

PALLADIUM SECURE MODEM

User's Manual

OM-50
Revision D
January 11, 1999

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5. THE FOREGOING SHALL CONSTITUTE BUYER'S SOLE RIGHT AND REMEDY UNDER THIS CONTRACT WITH RESPECT TO THE PRODUCT.

Mandatory Customer Information

- ◆ Palladium PCard Modem
- ◆ Model V.34, PCMCIA Type II
- ◆ FCC Registration Number: 6FEUSA-33272-MD-E
- ◆ AC REN: 0.7B
DC REN: 1.4
- ◆ Industry Canada Certification Number: 3208 9395 A

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! Warnings:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. The user is encouraged to try to correct the interference by one or more of the following measures.

- a) Reorient or relocate the receiving antenna.
- b) Increase the separation between the equipment and the receiver.

- c) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- d) Consult the dealer or an experienced radio/TV technician for help.

The authority to operate this equipment is conditioned by the requirement that no modifications will be made to the equipment unless the changes or modifications are expressly approved by Rainbow Mykotronx. To comply with Part 15 FCC Regulations the external DAA supplied with the unit must remain intact and unmodified.

To Users of Digital Apparatus in Canada:

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par Le Ministère des Communications du Canada.

Important Safety Instructions

1. Read and follow all warnings, notices and instructions marked on the product or included in the manual.
2. Do not attempt to service this product yourself, as opening or removing covers will destroy contents of product. Refer all servicing to Kasten Chase Applied Research Customer Support.
3. A special purpose cable is provided with this product, and has been designed to operate with this product only. Other items, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer.
4. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.

Government Requirements

Certain governments require that instructions pertaining to modem connection to the public switched telephone network be included in the installation and operation manual. Specific instructions are listed in the following sections.

United States**NOTICE TO USERS OF THE PUBLIC SWITCHED TELEPHONE NETWORK**

1. This equipment complies with Part 68 of the FCC rules. On the equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the Telephone Company.
2. The Universal Service Order Code (USOC) associated with the services the equipment is to be connected to is RJ-11C.
3. The Ringer Equivalence Number (REN) is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to determine the maximum RENs for the calling area.
4. If the modem causes harm to the telephone network, the Telephone Company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the Telephone Company will notify customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
5. The Telephone Company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the Telephone Company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.
6. If your modem needs to be returned for repair or replacement, follow the return policy as indicated in Appendix B.
7. This modem cannot be used on public coin service provided by the Telephone Company. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information).
8. The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send any message via a telephone fax machine unless such message clearly

contains in a margin at the top or bottom of each page or on the first page of the transmission, the date and time it is sent and an identification of the business or other entity, or other individual sending the message and the telephone number of the sending machine of such business, or other entity, or individual. In order to program this information; follow the steps outlined in the manual supplied with your fax software.

9. A FCC compliant telephone cord with modular plugs is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack, which is Part 68 compliant.

Canada

NOTICE TO THE USERS OF THE CANADIAN PUBLIC SWITCHED TELEPHONE NETWORK

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local Telecommunications Company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions might prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone line and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

! CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

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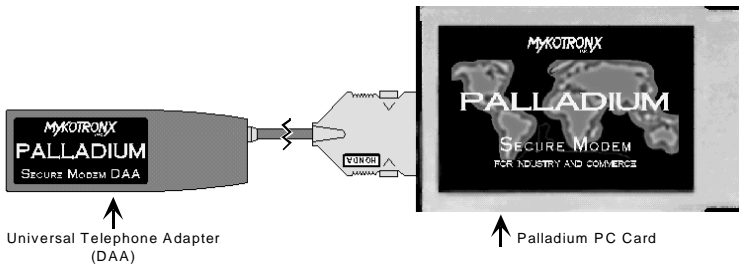
Introduction

Thank you for your purchase of the Rainbow/Mykotronx Palladium™ PC Card modem—and welcome to the world of portable high-speed, secure data communications!

The Palladium PC Card is a credit card size modem that combines V.34 data communications with encryption and decryption using the Skipjack algorithm. The device fits into any notebook, laptop or desktop personal computer that has a Personal Computer Memory Card International Association (“PCMCIA”) Release 2 (or “PC Card”) socket.

The Palladium PC Card modem can transmit and receive information over a standard telephone line at speeds up to 33,600 bits per second. It is compatible with a variety of modem standards, allowing it to communicate with various older model Palladium Secure Modems, and over older telephone system lines that are unable to handle higher data rates.

To ensure error-free data transmissions, the Palladium PC Card utilizes V.42 and MNP™ Level 2-4 error control.



The Palladium Secure Modem

1.1 Supplied Equipment

The Palladium Secure Modem comprises one each of the following supplied equipment:

- ◆ Palladium PC Card (illustrated on page 1).
- ◆ Universal Telephone Adapter (DAA; illustrated on page 1).
- ◆ 7 foot Telephone Cable.
- ◆ Palladium Secure Modem User's Manual (this book).
- ◆ 3.5" Floppy Diskette with Palladium Setup Files or Palladium Setup CD ROM.

1.2 Additional Requirements

In addition to the supplied equipment listed immediately above, you will require the following equipment and software to operate the PC Modem Card:

- ◆ A notebook or laptop personal computer with a PCMCIA (or PC Card) Release 2.0 socket, and installed drivers to operate the PCMCIA slots (such as Cardsoft or Phoenix).
- ◆ A communications program that allows the PC to communicate with the Palladium PC Card (such as HyperTerminal or ProComm Plus).
- ◆ A telephone outlet with an RJ-11 jack, for connection to a standard American or Canadian telephone line.

For full UL compliance, this modem is required to be connected with a UL Recognized Telecommunication Line cord, minimum 26 AWG.

1.3 Before You Begin

Before you begin setup procedures for the PC Card, note that:

- ◆ Unless your PC has a feature known as "hot swapping", always disconnect power from the PC before installing or removing the Secure Modem or any other PCMCIA card.
- ◆ When installing the PC Card, disconnect the RJ-11 telephone cord cable from the DAA.

- ◆ The Palladium PC Card's DAA is equipped with a telephone cable, and is terminated with an RJ-11 connector. Because the DAA also houses the clock for FORTEZZA operation, the cable must be connected when operating the PC Card as a FORTEZZA Crypto Card.
- ◆ The telephone cable shipped with the DAA is FCC compliant for use with American or Canadian telephones. In the future, the card will also be available with a European-compliant cable.
- ◆ When the DAA and telephone cable are connected to the PC Card, it will function as a modem in "secure" operation, indicated by an LED on the DAA.
 - ◇ Red indicates no connection.
 - ◇ Green indicates a secure connection.
- ◆ The card will also function as fully compliant FORTEZZA cryptographic card when the DAA is attached. See chapter 3 for instructions concerning FORTEZZA card operation.

1.4 The Modem Must Be Initialized Before First Use

The Palladium Secure Modem is shipped in an "un-initialized" state. Because no certificates (key material) or user-specific information has been stored in the modem, it will not function until it is "initialized" by an authorized Certificate Authority Workstation (CAW).

Either the facility that supplies the cards, or an existing or new CAW within an organization, can perform initialization.

After initialization, the Palladium Secure Modem will operate with and be authenticated by any other Palladium Secure Modem initialized for the same level of secure communication and that is a member of the same organizational hierarchy.

1.5 Dual Mode Function

The Palladium Secure Modem will operate as a standard FORTEZZA Crypto Card, or as a secure modem.

To select the PC Card's mode of operation, you set a small switch on the outer edge of the PC Card. Yellow and blue dots on the case mark the current switch setting and indicate the operation mode.

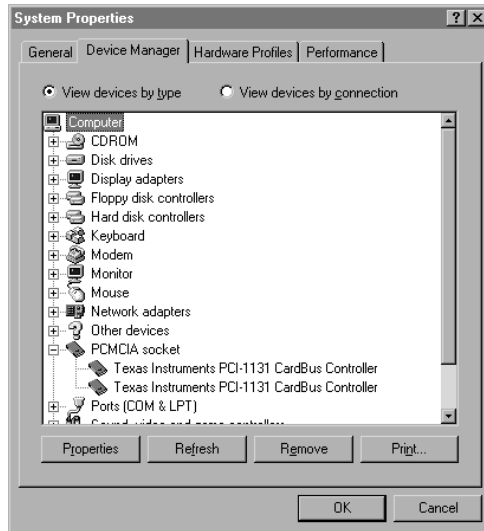
- ◆ The yellow dot indicates Secure Modem mode. (The modem is shipped with the switch in this mode.)
- ◆ The blue dot indicates FORTEZZA mode.

Because the switch is designed to prevent accidental re-positioning, you'll need to use a small tool—such as a paper clip or pen point—to slide the switch to the opposite position.

1.6 PCMCIA Socket Installation

To ensure that your computer's PCMCIA interface driver is correctly installed, use either of the following methods:

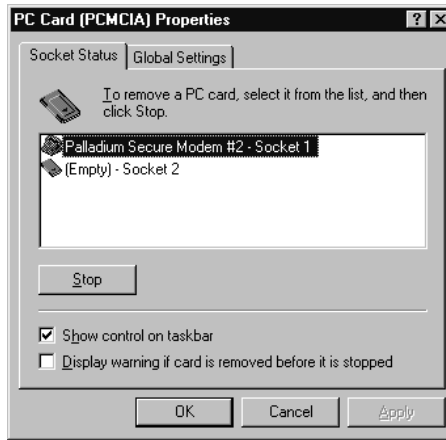
1. Confirm PCMCIA settings on your System Control Panel
 - ◇ To access the Control Panel, select "*Settings*" ⇒ *Control Panel* from the Start Menu. When the Control Panel window appears, double-click the *System* icon. The *System Properties* dialog box will appear.



System Properties Control Panel

Expand the *PCMCIA Socket* list.

- ◇ When the *System Properties* dialog box appears, click the “*Device Manager*” tab. Then, on the list of devices shown, click on the “+” sign next to the “*PCMCIA socket*” icon. A minus sign (-) will appear next to “*PCMCIA socket*” and a list of installed PCMCIA controller devices will appear below the icon.
2. When you insert your PC Card into the PCMCIA slot, you should hear a beep, and an icon indicating the presence of a PC Card should appear on the right side of your Windows 95/98 taskbar. To verify that the PC Card is installed correctly, double-click on the icon. The PC Card (PCMCIA) Properties window (shown on page 6) will appear.
 - ◇ In the list of PC Cards, the Palladium Secure Modem should appear. Click OK to close the window.



PC Card (PCMCIA) Properties Window

Look for the Palladium icon in the window. Click OK.

1.7 Regular Examination for Tampering

As with any security product, you should examine the Palladium Secure Modem regularly for evidence of tampering. Typical indications of possible tampering include:

- ◆ Bumps or dents in the metal case.
- ◆ Cracks in the plastic edges of the PC Card.
- ◆ Tears, air bubbles or creases in the front and rear labels.
- ◆ A PC Card with other evidence of tampering does not slide easily into the PCMCIA slot.

If you suspect tampering, or notice any of the conditions listed above, discontinue using the card. Notify your Security Officer or other responsible manager immediately and follow his or her instructions.

2

Getting Started

This chapter contains instructions to install and configure software for the Palladium Secure Modem. Instructions include procedures to install:

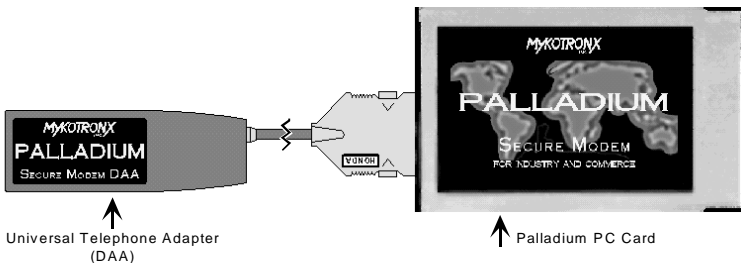
- ◆ The Palladium PC Card
- ◆ Dial-Up Resources.
- ◆ The PIN-Pal program.
- ◆ FORTEZZA libraries and drivers.

2.1 The Installation Disk

Included with the Palladium Secure Modem PC Card is an installation floppy diskette that contains:

- ◆ The Windows information file for Palladium setup (*Palladium.inf*),
- ◆ The PIN (personal identification number) application (also known as PIN PAL),
- ◆ Standard Fortezza Libraries and Drivers.

IMPORTANT: Before installing the standard FORTEZZA Libraries and Drivers, set up the new hardware in Windows 95/98 using the *Palladium.inf* file as described in Section 2.2.



Connect the plug to the receptacle on the outer edge of the card.

2.2 How to Install the Palladium PC Card

To install the Palladium Secure Modem PC Card:

1. Power on the computer, and allow Windows to load completely.
2. Connect the 26-pin Honda plug on the DAA to the receptacle on the outer edge of the PC Card. (Ensure that the side with the "HONDA" marking faces up.)
3. Insert the Palladium Secure Modem into an available PCMCIA slot. The *Windows Add New Hardware Wizard* will auto-detect the device, and attempt to load the appropriate software driver for it. To complete installation, you must provide the location of the custom Palladium.inf file.

If Windows fails to launch the *Add New Hardware Wizard*, select *Settings* ⇒ *Control Panel* on the Start Menu, then double click the *Add New Hardware* icon.



The Add New Hardware Wizard

Click *Next* to proceed with installation.

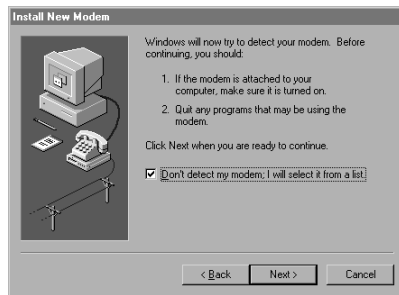
4. The *Update Device Driver Wizard* dialog box (shown on page 9) appears with installation information for a Standard PCMCIA Card Modem. Click on *Next>* to continue installation.



The Update Device Driver Wizard

Click *Next* to proceed with installation.

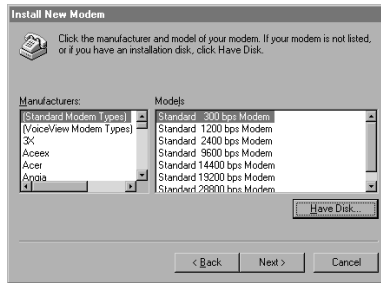
5. The *Install New Modem* dialog box displays. Check the box next to *Don't detect my modem, I will select it from a list*, and click *Next>* to continue installation.



The Install New Modem Dialog Box

Check the *Don't detect my modem...* box and click *Next* to proceed with installation.

6. When the following *Install New Modem* dialog box (shown on page 10) displays, insert the CD-ROM/diskette provided with your Palladium Secure Modem and click *Have Disk*.



The *Install New Modem* Dialog Box

Click *Have Disk* to proceed with installation.

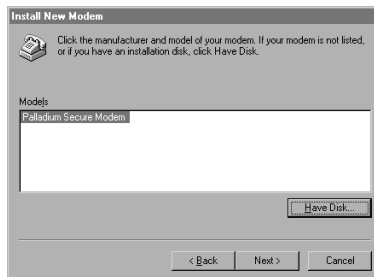
- In the *Install from Disk* dialog box, Windows prompts you to confirm the specific path of the Palladium.inf file. Click *Browse*, and set the path to the drive containing the Palladium.inf file. Finally, click *OK*.



The *Install from Disk* Dialog Box

Enter the letter representing the appropriate drive and click *OK*.

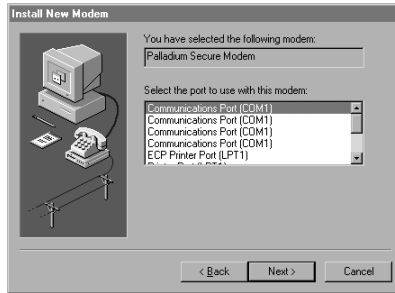
- A list of available modem configuration files (typically only one file) will display. Select the "Palladium Secure Modem" file and click *Next>*.



The *Install New Modem* Dialog Box

Select the "Palladium Secure Modem" file and click *Next>*.

9. Windows will install the Palladium.inf file and, on the following dialog box, ask you to select a COM port for the modem.



The *Install New Modem* Dialog Box

Select the proper COM port for Palladium and click *Next>*.

10. Once proper files are installed and the COM port is set, the final installation dialog box will indicate a successful installation. Click on *Finish* to complete the process.



The *Install New Modem: Finish* Dialog Box

Click *Finish* to conclude installation.

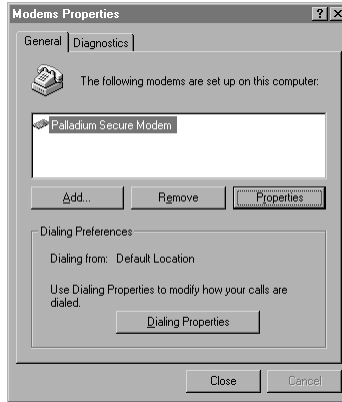
11. The installation of the Palladium.inf will be complete when the system is rebooted.

2.2.1 How to Confirm Proper Palladium Installation

After rebooting, you should verify the Palladium Secure Modem's proper installation. To do so:

1. From the Start Menu, select *Control Panel* and double-click the *Modems* icon. The *Modem Properties* dialog box will appear. If the Palladium Secure Modem was installed and configured

correctly, “Palladium Secure Modem” should appear as one of the modems set up for the computer.



The Modem Properties Dialog Box

Select *Palladium Secure Modem*
and click *Properties*.

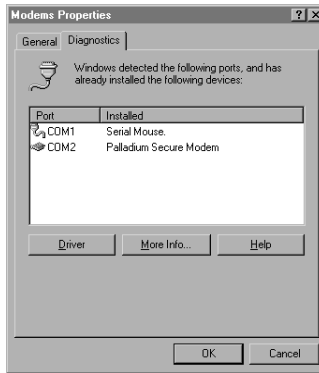
2. To verify the modem settings, select *Palladium Secure Modem* and click the *Properties* button. The following dialog box will appear. After verifying the presence of Palladium Secure modem and the general properties, click *OK* to close the dialog window.

2.2.2 Is The Modem Operational?

Once the operating system has recognized the Palladium Secure Modem, you should confirm that the modem is operational. You can accomplish this in either of two ways:

1. Access the *Modem Properties* dialog as described in the previous step, and click on the *Diagnostics* tab. Diagnostics information appears as shown on page 13.

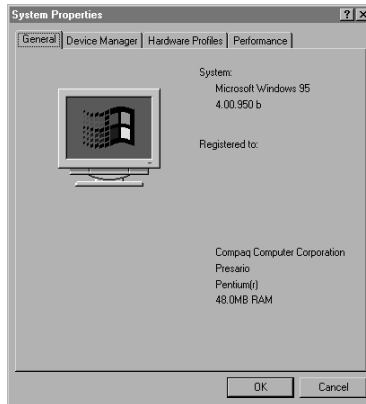
To query the modem, select the *Palladium Secure Modem* port and click on the *More Info...* button. After a few seconds, the system will report the modem's port and command settings in the following dialog box:



The Modem Properties Dialog Box

Select the Palladium Secure Modem port and click on *More Info*

2. You can also confirm proper installation through the *System Properties* control panel. To use this method:
 - ◇ From the Start Menu, select Settings ⇒ Control Panel, and click on the System icon. Current system properties for your computer will display.

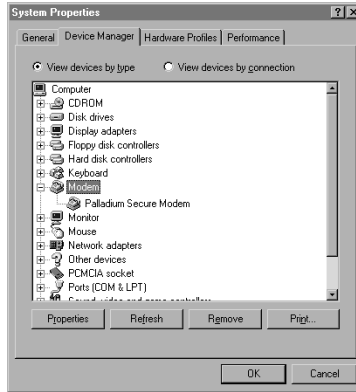


The System Properties Dialog Box

Click on the *Device Manager* tab.

- ◇ Click on the Device Manager tab to display the properties of all system devices.
- ◇ To confirm the properties for the Palladium Secure Modem, click on the "+" to the left of the Modem icon.

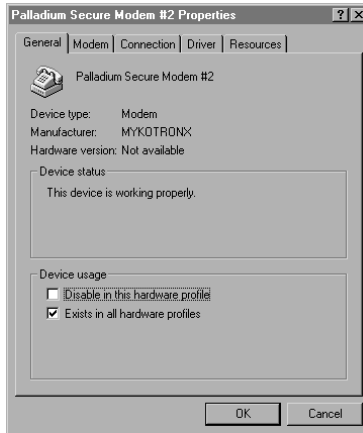
The list will expand, and Palladium Secure Modem should appear as an installed modem.



The *System Properties* Dialog Box

Click on the plus sign next to *Modem* to expand the list.

- ◇ To review and confirm the Palladium Secure Modem properties, click on the Properties button. The following dialog box appears.



The *Palladium Secure Modem Properties* Dialog Box

Confirm properties under each tab, then click *OK*.

- ◇ Click on the General, Modem, Connection, Driver, and Resources tabs to confirm the properties are set correctly.

- ◇ The Driver File Details... button, under the Driver tab, displays device driver file information. Do not attempt to modify this area. Click OK to return to the Palladium Secure Modem Properties dialog window.
- ◇ After checking each one of the tabs, click OK to return to the control panel to exit this process. Exit the control panel by clicking on the close box (X) at the top right corner of the control panel.

2.3 Dial-Up Networking Installation

Although Dial-Up Networking is the most common method used by Windows 95/98 PCs to connect to a host computer through a standard telephone line, you can use other standard communications programs, as well as Windows Hyperterminal.

To install Dial-Up Networking:

1. From your Desktop, double-click the *My Computer* icon. A dialog box will appear with numerous icons. Double-click the *Dial-Up Networking* icon.
2. The *Dial-Up Networking* dialog box will appear. Double-click the *Add New Connection* icon.
3. The *Make A New Connection* dialog window (shown on page 16) will appear. Type a name to identify the computer to which you wish to connect. In the *Select A Modem* line, be sure to specify the "Palladium Secure Modem". Click on *Next*>.

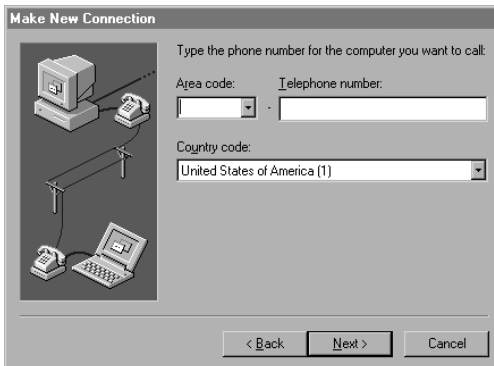
NOTE: If you wish to set custom modem properties for the connection, such as displaying a terminal window after dialing, click *Configure*. These and additional options may also be configured at a later time. (It is recommended that these settings be modified only by advanced operating system users.)



The *Make New Connection* Dialog Box

Specify the computer you will dial, and select “Palladium Secure Modem”.

- Another *Make New Connection* dialog box will appear. Type the telephone number *with area code* (even if the host computer's area code is the same as the remote system's) of the computer to which you wish to connect. Also select the appropriate Country Code. Click *Next>*.



The *Make New Connection* Dialog Box

Specify the telephone number, with area code, of the computer you will dial, and select the Country code.

5. Click *Finish* to save the new connection settings.



The *Make New Connection* Dialog Box

Click *Finish*.

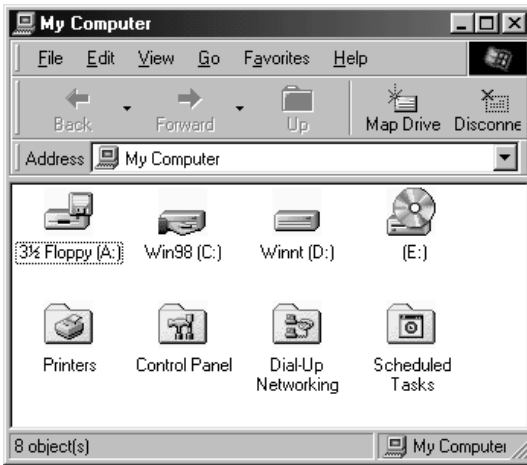
After you finish installation of a new Dial-Up Networking Script, its icon will appear in your *My Computer* window. To connect to the host computer, double-click the icon.

2.4 How to Install PIN Pal

PIN Pal is a program that enables you to initiate the Palladium Secure Modem with your PIN (personal identification number). The modem uses the PIN with Dial-Up Networking (or another Communications Program) to secure a communications link. The modems attempting to communicate will not initiate until the correct PIN number is entered.

To install PIN-Pal:

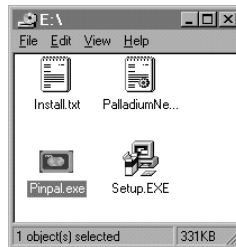
1. Insert the CD ROM/diskette provided with the Palladium Secure Modem into the appropriate drive. Double-click on "My Computer". In the following dialog box (shown on page 18), double-click on the drive's icon.



The My Computer Window

Double-click the appropriate drive's icon.

- Four files will appear in the drive's window. Click once on *Pinpal.exe*, and hold the left mouse button down. Then, drag *Pinpal.exe* to your Windows 95/98 desktop. This will place the PIN-Pal icon on your desktop for easy access to the program.



The CD-ROM Drive Window

Drag *Pinpal.exe* to your Windows desktop.

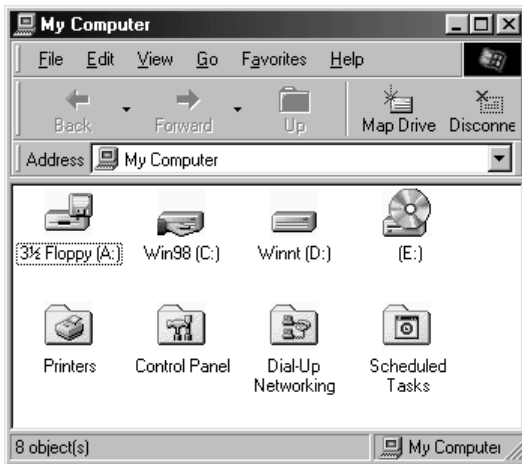
2.5 FORTEZZA Libraries and Drivers Installation

FORTEZZA Libraries and Drivers enable you to use the Palladium Secure Modem as a standard FORTEZZA Crypto Card.

To install FORTEZZA libraries and drivers under Windows 95/98:

1. Insert the CD ROM/diskette provided with the Palladium Secure Modem.

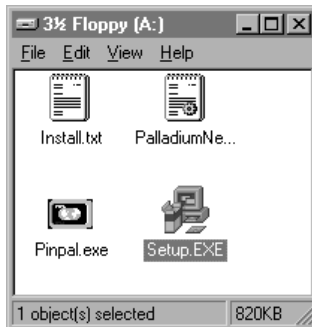
2. Double-click the "My Computer" icon on your Windows desktop. When the "My Computer" dialog box appears, double-click the drive letter/CD ROM drive icon.



The My Computer Window

Double-click the CD-ROM icon.

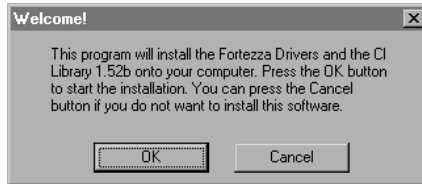
3. A window showing the drive's/CD's contents will appear. Double-click on the "Setup.exe" icon to launch the FORTEZZA Libraries and Drivers setup wizard.



The CD-ROM Drive Window

Double-click *Setup.EXE*.

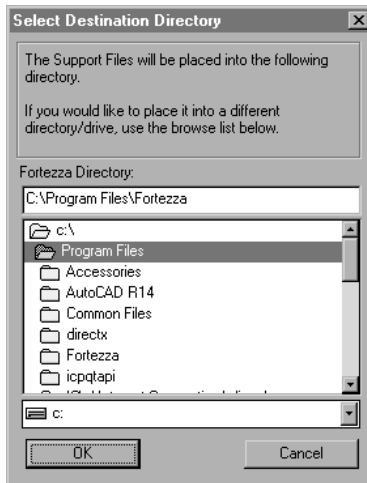
4. When the setup wizard launches, a Welcome dialog box will appear. Click OK.



The Setup Wizard Welcome Window

Click *OK*.

5. The Select Destination Directory dialog box (shown on page 20) will display. The wizard will propose C:\Program Files\Fortezza as the directory to contain Libraries and Drivers, but, if you wish, you may specify another directory. (Note that, if you specify another directory, you may need to also modify settings in future software installations that require the FORTEZZA interface.)



The Select Destination Directory Dialog Box

Specify an alternate file location if you wish.

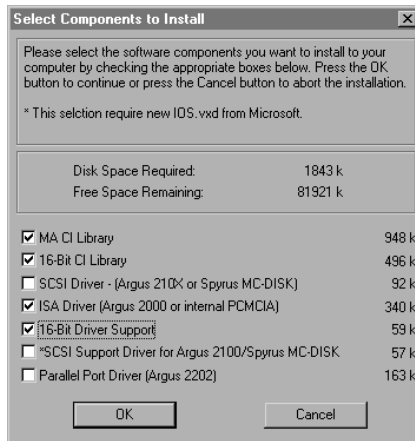
Click *OK*.

6. The *Select Components to Install* dialog box (shown on page 21) will appear, with a check next to *MA CI Library*. Check boxes for each of the following additional components:

- ◇ 16-bit CI Library

- ◇ ISA Driver (Argus 2000 or internal PCMCIA)
- ◇ 16-bit Driver Support

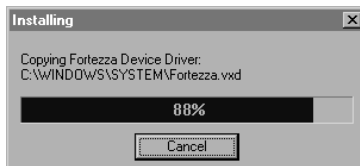
NOTE: Although the 16-bit driver support component allows you to run DOS and Windows 3.x applications, multi-access support is not currently provided for 16-bit programs. If 16-bit driver support is selected, a dialog will appear after you leave the component selection dialog. The dialog will ask for the maximum number of sockets to be supported by the 16-bit driver. Enter the total number of sockets (or less; maximum is 7).



The *Select Components to Install* Dialog Box

Specify appropriate components.
Click OK.

7. As the installation wizard copies FORTEZZA Libraries and Drivers files to your system, the Installing status box will display.



The *Installing* Dialog Box

This dialog box shows installation progress.

8. After files are copied, the MAX 16-bit devices dialog box appears. Once the files are copied onto the computer, enter the maximum number of Fortezza sockets connected to the computer (if other than 2). Click *OK*.

This completes set-up for the FORTEZZA Libraries and Drivers. The system must now be restarted for the settings to take effect. When the final installation dialog window appears, click *OK* to restart the system.

3 FORTEZZA Crypto Card Operation

This chapter describes the operation of the Palladium Secure Modem as a fully compliant FORTEZZA Crypto Card.

3.1 Switching to FORTEZZA Crypto Card Mode

The Palladium Secure Modem functions as a FORTEZZA Crypto Card as long as the DAA is attached and the switch is set to the correct setting.

To set the Palladium Secure Modem to FORTEZZA Mode:

1. Remove Palladium Secure Modem from the PCMCIA slot. The computer will respond with an audible beep.
2. Move the switch on the edge of the PC Card (opposite the 64-pin interface connector) toward the BLUE dot.
3. Reinsert the Palladium Secure Modem into the PCMCIA slot.

This completes the switch from Secure Modem to FORTEZZA card. To switch back to modem operation, remove the Palladium Secure Modem from the PCMCIA slot, move the switch back toward the YELLOW dot, and reinsert the Palladium Secure Modem into the PCMCIA slot.

3.2 FORTEZZA Crypto Card Installation

After the Palladium Secure Modem is set to FORTEZZA Crypto Card mode, follow these steps to ensure full FORTEZZA compliance:

1. Ensure the proper switch setting for FORTEZZA Crypto Card mode (refer to Section 3.1 Switching to FORTEZZA Crypto Card Mode).
2. Connect the DAA to the PC Card. Assure that the connector is inserted properly; the connector is designed to prevent improper connection. Ensure a secure physical connection to the PC Card.
3. Carefully insert the FORTEZZA Crypto Card into the PCMCIA slot. You'll hear a beep when the Card is completely and correctly inserted.

4 Palladium Secure Modem Operation

The Palladium Secure Modem secures links between two points across a standard telephone line. It may be used for either a point-to-point connection between two modems or as a remote access system connecting to a central network facility.

4.1 Switching to Palladium Secure Modem Mode

A switch on the edge of the Palladium Secure Modem case (next to the 64-pin connector) sets the unit to operate in Modem or FORTEZZA mode.

To set the mode of operation:

1. Remove the Palladium Secure Modem from the PCMCIA slot. A beep will sound.
2. **For FORTEZZA operation**, set the switch toward the blue dot on the back of the case. **For Modem operation**, set the switch toward the yellow dot.

4.2 How to Insert the PC Card

To insert the Palladium Secure Modem card into your computer:

1. If necessary, set the PC card for FORTEZZA Crypto Card mode (refer to Section 4.1, Switching to Palladium Secure Modem Mode).
2. Connect the DAA **securely** to the PC Card (the connector is designed to prevent improper connection).
3. Carefully slide the Palladium Secure Modem into the PCMCIA slot. You should hear a beep when the card correctly seats.
4. Insert the RJ-11 standard telephone cable into the DAA's empty socket. To complete the process, plug the other end of the cable into a standard RJ-11 receptor telephone wall jack.

4.3 PIN Activation

Before you begin using the Palladium Secure Modem, you must activate it with the proper PIN (personal identification number) assigned to the modem. To do so:

1. Double click the *PIN-Pal* icon on your Windows desktop (if you don't see the icon, refer to Section 2.4, How to Install PIN Pal).
2. When the Fortezza Modem Pin dialog box appears, type your PIN in the space provided and press Enter. The dialog box will disappear, and the Palladium Secure Modem will be ready to use.



Fortezza Modem Pin Dialog Box
Enter your PIN.

4.3.1 If You Mis-Enter Your PIN

WARNING:

If you misenter your PIN, the message "Incorrect PIN" will appear in a dialog box. Click OK and enter the correct PIN. If you fail to enter the correct PIN after ten attempts, the modem will be zeroized and rendered inoperable. It must be reinitialized by the CAW (see Section 1.4 The Modem Must Be Initialized Before First Use on page 3).



"Incorrect PIN" Information Message
Re-enter your PIN.

5 How to Establish Modem Communications

This section describes operation of the Palladium Secure Modem.

5.1 Establishing Secure Communications

NOTE: Before you proceed, use the PIN Pal application and enter your PIN. For procedures, refer to Section 4.3, "PIN Activation" on page 25.

To establish a secure communications link with the Palladium Secure Modem:

1. If necessary, activate the Palladium Secure Modem with the proper PIN as described in Section 2.4, How to Install PIN Pal (page 17).
2. Open your PC's *My Computer* window and double-click the *Dial-Up Networking* icon. The Dial-Up Networking options dialog box will appear.



The *Dial-Up Networking* Dialog Box

Click the icon you created for modem connections.

3. Double-click on the icon created in Chapter Getting Started to establish modem connections. The *Connect To* dialog box will appear (shown on page 27). Type your user name and password (assigned by your network administrator) for the network to which you are connecting, and click *Connect*.



The *Connect To* Dialog Box

Type your user name and password, and click *Connect*.

4. The modem will dial and attempt to connect with the host modem. If the two modems recognize one another as Palladium Secure Modems, they will negotiate a data rate and authenticate each other with the public key exchange. If either modem contains an unrecognizable key, the call will be immediately terminated.

CAUTION: Never remove the PC Card from the PCMCIA port while a modem connection is intact, or while an application that involves the modem is running.

Once the modems have been authenticated, the LED on the DAA will change from red to green, indicating a secure link. If the LED does not change to red, a secure link has not been achieved. You should end the call if it has not terminated automatically.

6 How to Use Manual AT Modem Commands

This chapter contains procedures to test or troubleshoot a communications link. It is intended primarily for users very familiar with modem technology, and is not recommended for average users.

When performing modem functions using AT commands, any communications terminal window may be used (HyperTerminal, etc.).

6.1 Palladium Secure Modem Manual Operations

The Palladium PC Card uses the industry standard Hayes™ “AT” command set and “S-Registers” to control its operation and configuration. These commands, as well as “extended AT” commands (which are unique to Palladium), are issued to the modem from your computer through your communications software.

The following are guidelines for using any AT command.

- ◆ “AT” commands must be entered while the modem is in Command Mode. The escape sequence is used to enter online command mode when a connection is established (+++); the modem will respond with an OK. The only difference between command mode and online command mode that, in online command mode, a connection is established.
- ◆ All commands begin with the character *A*, followed by a modifier. Commands are issued to the modem by pressing the *Enter* or *Return* key.
- ◆ Although the modem is not case sensitive, mixed cases (*aT* or *At*) are not acceptable. Upper case characters appear as a convention throughout this manual.
- ◆ The modem uses the *A* in an *AT* Command to determine the speed of the DTE port up to 115,200 bits per second. If the modem does not detect the port's speed when the first *A* is issued, you should issue a second *A* to the modem. If the command was interpreted correctly, the letter *A* will appear on screen when you type the command.
- ◆ The AT command set data character format (or “structure”), which can be set using your communications software, must be one of the following.
 - ◇ 8 data bits, no parity, 1 stop bit

- ◇ 7 data bits, (odd, even, mark or space) parity, 1 stop bit
- ◆ Commands can be entered individually or in strings (several commands per string AT&FS0=1&W). Strings can be up to 40 characters after the "AT" prefix. Spaces, parenthesis, and hyphens are not considered characters.
- ◆ Commands described in this manual with the suffix *n* have several options associated with the command. For example, with the *En* command, E0 disables the modem's ability to echo characters to the terminal, while E1 enables echo to the terminal screen. If no value is specified for the *n* it defaults to zero (0).
- ◆ Valid commands are acknowledged with a numeric or word result code (unless result codes have been disabled using the Q1 command). Appendix C lists all available result codes with numeric and word (verbose) equivalents.

6.2 How to Make a Call with Your Modem

The Dial Command (D) is used to initiate a call. When the modem receives this command, it goes off-hook to obtain a dial tone, and dials the telephone number specified in the command.

The following examples illustrate several ways to enter a dial command string. These strings contain the dial command, a modifier and the telephone number. A dial modifier is used to tell the modem to perform additional tasks (such as dialing an 8 or 9 to access an outside line) when dialing the telephone number.

EXAMPLE: A dial string for a standard tone dial:

- ◆ **TYPE:** ATDT8351510 **PRESS:** ENTER.
 - ◇ D is the dial command
 - ◇ T is for tone dialing
 - ◇ 8351510 is the telephone number.

EXAMPLE: A dial string for calling through a PBX (Private Branch Exchange) using tone dialing:

- ◆ **TYPE:** ATDT9W8351510 **PRESS:** ENTER
 - ◇ D is the dial command
 - ◇ T is for tone dialing

- ◇ 9 is to reach an outside line
- ◇ W is to wait for a dial tone for the outside line
- ◇ 8351510 is the telephone number.

6.3 How to Disconnect a Call

There are three ways to terminate a Palladium call:

- ◆ The *ATH* command
- ◆ *DTR* disconnect
- ◆ Pressing any key while the modem is dialing a call or is engaged in the handshaking process. (Handshaking refers to the negotiation that occurs before a complete connection is established, and before any exchange of other data takes place. This handshake is signified by the various tones emitted from the modems during a connection. Once the handshake is complete the modems switch to data mode, denoted with the connect message.)

6.4 How to Answer a Call

6.4.1 Automatic Answering Configuration

If you are configuring your PC to auto-answer, the recommended method is to configure S-register 0 to answer automatically after 1 or more rings. You may also answer a call manually.

6.4.2 How to Answer a Call Manually

To manually answer a call, issue the ATA command after receiving a ring.

- ◆ *TYPE: ATA PRESS: ENTER.*

6.5 Viewing, Selecting and Saving Configurations

Modem settings determine how your modem responds to the applications in which it is used. The Palladium PC Card has two user storable profiles for configuration—0 and 1.

When the modem is initially switched ON, it retrieves configuration settings into volatile memory. (These settings become the “ACTIVE” settings.) If you change the settings and power the unit off the

changes will be lost, and the initial settings will be load on the next power up.

Because configuration profiles are stored in a non-volatile area of memory (using the *&W* command), they remain in memory regardless of whether you power off the unit. If a certain application requires a particular modem configuration, you can store this configuration in non-volatile memory for recall as needed.

6.6 AT Commands

Below is a list of modem AT commands and explanations of their usage.

6.6.1 View Command (*&V*)

Displays the contents of the modem's active, profile0 and profile1 configurations, as well as the stored phone numbers.

The format for AT&V is:

◆ **TYPE:** AT&V*n* **PRESS:** ENTER

n is:

- ◇ 0 to view current configuration
- ◇ 1 display connection status

6.6.2 Write to Memory Command (*&W*)

When a change to a configuration option occurs, you can store it to memory, as either profile 0 or profile 1, using the *&W* command. (Remember that the active configuration will not be saved unless this command is used to store it to non-volatile memory).

The format for AT&W is:

◆ **TYPE:** AT&W*n* **PRESS:** ENTER

n is:

- ◇ 0 to save to profile 0 in NVRAM
- ◇ 1 to save to profile 1 in NVRAM

When the configuration is saved, the modem responds with *OK*.

6.6.3 Reloading Factory Configuration Settings (&F)

The Palladium PC Card ships from the factory with ready to operate configuration settings. These settings are set for optimum operation with most applications. Through the &F command, factory configuration can be recalled at any time.

The format for AT&F*n* is:

- ◆ **TYPE:** AT&F*n* **PRESS:** ENTER

n is:

- ◇ 0 to restore factory default profile 0
- ◇ 1 to restore factory default profile 1

When the factory configuration is loaded into the active profile, the modem responds with *OK*.

Some of the features loaded with the factory configuration are:

- ◆ V.34 operation with a maximum connect rate of 33.6Kbps
- ◆ V.42 error control
- ◆ CTS/RTS flow control
- ◆ CD and DTR set to standard RS-232 operation
- ◆ RTS set to ignore
- ◆ CTS and DSR forced ON

6.6.4 Reload Settings from Profile 0 or 1 (&Y)

Through the &Y command, you can specify whether the contents of either Profile 0 or Profile 1 are loaded into Active memory each time the modem turns ON, or when the Z command is issued.

The format for the AT&Y is:

- ◆ **TYPE:** AT&Y*n* **PRESS:** ENTER

n is:

- ◇ 0 to load profile 0
- ◇ 1 to load profile 1

- ◇ mod = 9 for V.32 9600 or 4800
- ◇ mod = 10 for V.32bis 14400 to 4800
- ◇ mod = 11 for V.34 28800 to 2400
- ◇ mod = 64 for Bell 103 300
- ◇ mod = 69 for Bell 212 1200
- ◇ automode = 0 for disable
- ◇ automode = 1 for enable

6.7.3 Error Control

Error control ensures that data sent and received between your modem and the remote modem arrives with 100% accuracy. This is a very necessary aspect of modem communications since the quality of phone lines cannot be guaranteed. The Palladium PC Card uses the ITU (formerly CCITT) standard V.42 and MNP 4-2 error control protocols. These protocols assure that errors are eliminated, even if it is necessary to re-transmit certain portions of data. This process occurs between the modems and is completely transparent to the user.

Once your modem is online, it negotiates error control. During the handshaking process, the modems attempt to agree upon the terms of the connection. First, the modems determine the connection protocol (V.34); next, they determine error control (V.42, MNP4-2). When all parameters are agreed upon, the connection is finalized and the modem is then in data mode.

6.7.3.1 The \N Command

The \N command determines the type of error control used. The factory default is \N7, which allows the modem to determine what type of error control and data compression is to be used based on the remote modem.

Once the modems are online (either by answering or originating a call) they automatically switch to data mode. In this state, any entries made from the computer are considered data and are transmitted to the remote computer. The modems remain in data mode until the connection is terminated or they receive an escape sequence (+++), S-register 2. When the escape sequence is sent to the modem it responds with *OK*. This tells the user that the modem is now in online command mode.

6.7.4 Switching Between Data & Online Command Mode

The escape sequence allows you to enter online command mode while maintaining a connection between modems. Once in command mode, you can issue the necessary commands and return to data mode. You can switch in and out of data mode as often as necessary without affecting the modem connection.

6.7.4.1 The ATO Command

To return to data modem from online command mode, use the ATO command.

◆ **TYPE:** ATO n **PRESS:** ENTER

n is:

- ◆ 0 to go into data mode
- ◆ 1 to issue an equalizer retrain sequence prior to going into data mode

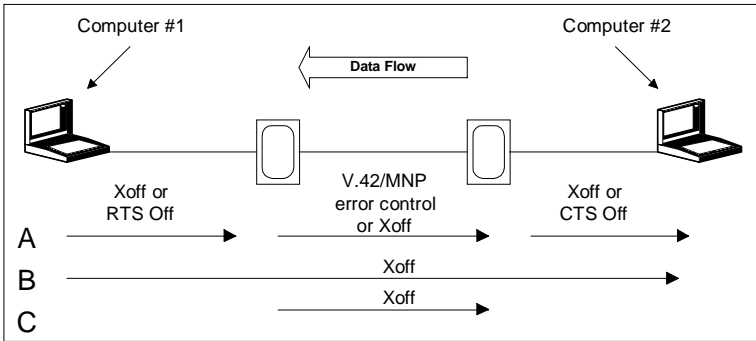
When using V.34, it is sometimes better to issue an O1 command to allow the modems to re-synchronize the connection. V.34 has the ability to up-speed and down-speed the line connection based on varying line quality. When telephone line characteristics improve, connection speed increases, but when they worsen, speed decreases.

6.8 Flow Control

Flow Control is used to control data sent and received between modems. There are basically two methods of flow control, Hardware (RTS/CTS) and Software (Xon/Xoff). There are also several ways to use these flow control settings

6.8.1 Computer to Computer Flow Control

In this case, if computer 1's modem buffer begins to fill, it can stop the flow of data by using the Xoff character. In this situation, the modems are configured to pass the Xon/Xoff characters over the link, rather than interpret them.



Flow Control

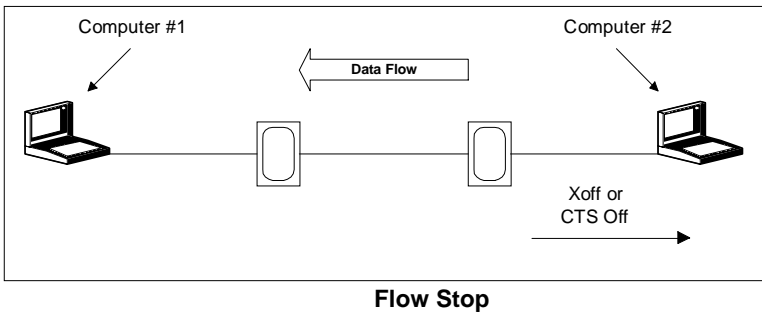
6.8.2 Modem to Modem Flow Control

Flow control can occur between the two modems. If the receiving modem's buffer begins to fill, it sends an Xoff to instruct the sending modem to stop sending. In turn, the sending modem will instruct computer #2 to stop sending. Data transfer resumes when the receiving modems buffer empties and an Xon is sent to the transmitting modem.

By factory default, the modems are configured for hardware flow control. This involves the use of RS-232 interface signals to control the flow of data (RTS, ready to send and CTS, clear to send), rather than the Xoff/Xon character.

For more information on flow control, refer to the `!G` and `&K` commands.

Flow control occurs when the transmitting modem's buffer is nearly full—or in the case of the Palladium PC Card, 84% full. When this level is reached data must be stopped until the buffer is emptied to an acceptable level. The following illustration depicts this function.



To stop the flow of data, the modem can use either the software flow control (Xon/Xoff) or hardware flow control (RTS/CTS). The IQ command lets you configure which method is used. When using Xon/Xoff you can also configure at what level you would like the flow control to operate at, modem-to-computer, computer-to-computer or modem-to-modem.

In addition to these types of flow control, data is also controlled by the error control function of the modems. Both V.42 and MNP have inherent methods of controlling the data transferred. V.42 and MNP manage flow control at a modem-to-modem level and are not user configurable, unless error control is disabled.

When configuring flow control, be aware that the application software operating the modems must be using the same technique. If you change the modem, you need to change the application to interpret its method. If you change the application software you will need to configure the modems to adhere to the applications method of flow control.

7 AT Command Set and S-Registers

This chapter contains a list of all “AT” commands and S-Registers used by the Palladium PC Card. The commands appear in alphabetical order, followed by the S-Registers. Factory settings are listed in **bold** type for each setting.

In general, “AT” commands and S-Registers are used to dictate the modems operation. Typically the default configuration from the factory is the optimum setting for the Palladium PC Card.

For an overview on how to use “AT” commands refer to chapter 6, *How to Use Manual AT Commands*.

7.1 AT Command Format

“AT” commands are issued from a personal computer running a communications program, or from a dumb asynchronous terminal. The PC or terminal can be configured for any data rate from 300 bps up to 115,200 bps using 8 data bits, no parity and 1 stop bit; hardware flow control should also be specified. Commands can only be entered when the modem is in command mode.

The following is an example of the format for AT commands:

- ◆ **TYPE:** ATXn **PRESS:** ENTER
 - ◇ X is the modifier and n is the argument.
- ◆ **RESPONSE:** OK

Incorrect entries will be acknowledged with an ERROR response from the modem. Also, any changes made will be lost if the &W command is not used to write the setting to memory.

The following illustration shows the elements of a dial command string.

7.2 AT Commands

The following table lists AT commands.

| AT Command | Description |
|---|---|
| A/ Repeat Command | Used to repeat the last command issued to the modem. You need not press ENTER; the command executes immediately following the /. |
| A Answer Mode | Used to manually answer an incoming call. Typically, answering a call is handled by the setting in S0. The A command is used for times when auto-answer is disabled and you receive an incoming call. |
| Bn CCITT/Bell Mode V.23 Controls | <p>Selects whether the modem uses the CCITT V.21 and V.22 protocols or the Bell 103 and 212A protocols for operation at 300 or 1200 bps. It also determines whether it receives at 75 bps and transmits at 1200 bps when using CCITT V.23 protocol.</p> <p>B0 The modem uses the V.21 and V.22 protocols for 300 bps and 1200 bps operation.</p> <p>B1 The modem uses the Bell 103 and 212A protocols for 300 bps and 1200 bps operation.</p> <p>DL Dial Last Number</p> <p>This command allows the modem to redial the last telephone number dialed. The command is useful for redialing busy numbers.</p> <p>The format for this command is:</p> <p>TYPE: ADTL PRESS: ENTER</p> <p>For this command to work properly, at least one valid entry of the dial command is necessary.</p> |
| DSn Dial Stored Number | <p>Used to dial one of the possible four pre-stored telephone numbers from the modem's directory.</p> <p>Directory locations are part of the modem's non-volatile memory. A stored number can be overwritten with a new telephone number using the AT&Zn=x command.</p> |

| AT Command | Description |
|-------------------------------------|--|
| <p>En Character Echo</p> | <p>Controls whether or not the modem will echo characters back to the terminal screen.</p> <p>The format for this command is:</p> <p>TYPE: ATDS<i>n</i> - where <i>n</i> is argument) 0 disables echo 1 enables echo</p> <p>PRESS: ENTER</p> |
| <p>Hn Hook Control</p> | <p>Allows you tell the modem to go on-hook or off-hook. This command is especially useful when attempting to determine whether dial tone is present.</p> <p>The format for this command is:</p> <p>TYPE: ATH<i>n</i> - where <i>n</i> is the argument 0 modem goes on hook 1 modem goes off hook</p> <p>PRESS: ENTER</p> |
| <p>In Identification</p> | <p>Displays specific information about the Palladium PC Card. This can be useful when troubleshooting modems.</p> <p>The format for this command is:</p> <p>TYPE: ATIn - where <i>n</i> is the argument 0 displays product code 1 ROM checksum 2 checks modem's eeprom status 3 displays firmware revision number 4 displays modems model number 5 displays country code 6 displays modem data pump model 7 displays DAA model code</p> |
| <p>Mn Speaker On/Off</p> | <p>Used to turn the speaker on and off.</p> <p>The format for this command is:</p> <p>TYPE: AM<i>n</i> - where <i>n</i> is the argument 0 disable speaker operation 1 speaker on until CD goes high 2 speaker always on</p> |

| AT Command | Description |
|---|--|
| <p>On Return to Online Data Mode</p> | <p>Used to return to data mode from online command mode. This command is used in conjunction with the escape sequence.</p> <p>The format for this command is</p> <p>TYPE: ATOn - where <i>n</i> is the argument 0 return to data mode 1 issue retrain before return to data mode</p> |
| <p>P Pulse Dial</p> | <p>Tells the modem to pulse dial. Default for this command is tone dial, the majority of public switched telephone networks use tone dial rather than pulse. In remote areas you may require pulse dial.</p> <p>See dial command for further details.</p> <p>Not available on US/Canada model. European DAA must be used with this command.</p> |
| <p>Qn Result Codes</p> | <p>Used to control the result codes the modem responds with when issued commands.</p> <p>The format for this command is:</p> <p>TYPE: ATQn - where <i>n</i> is the argument 0 enable result codes 1 disable result codes</p> |
| <p>Sn=r Change S-Register</p> | <p>Used to reconfigure S-registers. Please be aware that changes are not permanent unless the &W command is used.</p> <p>The format for this command is:</p> <p>TYPE: ATSn=r - where <i>n</i> is the register and <i>r</i> is the argument 0 enable result codes 1 disable result codes</p> <p>PRESS: ENTER</p> <p>The modem will respond with the numerical value configured in the S-Register selected.</p> |
| <p>Tn Tone Dial</p> | <p>Requests the modem to tone dial the telephone number entered.</p> |

| AT Command | Description |
|------------------------------------|--|
| Vn Result Code Format | Controls whether your modem will send result codes in English or Numeric form. Some programs require numeric responses to properly control modem functionality. The format for this command is: TYPE: ATVn - where n is the argument 0 display numeric result codes (Terse) 1 Display text result codes (Verbose) |
| Xn Extended Result Codes | Used to display extended result codes. The format for this command is: TYPE: ATXn - where n is the argument 0 Disable extended codes, blind dial 1 Report extended codes depending on country code, blinding 2 Report extended codes depending on country code 3 Enable monitor busy tone 4 Enable all extended message |
| Yn Long Space Disconnect | Determines how the modem handles receiving a continuous stream of spaces from the remote modem. This is an alternative way to disconnect the link. The format for this command is: TYPE: ATYn - where n is the argument 0 modem ignores long spaces 1 modem drops link if a long space is detected |
| Zn Software Reset | Used to issue a "software" reset. With a software reset, the modem remains active, but upon receiving the Z command initiates self test. Upon passing self-test the modem returns to command mode. (If you perform a software reset, you must enter your PIN again to use the modem.) The format for this command is: TYPE: ATZn - where n is the argument 0 loads profile 0 after reset 1 loads profile 1 after reset |

| AT Command | Description |
|---|---|
| &Cn Carrier Control (CD) | Carrier Detect is the signal your modem provides to the PC to indicate a connection with the remote modem. The format for this command is: TYPE: AT&Cn - where n is the argument 0 CD always on 1 CD normal |
| &Dn Data Terminal Ready Control (DTR) | Signal sent to the modem from the PC indicating a ready state. The format for this command is: TYPE: AT&Dn - where n is the argument 0 ignore DTR 1 puts modem into command mode when DTR is low 2 DTR normal |
| &Fn Reload Factory Default | Used to reload the factory default S-Registers. The format for this command is: TYPE: AT&F -or- AT&F0 |
| &Gn V.22bis Guard Tone | Determines whether the V.22bis guard tone is disabled, set to 550 Hz or set to 1800Hz. This option is for international use only. The format for this command is: TYPE: AT&Gn - where n is the argument 0 disabled 1 550 Hz 2 1800 Hz |
| &In Test & Diagnostics | Sets the power level the modem uses to transmit over telephone lines. Range -10dBm to -25 dBm. The format for this command is: TYPE: AT&In - where n is the argument 10 -10 dBm 18 -18 dBm |
| &Pn Make/Break Ratio | Sets the duration of the pulse for each number dialed when using pulse dial mode. The format for this command is: TYPE: AT&Pn - where n is the argument 0 make/break ratio is 39 ms to 61 ms 1 make/break ratio is 33 ms to 67 ms |

| AT Command | Description |
|--|--|
| <p>&Qn Async Mode and Dialer Type</p> | <p>Used to control the connection modes permitted. It also configures the dialing method.</p> <p>The format for this command is:</p> <p>TYPE: AT&Qn - where <i>n</i> is the argument</p> <ul style="list-style-type: none"> 0 async operation, normal dial 5 async error-correction (default) 6 async operation in normal mode (speed buffering) |
| <p>&Rn Ready To Send Control (RTS)</p> | <p>Controls the action of RTS. RTS is the signal that comes from the PC to the modem to indicate it is ready to send data.</p> <p>The format for this command is:</p> <p>TYPE: AT&Rn - where <i>n</i> is the argument</p> <ul style="list-style-type: none"> 0 RTS normal 1 RTS always on |
| <p>&Sn Data Set Ready Control (DSR)</p> | <p><i>Data Set Ready</i> is the signal from the modem to the PC indicating the modem has established a connection and is ready.</p> <p>The format for this command is:</p> <p>TYPE: AT&Sn - where <i>n</i> is the argument</p> <ul style="list-style-type: none"> 0 DSR always on (default) 1 DSR normal |
| <p>&Tn Test & Diagnostics</p> | <p>Allows testing of the modems functionality.</p> <p>The format for this command is:</p> <p>TYPE: AT&Tn - where <i>n</i> is the argument</p> <ul style="list-style-type: none"> 0 terminates test in progress 1 local analog loopback 2 returns ERROR 3 local digital loopback V.54 4 enable digital loopback acknowledgement for remote request 5 disable digital loopback acknowledgement 6 request remote digital loopback, V.54 loop2, no selftest 7 request remote digital loopback, V.54 loop2, selftest 8 initiate local analog loopback, V.54 loop3, selftest |

| AT Command | Description |
|---|---|
| &Vn View Configuration Settings | Allows you to view the configuration settings of the modem and the four pre-stored telephone numbers. The format for this command is: TYPE: AT&Vn - where <i>n</i> is the argument 0 displays current configuration 1 reserved 2 displays profile 0 3 displays profile 1 4 displays telephone directory |
| &Wn Write to Memory | Used to store configuration changes to non-volatile memory where they are permanent. The format for this command is: TYPE: AT&Wn - where <i>n</i> is the argument 0 write to profile 0 1 write to profile 1 |
| &Yn Load Profiles On Power Up | Allows you to load a specific set of configuration registers on power up (profile 0 or profile 1). The format for this command is: TYPE: AT&Yn - where <i>n</i> is the argument 0 load profile 0 1 load profile 1 |
| &Zn=x Store Telephone Number | Used to store a telephone number in one of four directory positions. The format for this command is: TYPE: AT&Zn=x - where <i>n</i> is the index, <i>x</i> is the number The following example shows a telephone number loaded into index 3. EXAMPLE: AT&Z3=835-1510 |

| AT Command | Description |
|---|--|
| <p>\An Maximum Frame Size</p> | <p>Determines the maximum frame size to be used when operating V.42 or MNP 4-2.</p> <p>The format for this command is:</p> <p>TYPE: AT\An - where <i>n</i> is the argument</p> <ul style="list-style-type: none"> 0 equals 64 characters per frame 1 equals 128 characters per frame 2 equals 192 characters per frame 3 equals 256 characters per frame 4 equals 32 characters per frame (cellular) 5 equals 16 characters per frame (cellular) <p>NOTE: V.42 has a maximum frame size of 128 characters per frame. To improve operation over poor phone lines decrease the number of characters in each frame.</p> |
| <p>\Gn Modem-to-Modem Flow Control</p> | <p>Controls modem-to-modem flow control as explained earlier in this manual.</p> <p>The format for this command is:</p> <p>TYPE: AT\Gn - where <i>n</i> is the argument</p> <ul style="list-style-type: none"> 0 disable modem-to-modem flow control 1 enable modem-to-modem flow control |
| <p>\Kn Buffer Handling</p> | <p>Controls how breaks are handled by the modem. Expedited indicates that break is sent to remote modem, destructive indicates that the data in the modems buffer is cleared upon receipt of a break.</p> <p>The format for this command is:</p> <p>TYPE: AT\Kn - where <i>n</i> is the argument</p> <ul style="list-style-type: none"> 0 expedited and destructive 1 expedited and non-destructive 2 non-expedited and non-destructive |

| AT Command | Description |
|----------------------------------|---|
| !Nn Error Control Mode | Determines the type of error control used by the modem, V.42 or MNP 4-2. The format for this command is: TYPE: AT!Nn - where <i>n</i> is the argument 0 buffer mode, no error control 1 direct mode, connect at PC data rate 2 MNP reliable mode 3 MNP autoreliable mode 4 V.42 reliable mode 5 V.42 autoreliable mode 6 reliable mode, always V.42 or MNP 7 autoreliable mode, always V.42 or MNP |
| !Cn Fortezza PIN | Used to enter the PIN number during Fortezza operation. The format for this command is: TYPE: AT!Cnnnn - where <i>n</i> is the 4 to 12 digit PIN |
| !Dn Delete KMID's | Used to delete a KMID from the pre-stored memory. The format for this command is: TYPE: AT!Dnnnnxxxx - where <i>n</i> is the KMID and <i>x</i> is its checksum. |
| !I Return Current KMID | Used to display the modems current KMID. The format for this command is: TYPE: AT!I RESPONSE: Display current KMID |
| !L List KMID's | Used to display all of the KMID's stored in the modem. A maximum of 63 can be stored The format for this command is: TYPE: AT!L RESPONSE: Lists all KMID's stored in modem. |

| AT Command | Description |
|--------------------------------------|--|
| !S Store KMID to Memory | Used to store KMID's in memory. KMID's are 16 bit strings. The format for this command is: TYPE: AT!Snx- where <i>n</i> is the KMID and <i>x</i> is the checksum RESPONSE: OK NOTE: When using the !S command the KMID must be followed with a checksum. |
| !Y Store Y Value to Memory | Used to store the Y value in memory. Y values are parsed and stored in 16 byte strings. A sequence of 8 !Y commands is used to store a single Y value. The format for this command is: TYPE: AT!Ynx - where <i>n</i> is 16 bytes of the Y value and <i>x</i> is the checksum. RESPONSE: OK NOTE: When using the !Y command each 16 byte sequence of the Y value must be entered in order and each 16 byte number must be followed by a 2 byte checksum. For more information on the !D, !S and !Y please refer to the Security Officer Manual. |

7.3 S-Register Format List

An S-Register is a memory location that controls a particular operation of the modem. This section describes the format for modifying S-registers and the options available.

Refer to the ATS? and the AT&Vn command for viewing registers. Also remember that the setting will not be permanent unless it is written to memory (&W).

To modify a register the format is:

TYPE: ATSn=x - where *n* is the register, *x* is the value.

PRESS: ENTER

| Register | Description |
|---|--|
| S0 Auto-Answer on Number of Rings | Sets the number of the rings required before the modem automatically answers a call. Setting this register to zero disables auto-answer mode. NOTE: If set to zero (0), the modem can only answer a call using the ATA command. Range: 0-255 rings The factory default is 0 |
| S2 Escape Sequence Character | Sets the character used for the escape sequence. The default value corresponds to an ASCII '+'. Any value greater than 127 disables the escape sequence. (i.e. no escape character will be recognized) The factory default is 43 (+) |
| S3 Carriage Return Character | Determines the ASCII value used as the carriage return (enter key). This character is used to end command lines and result codes. If you want to change the carriage return character from the Enter key to something else, enter a value from 0 to 127 (ASCII decimal) for the command character. The factory default is 13 (Carriage Return) |
| S4 Line Feed Character | Determines the ASCII value used as the line feed. The modem uses the line feed when responding to the PC. If you want to change the carriage return character from an Enter key to something else, enter a value from 0 to 127 (ASCII decimal) for the command character. The factory default is 10 (Line Feed) |
| S5 Backspace Character | Sets the character recognized as a backspace. Pertains to asynchronous operation only. The modem will not recognize the Backspace character if it is set to a value that is greater than 32 ASCII. Range: 0-32, ASCII decimal The factory default is 08 (Backspace) |

| Register | Description |
|--|---|
| S6 Blind Pulse Dial Time | Sets the length of time, in seconds, that the modem will wait before starting to dial after going off-hook when blind dialing. The modem always pauses for a minimum of 2 seconds, even if the value of S6 is less than 2 seconds. Range: 2-255 seconds The factory default is 2 seconds. |
| S7 No Answer Time Out | Sets the length of time, in seconds, that the modem will wait for carrier before hanging up. The timer is started when the modem finishes dialing (originate), or 2 seconds after going off-hook (answer). Range: 1-255 seconds Factory default is 50. |
| S8 “;” Pause Time of Dial Modifier | Sets the time, in seconds, that the modem must pause when the “;” dial modifier is encountered in the dial string. Range: 0-255 seconds Factory default is 2. |
| S9 Carrier Detect Response Time | Determines the time it takes for the modem to respond to detecting a valid carrier signal. Range: 1 to 255 tenths of a second (0.1 to 25.5 seconds). Factory default is 6 (0.6 second). |
| S10 No Carrier Disconnect | Determines how long the modem waits to disconnect if the carrier from the remote modem ceases. When set to 255, the modem functions as if a carrier is always present. Range: 1 to 255 tenths of a second. Factory default is 14 (1.4 seconds). |
| S11 DTMF Tone Timer (on) | Determines the length of ON time of the DTMF tone. Range: 50 to 255 milliseconds. The factory default is 95 milliseconds. |

| Register | Description |
|---|--|
| S12 Escape Guard Time | Sets the value for the required time before and after issuing an escape sequence. See escape sequence +++ in the previous section for more details. Range: 0 to 255 1/50 of a second. The factory default is 50 (1 second). |
| S13 DTMF Tone Timer (off) | This register determines the length of time the DTMF tone is off. Reserved. |
| S18 Test Time-out | Sets the length of time, in seconds, that the modem conducts a test (commanded by &Tn) before returning to the command mode. Range: 0 to 255 seconds. The factory default is 0 (disabled). |
| S24 Sleep Mode Timer | Determines how long the modem will wait in normal power mode without receiving activity before going into low power sleep mode. Zero disables sleep mode. Range: 0 to 255 seconds. The factory default is 0. |
| S25 DTR Detection | This register determines how much time elapsed between the modem detecting loss of DTR and the modem responding to the loss of DTR. Range: 0 to 255 hundredths of a second. 0 disable 1 - 254 hundredths of a second 255 infinite delay The factory default is 5. |
| S26 RTS-to-CTS Delay | Sets the length of time the modem waits after receiving RTS to issue CTS to the PC. Range: 0 to 255 hundredths of a second. The factory default is 1. |
| S30 Disconnect Inactivity Timer | Sets the amount of time the modem will remain online while not receiving or sending data. Range: 0 to 255 tenths of a second. The factory default is 0 (disabled). |

| Register | Description |
|--|--|
| S32 Xon Character | Sets the character to be used for the Xon command during flow control. Range: 0 to 255 (ASCII decimal) The factory default is 17, (11 hex). |
| S33 Xoff Character | Sets the character to be used for the Xoff command during flow control. Range: 0 to 255 (ASCII decimal) The factory default is 19, (13 hex). |
| S37 Desired Line Connection Speed | Used to force the modem to connect at a particular speed, rather than auto negotiate. This command is used in conjunction with the ATN command. Also refer to the +MS= command for connection speeds and modulations. The factory default is 0 (auto negotiate to highest speed) |
| S38 Delay Before Forced Hang Up | Determines the time the modem waits from the time it receives the H command until it goes on-hook. Range: 0 to 255 seconds Factory default is 20. |
| S86 Call Failure Reason Codes | When the modem issues a NO CARRIER messages a numeric code is written into this register. This code is the reason for the message. 0 normal disconnect, no error occurred 4 loss of carrier 5 V.42 failed to detect error correcting modem on remote side 9 could not find matching protocol 12 normal disconnect initiated by remote modem 13 remote modem does not respond after re-transmissions of the same message 10 protocol violation 14 |

8 Appendix A: Problem Resolution

This chapter lists possible problems associated with installing and configuring computer peripherals, and describes actions to remedy them.

Problem: Modem does not respond.

Action: Make sure that your PC supports Card Services and Socket Services.

Make sure the modem is properly seated in the PCMCIA slot.

Make sure the modem is not in low-power (sleep) mode.

Make sure the PC is PCMCIA compliant.

Make sure the PC is turned ON.

Check for resource conflicts such as IRQ's and Memory addresses.

Problem: Modem does not go off-hook and answer a call

Action: Make sure that your PC supports Card Services and Socket Services.

Make sure the telephone cable is connected.

Check to see if S0 is set to a 1.

Verify the PC is supplying DTR to the modem. Try setting the modem to ignore (&D) if this signal is not present.

Test phone line with standard telephone.

Problem: Modem answers but does not connect.

Action: Verify that modem is attempting to connect with a compatible modem.

Verify that security parameters are set correctly.

Check S register 86 (S86) to determine why the modem is not connecting.

If necessary, force the modem to connect with the same protocol as the remote modem.

Problem: Modem dials but does not connect.

Action: If the modem is operating through a PBX, verify that the correct modifiers are in the dial string (i.e. 8, 9, W).

Verify that the PBX does not use voice compression. Voice compression will cause connectivity problems using V.34 or V.34bis modems.

Test modem on direct outside telephone lines.

If handshake is heard, check to see if both modems are using the same protocol.

Verify security parameters are configured correctly.

Problem: Modem establishes—then immediately drops—link.

Action: Check security parameters. If incorrect or none are used in secure operation the modems will not connect.

Check to see if any of the interface signals are being dropped, in particular DTR. Try AT&D0 to ignore DTR.

Problem: Data is scrambled.

Action: If the security parameters are mismatched or not configured properly the modems will not be able to interpret the data properly.

Check to see if error control is enabled.

Check parity of data. Incorrect parity or DTE speed will cause data to be garbled.

Problem: Remote modem disconnects while host remains connected.

Action: Verify that ignore DTR is not set. Most applications use DTR to disconnect.

Verify the setting of S10, if disabled modem will not disconnect.

9 **Appendix B: Palladium Secure Modem Product Support**

In the event that you experience installation or operational problems, please contact Kasten Chase Applied Research Customer Support at:

- ◆ Telephone: (800) 268-7557 or (905) 238-6061
- ◆ Fax: (905) 238-7134
- ◆ Email: securesupport@kastenchase.com

In the event that you need to have the unit repaired, please contact Kasten Chase Applied Research RMA Administrator at:

- ◆ Telephone: (800) 268-7557 or (905) 238-6061
- ◆ Fax: (905) 238-7134
- ◆ Email: rma@kastenchase.com

NO EQUIPMENT SHALL BE ACCEPTED WITHOUT A VALID RETURN AUTHORIZATION NUMBER.

When contacting Kasten Chase Applied Research, please have the following information available:

- ◆ Model and unit serial number.
- ◆ Company name
- ◆ Contact name and number or email address.