

# **8510C Network Analyzer Upgrade Kit**

## **Agilent Technologies 85395C Installation Manual**

**Adds Agilent 8530A Operation to Agilent 8510C**

### **Serial Numbers**

The upgrade kit and installation manual apply only to Agilent 8510C network analyzers with a CRT display. An 85101C display unit (top box of the 8510C) with a CRT display has serial prefix number 3936A and lower or US4116.



**Agilent Technologies**

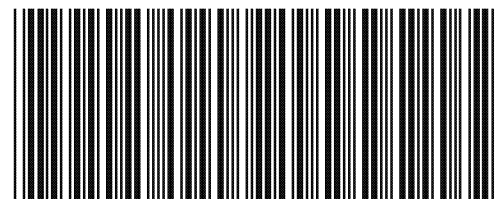
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85395-90005

# Hewlett-Packard to Agilent Technologies Transition

This documentation supports a product that previously shipped under the Hewlett-Packard company brand name. The brand name has now been changed to Agilent Technologies. The two products are functionally identical, only our name has changed. The document still includes references to Hewlett-Packard products, some of which have been transitioned to Agilent Technologies.

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# Installation

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The standard HP 85395C converts an HP 8510C to an HP 8530A (while retaining HP 8510C capability). This allows the customer to use both HP 8510C and 8530A feature sets. Option 111 deletes HP 8510C capability. This document explains how to install and check the HP 85395C upgrade.

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## Introduction

This introduction contains information about this and other upgrade kits, who should install the upgrade, supplied parts, and equipment/tools required. HP 8360-family source information is also provided.

### Intended Audience

This installation manual is intended for use by Hewlett-Packard customer engineers.

### Other Kits

HP 85395A	converts an HP 8510A (serial number suffix lower than 03000) to an HP 8530A with HP 8510C capability. Option 111 deletes HP 8510C operation.
HP 85395B	converts an HP 8510A (serial number suffix greater than 03000) <i>or</i> any HP 8510B to an HP 8530A (with HP 8510C capability). Option 111 deletes HP 8510C operation.
HP 85396A	adds HP 8510C operation to an HP 8530A.
HP 85012D	adds time domain operation to HP 8530A.

### Warranty Information

If the upgrade is installed by an HP customer engineer, an upgraded instrument has an on-site warranty of 90 days following the installation date. This upgrade does not affect any existing HP 8510/8530 warranty. The warranty of other system instruments does not change.

## 8360 Source Compatibility

Some 8360-family sources must be upgraded before “quick step” or “test port power flatness” features will function. Table 1-1 explains how to upgrade various 8360 models, and which models do not require an upgrade.

**Table 1-1.**

HP Model	Serial Prefix	Required for Test Port Flatness Correction	Required for Quick Step
83630A 83650A 83651A	All	No modification required. <sup>1</sup>	
83621A 83631A	<3103A	HP 83601A upgrade kit <sup>2</sup>	
	3103A	08360-60167 firmware kit	
	3104A to 3111A	08360-60201 firmware kit	
	≥3112A	No modification required. <sup>1</sup>	
83620A 83622A 83623A 83624A 83640A 83642A	≤3103A	08360-60167 firmware kit	X <sup>3</sup>
	3104A to 3111A	08360-60201 firmware kit	X <sup>3</sup>
	≥3112A	No modification required. <sup>1</sup>	X <sup>3</sup>

<sup>1</sup> Fully compatible at time of shipment.

<sup>2</sup> Includes installation.

<sup>3</sup> Cannot be retrofitted to these models.

### *How to use the table*

Example 1: Assume you have an HP 83621A with a prefix less than 3103A. You would need to upgrade the unit with the HP 83601A upgrade kit.

Example 2: Assume you have an HP 83621A with a prefix of 3103A. You need to order the 08360-60167 firmware upgrade kit.

Example 3: Assume you have an HP 83621A with a prefix of 3112 or above. This unit requires no modification. It can perform quick step and test port power leveling already.

Notice that the HP 83631A is listed in the same box (under HP Model) as the HP 83621A. This means that the prefix numbers shown for the HP 83621A would also apply to the HP 83631A.

**Supplied Parts**      The upgrade package supplies the following parts:

**Table 1-2. HP 85395C Upgrade Package Contents**

Item	Qty	HP Part Number
<b>Assemblies/Components</b>		
Keyboard assembly	1	85102-60243
A16 remote applications	1	85102-60235
A24 trigger board assembly	1	85102-60241
A10/12 IF amplifier assemblies	2	85102-60244
HP 8530A security IC	1	08530-69001 <sup>1</sup>
470 pF capacitor	1	0160-3447
Standard front dress panel <sup>2</sup>	1	08530-80002
Opt. 111 front dress panel <sup>3</sup>	1	85102-80116
<b>Cables</b>		
SMB(f) to BNC(m)	1	5062-7230
Cable, A24J3 to R.P. J10	1	85102-60246
Cable, A24J2 to R.P. J11	1	85102-60250
Cable, A10J6 to A24J7	1	85102-60251
Cable, A12J6 to A24J6	1	85102-60252
Cable, A12J7 to A24J4	1	85102-60253
Cable, A20J2 to A24J5	1	85102-60254
Cable, A10J7 to A24J8	1	85102-60256
Cable, A10J8 to A24J9	1	85102-60257
Cable, A10J8 to A12J8	1	85102-60258
<b>Connector Parts</b>		
BNC Body	1	1250-1091
15/32 inch hex nut	1	0590-1251
Internal star washer	1	2190-0102
Shouldered insulating washer	2	00310-48801
Flat washer	2	3050-1094
<b>Software/Disks</b>		
HP 8530 operating system disk	1	08530-80005
Antenna/RCS calibration disk	1	08530-10001
Blank disks	2	92192X

<sup>1</sup> Available only through Hewlett-Packard's rebuilt-exchange program. The original IC must be returned.

<sup>2</sup> Supplied with standard upgrade kits, not with option 111 kits.

<sup>3</sup> Supplied with option 111 upgrade kits, not with standard kits.

**Table 1-2.**  
**HP 85395C Upgrade Package Contents (continued)**

Item	Qty	HP Part Number
<b>Documentation</b>		
HP 8530A manual set	1	08530-90001
HP 85395C installation manual	1	85395-90005
Using Your Upgraded Receiver	1	85395-90007
<b>Tools</b>		
0.655 inch countersink drill bit	1	8920-0388
Rear panel hole alignment guide	1	85103-00001
9/16 inch nut driver	1	8720-0008
SMB connector remover	1	85103-00002
7/16 inch wrench	1	8720-0009
<b>Labels</b>		
Front panel I.D. label	1	08530-80001
Rear panel upgrade label	1	none
Rear panel 85102R label	1	85102-80125
Rear panel FTZ label	1	08530-80006
Rear panel source trigger label	1	none
Rear panel event trigger label	1	none
System Bus label	1	9320-5875
<b>Screws and Extra Hardware</b>		
Front panel PC board screw <sup>1</sup>	2	2360-0115
Front dress panel clip <sup>1</sup>	2	0510-1148
<b>Miscellaneous</b>		
SMB adapter tee	1	1250-1391
Rack mount kit (for top box)	1	5062-4072
HP 85102 service adapter	1	85102-60210
Safety glasses	1	9300-1159
Masking tape	1	0460-0030
Self-adhesive foam tape (2 ft)		0460-0114
Clear plastic sheet	1	85103-20001
Cable ties	5	1400-0249
Blank disks	2	92192X

<sup>1</sup> Supplied in case an existing item is lost.



## Required Tools and Equipment

In addition to the tools supplied, you will need the following to perform the upgrade procedure.

**Table 1-3. Equipment Required But Not Supplied**

Item	HP Part or Model Number
Source <sup>1</sup>	8350B with plug-in, 8340A/B, 8341A/B, or 8360-series
Frequency Converter or Test Set <sup>1</sup>	8511A/B, 85310A 8512A, 8513A, 8514A/B, 8515, 8516A, or 8517A
Flexible RF cable <sup>1</sup>	8120-4396
HP-IB cables <sup>2</sup>	10833A
Static control table mat	9300-0797
Wrist strap	9300-1367
Wrist-strap-to-mat cord (5 ft)	9300-1980
Small flat blade screwdriver	8730-0008
Flat blade screwdriver	8730-0019
Pozidriv (#2)	8710-0900
Pozidriv (#1)	8710-0899
Long nose pliers	8710-0595
Center punch	8890-0001
Variable speed drill	
Knife or scissors	
Solder removal tool	
Soldering iron and solder	
<b>For HP 85310A or 8511A Only</b>	
Power splitter	5086-7408
Semi-rigid cable <sup>3</sup>	08510-20005
Semi-rigid cable <sup>3</sup>	08510-20006

<sup>1</sup> Usually available as part of the customer's current test setup.

<sup>2</sup> Quantity and length depend on your test setup

<sup>3</sup> From HP 8510 service kit or HP 8511A test set



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## Upgrade Procedure

This procedure is given in the following steps. You may want to check off the boxes next to each step as you complete them.

- ☐ Check system operation.
- ☐ Install the HP 8530A security IC (integrated circuit).
- ☐ Install the new front panel and faceplate.
- ☐ Install the new BNC connector.
- ☐ Solder a small capacitor on the motherboard.
- ☐ Install the new PC board assemblies and reroute cables.
- ☐ Apply the labels.
- ☐ Load the HP 8530 operating system.
- ☐ Check HP 8530 operation.

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## Check System Operation

The HP 8510 needs to be operating as part of an existing system. This is necessary so you can test the upgrade when you install it. If the HP 8510 is not set up as part of a system, set it up as shown in Figure 1-1, Figure 1-2, or Figure 1-3, as applicable.

### Note



If you are using an HP 85310A frequency converter, you must set the HP 8510 up as explained in the HP 85310A manual. This includes placing the HP 8510 in the multiple source mode.

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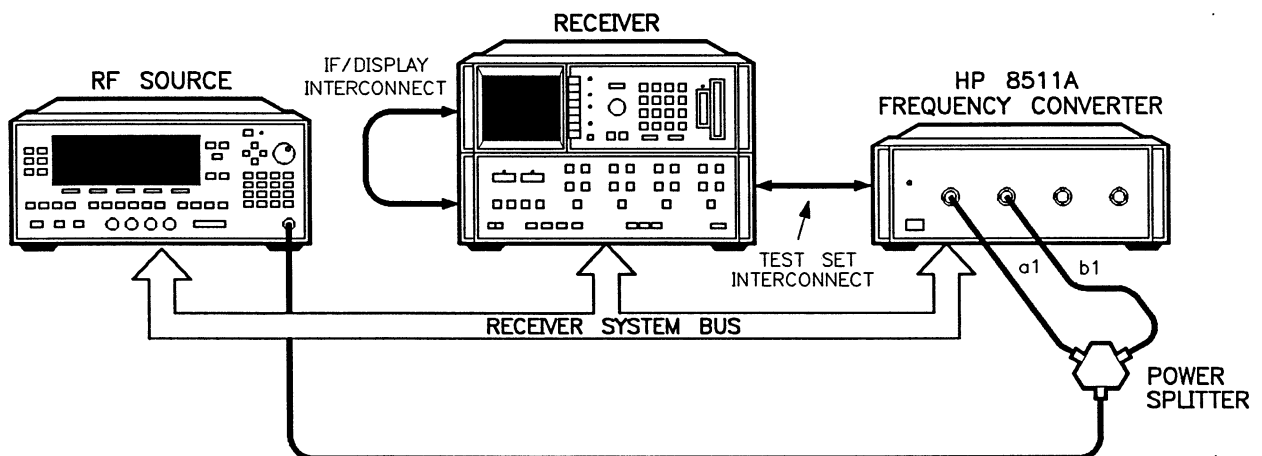
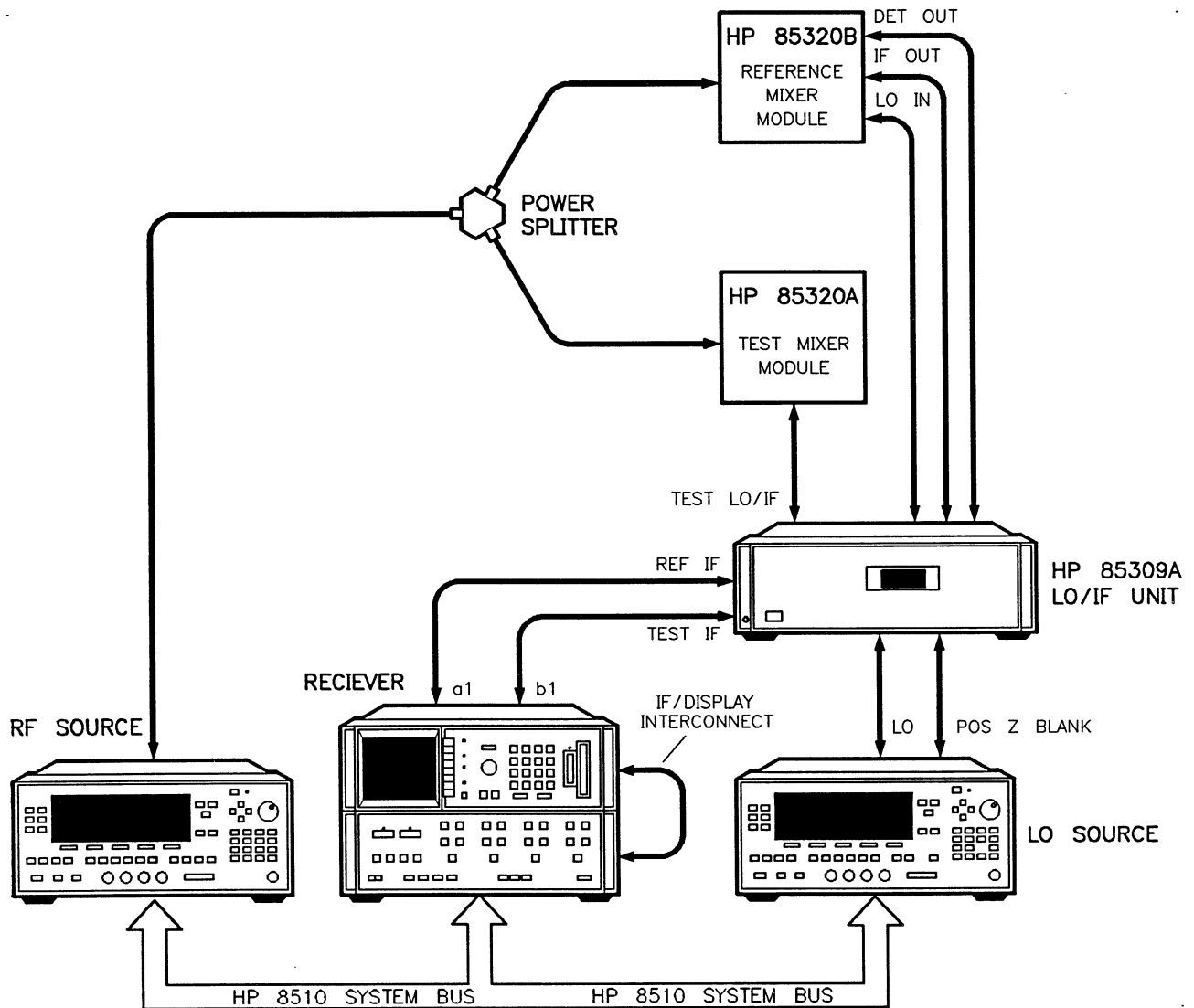
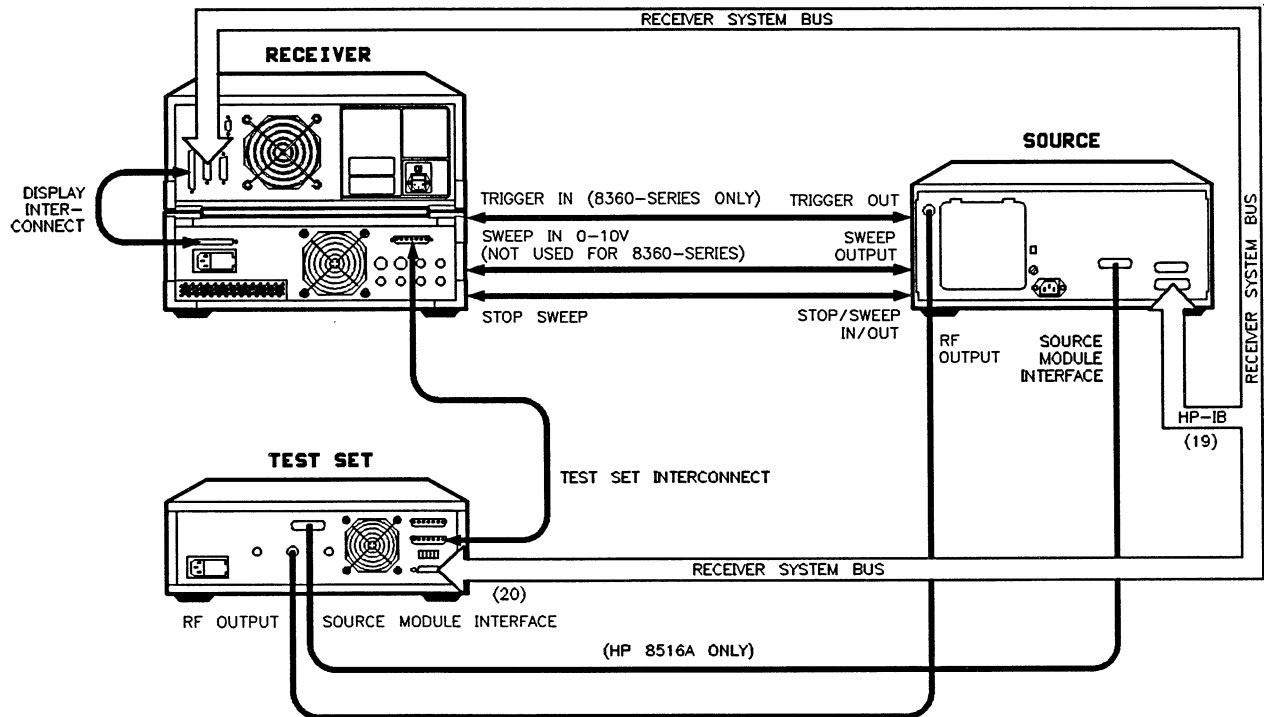


Figure 1-1. Temporary Equipment Setup Using an HP 8511A Frequency Converter



**Figure 1-2. Temporary Equipment Setup Using an HP 85310A Frequency Converter**



**Figure 1-3. Temporary Equipment Setup Using a Test Set**

1. Turn on the instruments in the following order:
  - a. The source (make sure the switch is turned to power on, not standby). Also turn on the LO source (if your system has one).
  - b. The test set or frequency converter.
  - c. The HP 85102 IF detector (HP 8510C bottom box).
  - d. The HP 85101 display processor (HP 8510C top box).
2. Make sure the HP 8510 passes all self-tests.
  - a. If the instrument fails self-test it will display a blue screen with diagnostic information on it. Such a failure is an indication that the equipment setup is wrong (or worse). Do not perform the upgrade until the problem is corrected.
  - b. If a measurement screen appears, then the instrument has passed self tests. Continue with the procedure. Error messages (which appear in red letters on the measurement screen) are normal at this time, ignore them.

*Ignore all error messages until you complete the next three steps.*

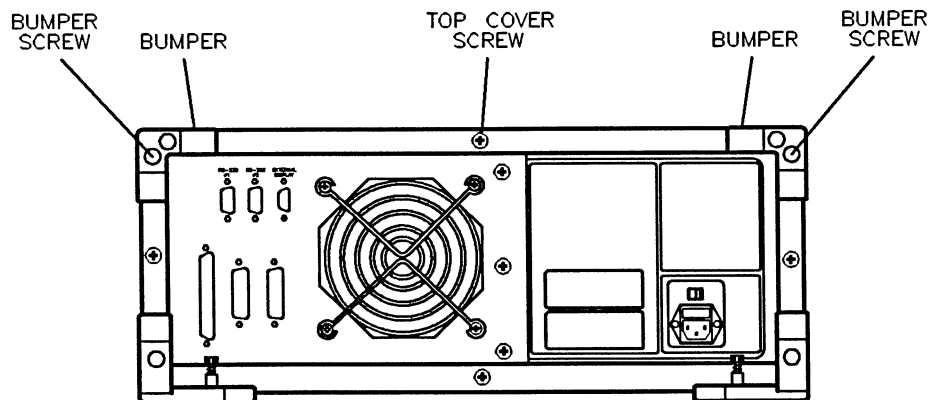
3. Press INSTRUMENT STATE **RECALL** and select **MORE FACTORY PRESET**.
4. Place the HP 8510 in step sweep mode by pressing STIMULUS **MENU STEP**.

5. Reduce source 1 power by pressing **POWER MENU** **POWER SOURCE 1** **[-]** **[5]** **[x1]**.
6. All error messages should now be gone. If an error message still appears on the display, solve the problem before continuing. Do not perform the upgrade until the problem is corrected.
7. Press **INSTRUMENT STATE** **[SAVE]** **USER PRESET 8**.

## Install HP 8530A Security IC

Perform these steps only at a static-safe workstation. Wear an anti-static wrist strap.

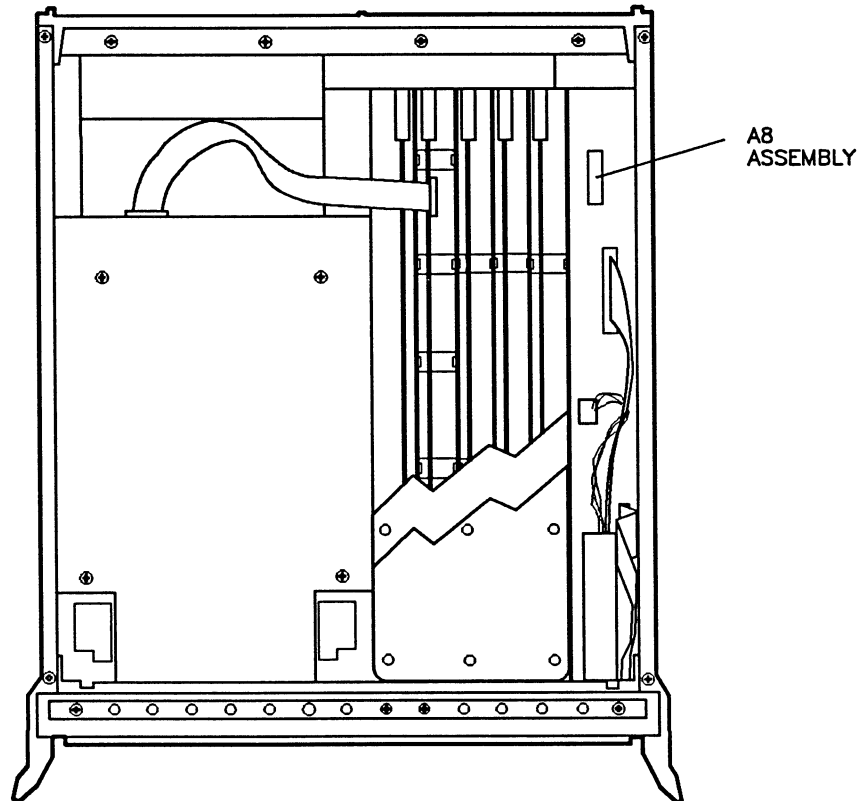
1. Turn off the top and bottom box.
2. Unplug the HP 85101 display processor box (top box).
3. If upgrading a racked system, remove the HP 8510C from the rack.
4. Refer to Figure 1-4. Remove the rear panel bumper feet, shown at the top of the instrument.
5. Remove the top cover of the display processor.



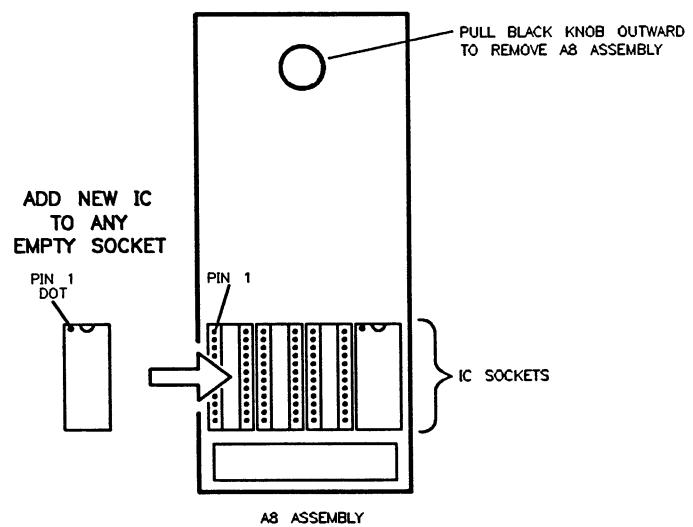
**Figure 1-4. Bumper feet and top cover screw locations.**

6. Refer to Figure 1-5. Pull the black knob on the A8 assembly directly outward. Remove the A8 assembly.
7. Place the supplied HP 8530 security IC into any empty IC socket as explained in the following sub-steps:
  - a. Refer to Figure 1-6. Make sure the IC is oriented as shown in the figure.
  - b. If necessary, bend the IC pins inward a little so they will go into the socket.
  - c. Watch the IC pins closely as you insert the IC. Make sure all the pins go into the socket without bending.

8. Replace the A8 assembly and push in the black knob.
9. Replace the top cover and bumper feet.



**Figure 1-5. A8 Assembly Location**



**Figure 1-6. IC Installation and Orientation**

---

## Install the new front panel

Refer to Figure 1-7 when performing this procedure. You will replace the front panel of the HP 85102 IF Detector (bottom box) in this procedure.

Perform these steps only at a static-safe workstation. Wear an anti-static wrist strap.

1. Disconnect the AC power cord from the HP 8510 bottom and top boxes.
2. Disconnect all cables from the back of the top box.
3. Separate the top box from the bottom box as follows:
  - a. Look at the bumper feet on the rear panel of the HP 8510. Chrome screws hold the top and bottom box together. Loosen the screws using a flat head screwdriver. When the screws pop up they are disengaged.
  - b. Now pull the top box forward to disengage it from the bottom box.

### Detaching the Front Panel from the Bottom Box

On the bottom box:

1. Remove the two instrument feet nearest the front panel.

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#### Note



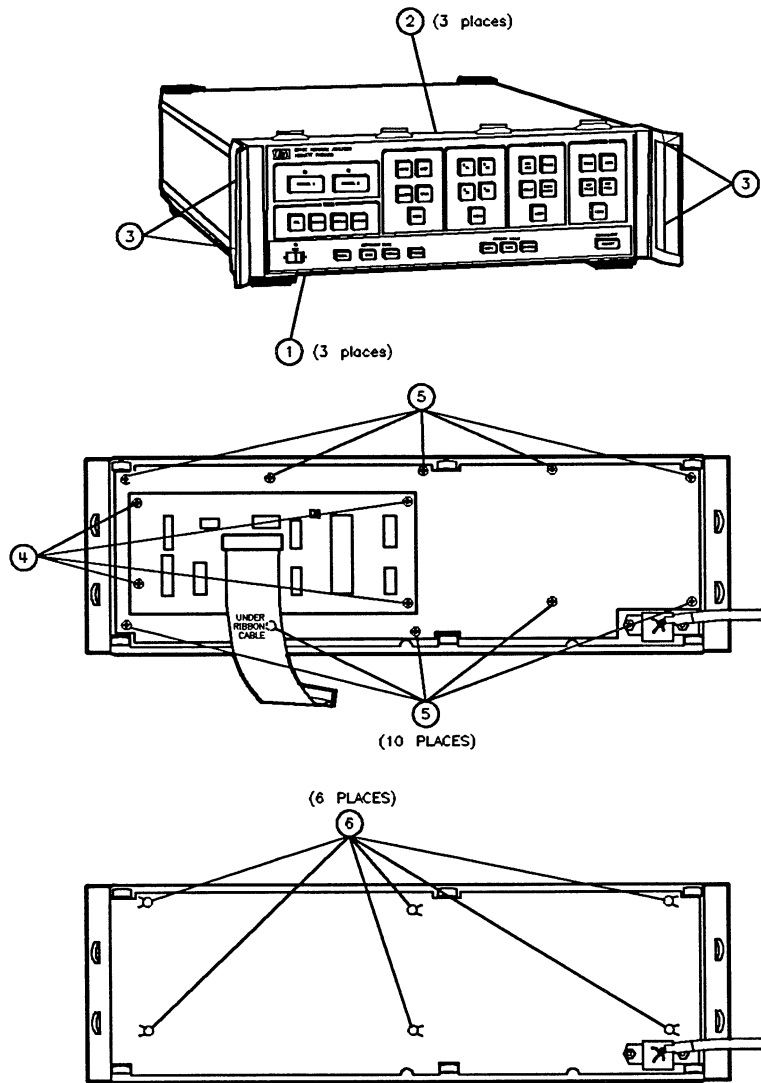
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Skip step 2 if your instrument has rack mount flanges.

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2. Pry the plastic screw covers off of the handles (use a flat blade screwdriver).
3. Remove the three screws that hold each handle in place (use large pozidriv).
4. Remove three screws from the bottom edge of the frame (item 1).
5. Remove the three screws from the top edge of the frame (item 2).
6. Remove two screws from each side of the frame (item 3).
7. Pull the front panel assembly outward to remove it from the instrument. Disconnect the ribbon cable from the motherboard and lay the front panel face-down on the instrument.





**Figure 1-7. Front Panel Disassembly**

### **Replacing the Front Panel Board**

8. Remove the four screws that hold the small A1A1 display interface board in place (item 4).
9. Pull straight up on the A1A1 assembly to detach it from the keyboard.

10. Remove the 10 screws (or clips) that hold the keyboard in place (item 5). (Some instruments use screws to hold the keyboard in place, others use clips.)
11. Remove the keyboard from the front panel frame.

## Note



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Some instruments have a plastic sheet that lays on top of the keyboard. This sheet is an “air dam” - it stops air from blowing out the front panel key holes. If your instrument has this plastic air dam, be careful not to damage it when handling the front panel assembly.

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12. Remove the six retainer clips (item 6) with long nose pliers. The front dress panel can now be removed.

## Reassembly

13. Press the replacement front dress panel tightly onto the frame. Replace the six clips (item 6).

Push the clips down as far as possible. DO NOT apply the clips with the frame resting on a flat surface. (A flat surface will not press the dress panel in all the way.) Instead, press the dress panel firmly with your fingers. Then place the six clips on the posts.

14. Install the new keyboard PC board assembly. **Make sure the three LEDs on the board are aligned properly with the holes in the front panel frame.**
15. Replace the plastic air dam (if your instrument has one). Install the 10 screws (or clips, item 5).
16. Place the A1A1 assembly onto the new keyboard. Be careful not to bend the interconnect pins, and make sure the pins go into the correct receptacle holes.
17. Reinstall the four screws that hold the A1A1 assembly in place (item 4).
18. Hold the front panel in front of the instrument cavity. Make sure the power switch is on your left.
19. Push the AC power cable behind the motherboard ribbon connector. This makes it easier to reinstall the front panel assembly.
20. Reconnect the ribbon cable and push the front panel back into place.
21. Install the frame screws (items 1, 2 and 3).
22. Replace the rack-mount flanges (if used) and handles.
23. Reinstall the plastic screw covers on each handle, if necessary.
24. Reinstall the bottom feet.

## Installing a BNC Connector

Use the following procedure to install a BNC connector on the rear panel of the HP 85102 (bottom box).

### Warning



The following procedure presents a danger to your eyes; the use of safety glasses during such procedures is required by law.

### Procedure

1. Put on safety glasses.
2. Remove all rear panel cables from the bottom box, and turn the unit around so the rear panel faces you.
3. Remove the lock feet (shown in Figure 1-8), and the top cover.
4. Position the rear alignment guide (85103-0001, shown in Figure 1-8) to locate the center of the hole for the BNC connector. Mark the location with a pencil.

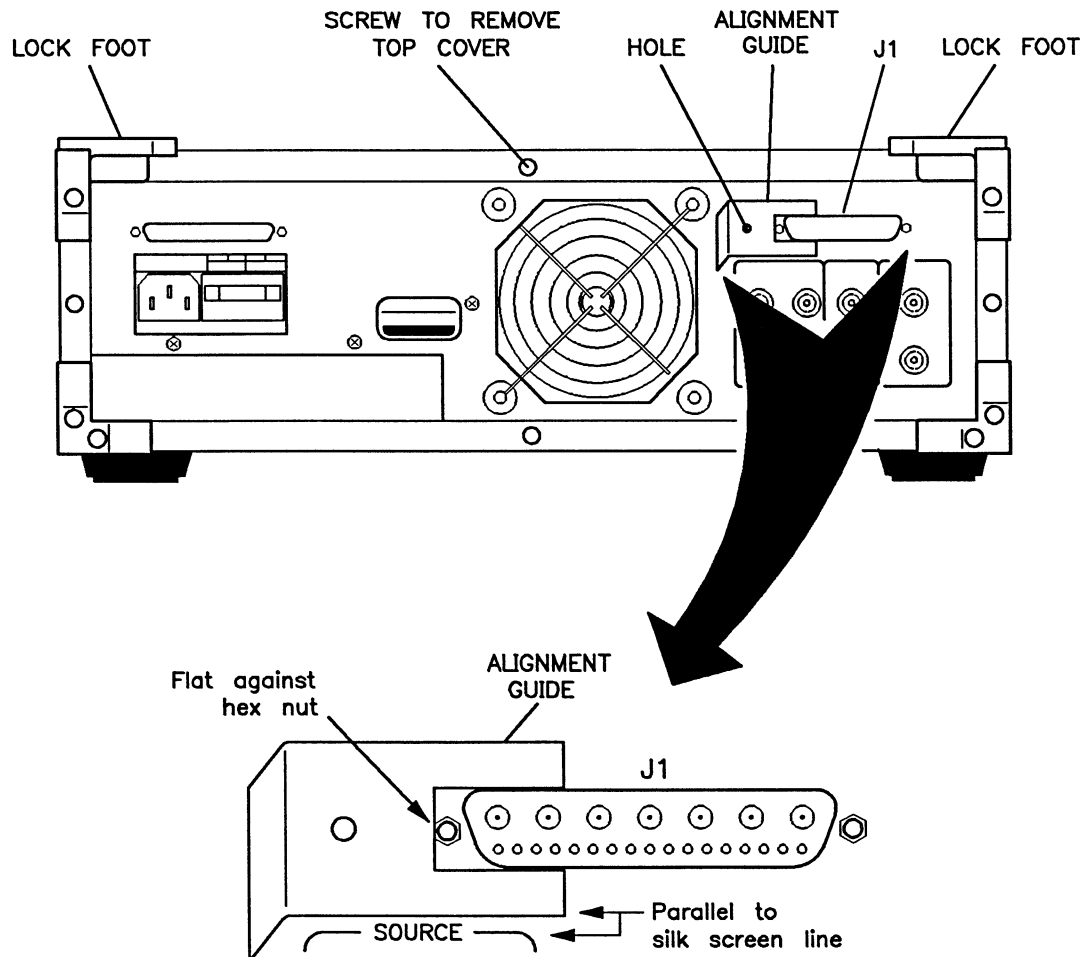


Figure 1-8. HP 85102 Rear Panel BNC Hole Location

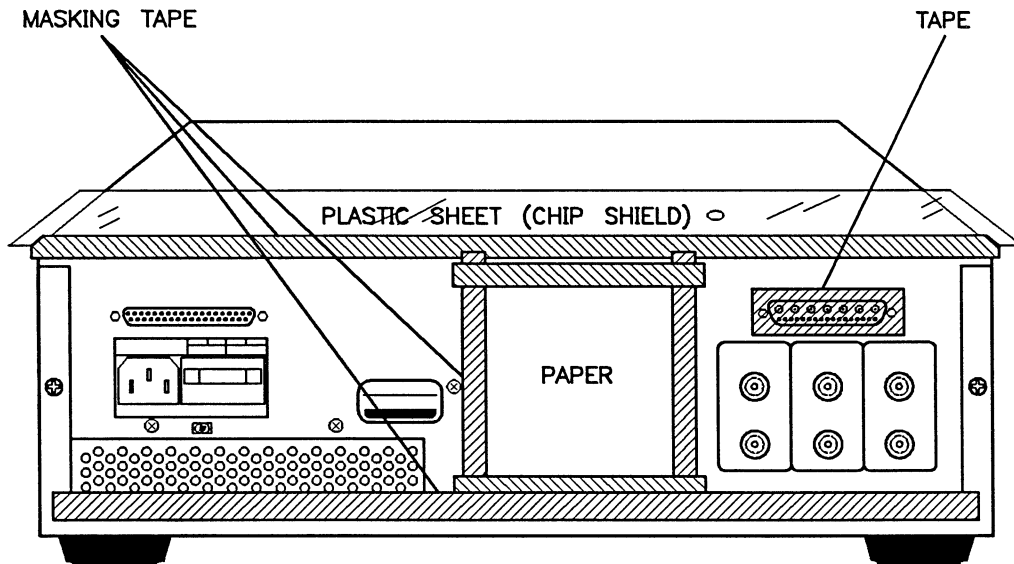
5. Remove the alignment guide, and center punch the marked spot (if an automatic center punch is not available, use the drill bit and a small hammer).
6. Cut the foam tape (0460-0114) into four pieces (each three-inches long).
7. Remove the backing from the foam tape and stack them on top of one another.
8. Stick the tape to the inside of the rear panel, directly behind the punched indentation.

## Note



The foam keeps metal chips out of the instrument.

9. Refer to Figure 1-9. To keep out metal chips, mask the fan opening and the lower edge of the rear panel with paper and masking tape.



**Figure 1-9. Masking Tape Applications**

10. Refer to Figure 1-9. Tape a piece of plastic (85103-20001) across the top of the instrument at the rear panel. Place tape over the hole in the plastic sheet. Lay the plastic sheet down away from you (the plastic sheet keeps metal fragments from flying up into the instrument).
11. Place the top cover over the portion of the instrument that is still exposed.

## Caution

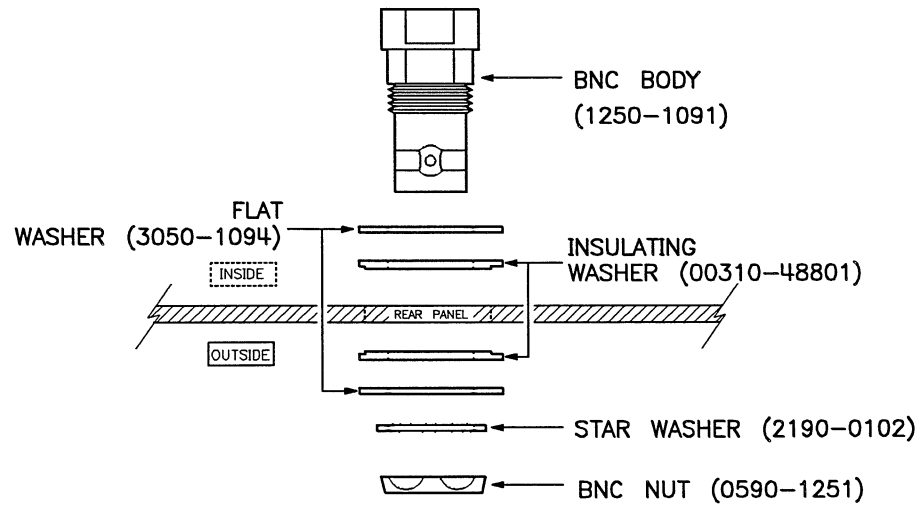


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Do not get metal fragments inside the instrument.

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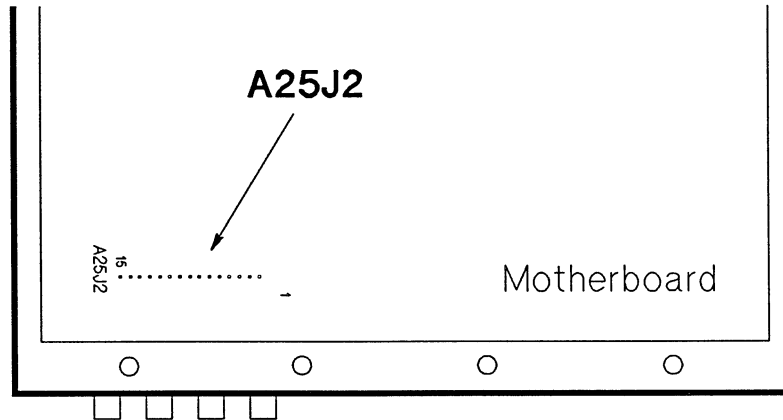
12. At the spot punched on the rear panel, use the supplied drill bit to drill the BNC hole. Keep the following in mind:
  - Use a constant but slow clockwise RPM.
  - Press *very hard*. Try to cut an “apple peel” strip rather than many small chips.
  - Use less pressure on the drill as the bit is about to go all the way through. Unlike other types of drill bits, this bit does not pull itself through the hole.
13. Once you drill completely through the rear panel, press the foam tape one last time to trap as many metal fragments as possible. Do not remove the tape yet.
14. From the outside, clean any fragments out of the hole you just drilled.
15. Remove the clear plastic sheet and the top cover.
16. Brush all metal fragments from the work bench, then *stand the instrument on its side panel*.
17. Carefully remove the foam tape stack so that any metal chips stuck to it do not fall into the instrument.
18. Search for any stray metal chips and pick them up with masking tape.
19. Place the instrument on its feet and remove all masking material.
20. Refer to Figure 1-10. Install the BNC connector body and hardware in the hole as shown. Tighten the BNC nut with a 9/16 inch nut driver until snug. Do not over tighten.
21. Leave the top cover off, continue with “Installing the STOP SWEEP Capacitor”



**Figure 1-10. BNC Parts Identification**

## Installing the STOP SWEEP Capacitor

1. Turn the instrument upside-down, with the rear panel facing you.
2. Remove the remaining rear panel bumper feet.
3. Remove the bottom cover.



### Bottom View

Figure 1-11. A25J2 Location

4. Refer to Figure 1-11, find A25J2 on the bottom of the motherboard.
5. Bend the leads on the supplied capacitor (0160-3447) as shown in Figure 1-12.

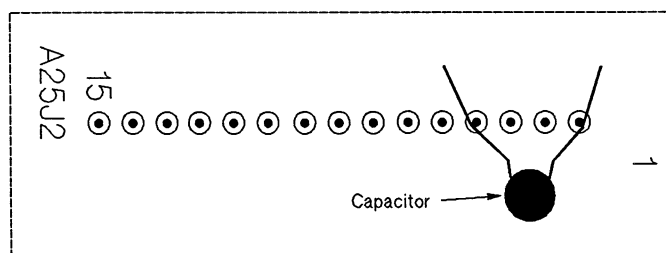
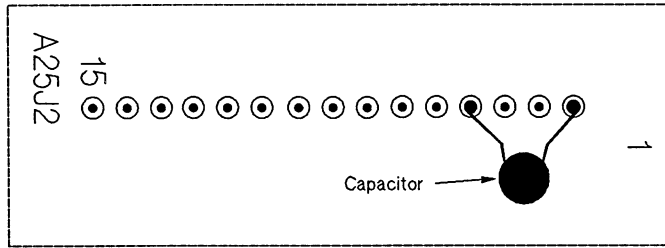


Figure 1-12. Mounting the Capacitor

6. Remove the solder from A25J2 pins 1 and 4.
7. Wrap the capacitor leads around pins 1 and 4. The capacitor is *not* polarized, so orientation is not important.
8. Solder the capacitor leads in place as shown in Figure 1-13 and cut off the excess lead length.



**Figure 1-13. Mounting the Capacitor**

9. Replace the bottom cover and rear bumper feet.
10. Turn the instrument so the top faces up.
11. Continue with "Installing Assemblies".



## Installing Assemblies

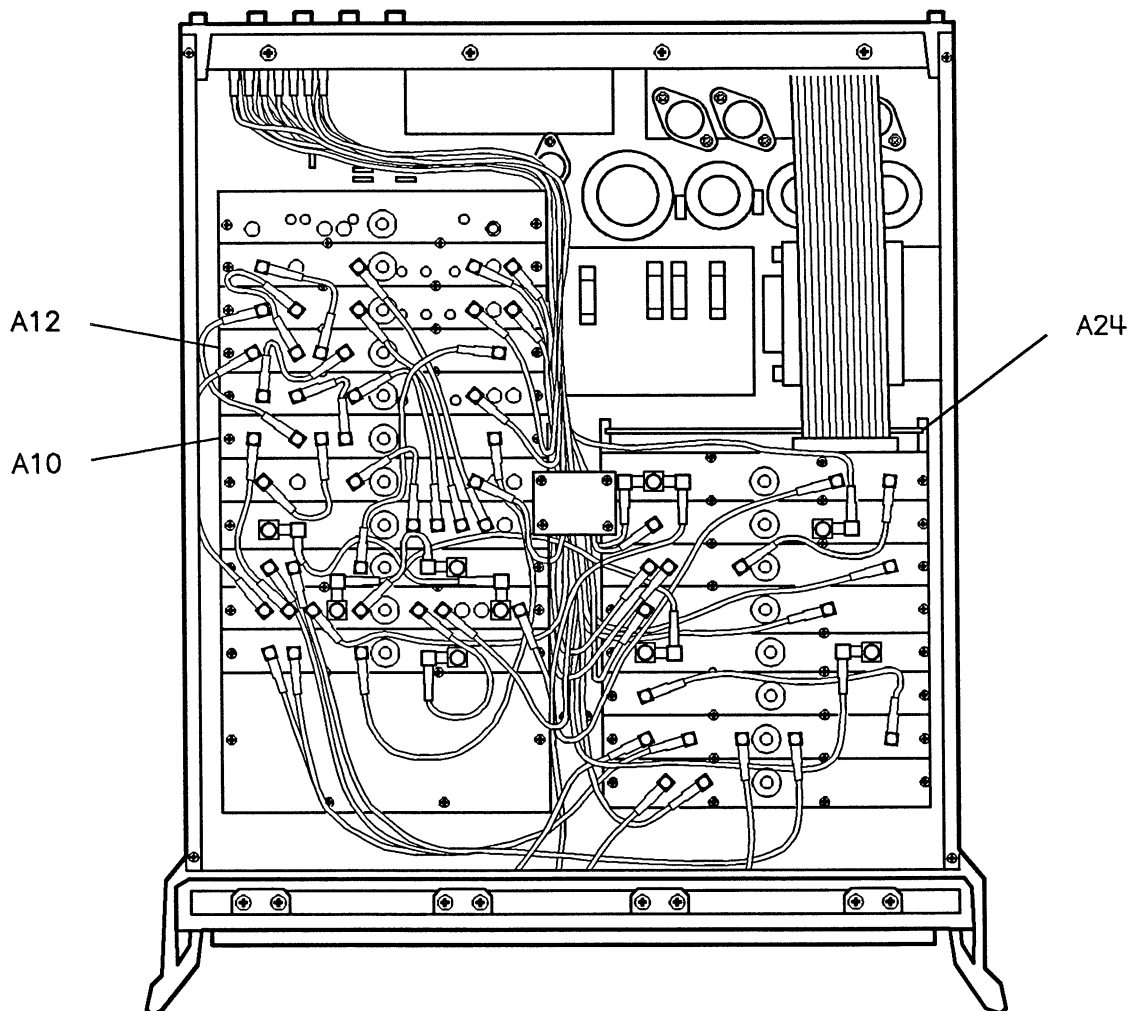
Use the following procedure to replace assemblies in the HP 85102 (bottom box).

### Caution



You handle assemblies in this procedure that are very sensitive to static electricity. Wear an anti-static wrist strap that is connected to earth ground. If you must place assemblies down, place them on a grounded anti-static surface.

There are two boards marked “A10/A12 Test Ref IF Amplifier.” Actually, the one closest to the rear panel is A12 (the reference channel amp), the other is A10 (the test channel amp). These boards are interchangeable.



**Figure 1-14. HP 85102 Assembly Locations**

1. Turn the bottom box around so the front panel faces you.

2. Refer to Figure 1-14. Using the supplied SMB cable remover, disconnect all cables from the A10 and A12 assemblies.
3. The following cables must be disconnected (only on one end) so you can remove the A10 and A12 assemblies. Disconnect these cables at the following places:

**Table 1-4.**  
**Cables that Interfere with Board Replacement**

Cable	Disconnect at
W2	A9J3
W1	A11J3
W30	A11J4
W4	A13J3
W32	A13J4
W3	A14J3

4. Remove the screws that hold the metal covers on both A10 and A12 assemblies.

#### Caution



In the following step, be careful not to damage the metal gaskets (located under the metal covers) when you remove the assemblies.

#### Note



The boards you remove in this procedure may be valuable spare parts if your customer owns other HP 8510A, 8510B or 8510C instruments (or plans on buying more in the future). Because of this, be careful to observe static precautions when removing the boards, and place them on an anti-static mat.

After you install the new boards, place the old ones in the anti-static bags and seal them.

The old boards will work in HP 8510A's with serial prefixes of 03000 or higher, or in any HP 8510B or 8510C.

5. Grab the white knob on top of the A10 assembly and pull upward to remove the board (the metal cover and PC board are all one piece). Move the assembly gently from side-to-side if necessary.
6. Remove the A12 assembly.
7. Install the new A10 and A12 assemblies (85102-60244). Push the boards in firmly and make sure they are fully seated. The new A10 and A12 boards are interchangeable.
8. Reinstall A10 and A12 cover screws.

---

## Replacing A24

1. Remove the ribbon cable going to A24.
2. Remove the A24 assembly (85102-60241, refer to Figure 1-14), and replace it with the new A24 board.
3. Reconnect the ribbon cable that goes to A24.

---

## Connecting Cables

Connect existing and new cables as explained below.

### Reconnect Existing Cables

1. Reconnect all internal cables as follows:
2. Sort through the loose cables and plug in the ones that go to the A9 board.
3. Repeat this step for A10, A11, A12, A13, and A14 (one at a time).

### Problem Solver



If you don't remember which board is A10 and which is A12, refer to Figure 1-15.

### Note



The following jacks should be empty at this time: A10J6, A10J7, A10J8, A12J6, A12J7, A12J8, and all the jacks on the new A24 board.

4. After connecting all cables, *inspect each jack on boards A9 through A14. This is very important! It is very easy to miss a connection. Try to move each connector. Sometimes a cable may look like it is connected, but may simply be laying on top of the PC board jack.*

### Adding and Rerouting Cables

1. Remove the metal plate shown in Figure 1-15.
2. Cut the cable ties that hold all yellow (rear panel) cables together.
3. Using the supplied 7/16 inch wrench, remove the cable that goes to the rear panel TRIGGER IN connector:
  - a. Carefully insert the wrench between existing rear panel cables.
  - b. Loosen the nut until the cable comes off.
  - c. Remove the other end of the cable from A20J2. Throw the cable away.
4. Install the supplied SMB adapter tee (1250-1391) on A10J8.
5. Connect the rest of the cables as shown in Table 1-5 and Figure 1-15.

**Note**

The new cables must be positioned (dressed) carefully. There are many new cables near A23 and A24. The new cables can be positioned well if you use care and a little skill. Notice the cables (W34 and W42) attached to the SMB tee on A23J1. Run some of the new cables under W34 and W42 to save space. Turn the SMB tee (on A23J1) clockwise. This allows you to plug cables into A24J4 and A24J5.

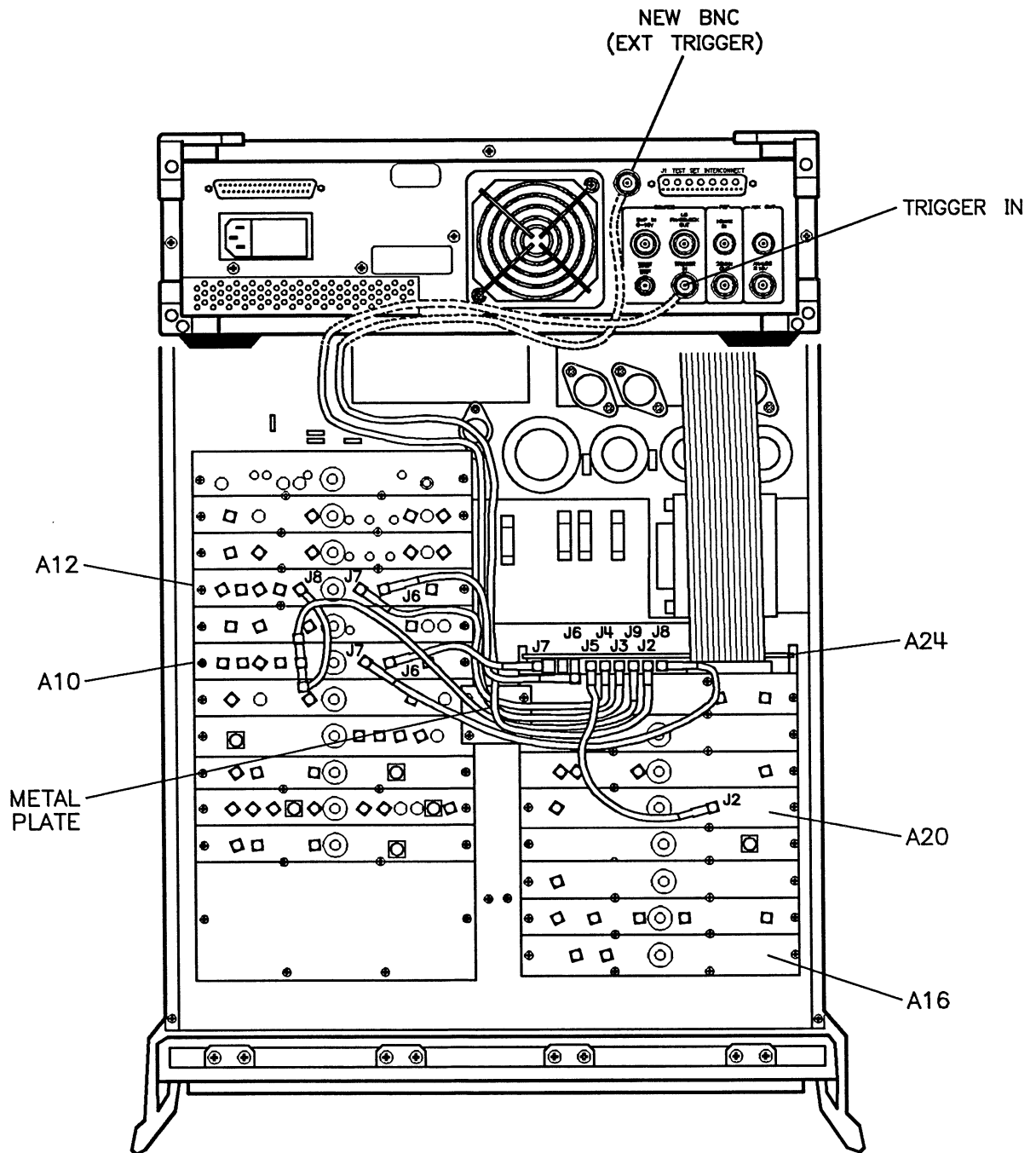
**Table 1-5. Cable Connections**

W #	From	To	Part Number
W74	A10J8	A12J8	85102-60258
W73	A10J8	A24J9	85102-60257
W72	A10J7	A24J8	85102-60256
W71	A24J2	New BNC	85102-60250 <sup>1</sup>
W70	A24J3	TRIGGER IN BNC	85102-60246
W69	A24J4	A12J7	85102-60253
W68	A24J5	A20J2	85102-60254
W67	A24J6	A12J6	85102-60252
W66	A24J7	A10J6	85102-60251

<sup>1</sup> This connector will be labeled "EVENT TRIGGER" when labels are applied.

6. Use three cable ties (1400-0249) to dress and secure the cables going to rear panel BNCs. Dress the cables so they go under the metal plate shown in Figure 1-15.
7. Reinstall the metal plate with the four remaining screws.

# REAR PANEL



# TOP VIEW

**Figure 1-15. HP 85102 New Cable Connections**

---

## Replacing A16

The location of the A16 assembly is shown in Figure 1-15.

*How to tell if you must change the A16 assembly:*

Two versions of A16 assemblies have been shipped in HP 8510 instruments. The newer version does not need to be changed. Look at the A16 board's VTO TUNE IN jack. If it is marked "J1" you have an old board. If VTO TUNE IN is marked "J5" you have a new board.

If you have the new board, go directly to "Apply Labels". If you have the old board, replace it as explained in the procedure below:

1. Disconnect any A17 cables that *cross over* the A16 assembly.
2. Remove W40 and W42 from the A16 assembly.
3. Remove the machine screws that hold the metal cover of the A16 assembly (use a small pozidriv).

### Caution



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In the following step, be careful not to damage the metal gasket (located under the metal cover) when you remove the assembly.

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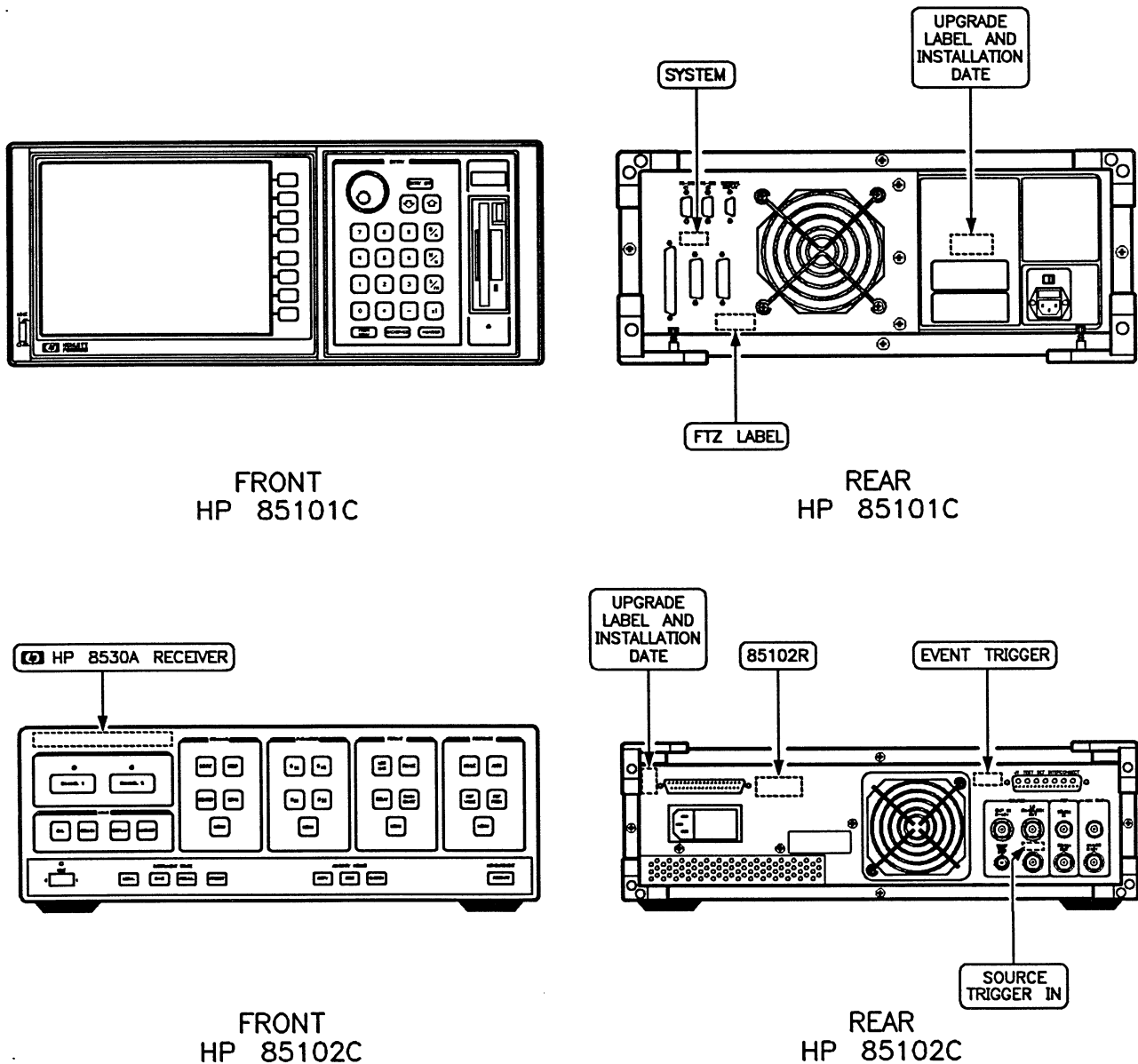
4. Remove A16 by pulling up on the white knob. (Move the assembly gently from side-to-side if necessary.)
5. Insert the new A16 board and replace the six screws that hold it in place.

The old board may be a valuable spare if the customer owns other HP 8510s. Place the old board in an anti-static bag and seal it.

6. Reconnect all cables that go to A17.
7. Connect W42 (gray cable) to A16J5. Connect W40 (yellow cable) to A16J6.
8. Carefully inspect each A16 and A17 cable, make sure they are plugged in all the way.

## Apply Labels

Place the supplied labels as shown in Figure 1-16. Do not reassemble the bottom box, do not reattach the top box.



**Figure 1-16. Location of New Labels**

One label requires you to write the today's date. This date information is important, because the date determines when the upgrade warranty period begins.

Write the date on the label as follows: MONTH/DAY/YEAR. The order you write the date is important! This is how the date will be interpreted for warranty coverage.

---

## Check Basic Instrument Operation

Now that major modifications have been made to the instrument, check basic instrument operation.

1. Place the top box *next to* the bottom box. Make sure the front panel is facing you.
2. Connect AC power to the top and bottom box.

### Note



You must make a decision at this time. The next stages of the procedure ask you to electrically reconnect the system and check its operation. If the other system components are in a rack, it may be easier to fully reassemble the top and bottom boxes and place them back into the rack. Before you do this, however, keep the following points in mind:

Point 1: You must re-open the bottom box again in a later procedure (to test the new trigger input BNC circuitry).

Point 2: If the following test shows a problem, the most likely cause is a cabling error, which will require you to open the bottom box again.

This procedure assumes you can bring the system instruments to the HP 8510/8530, so the bottom box remains accessible.

---

3. Reconnect system components in their original electrical configuration. Make sure the IF/Display Interconnect is connected between the HP 8530 top and bottom box.
4. Turn on the instruments in the following order:
  - a. The source (make sure the switch is turned to power on, not standby). Also turn on the LO source (if your system has one).
  - b. The test set or frequency converter.
  - c. The HP 85102 IF detector (HP 8530 bottom box).
  - d. The HP 85101 display processor (HP 8530 top box).
5. Make sure the HP 8530 passes all self-tests (if it displays a normal measurement screen it has passed self-tests).
  - a. If the instrument fails self-test, make sure the IF/DISPLAY INTERCONNECT cable is connected between the top and bottom box. If it is, recheck the previous PC board and cable installation. If necessary, use the troubleshooting information found in the HP 8530A service manual. Do not continue until the problem is corrected.
  - b. If a measurement screen appears, then the instrument has passed self tests. Continue with the procedure.

There should be no error messages on the screen. If an error message still appears, solve the problem before continuing.



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## Load the HP 8530 Operating System

1. Press **SYSTEM** **MORE** **SERVICE FUNCTIONS** **TEST MENU**.
2. Insert the HP 8530 operating system disk (the disk label should face the CRT).
3. Press **1** **9** **=MARKER** to load the operating system.
4. Press **LOAD FILE**. The default-selected file PG\_8530A will now load. The message LOADING PROGRAM FROM DISC ... will appear, followed by the instrument self-test sequence.

If the error message ERROR: SYSTEM KEY NOT INSTALLED appears, suspect a problem with the HP 8530A security IC (located in the top box). Refer to "Install HP 8530A Security IC". Remove and inspect the A8 assembly. Make sure the new security IC is oriented properly, and that no pins are bent.

The instrument is operating as an HP 8530 if P1:b1/a1 log MAG appears at the top of the display.

*Ignore error messages until you perform the next three steps.*

5. If using an HP 85310 distributed frequency converter, make sure the HP 8530 is in multiple source mode. This is explained in the HP 85310 manual.
6. Place the HP 8530 in step sweep mode by pressing **STIMULUS** **MENU** **STEP**.
7. Reduce source 1 power by pressing **POWER MENU** **POWER SOURCE 1** **-** **5** **x1**. All error messages should go away at this time. If error messages remain, check the setup.
8. Press **INSTRUMENT STATE** **SAVE** **USER PRESET 8**.

---

## In Depth Instrument Tests

This procedure checks HP 8530A operation and the new EVENT TRIGGER connector/circuitry.

### HP 85102R Functional Check

1. Turn the top and bottom boxes OFF.
2. Remove the top cover of the bottom box.
3. On the HP 85102 (bottom box):
  - a. Remove the Test Set-IF Interconnect cable.
  - b. Connect the rear panel ANALOG  $\pm 10V$  BNC to the SWEEP IN 0-10V BNC (failure to do this causes a false error).
  - c. Attach a BNC cable to the rear-panel 20 MHz output.
  - d. Connect the other end of the BNC cable to the supplied service adapter (85102-60210).

- e. Plug the service adapter into J1 (multi-pin rear-panel connector).
4. Turn on the HP 8530. Ignore the SYSTEM BUS ADDRESS ERROR or FAILED PRETUNE error messages.
5. Press **SYSTEM** **MORE** **SERVICE FUNCTIONS** **TEST MENU**.
6. Press **2** **2** **=MARKER**.
7. Press **2** **=MARKER**.
8. Press **=MARKER**.
9. Run all of the tests by pressing **M/u** (hexadecimal B) **=MARKER**. When finished, the instrument should display the following message at the top of the screen:  

>>> PASSED ALL HP 85102 TESTS <<<
10. Turn the HP 8530 OFF.
11. Disconnect the service adapter and its BNC cable. Disconnect the BNC cable that goes between the ANALOG  $\pm 10V$  BNC and the SWEEP IN 0-10V BNC.
12. Reconnect the Test Set-IF Interconnect.

## LO Phase Lock Out Functional Check

### Note




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Only perform this test if you replaced the A16 assembly. If you did *not* change A16, go directly to “Event Trigger Input Test”.

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The A16 assembly inverts the main phase lock signal to fine tune a sweep oscillator. In this check, you use the HP 8510C as an oscilloscope to check this function.

1. Check that all connections are as shown in Figure 1-1, Figure 1-2, or Figure 1-3.
2. Make sure the HP 8510 is OFF.
3. On the HP 85102 (bottom box):
  - a. Disconnect W24 from the A17J4 REF X connector.
  - b. Connect the (supplied) BNC-to-SMB cable (5062-7230) between the rear panel LO PHASE LOCK OUT jack and the A17J4 REF X connector.
4. Turn the HP 8530A ON.
5. Press **PARAMETER** **MENU** and select **USER 1**.
6. Press **FORMAT** **MENU** and select **REAL**.
7. Press **RESPONSE** **AUTO**.
8. The signal displayed should ramp up as shown in Figure 1-17.

## Note



If the trace flattens out and an IF Failed Cal message is displayed, press **ENTRY OFF** to clear the error. This is not a true error.

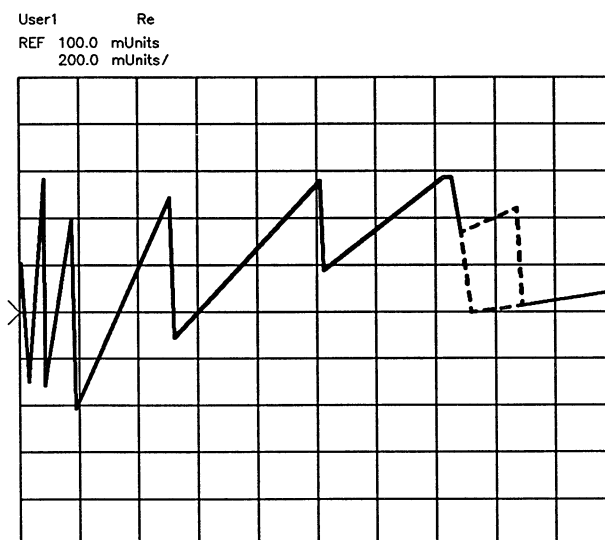


Figure 1-17. LO Phase Lock Out and Main Phase Lock Signals

9. Turn OFF the HP 8530A.
10. On the HP 85102:
  - a. Remove the BNC-to-SMB cable.
  - b. Reconnect W24 to A17J4.
  - c. Leave the top cover off.
11. Continue with “Event Trigger Input Test”.

## Event Trigger Input Test

This procedure tests the EVENT TRIGGER connector and circuitry.

1. Turn the HP 8530 top and bottom boxes are OFF.
2. Connect STOP SWEEP IN/OUT on the RF source to STOP SWEEP on the HP 8530.
3. Connect TRIGGER OUTPUT on the RF source to EVENT TRIGGER on the HP 8530.
4. Turn the HP 8530 ON.
5. Press STIMULUS **MENU** **RAMP** **MORE** **SINGLE**.

The SINGLE selection should become underlined for less than a second, then HOLD should become underlined. If this happens it is proof that the EVENT TRIGGER connector and circuitry work. (When the instrument switches to hold mode it indicates that a sweep has successfully been triggered, and that the sweep is finished.)

6. Reassemble the HP 8530A top and bottom boxes. This completes the upgrade.