

Installation Note

CPU Board Upgrade Kit

Upgrade Kit Number: E8356-60106

For E8356A, E8357A, and E8358A PNA Series RF Network Analyzers

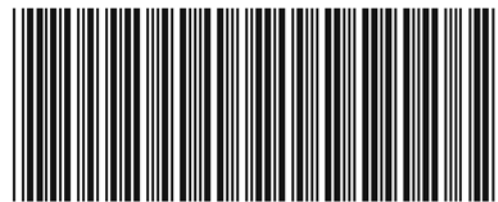


Agilent Part Number: E8356-90053

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E8356-90053

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The following safety notes are used throughout this document. Familiarize yourself with each of these notes and its meaning before performing any of the procedures in this document.

WARNING	Warning denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in injury or loss of life. Do not proceed beyond a warning note until the indicated conditions are fully understood and met.
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CAUTION	Caution denotes a hazard. It calls attention to a procedure that, if not correctly performed or adhered to, could result in damage to or destruction of the instrument. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.
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By internet, phone, or fax, get assistance with all your test and measurement needs.

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Americas			
Brazil (tel) (+55) 11 4197 3700 (fax) (+55) 11 4197 3800	Canada (tel) 888 447 7378 (fax) 905 282 6495	Mexico (tel) 1 800 734 7703 (fax) 1 800 734 7704	United States (tel) 800 829 4444 (alt) (+1) 303 662 3998 (fax) 800 829 4433
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Taiwan (tel) 0800 047 661 (tel) 0800 047 669 (fax) 0800 047 667	Thailand (tel) 1 800 2758 5822 (alt) (+66) 259 3442 (fax) 1 800 656 336	Malaysia (tel) 1800 880 399 (fax) 1800 801 054	
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Austria (tel) 0820 87 44 11* (fax) 0820 87 44 22	Belgium (tel) (+32) (0)2 404 9340 (alt) (+32) (0)2 404 9000 (fax) (+32) (0)2 404 9395	Denmark (tel) (+45) 7013 1515 (alt) (+45) 7013 7313 (fax) (+45) 7013 1555	Finland (tel) (+358) 10 855 2100 (fax) (+358) (0) 10 855 2923
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Italy (tel) (+39) (0)2 9260 8484 (fax) (+39) (0)2 9544 1175	Luxemburg (tel) (+32) (0)2 404 9340 (alt) (+32) (0)2 404 9000 (fax) (+32) (0)2 404 9395	Netherlands (tel) (+31) (0)20 547 2111 (alt) (+31) (0)20 547 2000 (fax) (+31) (0)20 547 2190	Russia (tel) (+7) 095 797 3963 (alt) (+7) 095 797 3900 (fax) (+7) 095 797 3901
Spain (tel) (+34) 91 631 3300 (alt) (+34) 91 631 3000 (fax) (+34) 91 631 3301	Sweden (tel) 0200 88 22 55* (alt) (+46) (0)8 5064 8686 (fax) 020 120 2266*	Switzerland (French) (tel) 0800 80 5353 opt. 2* (alt) (+33) (0)1 6453 5623 (fax) (+41) (0)22 567 5313	Switzerland (German) (tel) 0800 80 5353 opt. 1* (alt) (+49) (0)7031 464 6333 (fax) (+41) (0)1 272 7373
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About Installing the Upgrade

Products affected.	E8356A, E8357A, and E8358A (all options)
Installation to be performed by	Agilent service center or personnel qualified by Agilent.
Estimated time to back up and restore files	15 minutes
Estimated time to install the hardware.	30 minutes
Estimated time to run the Operator's Check . . .	30 minutes

Description of the Upgrade

This upgrade is to replace the standard 266 MHz CPU board with a new 500 MHz CPU board for the E8356A, E8357A, or E8358A PNA series RF network analyzer.

It is necessary, as part of this upgrade, to replace the hard disk drive as well. This is because the operating system used by the new 500 MHz CPU board is Windows® XP, whereas the operating system used by the 266 MHz CPU board was Windows 2000. The new Windows XP operating system is provided on the new hard disk drive.

Items Included in the Upgrade Kit

Check the contents of your kit against this list. If any item is missing or damaged, contact Agilent Technologies. Refer to [“Getting Assistance from Agilent” on page 3](#).

Table 1 Contents of the CPU Board Upgrade Kit (E8356-60106)

Description	Qty	Part Number
Installation note (this document)	1	E8356-90053
CPU board; 500 MHz, 512 MB RAM	1	E8364-60025
Programmed hard disk drive	1	E8801-60063

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Installation Procedure for the Upgrade

The network analyzer must be in proper working condition prior to installing this option. Any necessary repairs must be made before proceeding with this installation.

WARNING **This installation requires the removal of the analyzer's protective outer covers. The analyzer must be powered down and disconnected from the mains supply before performing this procedure.**

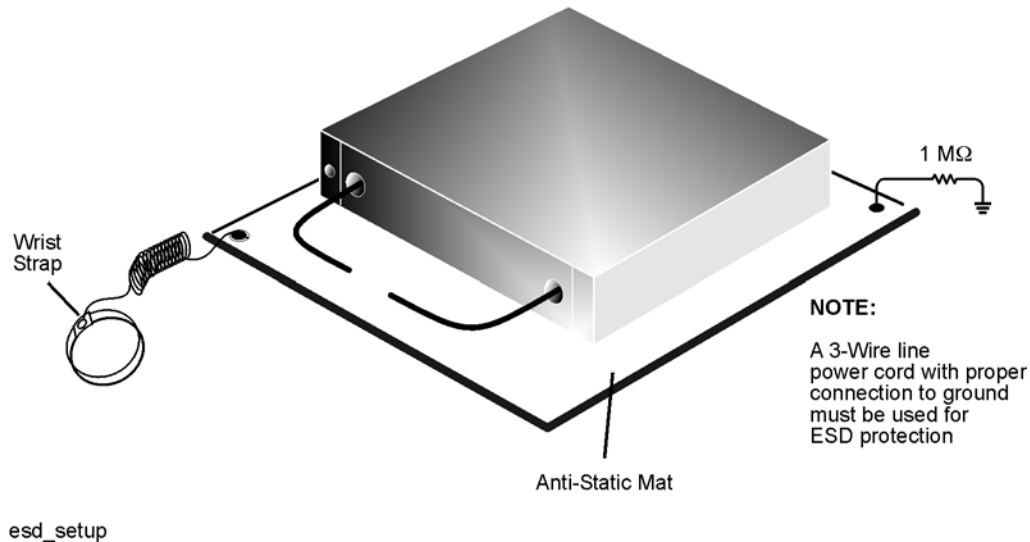
Electrostatic Discharge Protection

Protection against electrostatic discharge (ESD) is essential while removing assemblies from or connecting cables to the network analyzer. Static electricity can build up on your body and can easily damage sensitive internal circuit elements when discharged. Static discharges too small to be felt can cause permanent damage. To prevent damage to the instrument:

- *always* have a grounded, conductive table mat in front of your test equipment.
- *always* wear a grounded wrist strap, connected to a grounded conductive table mat, having a 1 M Ω resistor in series with it, when handling components and assemblies or when making connections.
- *always* wear a heel strap when working in an area with a conductive floor. If you are uncertain about the conductivity of your floor, wear a heel strap.
- *always* ground yourself before you clean, inspect, or make a connection to a static-sensitive device or test port. You can, for example, grasp the grounded outer shell of the test port or cable connector briefly.

Figure 1 shows a typical ESD protection setup using a grounded mat and wrist strap. Refer to “Tools and Equipment Required for the Installation” on page 6 for part numbers.

Figure 1 **ESD Protection Setup**



Overview of the Installation Procedure

IMPORTANT You must have a new Agilent administrator password to complete this upgrade procedure. It is recommended that this password be obtained before beginning this procedure. Read and understand the requirements of [“Step 5. Set Up the Agilent Administrator Password” on page 18](#) before beginning this installation.

1. Copy needed files from the existing hard disk drive for later installation onto the new hard disk drive using Windows® Explorer.
2. Remove and replace the A15 CPU board assembly and the A31 hard disk drive assembly.
 - A. Remove the outer and inner covers from the analyzer.
 - B. Remove and replace the A15 CPU board and A31 hard disk drive.
 - C. Reinstall the inner and outer covers.
3. Adhere the new Microsoft® license certificate to the outer cover.
4. Boot up the analyzer.
5. Set up the Agilent administrator password.
6. Install backup files onto the new hard disk drive.
7. Perform the Operator’s Check to verify basic analyzer operation.

Tools and Equipment Required for the Installation

Description	Model/Part Number
Tools for A15 CPU Board Assembly and A31 Hard Disk Drive Assembly Replacement	
T-10 TORX driver (set to 4 in-lbs; for hard disk drive replacement)	N/A
T-10 TORX driver (set to 7 in-lbs; for hard disk drive replacement)	N/A
T-10 TORX driver (set to 9 in-lbs; for all other T-10 applications)	N/A
T-20 TORX driver (set to 21 in-lbs)	N/A
ESD Equipment	
ESD grounding wrist strap	9300-1367
5 ft grounding cord for wrist strap	9300-0980
2 x 4 ft conductive table mat and 15 ft grounding wire	9300-0797
ESD heel strap (for use with conductive floors)	9300-1308
Equipment for the Operator’s Check	
Male short, type-N (from the 85032F calibration kit) ^a	E8356-60016

- a. Alternate choice: a 3.5 mm short from the 3.5 mm 85033E calibration kit and a type-N to 3.5 mm adapter.

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Step 1. Back Up Unique Files Located on the Hard Disk Drive

In this upgrade, the analyzer's hard disk drive is replaced. Files exist on this disk drive that are necessary for proper operation of your analyzer. These files, listed in the procedure below, must be copied to another location to allow them to be installed onto the new hard disk drive.

An abbreviated procedure is provided in *italic* typeface. If you need more detailed instructions, they are provided in each step following the italicized instruction.

Procedure

The network analyzer must be powered up and operating for this procedure.

1. *Insert a writable floppy disk into the floppy disk drive.*

2. *Open two copies of **Windows Explorer**:*

Detailed instructions:

- a. Click on **START**. (It may be necessary to exit the **Network Analyzer** application.)
- b. Point to **Programs, Accessories**, and then click on **Windows Explorer**.
- c. Adjust the horizontal width of the **Windows Explorer** window to approximately one-half the width of the display and position it to either the left or right side of the display.
- d. Repeat steps a–c to create another copy of the **Windows Explorer** window and position it to the opposite side of the display so that the two copies are displayed side-by-side.

3. *Set one copy of **Windows Explorer** to the **A:** drive and the other to the **C:** drive:*

Detailed instructions:

- a. In one copy of **Windows Explorer**, double-click on **My Computer**, and then double-click on **3 1/2 Floppy (A:)**. A listing of the files on the floppy disk will appear in the right-hand side of the window.
- b. In the other copy of **Windows Explorer**, double-click on **My Computer**, and then double-click on **Hard Disk (C:)**.
- c. Navigate to `C:\Program Files\Agilent\Network Analyzer` by double-clicking on each of the names in this path name, in turn. A listing of the files in this directory on the hard disk will appear in the right-hand side of the window.

4. *Copy each of the following files from the hard disk drive to the floppy disk drive:*

Detailed instructions:

a. Files to copy:

gen.lic user_calkitfile files beginning with mxcalfile_

Any personal user files that you wish to preserve.

- b. Click and drag each of the files on the **C:** drive from the `C:\Program Files\Agilent\Network Analyzer` directory by clicking and holding on the file name in the directory and, while holding the mouse button down, drag the file name to the **A:** drive. If you need help with this “dragging” process, refer to Windows Help.

5. *After all files have been copied, remove the floppy disk from the analyzer's disk drive and exit both copies of **Windows Explorer**.*

Step 2. Remove and Replace the A15 CPU Board Assembly and the A31 Hard Disk Drive Assembly

A. Remove the Outer and Inner Covers from the Analyzer

Refer to [Figure 2](#) for this procedure.

Remove the Outer Cover

CAUTION This procedure is best performed with the analyzer resting on its front handles in the vertical position. *Do not place the analyzer on its front panel without the handles.* This will damage the front panel assemblies.

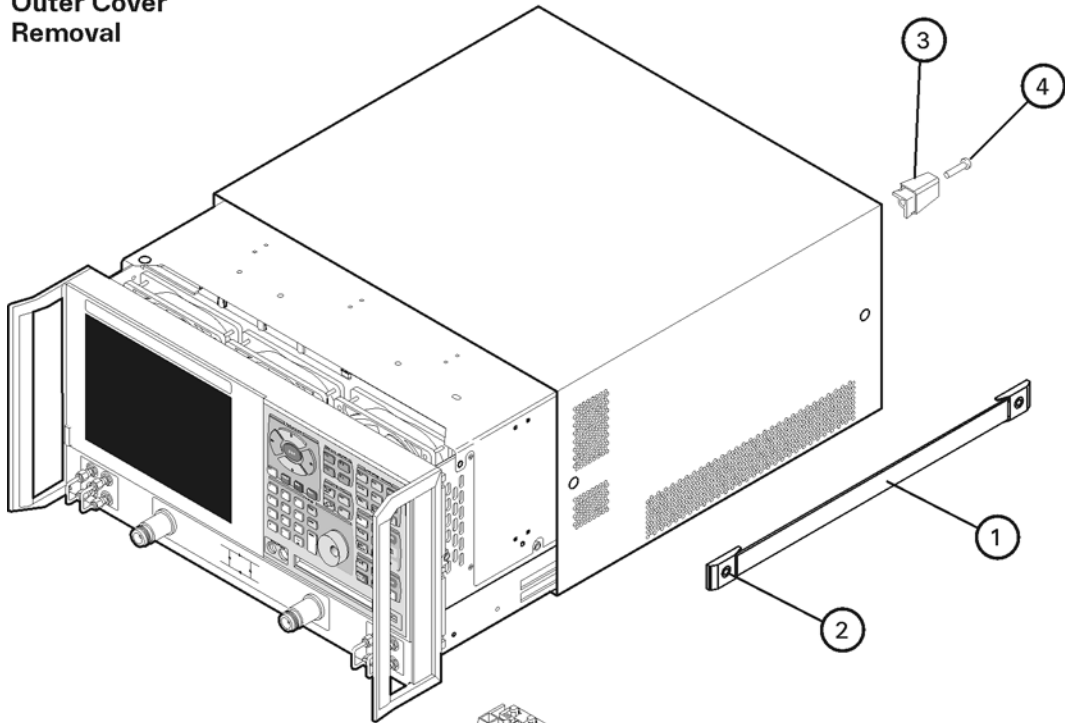
1. Disconnect the power cord (if it has not already been disconnected).
2. With a T-20 TORX driver, remove the strap handles (item ①) by loosening the screws (item ②) on both ends until the handle is free of the analyzer.
3. With a T-20 TORX driver, remove the four rear panel feet (item ③) by removing the center screws (item ④).
4. Slide the four bottom feet (item ⑤) off the cover.
5. Slide the cover off of the frame.

Remove the Inner Cover

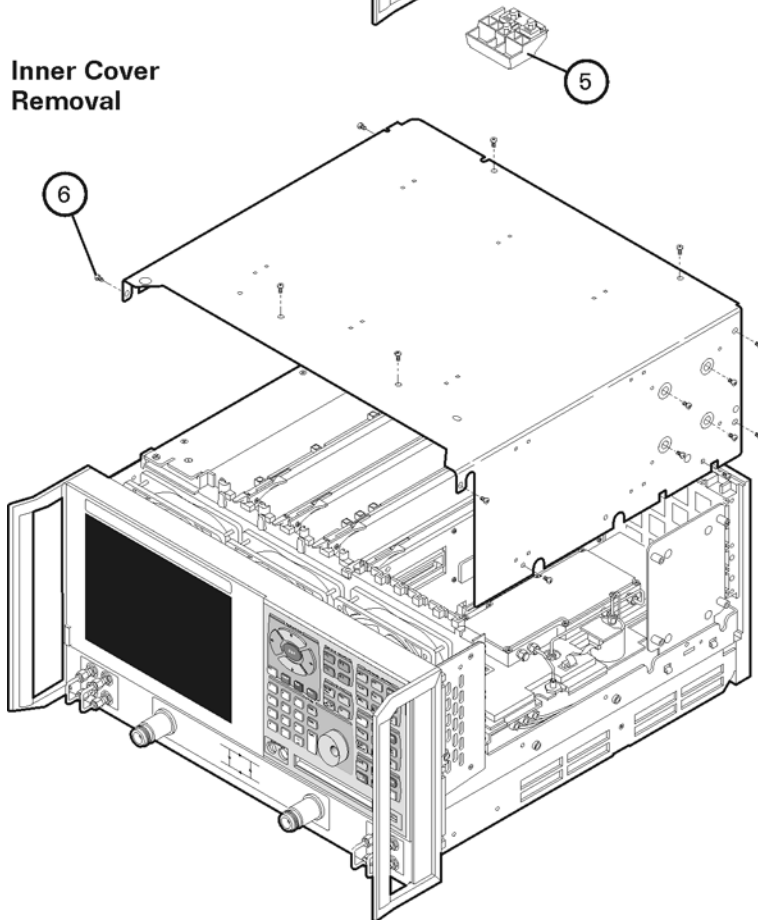
1. With a T-10 TORX driver, remove the 15 screws (item ⑥).
2. Lift off the cover.

Figure 2 Outer and Inner Cover Removal

Outer Cover Removal



Inner Cover Removal



sc857a

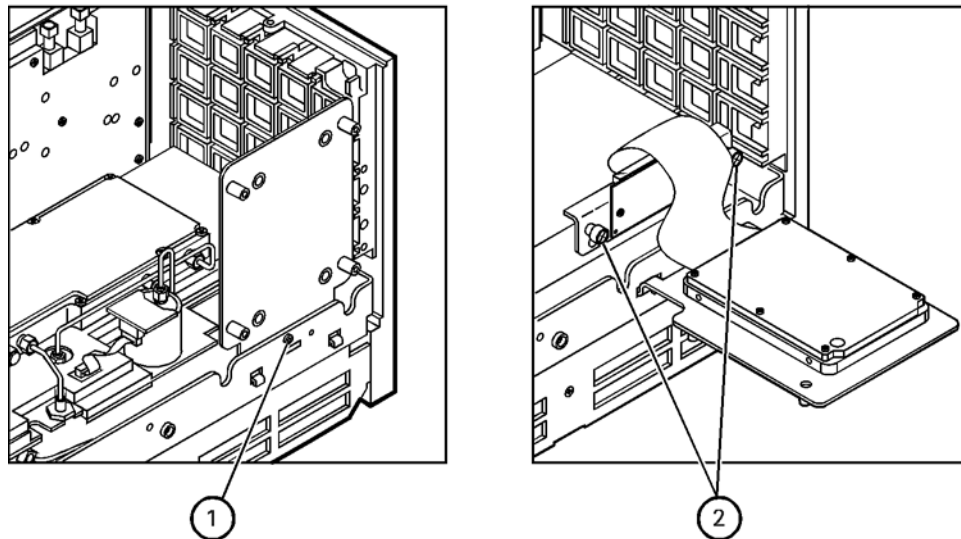
B. Remove and Replace the A15 CPU Board and A31 Hard Disk Drive

Remove the A31 Hard Disk Drive Assembly (HDDA)

Refer to [Figure 3](#) for this procedure.

1. With a T-10 TORX driver, remove the mounting screw (item ①).
2. Move the HDDA to the outside of the analyzer and slide the HDDA bracket feet into the slots in the frame to place the disk drive in the horizontal position.
3. With a T-10 TORX driver, loosen the mounting screws (item ②) and disconnect the interface board from the A15 CPU board assembly.
4. Remove the HDDA bracket feet from the slots in the frame and remove the A31 hard disk drive assembly from the analyzer.

Figure 3 A31 Hard Disk Drive Assembly Removal



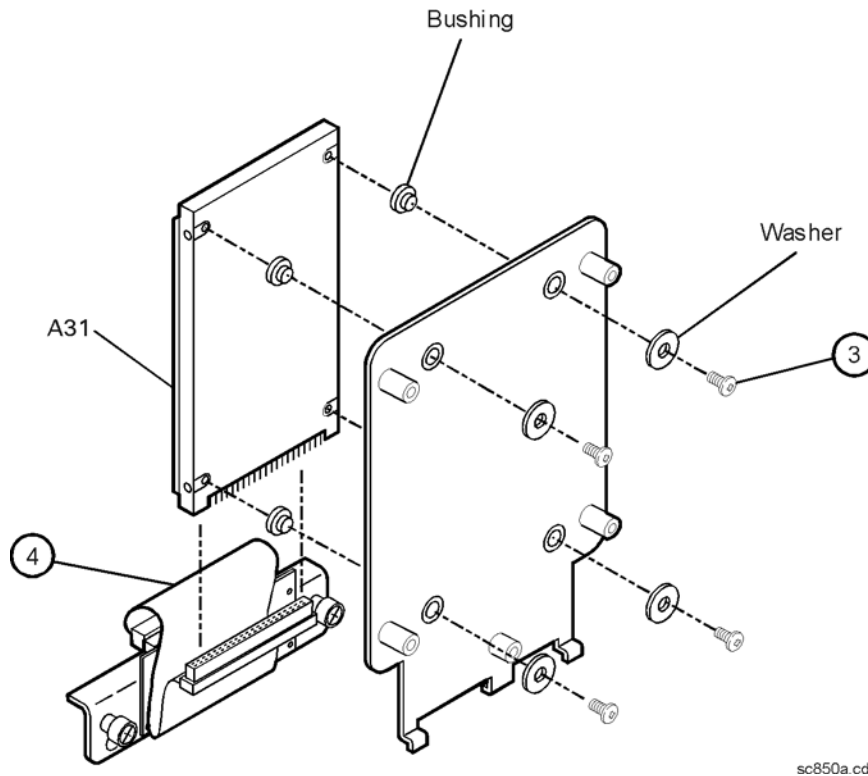
sc840a.cdr

Replace the Hard Disk Drive

Refer to [Figure 4](#) for this procedure.

1. With a T-10 TORX driver, remove the four screws (item ③), flat washers, and bushings that mount the hard disk drive to the bracket.
2. Disconnect the ribbon cable (item ④) from the hard disk drive. Discard the hard disk drive.

Figure 4 A31 Hard Disk Drive Assembly (Exploded View)



WARNING When connecting the ribbon cable (item ④ in **Figure 4**) to the hard disk drive, take special care to align the connector pins. Applying power to a misaligned connection can permanently damage the hard disk drive.

IMPORTANT When replacing the hard disk drive, first torque all four screws (item ③) to 4 in-lb with a T-10 TORX driver. Then secure each screw to 7 in-lb with a T-10 TORX driver.

3. Install the new hard disk drive:
 - a. Connect the ribbon cable (item ④) to the new hard disk drive. Refer to **WARNING** above.
 - b. With a T-10 TORX driver, install the four screws (item ③), flat washers, and bushings that mount the hard disk drive to the bracket. Refer to **IMPORTANT** note above.
4. Do not reinstall the hard disk drive assembly into the analyzer at this time.

Remove the A15 CPU Board Assembly

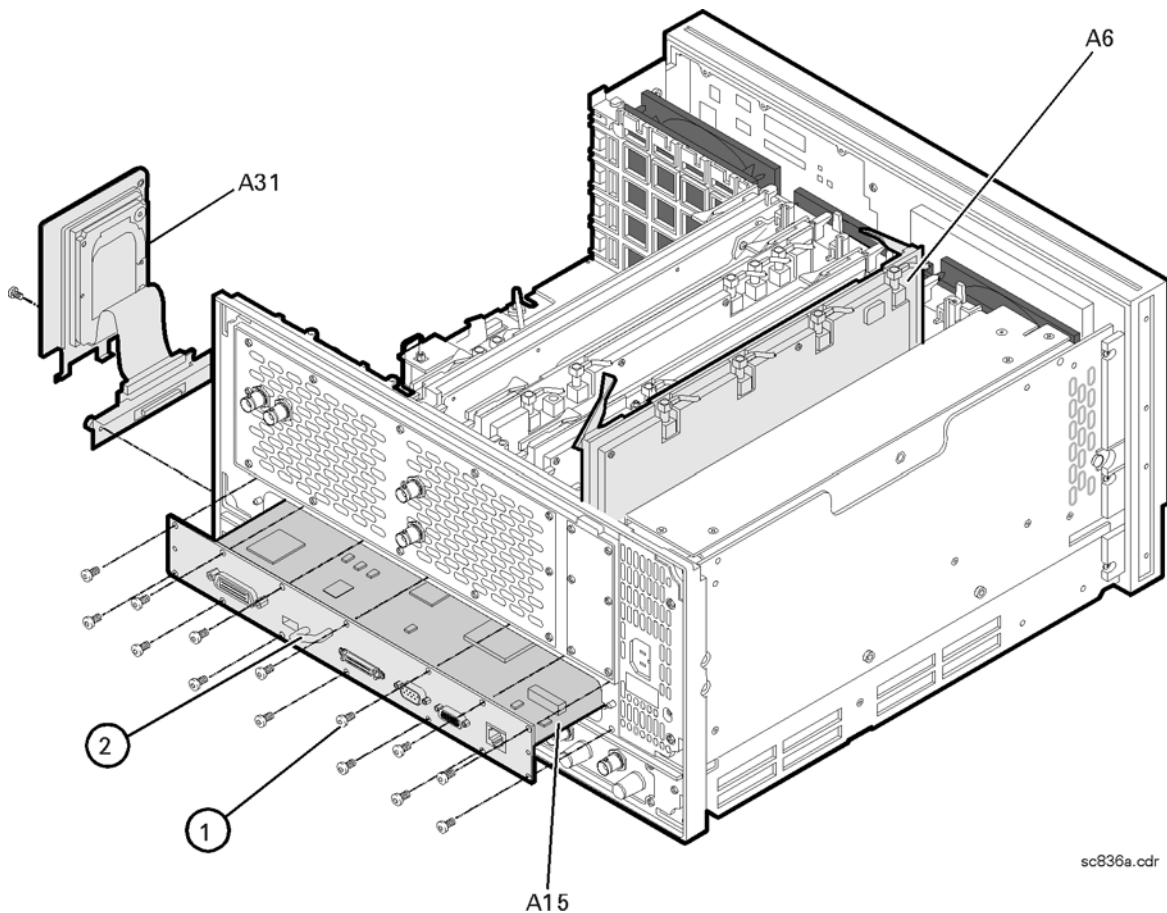
Refer to [Figure 5](#) for this procedure.

1. Disengage the A6 SPAM board assembly from the A15 CPU board assembly by performing the following steps.
 - a. Lift the two extractors located at each end of the board.
 - b. While holding onto the extractors, lift the board halfway out of the slot.
 - c. Let the extractors drop to their normal position.
 - d. Let the board drop into the slot.

The board should now rest above its normal seated position.

2. With a T-10 TORX driver, remove the 14 screws (item ①) from the rear panel of the A15 CPU board assembly.
3. Gently pull on the finger grip (item ②) to disengage the A15 CPU board assembly from the analyzer.
4. Slide the A15 CPU board assembly out of the analyzer.

Figure 5 A15 CPU Board Assembly Removal



Install the New A15 CPU Board Assembly

Refer to [Figure 5](#) for this procedure.

1. Slide the new A15 CPU board into the analyzer slot while being sure that nothing is in its path that may obstruct it, such as the A6 SPAM board assembly.
2. With a T-10 TORX driver, install the 14 screws (item ①) into the A15 CPU board assembly.
3. Reinstall the A6 SPAM board assembly into the A15 CPU board assembly by aligning it with the connector and pressing down on the board to firmly seat it into position. Make sure the board extractors are down in a horizontal position.

Reinstall the A31 Hard Disk Drive Assembly (HDDA)

Refer to [Figure 3](#) for this procedure.

1. Place the HDDA in the service position by inserting the bracket feet into the slots in the frame.
2. Place the interface board into position and, with a T-10 TORX driver, tighten the mounting screws (item ②).
3. Remove the HDDA from the service position and place it into its permanent location.
4. With a T-10 TORX driver, install the mounting screw (item ①).

C. Reinstall the Inner and Outer Covers

Refer to [Figure 6](#) for this procedure.

Reinstall the Inner Cover

1. Place the inner cover on the analyzer. There are two alignment pins on the front frame that must be aligned with holes in the cover.
2. With a T-10 TORX driver, install the 15 screws (item ①).

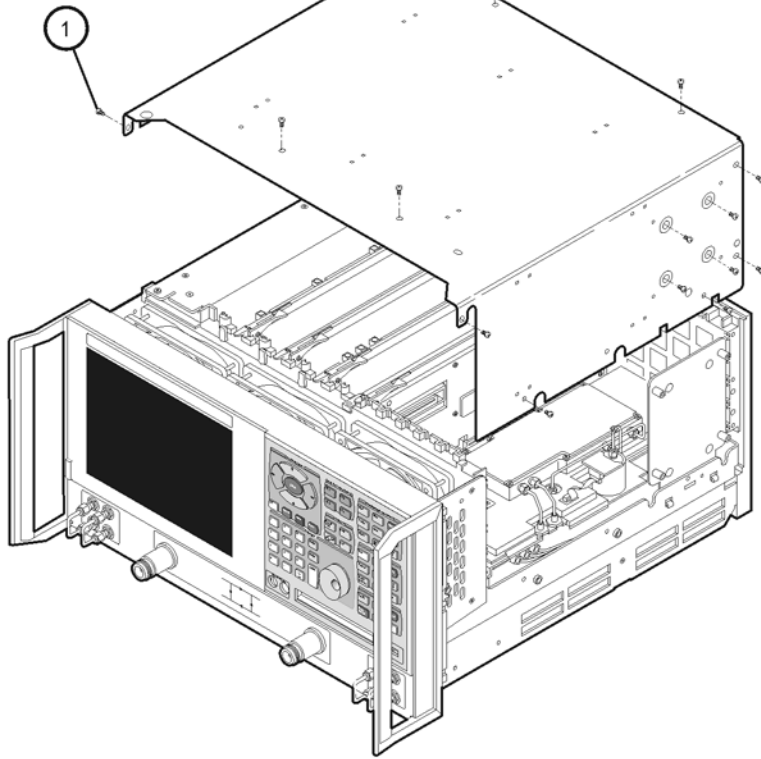
Reinstall the Outer Cover

CAUTION This procedure is best performed with the analyzer resting on its front handles in the vertical position. *Do not place the analyzer on its front panel without the handles.* This will damage the front panel assemblies.

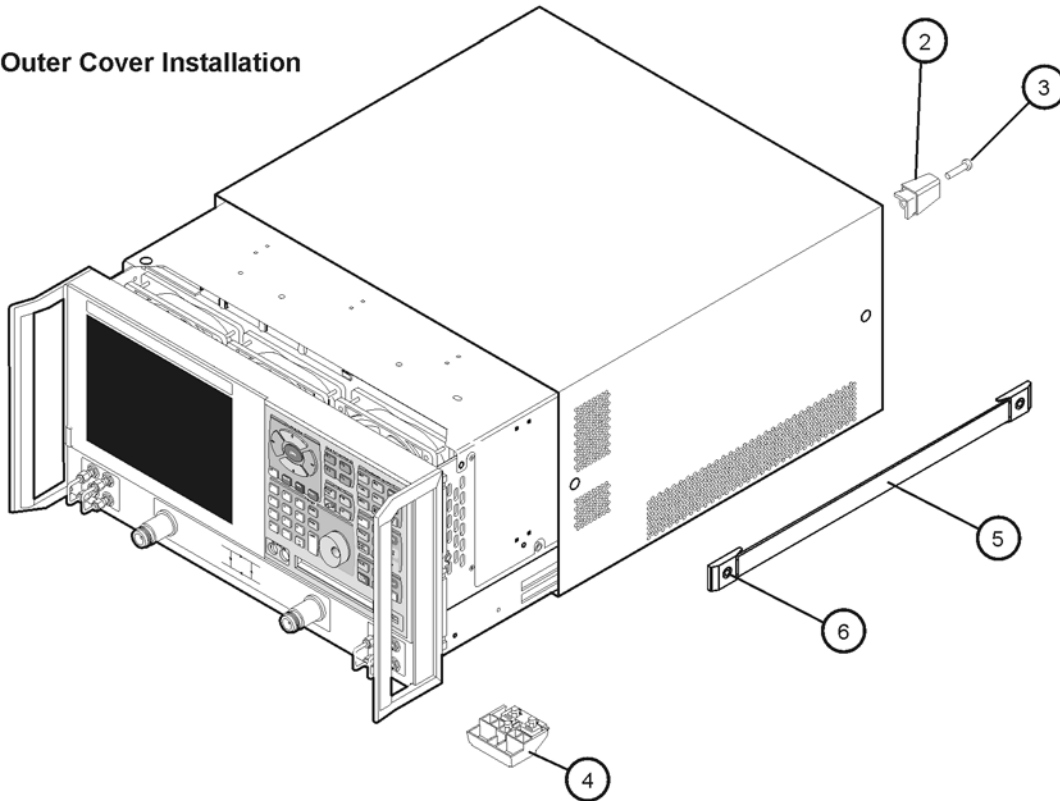
1. Slide the cover onto the frame.
2. With a T-20 TORX driver, install the four rear panel feet (item ②) by installing the center screws (item ③).
3. Slide the four bottom feet (item ④) onto the cover.
4. With a T-20 TORX driver, install the strap handles (item ⑤) by tightening the screws (item ⑥) on both ends.

Figure 6 Inner and Outer Cover Reinstallation

Inner Cover Installation



Outer Cover Installation



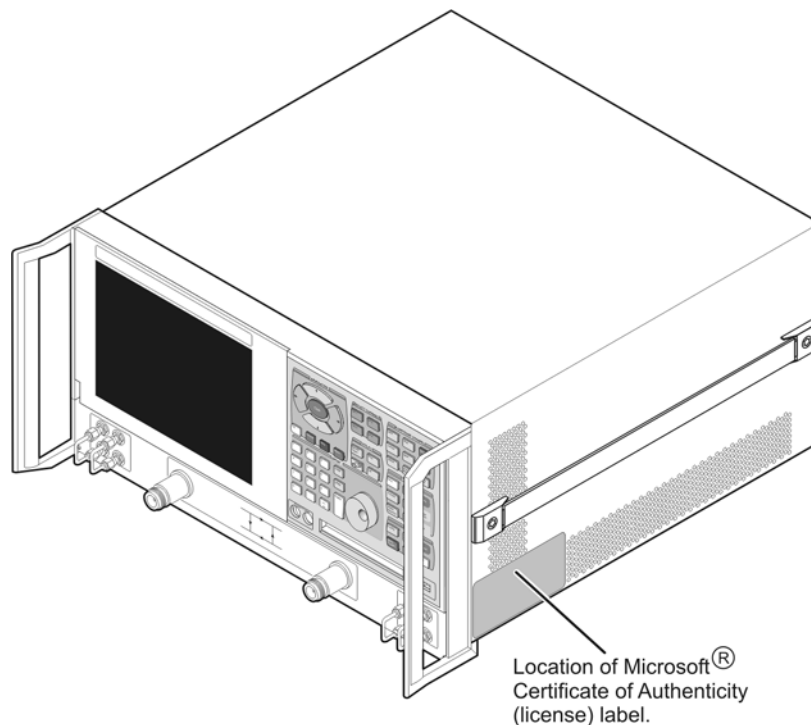
dc802o

Step 3. Adhere the New License Certificate to the Instrument Cover

One new Certificate of Authenticity (license) label for the Microsoft operating system is supplied with the new CPU board and one with the new hard disk drive. Only one is required for this upgrade. In most cases these two assemblies are not replaced at the same time, making it necessary to provide a new label with each assembly.

1. Adhere one new Certificate of Authenticity label to the outside cover of the analyzer anywhere in the area specified in [Figure 7](#):
 - a. Only one label is required, additional labels can be discarded.
 - b. The new label can be adhered over the old one.
 - c. Clean the surface thoroughly before applying the new label.

Figure 7 Location of Certificate of Authenticity Label



license_location_rf

Step 4. Initialize the New Windows XP Operating System

1. Connect a mouse and keyboard to the analyzer.
2. Turn on power to the analyzer.
3. The operating system initialization process will run automatically. Part way through the process, you will be prompted to accept the Windows XP licensing agreement. The entire process takes approximately six minutes.
4. When the initialization process is complete, the analyzer will reboot automatically. After the PNA application screen is displayed, there may be a display to remind you to upgrade the firmware. If so, click **OK** to continue.

Step 5. Set Up the Agilent Administrator Password

If the hard disk has been replaced, it is necessary to set up the Agilent administrator password for the analyzer. This requires obtaining a password from Agilent:

Obtain a Password

- If this procedure is being performed by Agilent personnel, go to the following Internet site and follow the instructions under “Agilent Administrator Password.”

<http://mktwww.soco.agilent.com/field/service/network/pna/support.htm>

- If this procedure is being performed by non-Agilent personnel and email is available:
Send email to: CTD-SoCo_support@agilent.com and include the following items:
 1. Complete model number and serial number of your analyzer
 2. Subject line: “Subject: Agilent Administrator Password”
 3. Attention line: “Attn: PNA Customer Support Engineer”
- If this procedure is being performed by non-Agilent personnel and email is not available:
Contact Agilent for a password before beginning this procedure. Refer to “[Getting Assistance from Agilent](#)” on page 3.

Enter Your Agilent Administrator Password

The network analyzer must be powered up and operating for this procedure.

1. Exit the Network Analyzer program, if it is running.
2. On the **Windows Desktop**, right-click on **My Computer**, and then click **Manage**.
3. In the **Computer Management** window, navigate to **System Tools, Local Users and Groups, Users**.
4. Right-click on **Agilent**, and then click on **Set Password**.
 - a. Type the password obtained from Agilent as the **Password**. Refer to “[Obtain a Password](#)” for information if you have not yet obtained this password.
 - b. Type the password again in the **Confirm password** block.
 - c. Click **OK**.
5. Right-click on **Agilent**, and then click on **Properties**.
 - a. Unselect **User must change password at next logon** (if not already unselected).
 - b. Unselect **User cannot change password** (if not already unselected).
 - c. Select **Password never expires** (if not already selected).
 - d. Click **OK**.
6. Close the **Computer Management** window.

Step 6. Install Backup Files onto the New Hard Disk Drive

The files that were previously saved onto a floppy disk must now be installed onto the new hard disk drive for the analyzer to operate properly. The network analyzer must be powered up and operating.

An abbreviated procedure is provided in *italic* typeface. If you need more detailed instructions, they are provided in each step following the italicized instruction.

1. *Insert the floppy disk containing the backup files into the floppy disk drive.*

2. *Open two copies of **Windows Explorer**:*

Detailed instructions:

- a. Click on **START**. (It may be necessary to exit the **Network Analyzer** application.)
- b. Point to **Programs, Accessories**, and then click on **Windows Explorer**.
- c. Adjust the horizontal width of the **Windows Explorer** window to approximately one-half the width of the display and position it to either the left or right side of the display.
- d. Repeat this procedure to create another copy of the **Windows Explorer** window and position it to the opposite side of the display so that the two copies are displayed side-by-side.

3. *Set one copy of **Windows Explorer** to the **A:** drive and the other to the **C:** drive:*

Detailed instructions:

- a. In one copy of **Windows Explorer**, double-click on **My Computer**, and then double-click on **3 1/2 Floppy (A:)**. A listing of the files on the floppy disk will appear in the right-hand side of the window.
- b. In the other copy of **Windows Explorer**, double-click on **My Computer**, and then double-click on **Hard Disk (C:)**.
- c. Navigate to C:\Program Files\Agilent\Network Analyzer by double-clicking on each of the names in this path name, in turn. A listing of the files in this directory on the hard disk will appear in the right-hand side of the window.

4. *Copy each of the backup files from the floppy disk to the hard disk drive:*

Detailed instructions:

- a. Click and drag each of the files from the **A:** drive to the C:\Program Files\Agilent\Network Analyzer directory by clicking and holding on the file name in the **A:** directory and, while holding the mouse button down, drag the file name to the Network Analyzer directory on the **C:** drive. If you need help with this “dragging” process, refer to Windows Help.

5. *Repeat steps 3 and 4 for the **A:** and **D:** drive. After all files have been copied, remove the floppy disk from the analyzer’s disk drive and exit both copies of **Windows Explorer**.*

Step 7. Perform the Operator's Check

The operator's check is a software driven test that checks the basic operation of the assemblies in the Port 1 and Port 2 paths. By performing the operator's check, the following is determined:

- operation of the transfer switch (switch repeatability check)
- phase-lock capability across the entire frequency band (switch repeatability check)
- function of the four receivers (switch repeatability check)
- operation of the step attenuators (attenuator range check)
- receivers' linearity (attenuator range check)

Switch Repeatability Check

This check performs a reflection measurement of a short and stores the resulting trace in memory. The transfer switch is toggled to the opposite port and back, and then another reflection measurement is made. The difference between the stored trace and the return trace is the switch repeatability. This test also checks the phase lock across the entire frequency band and operation of all four receivers.

Attenuator Range Check

This check performs a reflection measurement of a short and stores the resulting trace in memory. As the internal attenuator is switched in 10 dB steps over its 70 dB range, reflection measurements are made and compared with the stored trace. The resulting measurements must fall within a limit testing window to pass the test. The window size is based on source and receiver specifications. By performing the Port 1 and Port 2 tests, rough checks of the linearity for all four receivers (from 0 dB to 70 dB) are verified and operation of the attenuator is verified.

Run the Operator's Check

The network analyzer must be powered up and operating for this procedure and the Network Analyzer application must be running.

1. From the **System** menu, point to **Service**, and then click **Operator's Check**.
2. In the **Operator's Check** dialog box, under **Sequencing**, select **Automatic** to run through the test without stopping or select **Prompted** to pause at each step in the test process.
3. To check Port 1, click the **Start--Port 1** or to check Port 2, click **Start--Port 2**.
4. The test will prompt you to connect the short.
5. The result of the operator's check will be shown as a PASS or FAIL next to the test title.

If the Operator's Check Fails

1. Clean the test ports, shorts, and adapters. Torque to specification. Repeat the check.
2. If the check still fails, refer to troubleshooting in your analyzer's service guide for additional information.