▲, ►, ▼ keys, *See* cursor
{ } in IRL filenames, 7-3

Numbers

102-key PC keyboard, 2-4, 2-17, B-3
16 x 10 display size, 2-22, 12-48
16 x 20 display size, 2-22, 12-48
25 x 80 display size, 2-22, 12-48
386 microprocessor, 1-3
3-wire cable, Interlnk, 6-21, A-5
640K memory, *See* conventional memory
8 x 10 display size, 2-22, 12-48
8 x 20 display size, 2-22, 12-48
900 MHz RF communications, 1-5, 6-41
9154 Multi-Drop Line Controller for BFT, 6-42
9161 Multi-Drop and Port Concentrators, 6-42
9180 Network Controller for BFT, 6-42

A

ABC Codabar, 12-16
About menu, IRL Desktop, 7-6
AC power source
    battery power, managing, 2-41
    for Auto-Loader, 3-16, D-11
    using with reader accessories, 2-42
AC power source, using for PutDisk, 3-27
accent marks, typing, 8-12
accessories for the reader, 1-4
Accumulate, Enter, *See* Enter Accumulate mode
Accumulate, Exit, *See* Exit Accumulate mode
Address, Multi-Drop command, 12-7
advanced power management, D-9
AFF command, 12-8
AIAG check digit, Code 39, 12-23
alphanumeric keypad
    ASCII characters, entering, 2-16
    characters, capitalizing, 2-10
    characters, typing, 2-6
    charts, for entering characters, B-3 to B-7
    Compound Function key, using, 2-8
    Control mode, key combinations, B-7
    Ctrl, Alt, and Shift keys, using, 2-7
    cursor keypad, using, 2-11
    number pad, using, 2-13, B-6
    special keys, finding, 2-5

Alt Gr key, on international keypads, 8-12
Alt key
    icon, 2-7, 2-29
    international keypads, using, 8-12
    using, 2-7
Alternate Key Code Entry, 12-34
American Blood Commission, *See* ABC Codabar
analysts, using this manual, xx
APM_4M.EXE
    defined, 3-8
    loading, 3-8, 4-22
    troubleshooting, 10-21
application break bit
    breaking out of an application, 9-6
    defined, 9-5
    exiting IRL programs, 7-9, 11-12
    preparing applications to exit lockups, 3-37
applications, *See also* communications applications
    BFT-ready PSK application, 6-41
    display, adjusting with Control mode, 2-27
    downloading with BFT, 6-38 to 6-48
    programming for the reader, 3-35
    resuming IRL programs, 7-15
    storing on drives, 2-44
    troubleshooting, 10-22 to 10-24
ASCII
    bar code chart, C-17 to C-22
    characters, entering on the number pad, 2-16
    Code 39, full, 12-21
    Code 39, mixed-full, 12-22
    Code 39, non-full, 12-21
    control characters
        command override and DLE, 11-6
        in Communications Manager fields, 6-36
        list of, C-16
        preamble/postamble, configuring, C-3
        protocol characters, configuring, C-3
    equivalents, C-14 to C-16
ATA card
    defined, 4-5
    using, 4-17
audio signals
    beep duration, setting, 12-12
    beep frequency, setting, 12-13
    keypad clicks, enabling or disabling, 12-70
    list of, 2-32
    low battery, 2-40
    PC card, inserting, 2-32
    testing with IMBEEP.EXE, 2-33
    volume, adjusting, 12-15
AUTOEXEC.BAT
    after upgrading the reader, 9-15
    conventional memory, absorbing, 10-22
    defined, 3-7
    editing on drive C, 3-11