

Intermec

**User's
Manual**

JANUS™ 2020
Hand-Held Computer (4MB)

P/N 065715-001

Intermec

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Hand-Held Computer (4MB)

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Glossary

I

Index

Before You Begin

This section introduces you to standard warranty provisions, safety precautions, dangers, 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.

Note: For laser compliance and safety information, refer to the JANUS 2020 Manual Supplement that is shipped your JANUS reader.

Dangers, Warnings, and Cautions

The dangers, warnings, and cautions in this manual use this format.



Danger

A danger warns you of possible eye damage caused by use of a Class IIIa laser product. Use of this symbol is mandated by CFR21 1040.

Danger

Un signe de danger vous avertit d'un risque d'endommagement de l'œil causé par l'utilisation d'un produit au laser de classe IIIa. CFR21 1040 oblige l'utilisation de ce symbole.



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 manipulant 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 2020 User's Manual (4MB)* describes the reader's features and explains how you can operate, configure, network, and create programs for the JANUS 4MB 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, 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 that comes 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.

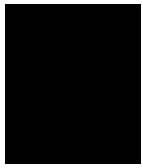
What You Will Find in This Manual (continued)

Chapter	What You Will Find
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.

Terminology











You should be aware of how these terms are being used in this manual. For definitions of the technical terms used in this manual, see the glossary.

Term	Description
Reader	The generic term "reader" indicates any JANUS 2020 reader. More specific terms, such as "JR2020," indicate a specific type of JANUS 2020 reader.
JR2020	The term "JR2020" indicates any JANUS 2020 reader with a radio frequency (RF) interface for RF communications.
IC.EXE	The Interactive Configuration application (IC.EXE) was called "the configuration application" in previous versions of this manual.
PC cards	"PC cards" were referred to as "PCMCIA cards" in previous versions of this manual, its addendums, and README.DOC. Intermec no longer uses the name of the Personal Computer Memory Card International Organization (PCMCIA) to refer to this type of PC card.
"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.



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.
<i>Italic text</i>	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.
	Shows the key you must press on the reader. For example, “press  ” directs you to press the key labeled “Enter” on the reader keypad.
	Shows a series of reader keys you must press and release in the order shown. For example, “Press     to boot the reader.”
	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  -  to enter Control mode.”

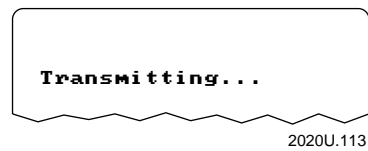
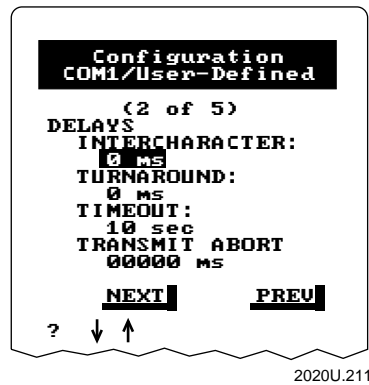
Format Conventions for Bar Codes

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:



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:



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 :

```
loadadd c:\janus\config.sys c:\atadr\*. * 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.
<i>Italic text</i>	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.
<i>0100 Access Point User's Manual</i>	062367
<i>0110 Access Point User's Manual</i>	065053
<i>The Bar Code Book</i>	051241
<i>Data Communications Reference Manual</i>	044737
DOS user's manual	064673
<i>IRL Programming Reference Manual</i>	048609
<i>JANUS 2.4 GHz Installation Utility (4MB) User's Manual</i>	064673
<i>JANUS 2.4 GHz Terminal Emulation Quick Reference Guide</i>	063682
<i>JANUS 900 MHz Radio Frequency Quick Reference Guide</i>	060207
<i>JANUS 2010 and 2020 Optical Link Adapter Quick Reference Guide</i>	058431
<i>JANUS 2020 Battery Charger Quick Reference Guide</i>	059955
<i>JANUS 2020 Communications Dock Quick Reference Guide</i>	059954
<i>JANUS Application Simulator User's Manual</i>	062778
<i>JANUS PSK for Ada Reference Manual</i>	062038
<i>JANUS PSK for Basic Reference Manual</i>	063191
<i>JANUS PSK for C++ Reference Manual</i>	062133
<i>JANUS 900 MHz Terminal Emulation Quick Reference Guide</i>	062178
<i>PC-IRL Reference Manual</i>	049212
<i>RF System/9180 User's Manual</i>	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.”

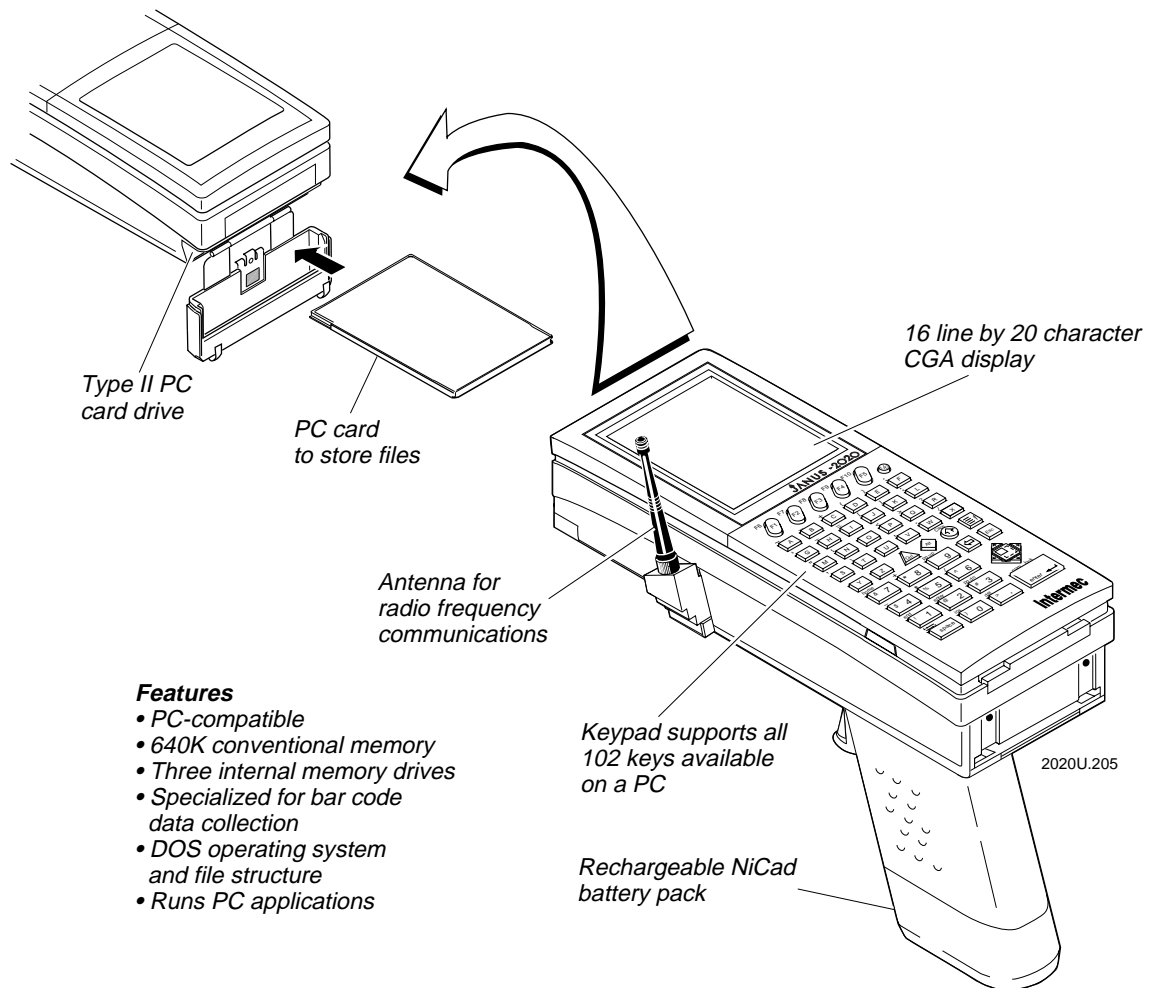


Getting Started

This chapter introduces the JANUS 2020 reader and explains how to get your new reader up and running.

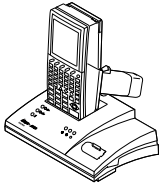
What Is the JANUS 2020 Reader?

The JANUS 2020 is a combination hand-held bar code reader and computer. It has a 386 microprocessor, contains Microsoft MS-DOS, and is PC-compatible.

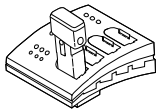


Accessories for the Reader

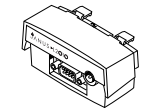
You can use these accessories with the JANUS 2020 reader:



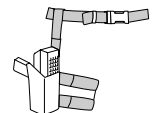
JD2020 Communications Dock The dock allows the reader to communicate with a host computer and other devices through two serial ports, while simultaneously charging the NiCad battery pack in the reader. The dock also has a slot to charge a spare NiCad battery pack.



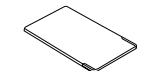
JZ2020 Battery Charger The charger lets you charge up to four NiCad battery packs at one time. The battery charger senses when a battery pack is fully charged and will not overcharge it, ensuring long and consistent battery pack life.



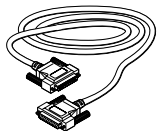
JL2010 Optical Link Adapter The optical link adapter allows the reader to communicate with a host computer or other device by means of an RS-232 serial port. You can also connect a power supply to the optical link adapter to operate the reader and charge the NiCad battery pack.



JH2020 Leg Holster The holster is a convenient way to carry the reader. The holster attaches to a belt with an adjustable Velcro tether, and two adjustable leg straps hold the reader firmly and comfortably in place.



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.

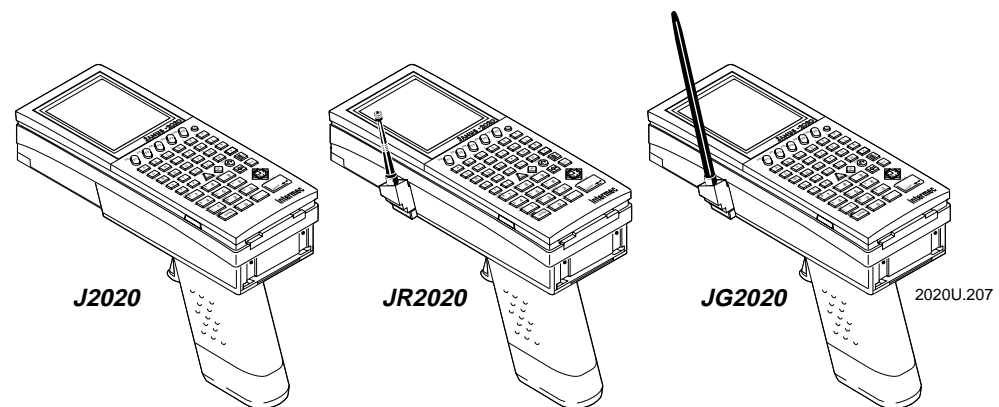
JANUS 2020 Models and Options

The JANUS family of 2020 readers includes these models:

J2020 The basic reader is a combination hand-held programmable data collection computer. The reader has a Type II PC card drive for Type I or Type II memory and expansion cards and uses a serial port for data communications.

JR2020 The JR2020 complements the functionality of the basic reader with an 900 MHz RF interface.

JG2020 The JG2020 complements the functionality of the basic reader with an 2.4 GHz RF interface.



These options are available for the JANUS 2020 reader:

- Alphanumeric keypad that is available in English, French, German, Italian, and Spanish.
- Large numeric keypad that is available in English.
- Standard or long-range laser scanner.
- Terminal emulation (TE) software and keypads that let the reader emulate IBM 3270, IBM 5250, or VT100/220/320 and ANSI terminals.
- Radio frequency communications available for 900 MHz and 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 is 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

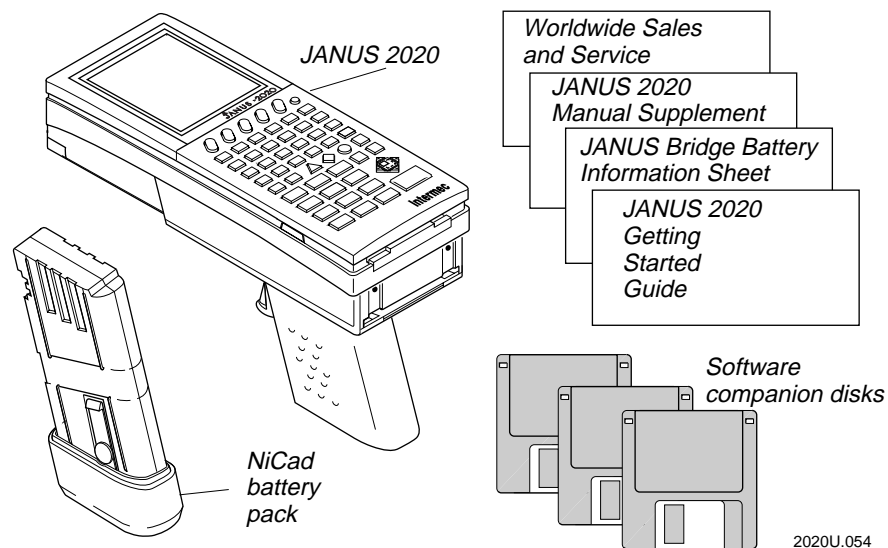
Follow these steps to get your new JANUS 2020 reader up and running:

1. Unpack the reader, 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. Verify that the reader is operating correctly.

These steps are described in detail in the next sections.

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.

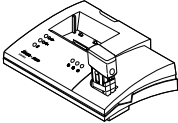
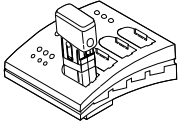
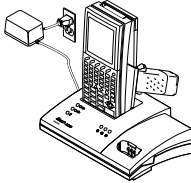
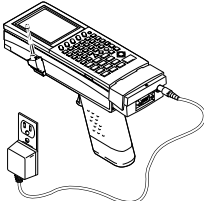


A set of companion disks are included in the box with the reader. These disks contain software you can use on the reader. Look on the Boot Utilities companion disk 1 for a README.DOC file. This file may contain information about the reader that was not available when this manual was published. You can 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.

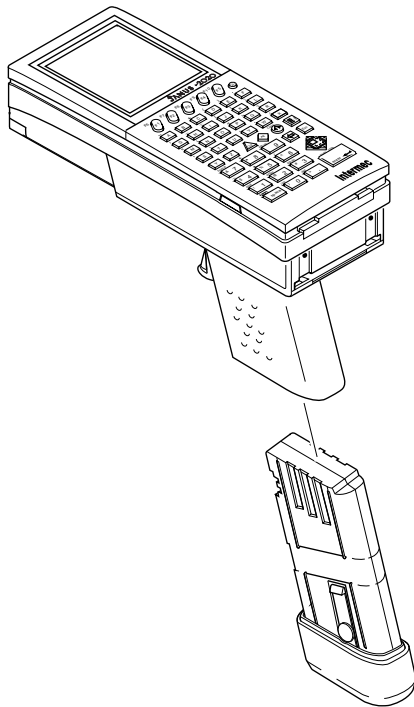
Method	Description	Time to Charge
	Place the battery pack in the battery slot of the communications dock.	About 2.5 hours
	Place the battery pack in the battery charger.	About 2.5 hours
	Install the battery pack in the reader, place the reader in the communications dock reader slot, and connect an external 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

Next, you install the newly charged battery pack into the reader.

To install the battery pack

1. Hold the reader with the handle pointing down.
2. Position the battery pack underneath the empty reader handle with the molded rubber end of the pack on the bottom.
3. Slide the battery pack up into the reader handle. Push very firmly on the bottom of the pack until it locks into the handle. You will hear two clicks as the battery pack latches into the reader handle.




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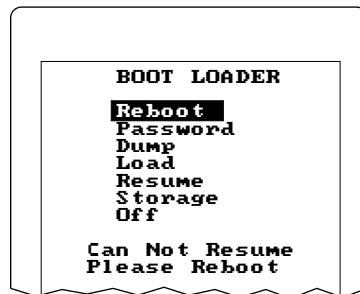
Turning On the Reader for the First Time

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.

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

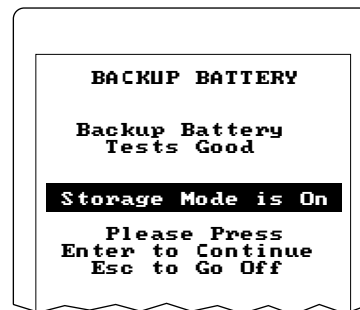


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
2. Press  to reboot the reader. The reader performs a cold boot, which is described in Chapter 9, “Booting and Resetting the Reader.”

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.

The BACKUP BATTERY screen appears, describing the status of the lithium bridge battery.



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3. Press  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. Scan this bar code at the DOS prompt:



TIME


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

To type a colon on an alphanumeric keypad, press  . To type a colon on a large numeric keypad, press  .

3. Scan this bar code at the DOS prompt:




DATE

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

To type a dash on an alphanumeric keypad, press  . To type a dash on a large numeric keypad, press    .

Verifying That the Reader Is Operating Correctly

Once you have turned on the reader, 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 :

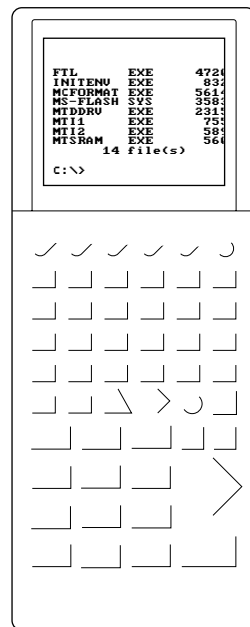
```
dir
```

Or scan this bar code:



DIR

The directory of the current drive appears on the reader display.



2020U.217

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 ⏸ key in the upper right corner of the keypad, as shown in this illustration:

When you press ⏸ 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.

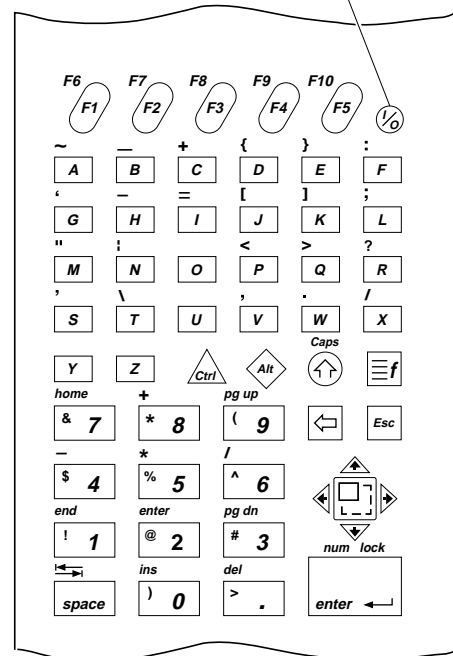
When you press ⏸ to turn the reader back on, the reader resumes exactly where it was when you turned it off.

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.

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



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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

To learn to use the reader's keypad, display, audio signals, batteries, COM ports, drives, and scanner

To learn to use the reader's software and manage its disk space and memory

To learn to use PC cards in the reader's PC card drive or drives

To learn about configuration files and ways to change the reader's configuration

To add the reader to your data collection system and learn how to communicate with other devices

To run IRL programs on the reader

To configure the reader for an international language and learn to use the matching keypad

To learn to boot the reader, solve problems, and respond to error messages

See This Chapter

Chapter 2, "Learning How to Use the Reader"

Chapter 3, "Learning About the Software"

Chapter 4, "Using PC Cards in the Reader"

Chapter 5, "Configuring the Reader"

Chapter 6, "Networking the Reader"

Chapter 7, "Working With IRL"

Chapter 8, "Preparing the Reader for International Use"

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, drives, and laser scanner.

JANUS 2020 Features

This chapter tells you about these features on the JANUS 2020 reader:

Laser scanner

The reader has a built-in laser scanner to scan bar code data. There are two scanner options: the standard laser scanner scans bar code labels up to 25 inches away, or the long-range laser scanner scans bar code labels up to 60 inches away.

Display

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

Communications port

You can use radio frequency (RF) on the reader to communicate with the RF controller.

Keypad

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

Drives

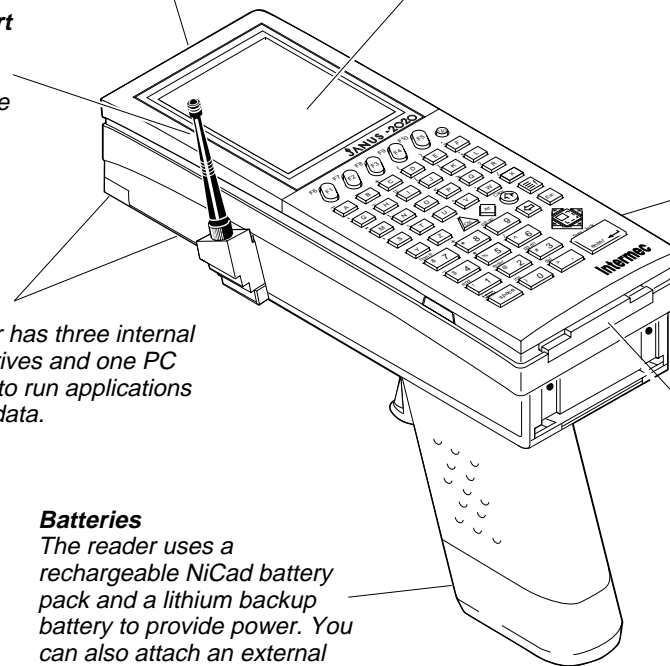
The reader has three internal memory drives and one PC card drive to run applications and store data.

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 backup battery to provide power. You can also attach an external power supply.



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Using the Alphanumeric Keypad

The JANUS 2020 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.

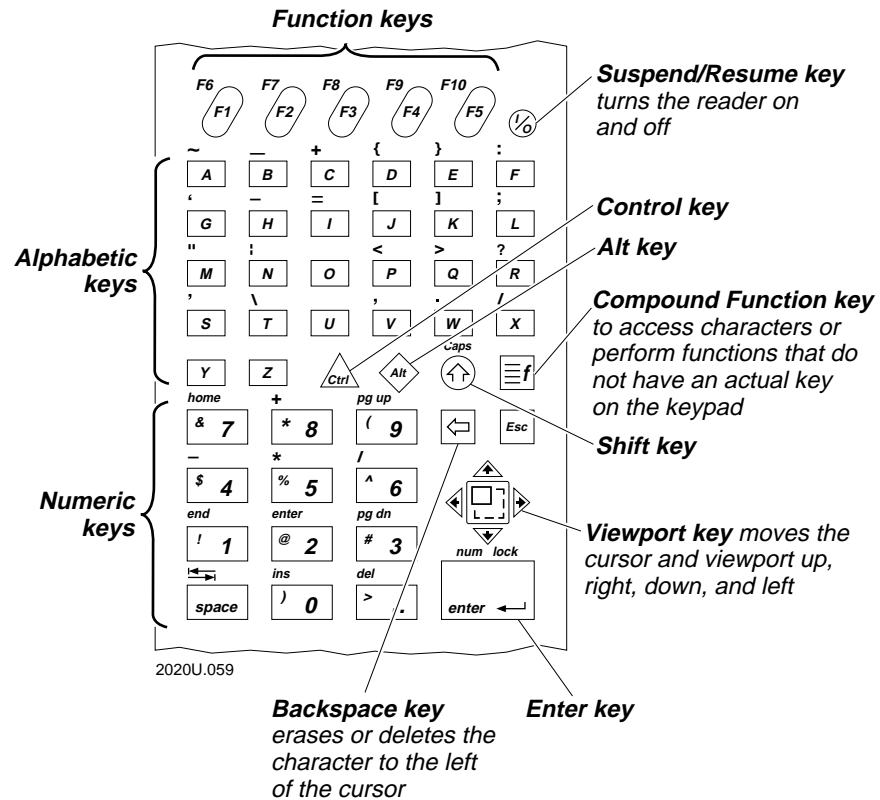
The alphanumeric keypad is available in English, French, German, Italian, and Spanish. For help with an international keypad, see Chapter 8, "Preparing the Reader for International Use."

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 2020 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.

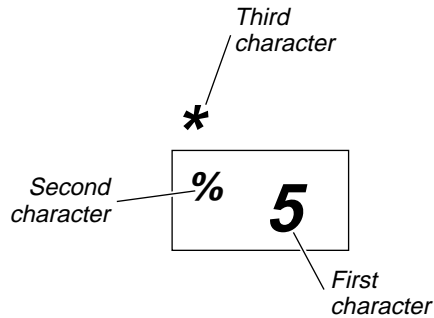
Finding the Special Keys



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



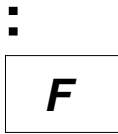
How to Type the Characters Printed on the Keypad

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

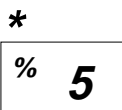


Character	Description	To Type the Character
First	The first character is the one in the middle or lower right corner of the key. If there are two characters printed on the key, it is the larger character. Every key on the keypad has a first character.	<ul style="list-style-type: none"> Press the key 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 through Z) do not show the second key, but it is the uppercase version of the letter.	<ol style="list-style-type: none"> Press . 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.	<ol style="list-style-type: none"> Press . Press the key the character appears above.

To practice using an alphanumeric keypad, type these characters



- To type a lowercase f, press .
- To type an uppercase F, press . Press .
- To type a colon (:), press . Press .



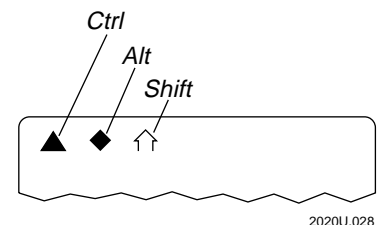
- To type the number 5, press .
- To type the percent sign (%), press . Press .
- To type the asterisk (*), press . Press .

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 , , 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.



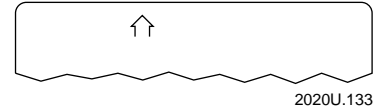
To flush the , , or key from the buffer without performing any action, just press the key again. The icon disappears from the display.


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 , , 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 , , 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.












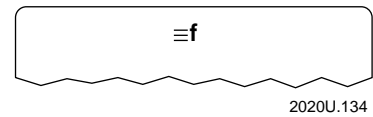
2. Press the second key. For example, press  to type the uppercase letter A. The Shift icon disappears from the reader's display.



Or, to flush the key from the keypad buffer without performing any action, press , , 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  key to access characters or perform functions that do not have an actual key on the keypad.

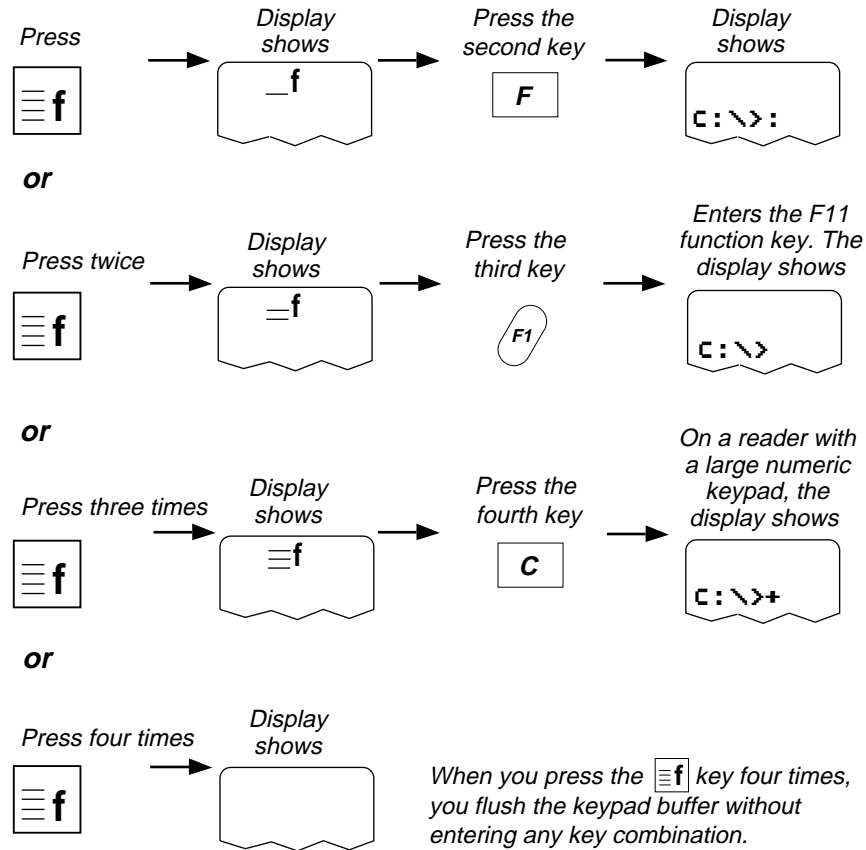
The  key works like the , , and  keys. When you press , the key is held in a buffer and the Compound Function key icon appears on the reader's display. Once you press a key other than , the key combination is entered into the reader and the icon disappears from the display. For example, you press   to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



The  key has three levels to access additional key combinations that are not displayed on the keypad. You can press  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






2020U.032

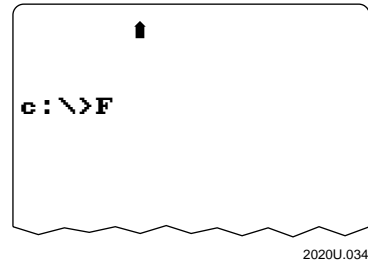
Note: To enter the third key combination shown above, , you must use a large numeric keypad.

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 .
2. Press . The Caps Lock icon appears on the reader's display.
3. Type an alphabetic character. The letter appears as an uppercase letter on the reader's display. For example, press  to type an uppercase letter F.



To disable Caps Lock

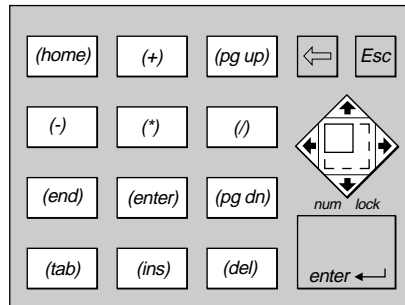
1. Press .
2. Press . The Caps Lock icon disappears from the reader's display.
3. Type an alphabetic character. The letter appears as a lowercase letter on the reader's display.

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

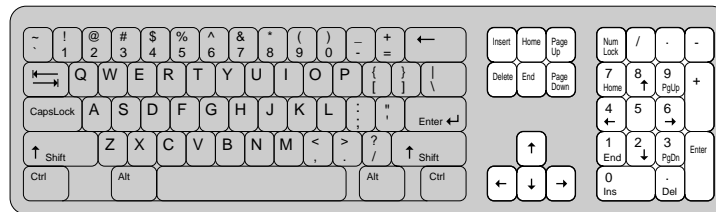
Learning How to Use the Cursor Keys

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 2020



Cursor keypads on PC keyboard





















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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.

Using the Cursor Keys

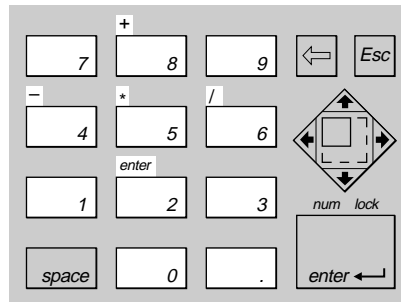
Cursor Key	To Use the Key	Description
Home	Press  	Moves the cursor to the top left corner of the display. If you are at the DOS prompt, moves the cursor to the beginning of the line.
End	Press  	Moves the cursor to the end of the last line displayed on the screen.
Page up	Press  	Moves the cursor up 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  	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  	Each character you type is inserted after the cursor until you exit Insert mode by pressing   again. Normally, you type text in Overwrite mode. Characters are typed over the existing characters on the screen.
Delete	Press  	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

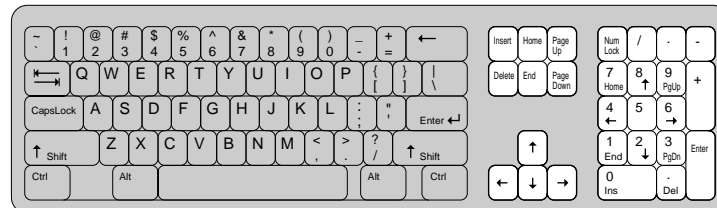
You can use the number pad to move the cursor around the screen and to type numbers and mathematical symbols. The reader's number pad is designed to work like the number pad on a regular PC keyboard. If you are programming or using an application that requires the scan code for a character from the PC's 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 2020



Number pad on PC keyboard



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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 with 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   .

To turn Num Lock on



Press  .

To turn Num Lock off


Press  .

To disable the number pad

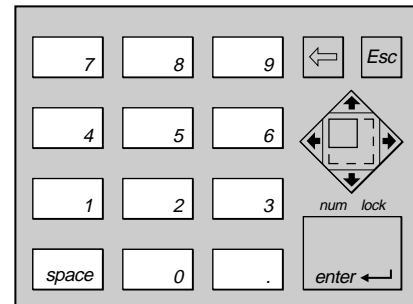
Press   .

With the number pad enabled, you press   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

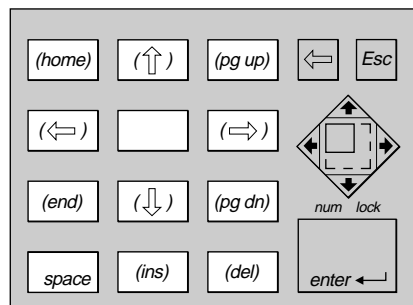
To type the characters in this figure, press a key on the number pad. For example, to type the number 2, press .

You can also type any ASCII character in the extended character set. For help, see “How to Enter ASCII Characters” later in this chapter.



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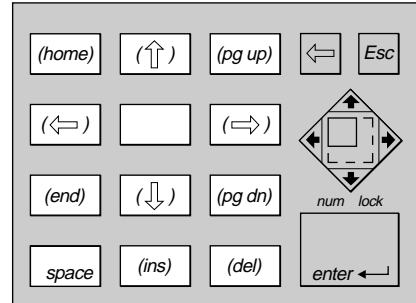
To use the cursor keys in this figure, press  and then press a key on the number pad. For example, to page up (pg up), press  .



2020U.127

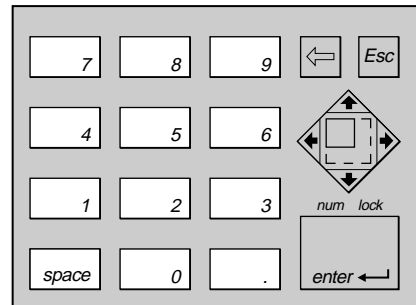
To type these keys with the number pad enabled and Num Lock turned off

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 **7**.



2020U.127

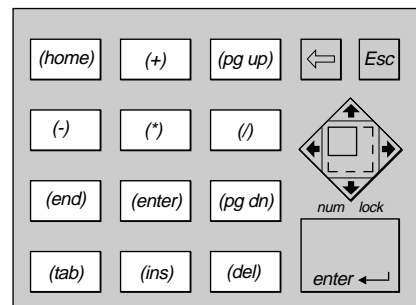
To type the characters in this figure, press **↑** and then press a key on the number pad. For example, to type the number 6, press **↑ 6**.



2020U.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 **⇧** and then press a key on the number pad. For example, to type the plus (+) sign, press **⇧ 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 .
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.
Nothing happens	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   to find out the status of the number pad.

Displays	What Do You Do Next?
%	Press  to erase the character. Press    to enable the number pad. Press   to turn the Num Lock on.
5	Press  to erase the character. Press   to turn the Num Lock on.
Nothing happens	Go to Step 2.

2. Press and hold .
3. Type the three-digit decimal ASCII value for the character. The value cannot be larger than 255. For example, type    for the @ symbol.
4. Release the  key. The ASCII character appears on the reader's display.
5. To exit and disable the number pad, press   .

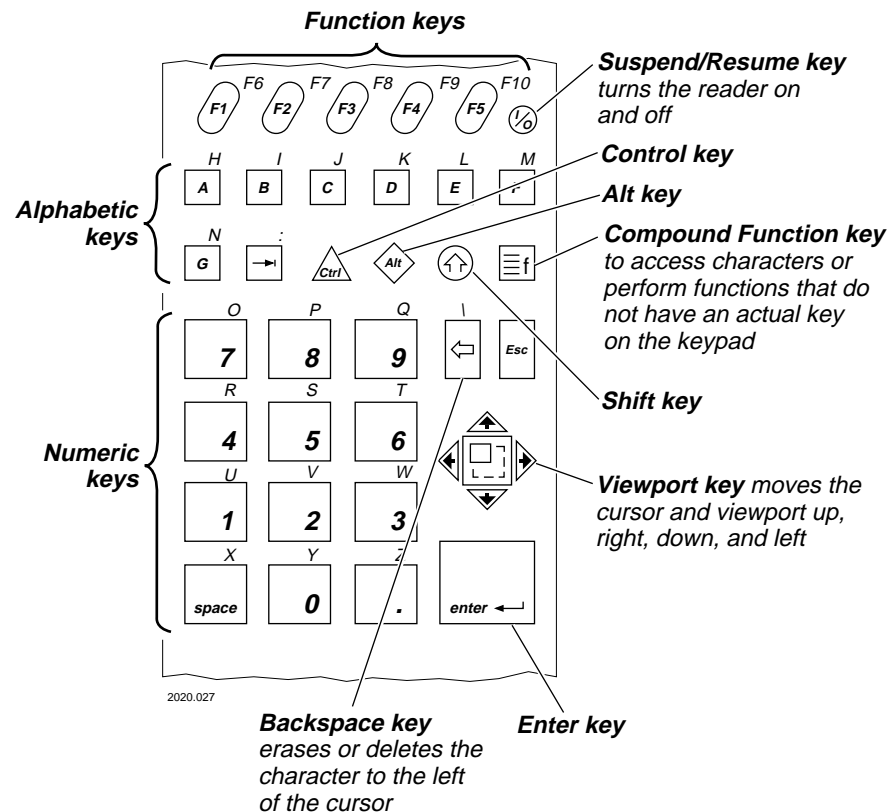
Using the Large Numeric Keypad

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 that are 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.

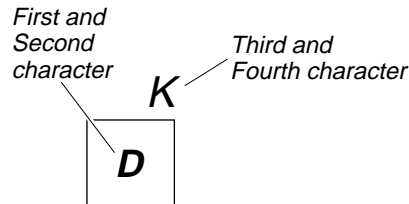
Finding the Special Keys





Make sure you can find these special keys on the large numeric keypad.



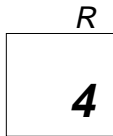
How to Type the Characters Printed on the Keypad

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



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.	<ul style="list-style-type: none"> 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.	<ol style="list-style-type: none"> Press . 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.	<ol style="list-style-type: none"> Press . 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.	<ol style="list-style-type: none"> Press . Press . Press the key the character appears above.

To practice using a large numeric keypad, type these characters



- To type the number 4, press .
- To type the lowercase r, press . Press .
- To type the uppercase R, press . Press . Press .



- To type a lowercase d, press .
- To type an uppercase D, press . Press .
- To type a lowercase k, press . Press .
- To type an uppercase K, press . Press . Press .

How to Type Other Characters

The large numeric keypad does not have an actual key for every character and function available. You use the , , , and 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

See “How the Ctrl, Alt, and Shift Keys Work” earlier in this chapter.



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.”

through

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.”

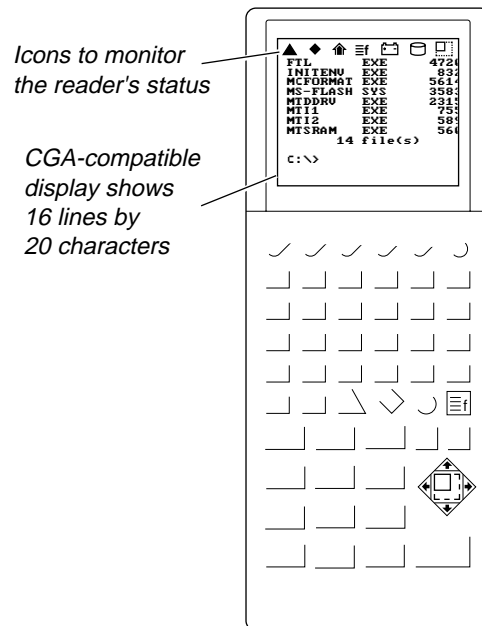
How to Use the Reader's Display

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.

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.



2020U.033

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 "Display Setup" 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)	<p>You can set these parameters:</p> <p>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 "Display Setup" in Chapter 12.</p> <p>Scroll Line: Set the line at which the display scrolls to 8, 16, or 25. <i>Note: If you run an application that uses a 25 line by 80 character display, the reader display will scroll at line 25.</i></p> <p>Character Height: Set normal- or double-height characters.</p>
16 x 20 (16 lines by 20 characters)	<p>These parameters are automatically set.</p> <p>Video Mode: Normal-width characters</p> <p>Scroll Line: Line 16</p> <p>Character Height: Normal-height characters</p>
8 x 20 (8 lines by 20 characters)	<p>These parameters are automatically set:</p> <p>Video Mode: Normal-width characters</p> <p>Scroll Line: Line 8</p> <p>Character Height: Double-height characters</p>
16 x 10 (16 lines by 10 characters)	<p>These parameters are automatically set:</p> <p>Video Mode: Double-width characters</p> <p>Scroll Line: Line 16</p> <p>Character Height: Normal-height characters</p>
8 x 10 (8 lines by 10 characters)	<p>These parameters are automatically set:</p> <p>Video Mode: Double-width characters</p> <p>Scroll Line: Line 8</p> <p>Character Height: Double-height characters</p>

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. The other display sizes are not DOS standard and are for use 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).

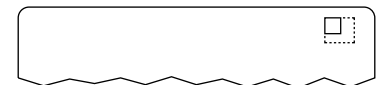
For help on programming the reader or setting Graphics mode, see your JANUS PSK reference manual.

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.

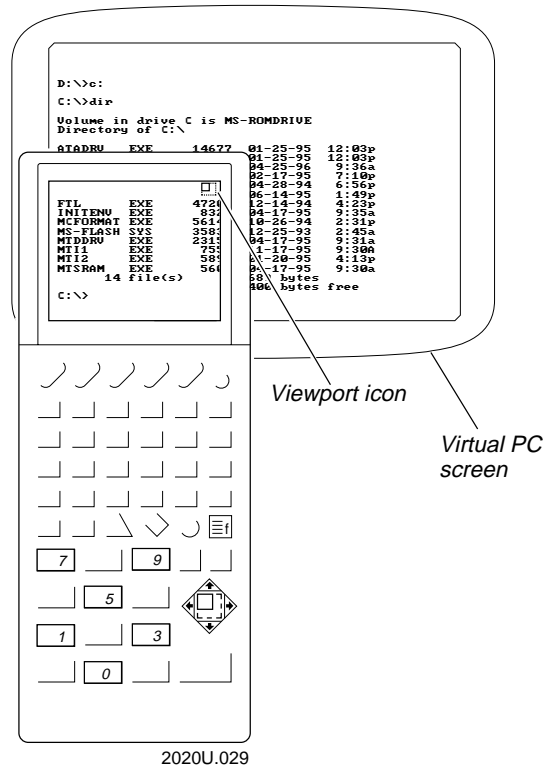


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Note: To use the display as a viewport, you must configure the reader display size to 25 x 80. For help, see "Display Setup" in Chapter 12.

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.



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 `⇨`. The viewport moves one “step” to the right to see 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 `⇨ ⇨ 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  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 “Viewport Movement Steps” in Chapter 12.

Moving the Viewport

You can configure the reader to have:

























- the viewport automatically follow the cursor.
- the operator manually move the viewport.

For help, see “Viewport Movement Mode” 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	 →	Viewport Right  *.*
One step to the left	 ←	Viewport Left  *%.*
Up one step	 ↑	Viewport Up  *%/.*
Down one step	 ↓	Viewport Down  *%+.*

Moving the Viewport (continued)

To Move the Viewport	Press These Keys	Or Scan This Bar Code
To the lower right corner of the virtual display	  	Viewport End  *..%.*
To the upper left corner of the virtual display	  	Viewport Home  *..%/.*
Up one page	  	Viewport Page Up  *..%+.*
Down one page	  	Viewport Page Down  *..%-.*
Moves the viewport to the cursor. This command may not work if you are using the reader in Graphics mode.	  	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.	  	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

Move the viewport to the cursor's position. This command may not work if you are using the reader in Graphics mode.

Press These Keys**Or Scan This Bar Code**

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.



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 , press , and then release both keys. The  and  icons appear on the reader's display.
2. Press any of these key sequences to adjust the display.

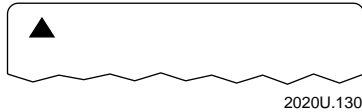
Press	To Adjust the Display
	Make the display contrast darker.
	Make the display contrast lighter.
	Turns the display backlight on or off.
	Change the scroll line to line 8.
	Change the scroll line to line 16.
	Change the scroll line to line 25.
	Change the characters to normal height.
	Change the characters to double height.
	Change the viewport to automatically follow the cursor.
	Change the viewport so that you must manually move it.
	Make the beep volume quieter.
	Make the beep volume louder.

3. Press  to exit Control mode. The  and  icons disappear from the reader's display.

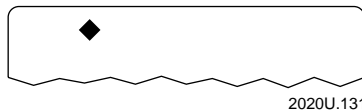
Note: The display parameters you set in Control mode are reset to the default configuration value when you warm boot the reader. Display Contrast is reset only when you cold boot the reader.

Understanding the Icons

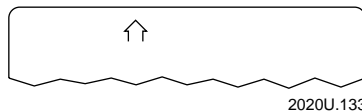
You can use the reader's icons to monitor the status of special keys, battery power, PC card drive, viewport movement, and RF communications. As you use the reader, the icons are turned on and off in the top line of the reader display to indicate the current status.



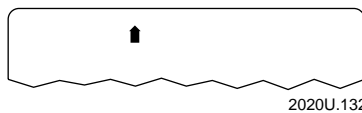
Ctrl This icon appears when you press \triangle_{Ctrl} . The key is stored in the keypad buffer until you press another key. When you press a second key, the key combination is entered into the reader and the icon disappears.



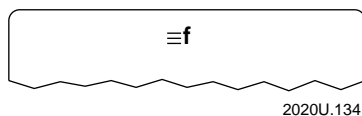
Alt This icon appears when you press \diamond_{Alt} . The key is stored in the keypad buffer until you press another key. When you press a second key, the key combination is entered into the reader and the icon disappears.



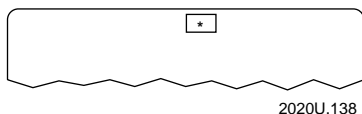
Shift This icon appears when you press \uparrow_{Shift} . The key is stored in the keypad buffer until you press another key. When you press a second key, the key combination is entered into the reader and the icon disappears.



Caps Lock This icon appears when you press $\square_{Caps} \uparrow_{Shift}$ to enable the Caps Lock feature and type all alphabetic characters as uppercase letters. When you press $\square_{Caps} \uparrow_{Shift}$ to disable Caps Lock, the icon disappears.

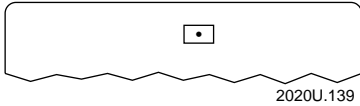


Compound Function This icon appears when you press \equiv_{CF} . You can press \equiv_{CF} up to three times plus one more key to access a wide range of key combinations. Each time you press \equiv_{CF} , an additional line appears on the Compound Function key icon to indicate the number of times you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

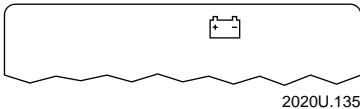


Connected This icon contains an asterisk. It blinks on a JANUS display when the RF interface is either actively channel searching or trying to reestablish RF communications with the network controller. When the Connect icon stays on, the RF interface is connected to a network controller. When RF communications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

Understanding the Icons (continued)



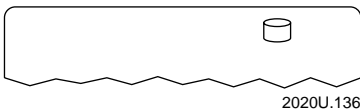
Data This icon contains a period. It appears on a JANUS display when data is buffered in the RF interface. The data is either being transmitted to the network controller, or received data has not been accepted by the reader's application. When no data is being buffered in the RF interface, the Data icon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



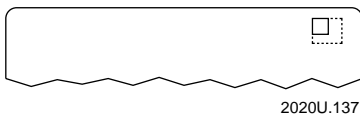
Battery This icon turns on and stays on when the NiCad battery pack has approximately 15 to 45 minutes of power left. If you are using an RF JANUS device, you should replace or recharge the battery pack immediately because you will soon lose RF communications. For help, see your JANUS RF documentation.

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 and RF communications are turned off 15 seconds after the first low battery chirp.

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



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. If you are using an SRAM card and the card's lithium battery is low, the icon turns on and off every 2 seconds. For help on changing the card's lithium battery, see "Replacing Lithium Batteries in an SRAM Card" in Chapter 4.



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 will 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."


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	The reader sounds this beep sequence whenever you update the reader's configuration.
Medium beep, high beep	The reader recognized the PC card that you inserted. You can begin using the card.

Understanding the Reader's Audio Signals (continued)

Beep Sequence	Description
High beep, medium beep	You hear this beep sequence when you remove a PC card.
Click	The reader sounds a click each time you press a key. You can disable the keyclick. For help, see "Keypad Clicker" 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 sounds a chirp every 5 seconds when the NiCad battery pack is low, or every 15 seconds when the lithium bridge battery is low. For help, see "Recognizing a Low or Discharged Battery" 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.

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

To demonstrate the reader's audio signals




1. Copy the IMBEEP.EXE file from 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 :

imbEEP

Or scan this bar code:



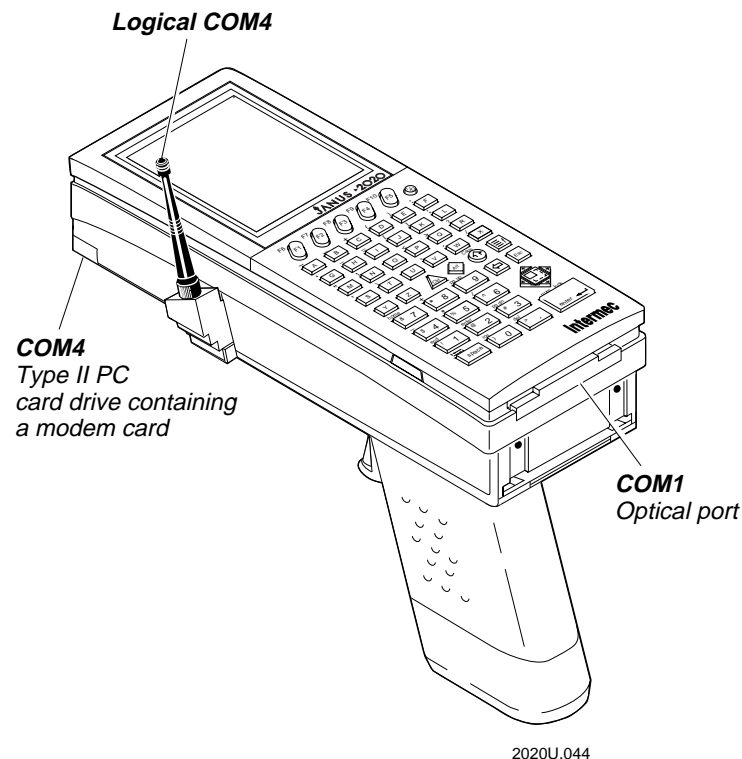
IMBEEP

4. Follow the instructions on the screen. Press a letter from  to  to listen to each audio signal the reader sounds.
5. Press  to exit the program.

Locating the Communications Ports

Communications ports, also called COM ports, are locations from which data can be 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 devices.



You can communicate with other RS-232 devices, such as modems and terminals, through COM1 by:

- using a JD2020 Communications Dock.
- using a JL2010 Optical Link Adapter.
- lining 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."

Learning About the Reader's Batteries

There are two batteries in the JANUS 2020 reader:

Lithium Bridge Battery This battery backs up the RAM and clock when the NiCad battery pack is removed from the reader.

NiCad (Nickel-Cadmium) Battery Pack This battery provides the main power source to operate the reader.

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 $\text{\textcircled{0}}$ 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.*

**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

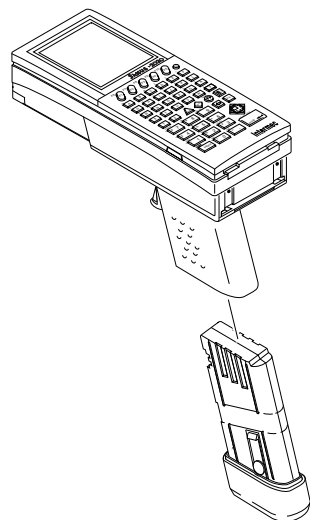
La pile au lithium ne peut être remplacée que par un technicien de service Intermec. Le fait d'ouvrir l'unité annule la garantie et peut endommager les pièces internes.

NiCad Battery Pack

The NiCad battery pack is the main power source for the reader. Always keep a charged battery pack in the reader to preserve the life of the lithium bridge battery. When you remove a battery pack, insert another charged battery pack in the reader. If you leave the reader without at least a partially charged battery pack installed, you will prematurely discharge the lithium bridge battery. For help, see “Managing Your Battery Power” later in this chapter.

Installing the Battery Pack

1. Hold the reader with the handle pointing down.
2. Position the battery pack underneath the empty reader handle with the molded rubber end of the pack on the bottom.
3. Slide the battery pack up into the reader handle. Push very firmly on the bottom of the pack until it locks into the handle. You will hear two clicks as the battery pack latches into the reader handle.



2020U.002

Removing the Battery Pack

The battery pack is encased in the reader handle.



Caution

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

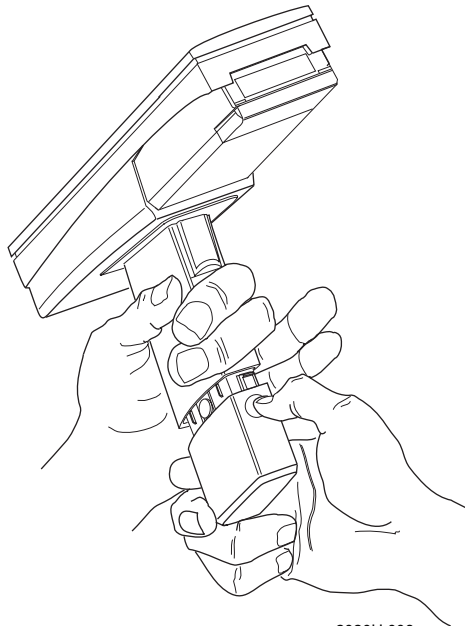
Conseil

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

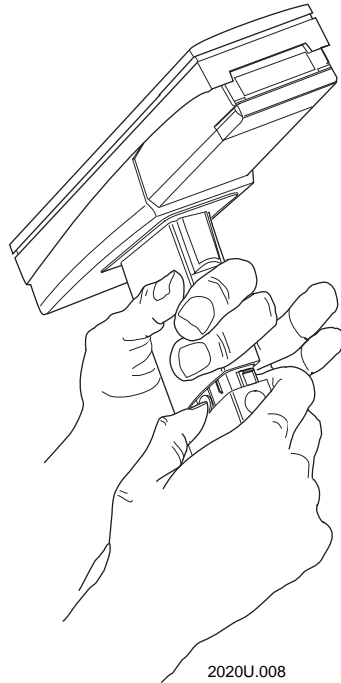
1. Switch off the reader by pressing (10).
2. Hold the reader with the handle pointing down. Press firmly on the top part of the raised circular button and, at the same time, push the battery pack up until you hear a click. Pull down gently. The pack will release from the handle and slide down approximately 0.5 inch (1.27 cm) before stopping.

Note: Do not hold the reader with the handle up to remove the battery pack. Hold it with the handle pointing toward the floor.




2020U.006

3. With your thumb and forefinger, firmly squeeze the two yellow buttons and push the pack up a little to release the latches inside the handle. Pull down gently and the battery pack will slide out of the handle.



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  :

power

Or scan this bar code:



POWER

The Power Management Status screen appears similar to this example:

```

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

2020U.037

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 $\pm 10\%$. 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 2020 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.

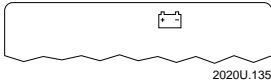
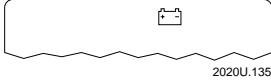
Disposing of the NiCad Battery Pack

The materials used in the construction of the JANUS 2020 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 you see the Battery icon or hear a chirping sound, the reader is indicating that the NiCad battery pack or the 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
 <p>NiCad battery pack is low (15 to 45 minutes left).</p>	<ul style="list-style-type: none"> The Battery icon turns on and stays on. <p>If you are using a J2020, replace the battery pack soon.</p> <p>If you are using a JANUS RF device, replace the battery pack immediately because you will soon lose RF communications.</p>
 <p>NiCad battery pack is critically low (1 minute left).</p>	<ul style="list-style-type: none"> 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. <p>Replace the battery pack immediately, or attach an external power supply.</p> <p>The laser scanner and RF communications are turned off 15 seconds after the first chirp.</p>

Low NiCad or Lithium Battery Warning



Lithium battery is critically low (1 minute left).

- 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 valid data, and double-clicks when you press any key.
- The Backup Battery screen appears each time you turn the reader on.

What You Need to Do

You must 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 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.	<ul style="list-style-type: none"> • Put the reader in Suspend mode. • Use the Automatic Shutoff feature. 	<p>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).</p> <p>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 "Automatic Shutoff" in Chapter 12.</p>
You will not use the reader again for 1 week or longer.	<ul style="list-style-type: none"> • Put the reader in Storage mode and remove the NiCad battery pack. 	<p>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</p>

Preserve the Bridge Battery” in Chapter 9.

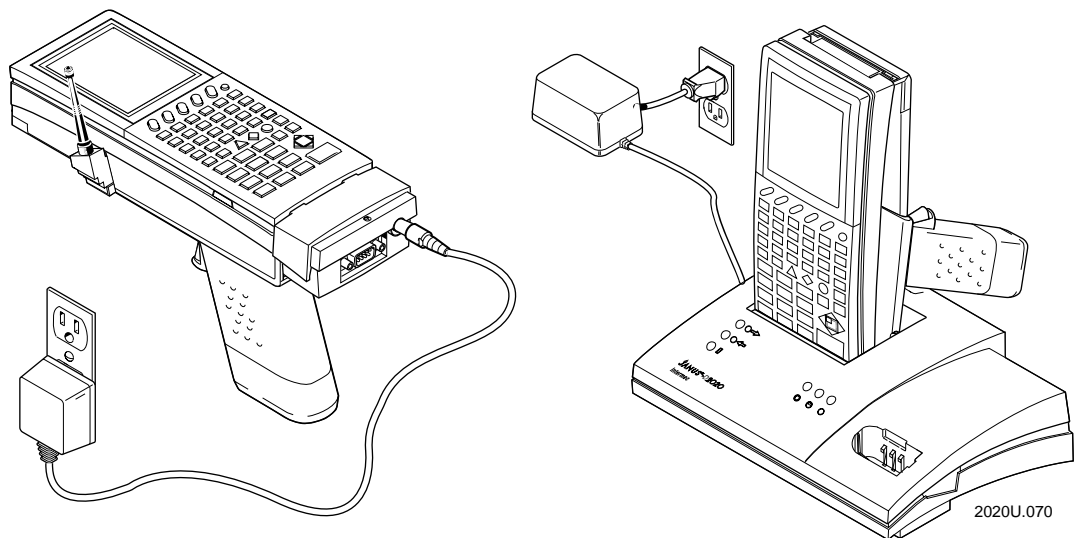
Situation	Ways to Save Battery Power	Description
You are operating the reader and the NiCad battery pack charge becomes low.	<ul style="list-style-type: none">• Remove the battery pack and insert another charged battery pack.• Attach an external power supply to charge the battery pack installed in the 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 "NiCad Battery Pack" earlier in this chapter.
You are using RF communications.	<ul style="list-style-type: none">• Use the Duty Cycle parameters.	Duty Cycle automatically alternates RF communications between Receiving and Standby mode. In Standby mode, the JANUS device uses less NiCad battery pack power.

Using an External Power Supply

You can operate the reader using an external power supply with the following JANUS 2020 accessories:

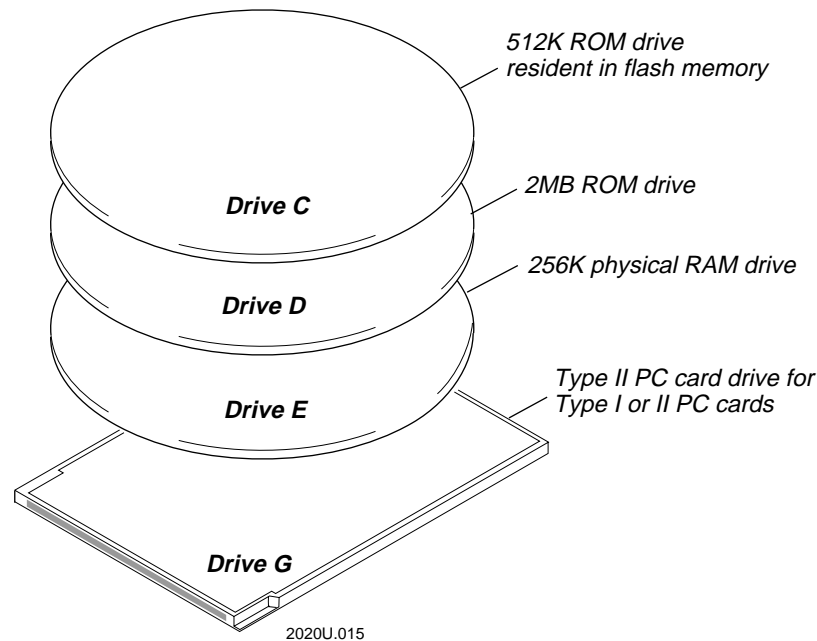
- Communications dock
- Optical link adapter connected to a power supply

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.



Defining the Reader's Drives

The reader has three standard memory drives and one PC card drive to run applications and store data.



Drive C is a 512K ROM drive that resides in flash memory. This drive is upgradeable, but has limited write capability. Drive C uses a file allocation table (FAT) type format. The startup files, AUTOEXEC.BAT and CONFIG.SYS files, are stored on drive C. You can also use the drive to store applications and files. You use special utilities to add, change, or delete files on drive C. For help, see Chapter 3, “Learning About the Software.”

Drive D is a 2MB ROM drive that uses a FAT-type format. The reader’s applications and DOS system files are stored on drive D. You use special utilities to add, change, or delete files on drive D. For help, see Chapter 3, “Learning About the Software.”

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. Drive E can also be reduced or eliminated to free extended memory and use it for an application. For help, see “Creating and Using a Physical RAM Drive” in Chapter 3.

Drive G is a 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 (Personal Computer Memory Card International Association) Standard 2.1. You use memory cards to store applications or data files. You 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."

Note: Drive F is a placeholder since there is only one PC card drive on the JANUS 2020 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 G. For help on selecting a PC card, see Chapter 4, "Using PC Cards in the Reader."

Applications and look-up tables Use drive C or E to store all applications and look-up 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 G. For help on 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.

Using the Laser Scanner

You use the built-in laser scanner on the JANUS 2020 reader to scan and enter bar code data. The laser scanner emits a beam of laser light that is visible on a bar code label as you scan it. The reader decodes the bar code label and enters the data or command you scanned.



Warning

Do not look directly into the window area or at a reflection of the laser beam while the laser is scanning. Long-term exposure to the laser beam can damage your vision.

Avertissement


Ne regardez pas directement la réflexion d'un rayon laser ou dans la fenêtre du laser lorsque celui-ci est en opération. Si vous regardez trop longtemps un rayon laser, cela peut endommager votre vue.

Scanning a Label With the Reader

There are two types of scanners available:

- Standard laser scanners can scan bar code labels up to 25 inches away, depending on the bar code height and density.
- Long-range laser scanners can scan bar code labels up to 60 inches away, depending on the bar code height and density.

To scan a bar code label with a standard scanner

1. Press  to turn the reader on.
2. Hold the reader at a slight angle a few inches from the bar code label. The laser scanner window must be pointing toward the label.
3. Pull and hold the yellow trigger on the reader to activate the scanner. Direct the beam so that it falls across all bars in the bar code label. After reading the label, the reader beeps and the scanner turns off.
4. Release the scanner trigger.

To scan bar code labels with a long-range scanner

1. Press I/O to turn the reader on.
2. Point the laser scanner toward the bar code label.
3. Pull and hold the yellow trigger on the reader to activate the scanner. The spotting beam (a small red dot) lights for about half a second to help you aim the scanner. The spotting beam automatically spreads into a normal sweeping laser line.
4. Direct the beam so that it falls across all bars in the bar code label. The reader beeps when it reads the label.

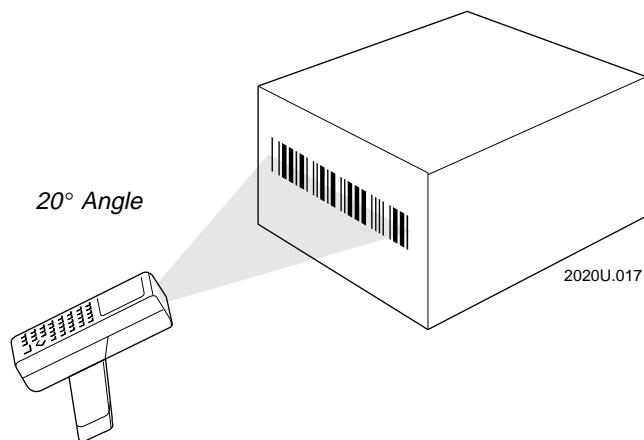


Danger

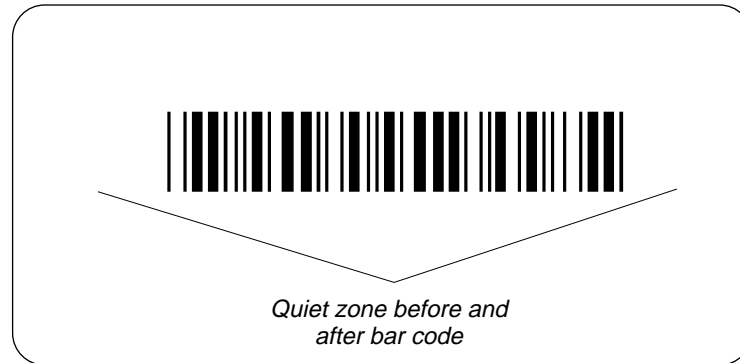
Avoid direct beam exposure. Do not look directly into the window area or at a reflection of the laser beam while the laser is on. Exposure to the laser beam can damage you vision.

Danger

Évitez l'exposition de l'œil directe. Ne regardez pas directement la réflexion d'un rayon laser ou dans la fenêtre du laser lorsque celui-ci est en opération. Si vous regardez un rayon laser, cela peut endommager votre vue.



To successfully read a bar code label, the laser beam must see all the bars in a label and a “quiet zone” at each end of the label. A quiet zone is a clean, non-printed space.



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With either the standard or long-range scanner, you will have the best success if you hold the reader so that the horizontal reading angle is near zero and the vertical reading angle is near 20 degrees. Optimum angles vary with the type and printing quality of the bar code label, the distance of the reader from the label, and the lighting of the work area.

Note: You should not scan the bar code label “straight on.” In a 2-degree conical “dead zone” directly above the label, the laser beam may reflect back into the scanner window and prevent the reader from reading the label.

Laser Scanner Options

You can set several configuration command parameters to configure the laser scanner to meet your needs. The parameters available are:

Decode Security 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.

Scan Ahead Allows you to scan a number of bar code labels at one time. The labels are held in a stack until the reader can process the data.

Scanner Mode Defines how the scanner operates when the trigger is pulled. In One-Shot mode, the laser turns on and stays on until you release the trigger or a label is decoded. In Automatic mode, you can continuously scan bar code labels without having to release the trigger between labels.

Scanner Redundancy Defines the number of scans (voting) the scanner takes of the same label. When set, voting allows the reader to decode the same bar code label multiple times during a single-trigger event, and compare the decoded information before signaling a good read. The scanner redundancy parameter is important when you are scanning poor quality bar code labels.

Scanner Timeout Defines the maximum length of time the scanner stays on each time you pull the scanner trigger.

Scanner Trigger Allows you to set the triggering to level 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 until you pull the trigger a second time, or the scanner timeout turns the laser off.

There are several ways to set the laser scanner commands on the reader. For help configuring the reader, see Chapter 5, "Configuring the Reader." For help using the scanner configuration commands, see Chapter 12, "Configuration Command Reference."

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 and 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 Your 4MB JANUS device comes with MS-DOS 6.2 and supports many standard MS-DOS 6.2 commands. Use DOS commands and utilities to transfer files, create and run programs, create a RAM drive, and access files on PC cards. For help using MS-DOS commands, see any MS-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.”

Interlnk 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 2020 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 2020 fournis par Intermec (tels que IC.EXE). N'exécutez pas non plus sur votre PC de programmes .EXE qui utilisent des bibliothèques 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?

You receive a set of companion disks 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  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
<code>echo off</code>	The AUTOEXEC.BAT commands are not displayed on the screen as they are executed.
<code>cls</code>	Clears the screen.
<code>if not exist autoinst.bat goto T2</code> <code> call autoinst</code> <code> goto T3</code>	These commands call the AUTOINST.BAT file, enabling you to update drives C or D with Auto-Loader.
<code>:T2</code>	Do not remove these commands.
<code>if exist d:\autoinst.bat call</code> <code> d:\autoinst</code>	Do not delete AUTOINST.BAT from drives C or D.
<code>:T3</code>	
<code>set prompt=\$p\$g</code>	Sets the DOS prompt to display the current drive and directory, followed by the > symbol.
<code>set path=c:\;d:\;e\;</code>	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 (continued)**Command Line**

```
if not exist c:\fta.exe goto
    DOS_PROMPT
e:
fta.exe checkhost; exit
```

```
%IM_APPLICATION%
:DOS_PROMPT
```

```
c:
```

```
cls
```

Definition

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.

After FTA terminates, %IM_APPLICATION% runs any application identified by the DOS environment variable IM_APPLICATION.

Resets the JANUS device to drive C or D.

Clears the screen.

CONFIG.SYS File

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

Command Line

```
[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

shell=command.com /e:2000 /p

device=d:\himem.sys /testmem:off
dos=high

device=d:\power.exe /low

device=d:\sramdisk.sys 256 512 /e

install=d:\card_sr.exe
```

Definition

Creates the Startup menu.

Increases the size of the environment space to 2000 bytes. This line is required for Auto-Loader.

Loads the DOS extended memory manager, HIMEM.SYS. You must load HIMEM before you load device drivers.

Loads APM power management.

Creates the 256K RAM drive E.

Loads software required for the PC card drives.

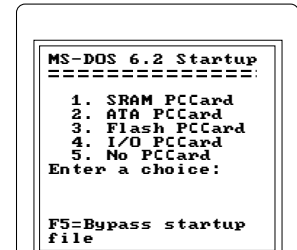
CONFIG.SYS File (continued)

Command Line	Definition
<pre>[sram] device=d:\cs.exe /poll:1 device=d:\csalloc.exe d:\csalloc.ini device=mtsram.ext device=mtddrv.exe</pre>	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.
<pre>[ata] device=d:\cs.exe /poll:1 device=d:\csalloc.exe d:\csalloc.ini device=\atadriv.exe /s:2 device=mtddrv.exe device=d:\cardid.exe</pre>	Loads software required for ATA cards.
<pre>[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</pre>	Loads software required for flash cards.
<pre>[io] device=d:\cs.exe /poll:1 device=d:\csalloc.exe d:\csalloc.ini device=mtsram.exe device=mtddrv.exe device=d:\cardid.exe</pre>	Loads software required for SRAM and I/O cards.
<pre>[no]</pre>	
<pre>[common] device=d:\interlnk.exe /drives:7 /noprinter /com:1 /auto</pre>	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.
<pre>buffers=10</pre>	Sets the amount of memory that DOS reserves for data transferred to and from a disk.
<pre>files=50</pre>	Sets the number of files that can be open at one time. You need this command for IRL support.
<pre>stacks=9,256</pre>	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.



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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.

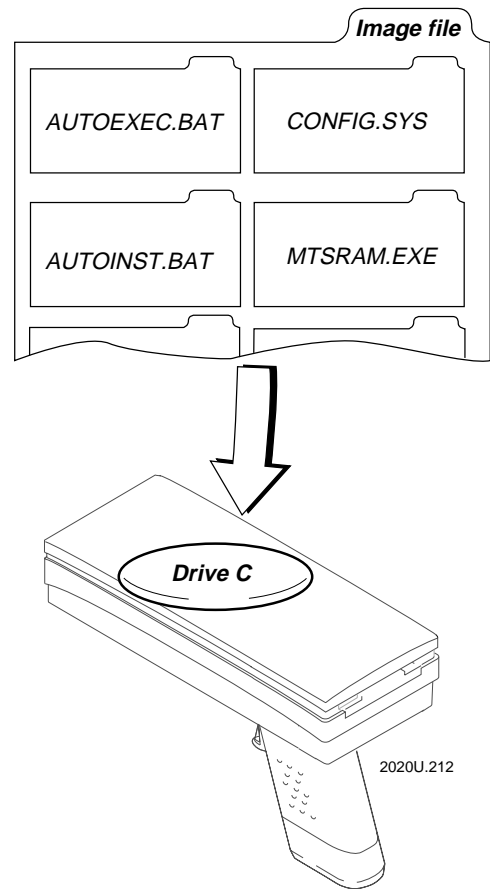
You can use these utilities to create an image file and copy it to drive C:

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.



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	See “Adding or Editing Files on Drive C” later in this chapter.
	or MakeDisk/PutDisk	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	See “Adding or Editing Files on Drive C” later in this chapter.
	or MakeDisk/PutDisk	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	See “Replacing All Files on Drive C” later in this chapter.
	or MakeDisk/PutDisk	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	See “Deleting Files From Drive C” later in this chapter.
	or MakeDisk/PutDisk	See “Using MakeDisk and PutDisk to Change Drives C or D” later in this chapter.
Copy one image file to multiple readers.	Auto-Loader	See “Copying One Image File to More Than One Reader” later in this chapter.
	or BFT	See “Downloading Applications Across the Network” in Chapter 6.
	or MakeDisk/PutDisk	See “Using MakeDisk and PutDisk to Change Drives C or D” later in this chapter.

Using Auto-Loader to Change Drive C

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 serial port 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 that are shipped with the reader.

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:\atadriv\*. * c:\data\*. *
```

7. 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.
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  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:\atadriv\*. * 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  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. 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:\atadriv\*. * 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     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 preserve 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 procedures:

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:\atadriv\*. * c:\data\*. *
```

6. The image file is saved as NEWDRV_C\IMAGE\DRIVEC.IMG on the host computer. The next time you execute the MAKENEW command, this image file will be 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:

```
loading 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:

```
loading 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     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     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 bibliothèques 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.

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 filename is the name of the drives C or D image file created by 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
You execute CONFIG.SYS after changing the command that creates the RAM drive.	Lost
You turn off the reader (by pressing Ⓜ 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 three RAM drives, DOS may assign them drives E, F, and G. In this case, the reader's 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 *disksize*s 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     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 that help you create applications for your reader:

- JANUS Programmer's Software Kit (PSK)
- JANUS Application Simulator
- Interactive Reader Language (IRL)
- PC-IRL

Using JANUS PSK and JANUS Application Simulator

The JANUS 2020 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 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 2020 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 would 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 back 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 program 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 chapter.

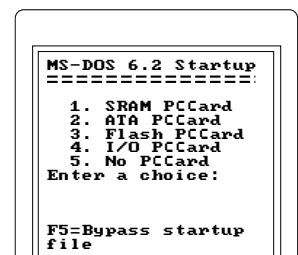
Making More Memory Available on the Reader

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.



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 .

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 .

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 .

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 .

kwc 4

Or, scan this bar code.



KWC 4