

# Installation Note

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**HP ESG E4400B, E4420B, E4421B, E4422B and  
HP ESG-D E4430B, E4431B, E4432B, E4433B  
Series Signal Generators  
Special Firmware Upgrade Kit  
HP Kit Part Number E4400-60208**



HP Part Number E4400-90311

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# Special Firmware Upgrade Kit

Product Affected: . . . . .	HP ESG E4400B, E4420B, E4421B, E4422B HP ESG-D E4430B, E4431B, E4432B, E4433B Series Signal Generators
Serial Numbers: . . . . .	All
Options: . . . . .	All
To Be Performed By: . . . . .	(X) HP Service Center (X) Personnel Qualified by HP (X) Customer
Estimated Installation Time: . . . . .	1 hour
Estimated Verification Time: . . . . .	1 minute

## Introduction

The firmware revision is changed by downloading the updated firmware files via computer RS-232 interface or the HP Access Web site. This installation note includes separate procedures for, PC, laptop, or palmtop computers.

## Upgrade Kit Parts List

**Table 1 Kit Contents**

Item	Quantity	Description	Part Number
1	1	Firmware DOS disk upgrade	E4400-10012
2	1	RS-232 Cable Kit	E4400-60049
3	1	Installation Note	E4400-90311

## Tools Required

- 5-mm nut driver, HP part number 8710-1219

## Equipment Required

The computer controller may be a PC (IBM compatible), laptop (HP OmniBook), or palmtop (HP 200LX). Notice that the palmtop must have 256 kB available memory for DOS. The required equipment is listed under each procedure.

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**NOTE** A kit containing the RS-232 parts listed in each procedure can be obtained by ordering the RS-232 Cable Kit, HP part number E4400-60049.

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## Functionality Check

This procedure verifies that the signal generator powers up and that the internal instrument check identifies no errors. The internal check evaluates the correctness of operation and returns an error message if a problem is detected.

1. Turn on power to the signal generator by pressing the power switch. Let the instrument warm up for at least five minutes.

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**NOTE** For instruments with Option 1E5, the error message ERROR 514, Reference Oven Cold will occur whenever the signal generator is first connected to AC line power. The OVEN COLD annunciator and the ERR annunciator will both turn on. The OVEN COLD annunciator automatically clears after approximately 5 minutes. The error queue cannot be cleared, however, until the OVEN COLD annunciator turns off.

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2. Cycle the power to the signal generator. The green LED should be lit and the instrument performs a check.
3. When the display is lit, check to see if the ERR annunciator is turned on.
4. If the ERR annunciator is turned on, review the error messages in the queue by pressing **Utility, Error Info, View Next Error Message**. The first error message in the queue will be shown in the text area of the display. Refer to the service guide for information about the error message.  
  
If there is more than one error message (each message will be designated as 1 of *n*), continue pressing the **View Next Error Message** softkey until you have seen all of the messages.
5. When you have resolved all of the error messages, press **Clear Error Queue(s)** to delete the messages.

## Installation Procedure: PC Version

This procedure uses a PC (IBM compatible computer) to download new firmware into the signal generator.

**Table 1**                      **Equipment Required for PC Connection**

Quantity	Description	Part Number
1	Serial RS-232 cable 9-pin (male) to 9-pin (female)	8120-6188
1	RS-232 null modem (male-male)	5181-6639
1	Serial RS-232 adapter (female-female)	1252-7825

1. Connect the computer to the signal generator via the null modem:
  - a. Attach the male end of the RS-232 cable to the signal generator.
  - b. Attach the female end of the RS-232 cable to the null modem.
  - c. Remove both standoffs from the female adapter with the 5-mm nut driver.
  - d. Attach the modified adapter to the modem and to the selected RS-232 port on the PC.

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**NOTE** Typically, you would use the COM1 RS-232 port, but COM2 is acceptable if it is available. No other program can make use of this port at any time during the procedure.

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2. Insert the firmware upgrade disk into the computer disk drive.
  - a. Create an empty directory called `update` on the C:\ drive to unpack the zip archive.
  - b. Using MS Windows, go to File Manager and select drive A:\ or B:\. The two files, `dlserial.zip` and `pkunzip.exe`, should be present.
  - c. To unpack the zip archive (`dlserial.zip`), in the File Manager click File, then click Run, and type the following inside the Command Line box:  
  
`A:\pkunzip dlserial.zip C:\update`  
  
Or, in MSDOS, type the above line at any MSDOS prompt.  
  
Or, in Windows 95/NT, select Start/Run from the task bar and then type the above line.
  - d. Press **Enter**.

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**NOTE** See the Appendix for information on unzipping files or extracting .exe files using MS Windows.

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3. Verify that the following items were unpacked:

readme.txt	(these instructions)
dlserial.bat	(script to perform the download)
dlfmwr.bat	(script to perform the EGS firmware download)
dlarb.bat	(script to perform the UND firmware download)
split_dl.exe	(auxiliary program used by dlserial.bat)
wait.exe	(auxiliary program used by dlserial.bat)
ask.exe	(auxiliary program used by dlserial.bat)
falcon.out	(the ESG firmware image)
arbdsp.out	(auxiliary firmware for the UND option)

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**NOTE** The directory may also contain files that are used for other operating systems.

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4. Execute the dlserial.bat script to start the firmware download program.

- a. Change your computer directory to the update directory as follows:

```
C:\>cd c:\update
```

- b. Within the update directory, type dlserial.bat and press **Enter** on the computer. This will start the firmware download program.

- c. See the Appendix for the DOS directory setup example.

5. Follow the instructions as they are presented.

- Press any key to continue refers to any key on the computer keyboard. Do not press any keys on the signal generator.
- Close all Windows programs. Any interruption of serial communications will cause the download process to fail.
- The firmware download will be complete when the large complete note is displayed at the end of the download on the computer's screen.

- a. When you see this prompt: Will you be using COM1 for this firmware download? (Y/N) Return, press the computer keyboard **Y** or **N** key.

**Y** = Continue with the download.

**N** = Causes a prompt to the user about using COM2.

- b. When you see this prompt: Will you be using COM2 for the firmware download? (Y/N) Return, press the computer keyboard **Y** or **N** key.

**Y** = Continue with the download.

**N** = Download will be terminated. The port must be either COM1 or COM2.

- c. When you see this prompt: With this firmware download, are you also installing new hardware in the instrument? (Y/N) Return, press the computer keyboard **Y** or **N** key.

**N** = Indicates no new hardware has been installed, continue with the download.

**Y** = Is the new hardware physically installed? (Y/N) Return, press the computer keyboard **Y** or **N** key.

**Y** = Continue with the download.

**N** = The new hardware must be physically installed before continuing the download process. Consult the hardware installation note for more information. The download process will now be terminated.

- d. Connect the serial cable between the signal generator to the computer's COM1 port, then press any key on the computer's keyboard to continue.
- e. Turn on the signal generator, then press any key on the computer's keyboard to continue.
- f. When you are prompted with Be sure the instrument RS-232 settings under the front panel keys [Utility] [HP-IB/RS-232] are set as follows (Baud rate = 19200, Echo = off, Transmit Pace = None, Receive Pace = X On, RTS/CTS = RTS On), verify the settings and then press any key on the computer's keyboard to continue.
- g. When you are prompted with Note: If this ESG contains an old bootrom, executing this download will cause the instrument to reinitialize the user file system, arb file system, and instrument states. Instrument calibration files will not be affected. Do you want to proceed? [(Y/N) Return], press the computer keyboard **Y** or **N** key.
- Y** = Continue with the download.
- N** = Terminate the download.
- h. Once the download starts, it will take 40 minutes to complete. No further interaction is required. While the download is in progress, dserial.bat will show the communication that is taking place with the signal generator. What appear to be several (non-highlighted) prompts will appear on the display. These will be automatically answered by the dserial.bat program.

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NOTE	After the firmware download is complete, the instrument will reboot automatically.
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NOTE	If the download process fails (due to loss of synchronization, accidental loss of power, etc.) repeat from Step 4.
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6. When dserial.bat completes and the signal generator is running the new firmware, disconnect the RS-232 cable.
7. To verify that the new firmware has been downloaded, on the signal generator press **Utility**, **Instrument Info/Help Mode**, **Diagnostic Info**. The new firmware revision and firmware date should be displayed under "Instrument Information."

## Troubleshooting Hints

Normally, the controller will set the signal generator to "bootROM mode." If the signal generator is in the wrong mode, the download program will *not* detect this condition. If this occurs, you must reboot the computer by pressing the following three keys simultaneously: **Ctrl Alt Del**. Then repeat the procedure from Step 4.

## Installation Procedure: OmniBook PC Version

This procedure uses an OmniBook PC to download firmware into the signal generator.

**Table 2**                      **Equipment Required for Omnibook PC Connection**

Quantity	Description	Part Number
1	Serial RS-232 cable 9-pin (male) to 9-pin (female)	8120-6188
1	RS-232 null modem (male-male)	5181-6639
1	Serial RS-232 adapter (female-female)	1252-7825

1. Connect the computer to the signal generator via the null modem:
  - a. Attach the male end of the RS-232 cable to the signal generator.
  - b. Attach the female end of the RS-232 cable to the null modem.
  - c. Remove both standoffs from the female adapter with the 5-mm nut driver.
  - d. Attach the modified adapter to the modem and to the selected RS-232 port on the PC.

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**NOTE** Typically, you would use the COM1 RS-232 port, but COM2 is acceptable if it is available. No other program can make use of this port at any time during the procedure.

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2. Insert the firmware upgrade disk into the computer disk drive.
  - a. Create an empty directory called `update` on the C:\ drive to unpack the zip archive.
  - b. Using MS Windows, go to File Manager and select drive A:\ or B:\. The two files, `dlserial.zip` and `pkunzip.exe`, should be present.
  - c. To unpack the zip archive (`dlserial.zip`), in the File Manager click File, then click Run, and type the following inside the Command Line box:  

```
A:\pkunzip dlserial.zip C:\update
```

Or, in MSDOS, type the above line at any MSDOS prompt.  
Or, in Windows 95/NT, select Start/Run from the task bar and then type the above line.
  - d. Press **Enter**.

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**NOTE** See the Appendix for information on unzipping files or extracting `.exe` files using MS Windows.

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3. Verify that the following items were unpacked:

<code>readme.txt</code>	(these instructions)
<code>dlserial.bat</code>	(script to perform the download)
<code>dlfmwr.bat</code>	(script to perform the EGS firmware download)
<code>dlarb.bat</code>	(script to perform the UND firmware download)
<code>split_dl.exe</code>	(auxiliary program used by <code>dlserial.bat</code> )
<code>wait.exe</code>	(auxiliary program used by <code>dlserial.bat</code> )
<code>ask.exe</code>	(auxiliary program used by <code>dlserial.bat</code> )
<code>falcon.out</code>	(the ESG firmware image)
<code>arbdsp.out</code>	(auxiliary firmware for the UND option)



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**NOTE** The directory may also contain files which are used for other operating systems.

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4. Execute the `dlserial.bat` script to start the firmware download program.
  - a. Change your computer directory to the update directory as follows:  
`C:\>cd c:\update`
  - b. Within the update directory, type `dlserial.bat` and press **Enter** on the computer. This will start the firmware download program.
  - c. See the Appendix for the DOS directory setup example.
5. Follow the instructions as they are presented.
  - Press any key to continue refers to any key on the computer keyboard. Do not press any hardkeys or softkeys on the signal generator.
  - Close all Windows programs. Any interruption of serial communications will cause the download process to fail.
  - The firmware download will be complete when the large complete note is displayed at the end of the download on the computer's screen.
  - a. When you see this prompt: Will you be using COM1 for this firmware download? (Y/N) Return, press the computer keyboard **Y** or **N** key.
    - Y** = Continue with the download.
    - N** = Causes a prompt to the user about using COM2.
  - b. When you see this prompt: Will you be using COM2 for the firmware download? (Y/N) Return, press the computer keyboard **Y** or **N** key.
    - Y** = Continue with the download.
    - N** = Download will be terminated. The port must be either COM1 or COM2.
  - c. When you see this prompt: With this firmware download, are you also installing new hardware in the instrument? (Y/N) Return, press the computer keyboard **Y** or **N** key.
    - N** = Indicates no new hardware has been installed, continue with the download.
    - Y** = Is the new hardware physically installed? (Y/N) Return, press the computer keyboard **Y** or **N** key.
      - Y** = Continue with the download.
      - N** = The new hardware must be physically installed before continuing the download process. Consult the hardware installation note for more information. The download process will now be terminated.
  - d. Connect the serial cable between the signal generator to the computer's COM1 port, then press any key on the computer's keyboard to continue.
  - e. Turn on the signal generator, then press any key on the computer's keyboard to continue.
  - f. When you are prompted with Be sure the instrument RS-232 settings under the front panel keys [Utility] [HP-IB/RS-232] are set as follows (Baud rate = 19200, Echo = off, Transmit Pace = None, Receive Pace = X On, RTS/CTS = RTS On), verify the settings and then press any key on the computer's keyboard to continue.

- g. When you are prompted with Note: If this ESG contains an old bootrom, executing this download will cause the instrument to reinitialize the user file system, arb file system, and instrument states. Instrument calibration files will not be affected. Do you want to proceed? [(Y/N) Return], press the computer keyboard **Y** or **N** key.

**Y** = Continue with the download.

**N** = Terminate the download.

- h. Once the download starts, it will take 40 minutes to complete. No further interaction is required. While the download is in progress, dlserial.bat will show the communication that is taking place with the signal generator. What appear to be several (non-highlighted) prompts will appear on the display. These will be automatically answered by the dlserial.bat program.

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<b>NOTE</b>	After the firmware download is complete, the instrument will reboot automatically.
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<b>NOTE</b>	If the download process fails (due to loss of synchronization, accidental loss of power, etc.) repeat from Step 4.
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6. When dlserial.bat completes and the signal generator is running the new firmware, disconnect the RS-232 cable.
7. To verify that the new firmware has been downloaded, on the signal generator press **Utility, Instrument Info/Help Mode, Diagnostic Info**. The new firmware revision and firmware date should be displayed under "Instrument Information."

## Troubleshooting

Normally, the controller will set the signal generator to "bootROM mode." If the signal generator is in the wrong mode, the download program will *not* detect this condition. If this occurs, you must reboot the computer by pressing the following three keys simultaneously: **Ctrl Alt Del**. Then repeat the procedure from Step 4.

## Installation Procedure: HP Palmtop Version

This procedure uses an HP 200LX palmtop computer to download new firmware into the signal generator.

**Table 3**                      **Equipment Required for HP Palmtop Connection**

Quantity	Description	Part Number
1	Serial RS-232 cable 9-pin (male) to 9-pin (female)	8120-6188
1	Serial RS-232 adapter (male-male)	1252-7824
1	5 MB flash disk	F1012A
1	HP connectivity pack (contains connectivity pack software and serial cable)	F1015-80002

1. Insert the firmware upgrade disk into a PC compatible computer disk drive.
  - a. Create an empty directory called `update` on the `C:\` drive to unpack the zip archive.
  - b. Using MS Windows, go to File Manager and select drive `A:\` or `B:\`. The two files, `dlserial.zip` and `pkunzip.exe`, should be present.
  - c. To unpack the zip archive (`dlserial.zip`) click File, then click Run and type the following inside the Command Line box:  

```
A:\pkunzip dlserial.zip C:\update
```
  - d. Press Enter.

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**NOTE** For the connectivity pack serial cable connection to the palmtop, make sure that the HP logo on the plug faces up.

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2. See the Appendix for unzip. Using the palmtop's connectivity pack software and hardware, download the upgrade firmware files from `c:\update` to the palmtop's flash disk, into a directory called `A:\dl`. See the Appendix for a DOS file copy example. Refer to the palmtop owner's manual for this procedure.
3. Verify that the following items were unpacked:

<code>readme.txt</code>	(these instructions)
<code>dlserial.bat</code>	(script to perform the download)
<code>dlfmwr.bat</code>	(script to perform the EGS firmware download)
<code>dlarb.bat</code>	(script to perform the UND firmware download)
<code>split_dl.exe</code>	(auxiliary program used by <code>dlserial.bat</code> )
<code>wait.exe</code>	(auxiliary program used by <code>dlserial.bat</code> )
<code>ask.exe</code>	(auxiliary program used by <code>dlserial.bat</code> )
<code>falcon.out</code>	(the ESG firmware image)
<code>arbdsp.out</code>	(auxiliary firmware for the UND option)
<code>dlserial.icn</code>	(icon file for the system manager)

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**NOTE** The directory may also contain files which are used for other operating systems.

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4. Connect the palmtop to the signal generator.
  - a. Attach the male end of the RS-232 cable to the signal generator.
  - b. Attach the female end of the RS-232 cable to the male adapter.
  - c. Attach the connectivity pack serial cable to the male adapter and to the selected RS-232 port on the palmtop. Make sure that the HP logo on the plug faces up.

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**NOTE** Use the COM1 RS-232 port. No other program can make use of this port at any time during the procedure.

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5. Use the following procedure to set up the palmtop's application manager:
  - a. On the palmtop, open the Applications Manager: press **&....**
  - b. Then press **MENU**.
  - c. Press **A** (Application).
  - d. In the Name box, type download. Then press **TAB**.
  - e. In the Path box, type `a:d1\dlerial.bat com1|250`. (Press the shift key and the `\` key to type the `|`.) Then press **TAB**.
  - f. In the Comments box, type `¿ (Fn, 3)` followed by `¡ (Fn, FLER)`. Then press **TAB**.

These settings prevent the system manager from interfering with the download. The `|250` entry in the Path box provides sufficient DOS memory for the programs.
6. In the Icon box, scroll, using the up arrow key, to select the signal generator icon. If everything is correct, press **F10** (OK). This will return you to the applications manager screen. The new application icon should be present.
7. To start the download program, select the signal generator icon and press **ENTER**.
8. Follow the instructions as they are presented.
  - a. Press any key to continue refers to any key on the computer keyboard. Do not press any hardkeys or softkeys on the signal generator.
  - b. When you are prompted `With this firmware download, are you also installing new hardware in the instrument? (Y/N)` Return, press the computer keyboard **Y** or **N** key.

**N** = Indicates no new hardware has been installed, continue with the download.

**Y** = Is the new hardware physically installed? (Y/N) Return, press the computer keyboard **Y** or **N** key.

**Y** = Continue with the download.

**N** = The new hardware must be physically installed before continuing the download process. Consult the hardware installation note for more information. The download process will now be terminated.
  - c. Connect the serial cable between the signal generator to the computer's COM1 port, then press any key on the computer's keyboard to continue.
  - d. Turn on the signal generator, then press any key on the computer's keyboard to continue.
  - e. When you are prompted with `Be sure the instrument RS-232 settings under the front panel keys [Utility] [HP-IB/RS-232] are set as follows` (Baud rate = 19200, Echo = off, Transmit Pace = None, Receive Pace = X On, RTS/CTS = RTS On), verify the settings and then press any key on the computer's keyboard to continue.

- f. When you are prompted with **Note: If this ESG contains an old bootrom, executing this download will cause the instrument to reinitialize the user file system, arb file system, and instrument states. Instrument calibration files will not be affected. Do you want to proceed? (Y/N) Return], press the computer keyboard Y or N key.**

**Y = Continue with the download.**

**N = Terminate the download.**

- g. Once the download starts, it will take 40 minutes to complete. No further interaction is required. While the download is in progress, `dlserial.bat` will show the communication that is taking place with the signal generator. What appear to be several (non-highlighted) prompts will appear on the display. These will be automatically answered by the `dlserial.ksh` program.

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**NOTE** After the firmware download is complete, the instrument will reboot automatically.

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**NOTE** If the download process fails (due to loss of synchronization, accidental loss of power, etc.), repeat from Step 4.

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9. When `dlserial.bat` completes and the signal generator is running the new firmware, disconnect the RS-232 cable.
10. To verify that the new firmware has been downloaded, on the signal generator press **Utility, Instrument Info/Help Mode, Diagnostic Info**. The new firmware revision and firmware date should be displayed under “Instrument Information.”

## Troubleshooting Hints

1. If the signal generator does not enter remote mode when downloading:
  - Make sure that you turn on the signal generator within 5 seconds of the request.
  - Make sure that the serial cable is plugged into the palmtop with the HP logo facing up.
  - Make sure that the serial cable and adapters are securely connected to the signal generator.
2. If the signal generator displays `Command not found` or if the download stops working properly:
  - Make sure that the power is not interrupted and no keys are pressed on the signal generator during the download.
  - Make sure that the serial cable is securely connected.
  - Check the palmtop for a low battery.

## HP Access Web Site Firmware Download Procedure

This procedure uses a net browser (such as Netscape Navigator) to download new firmware into the signal generator.

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**NOTE** See the Appendix for a browser copy file example.

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1. Access the “HP Test & Measurement” web page at the following URL:  
`http://www.tmo.hp.com/`
2. Click on the “Product Information” icon.
3. Click on the “HP model number” link.
4. On the model number index, click on “E” to review the HP E series products.
5. From the HP E product numbers, if your signal generator is an HP ESG series (analog), click on any one of the HP ESG series signal generator models. If your signal generator is an HP ESG-D series (digital), click on any one of the HP ESG-D series signal generator models.
6. Scroll through the “Product Information” and click on “Free Firmware Upgrade for the ESG (or ESG-D) Series Signal Generators.
7. To download the latest firmware to a PC, follow these steps:
  - a. Place an empty, formatted disk in drive A.
  - b. Click on the HP ESG (or ESG-D) Series Firmware Upgrade, PC format (DOS) link.
  - c. Click “Save File”.
  - d. Choose the A:\ directory if you are using an empty formatted disk.
  - e. The file dlserial.zip should be displayed in the File Name: window. Click the OK button to start the file transfer. (See “Installation Procedure: PC Version” to uncompress files.)

The Saving Location window will appear showing the file transfer process. Once the file has transferred, you will be returned to the web page.
  - f. To download pkunzip.exe to the PC disk located in drive A:\, click the pkunzip.exe link and repeat steps 7a through 7e.
  - g. Exit Netscape when the download is complete.

# Appendix

## Copying Files to a Directory Using DOS

The PC MS-DOS® command line example below shows how to create a new file directory on the PC hard drive, and move the necessary files from the firmware upgrade disk into the new directory.

1. C:\> md dl (Make the directory called dl.)
2. C:\> cd dl (Change to the directory called dl.)
3. C:\DL> copy a: split\_dl.exe (Copy split\_dl.exe to the directory called dl.)
4. C:\DL> copy a: dlserial.bat (Copy dlserial.bat to the directory called dl.)
5. C:\DL> copy a: wait.exe (Copy wait.exe to the directory called dl.)
6. C:\DL> copy a: falcon.out (Copy falcon.out to the directory called dl.)

## Unzipping a File Using MS Windows

The pkunzip.exe file is included on the PC disk with the zipped file.

1. To review the files, go to the Windows File Manager and choose the appropriate directory (A: or B:).
2. To unzip a file, click **File**, then click **Run**.
3. Type the following information in the command line box, and then press enter:

```
A:\pkunzip <filename>.zip c:\update  
(run pkunzip) (zip filename) (directory where you want the unzipped file to go)
```

## Using a Browser Such as Netscape Navigator to Download or Copy a File from a Web Page

1. Click on **File**, located at the top left corner of Netscape.
2. Choose **Save As**.
3. Choose an empty directory.
4. Make sure that the file name to download or copy is within the File Name Window.
5. Click the **OK** button to copy the file. (A Saving Location window will appear indicating the copy file progress.)
6. Once the download or copy of the file is complete, exit Netscape.

## Using MS Windows to Unpack a .exe File

1. Using the Windows File Manager, locate the downloaded file (in directory A: or B:).
2. Highlight the file, then click **Run**.
3. In the command line box, type the following, then press **Enter**: A:\<filename>.exe c:\update.

