HP E2747A and E2748A Baseband Vector Waveform Generator

Installation Guide

HP Part Number E2748-90004

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The Waveform Generator at a Glance

The HP E2747A and E2748A Baseband Vector Waveform Generator is a highly versatile modular signal source providing both I and Q or composite IF output. It is optimized for the generation of digitally modulated communications signals in the frequency range from dc to 6 MHz. However, it is also capable of generating analog modulation, arbitrary waveforms, sine waves, and traditional function generator outputs. Signal frequencies above 6 MHz may be achieved by adding an upconverter such as the HP 89431A or an I/Q modulator such as the HP ESG-D2000A. The waveform generator's signal bandwidth can be up to 2 MHz, depending on the configuration settings, for real time signal computation and 6 MHz in playback mode.

The waveform generator can be controlled using either the graphical user interface or the function library accessible via Microsoft Visual Basic or Visual C++.

The HP E2747A Baseband Vector Waveform Generator is a preconfigured PC-format instrument that contains one, two, or three HP E2748A Baseband Vector Waveform Generator Modules.

The HP E2748A Baseband Vector Waveform Generator Module is a printed circuit board assembly designed to plug into a DSP module, then into either a PC or a VXI system. For a PC, the DSP module is the Dakar C44-Based PCI Processor Board from Spectrum Signal Processing*. Up to three HP E2748A waveform generators can be plugged into this DSP module to create a three channel system. For a VXI system, the DSP module is the HP SCMVX008 TI-based DSP Module with optional SMB connectors and 4 MB DRAM. Up to six HP E2748A waveform generators can be plugged into this DSP module to create a six channel system. Larger systems can be created using multiple SCMVX008 modules.

* Spectrum Signal Processing, Vancouver, British Columbia, Canada.

In This Book

This book provides installation information for the HP E2747A Baseband Vector Waveform Generator and the HP E2748A Baseband Vector Waveform Generator Module. All other information is available in online help.

Contents

1

Installing the HP E2747A and E2748A

Installing the HP E2747A and E2748A

This chapter contains instructions for installing, transporting, and storing the HP E2747A Baseband Vector Waveform Generator and HP E2748A Baseband Vector Waveform Generator Module.

Caution

To protect circuits from static discharge, observe anti-static techniques whenever handling the HP E2748A Baseband Vector Waveform Generator Module.

To inspect the HP E2747A and E2748A

The HP E2747A and E2748A waveform generator was carefully inspected both mechanically and electrically before shipment. It should be free of marks or scratches, and it should meet its published specifications upon receipt.

If the product was damaged in transit, do the following:

- Save all packing materials.
- File a claim with the carrier.
- Call your Hewlett-Packard sales and service office.

To install the HP E2747A

The HP E2747A Baseband Vector Waveform Generator is a preconfigured PC-format instrument. Its I analog output or composite IF output (labeled B-I, C-I, D-I), Q analog output (labeled B-Q, C-Q, D-Q), and external 10 MHz frequency reference input (labeled Ref) are located on the rear panel as shown. C-I, C-Q, D-I, and D-Q are optional outputs. For ease of upgrading, these SMB connectors are installed even if option 001 (1 additional I and Q outputs) or option 002 (2 additional I and Q outputs) is not installed. For instructions on adding additional channels, see "To install the HP E2748A in a PC" on page 1-17.

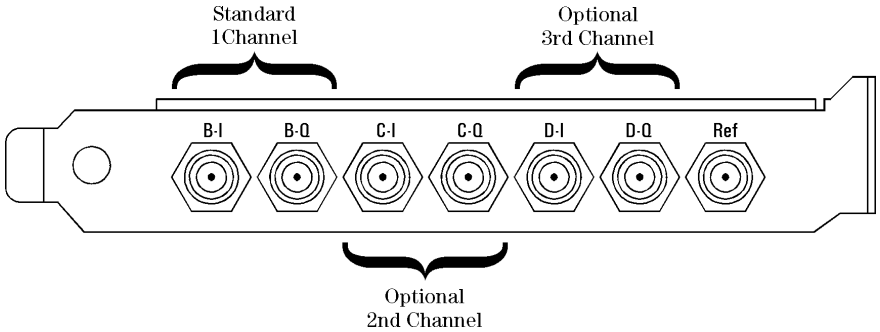


Figure 1-1 **HP E2747A Rear Panel Connectors**

Since the HP E2747A is a preconfigured PC-format instrument, to install it you merely have to set up the PC. First read "Power Requirements" and "Power Cable and Grounding Requirements", then follow the PC's installation instructions.

Power Requirements

The HP E2747A Baseband Vector Waveform Generator can operate from a single-phase ac power source supplying voltages as shown in the table.

Range	Frequency	Maximum Power Consumption
PC		
100-127 V	60 Hz	120 W
200-240 V	50 Hz	120 W
Display		
100-240 V	60/50 Hz	100 W

Power Cable and Grounding Requirements

The HP E2747A Baseband Vector Waveform Generator is equipped with two three-conductor power cords that ground the PC and display when plugged in to appropriate receptacles. The type of power cable plugs shipped with each HP E2747A depends on the country of destination. The following shows available power cable and plug configurations.

Plug Configuration	Country or Region	Plug Designator	Rating (Vac/A)	HP Part Number
	Australia/ New Zealand	AS 3112	250/6	8120-1369
	China	GB 1002	250/10	8120-8376
	Continental Europe	IEC 83 C4	250/6	8120-1689
	India/ South Africa	BS546	250/10	8120-4211
	Israel	SI 32	250/6	8120-5182
	Japan	JIS C8303	125/12	8120-4753
	North America	NEMA 5-15P	125/10	8120-1378
	Switzerland	SEV 1011 (Type 12)	250/6	8120-2104
	United Kingdom	BS 1363/A	250/6	8120-1351
	Denmark	DHCR 107	220/6	8120-2956

Figure 1-2 **HP E2747A Power Cords**

To install the HP E2748A in a VXI system

What You Need

- A VXI mainframe capable of supplying the power and cooling required for the number of HP SCMVX008 DSP modules, HP E2748A waveform generators, and computer or interface cards. See the Technical Specifications for the individual system elements.
- A Windows NT® or Windows® 95 computer for the VXI environment. This can be either an embedded slot 0 Pentium-class controller, or a MXI module extender card to an external Pentium-class PC from National Instruments. See the HP VXI catalog for choices.
- HP SCMVX008 TI-based VXI DSP Module with option 001 SMB connectors and option 082 4 MB DRAM (maximum 6 HP E2748As per HP SCMVX008).
- HP E2748A Vector Waveform Generator Module (includes 2 nylon nuts (HP 0535-0161), 3 mini-to-SMB cables (HP E2748-61601), 2 mini-to-mini cables (HP 8120-8718), and 2 SMB-to-BNC cables (HP 8120-6269)).
- Communication Port Cable Kit (HP SCM00010) for HP E2748As installed in HP SCMVX008 sites C and D.

Installation Overview

Step 1. Configure VXI DSP module.

Step 2. Install HP E2748A in DSP module.

Step 3. Connect cables.

Step 4. Set jumpers on HP E2748A.

Step 5. Install DSP module in VXI mainframe.

Step 6. Install software.

Step 7. Configure software.

Step 1. Configure VXI DSP module

This procedure outlines the steps required to configure the HP SCMVX008 TI-based VXI DSP module. For details, see the *VX8 Installation Guide*.

Caution

To protect circuits from static discharge, observe anti-static techniques whenever handling the HP SCMVX008 VXI DSP module.

1. Remove the top shield.
2. Check that the DRAM jumpers JP3, JP4, and JP5 are set correctly for the amount of installed DRAM memory.
3. Check that jumpers JP1, JP2, JP6 and JP7 are in the following positions: JP1 pins 1-2, JP2 pins 2-3, JP6 and JP7 out.
4. Set the Logical Address configuration switch. Note the address you selected since you will be asked to enter the address in "Step 7. Configure software" on page 1-16.

Step 2. Install HP E2748A in DSP module

The HP SCMVX008 VXI DSP module contains six SMB connectors on its front panel. The following table shows the maximum number of HP E2748As you can install in the DSP module based on the connections you want to make to the front panel.

If you want...			You can install the following number of HP E2748As
I or IF output	Q output	External reference input	
YES	no	no	6
YES	no	YES	5
YES	YES	no	3
YES	YES	YES	2

Note

You should fill TIM-40 sites E, F, G, and H before sites C and D. HP E2748As installed in sites C and D require an external cable on the VXI DSP module's front panel to complete the COM port connection. To insure that the cables reach from HP E2748A to HP E2748A, fill adjacent sites rather than diagonal sites. For example, fill sites H and F or H and G rather than H and E.

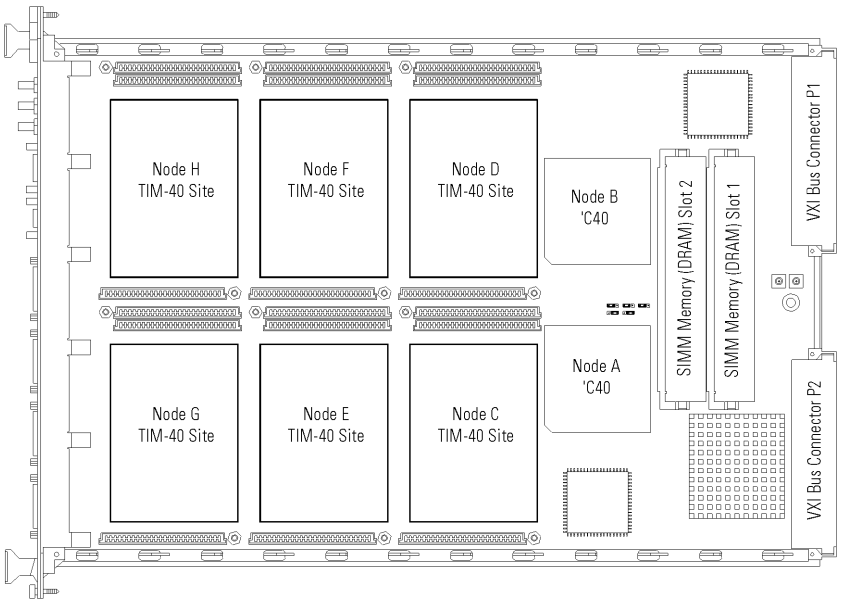


Figure 1-3 **TIM-40 sites on the HP SCMVX008 VXI DSP module**

To install the HP E2748A in a VXI system

For each HP E2748A, do the following:

1. Align the HP E2748A over the TIM-40 site ensuring that the connectors and nylon retaining posts are properly aligned.
2. Gently push the HP E2748A onto the connectors, applying pressure directly over the connectors to avoid bending the circuit board.
3. Using an open end wrench, fasten the HP E2748A to the VXI DSP module with the provided nylon nuts. Do not over tighten.
4. Note the TIM-40 site you selected since you will be asked to specify which sites contain an HP E2748A in "Step 7. Configure software" on page 1-16.

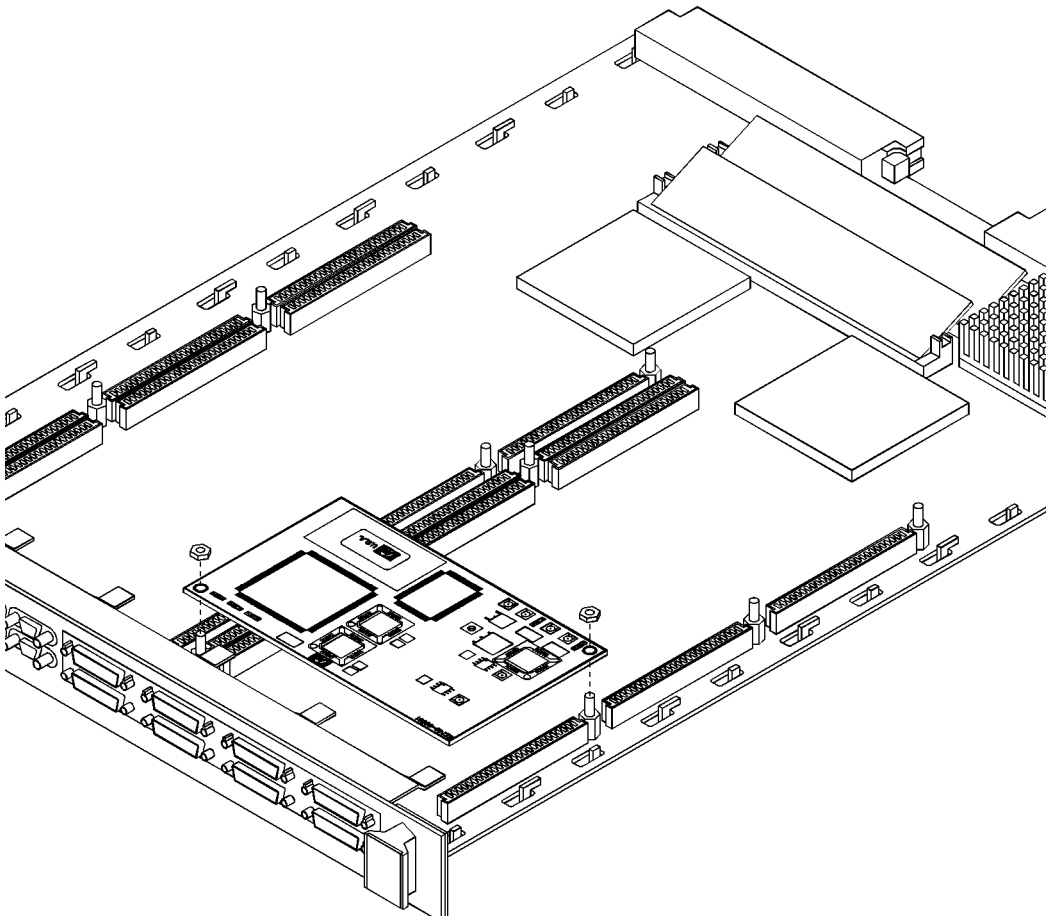


Figure 1-4 **Installing HP E2748A in HP SCMVX008 VXI DSP module**

Step 3. Connect cables

The HP E2748A waveform generator is tested with the mini-to-SMB cables already connected. Do not disconnect the cables unless absolutely necessary.

Caution

The mini cables and connectors can be easily damaged. To avoid damage, be extremely careful when connecting and disconnecting. When connecting, make sure you line up the cable with the slot in the connector, then press straight down. When disconnecting, slowly work the cable out of the connector by gently prying the cable up with a tweezer as shown.

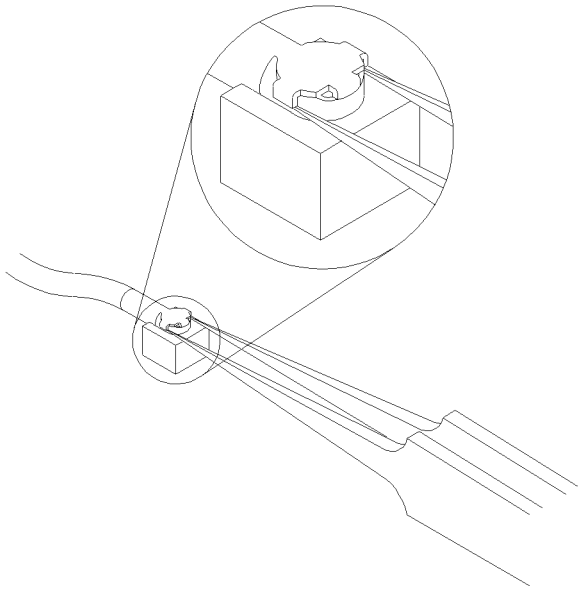


Figure 1-5 **Disconnecting mini cables**

Note

If you will be using the internal frequency reference from the embedded slot 0 controller, you do not need to connect cables to P8 or P13. However, if cables are already connected to P8 or P13, you do not have to disconnect them.

1. If you will be using an external 10 MHz frequency reference, do the following:

   a. If you only have one HP E2748A, connect a mini-to-SMB cable from P8 or P13 to one of the front panel connectors. P8 and P13 are connected, therefore it does not matter which one you choose.

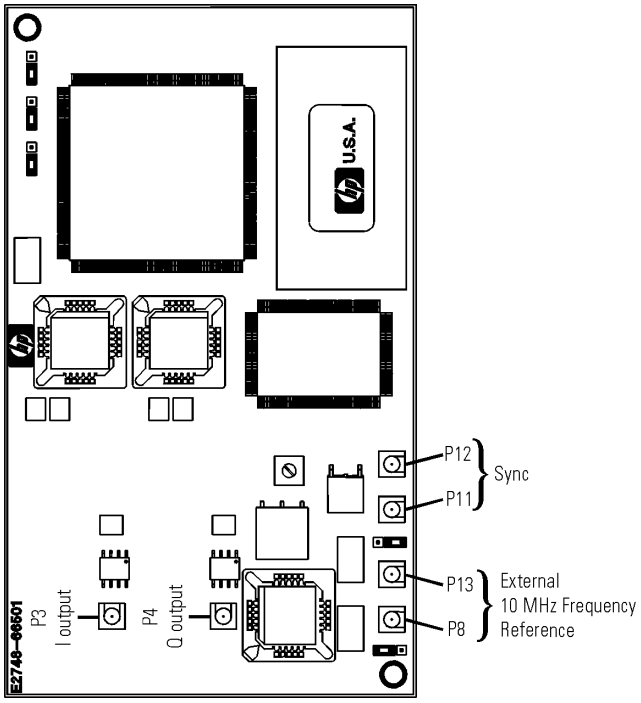


Figure 1-6 **HP E2748A connectors**

   b. If you have more than one HP E2748A, you must carefully plan your cable routing before connecting any cables. The external frequency reference is connected to one HP E2748A, then daisy chained from the first one to the second, from the second to the third and so on. Your routing must allow all HP E2748As to be connected to HP E2748As in adjacent sites rather than HP E2748As in diagonal sites. See Figure 1-7 on page 1-12 for an example of cable routing.

   - Connect the supplied mini-to-SMB cable from P8 or P13 to one of the front panel connectors. P8 and P13 are connected, therefore it does not matter which one you choose.
   - Connect the supplied mini-to-mini cable from P8 or P13 on the first HP E2748A to P8 or P13 on the second, from P8 or P13 on the second to P8 or P13 on the third, and so on.

2. If you have more than one HP E2748A, you must carefully plan your cable routing before connecting any cables. The sync line is daisy chained from one HP E2748A to the second, from the second to the third and so on. Your routing must allow all HP E2748As to be connected to HP E2748As in adjacent sites rather than HP E2748As in diagonal sites. If you connected the frequency reference cables in step 1, use the same routing. See Figure 1-7 on page 1-12 for an example of cable routing.
   - Connect the supplied mini-to-mini cable from P11 or P12 on the first HP E2748A to P11 or P12 on the second, from P11 or P12 on the second to P11 or P12 on the third, and so on.
3. If you want to connect the I channel to the front panel, connect the cable connected to P3 to one of the front panel connectors.
4. If you want to connect the Q channel to the front panel, connect the cable connected to P4 to one of the front panel connectors.
5. Repeat steps 3 and 4 for each HP E2748A.

Caution

Cables attached to P3 and P4 that are not connected to the front panel can damage circuits if the unused connector comes in contact with and shorts out components on the circuit board. Disconnect and remove unused cables to prevent accidental damage to circuits (see Figure 1-5 on page 1-9).

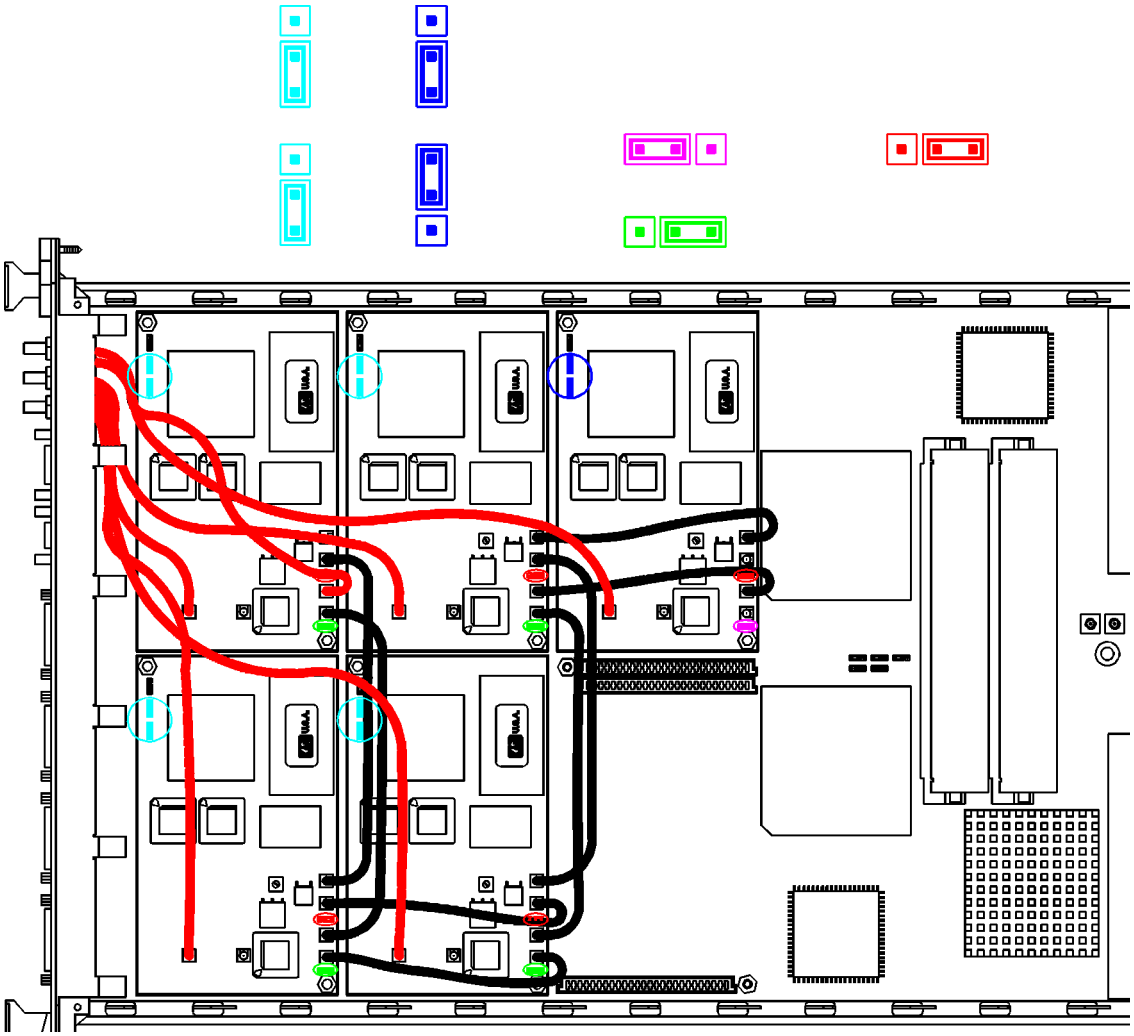


Figure 1-7 **Example showing 5 HP E2748As installed in VXI DSP module**

Step 4. Set jumpers on HP E2748A

1. If you will be using the internal frequency reference provided by the embedded slot 0 controller, connect a jumper to P7 pins 1 and 2 on each HP E2748A installed in the DSP module. The P10 jumper can be in any position.

Note

See "Step 1. Configure VXI DSP module" on page 1-6 for correct jumper positions.

2. If you will be using an external 10 MHz frequency reference, do the following:
   a. Connect a jumper to P7 pins 2 and 3 on each HP E2748A installed in the DSP module to enable P8 and P13 to receive the external 10 MHz frequency reference.
   b. If you have only one HP E2748A installed in the DSP module, connect a jumper to P10 pins 1 and 2 to terminate the external frequency reference in 50 ohms.
   c. If you have multiple HP E2748As installed in the DSP module, connect a jumper to P10 pins 1 and 2 on the last HP E2748A in the frequency reference daisy chain to terminate the external frequency reference in 50 ohms. See Figure 1-7 on page 1-12 for an example of correct jumper positions.
   d. For all other HP E2748As, connect a jumper to P10 pins 2 and 3.
3. For each HP E2748A installed in sites E, F, G, or H on the DSP module, set the COM port to 5 by connecting a jumper to P5 pins 1 and 2 and to P6 pins 1 and 2. See Figure 1-7 on page 1-12 for an example of correct jumper positions.
4. For each HP E2748A installed in sites C or D on the DSP module, set the COM port to 2 by connecting jumpers to P5 pins 1 and 2 and P6 pins 2 and 3.

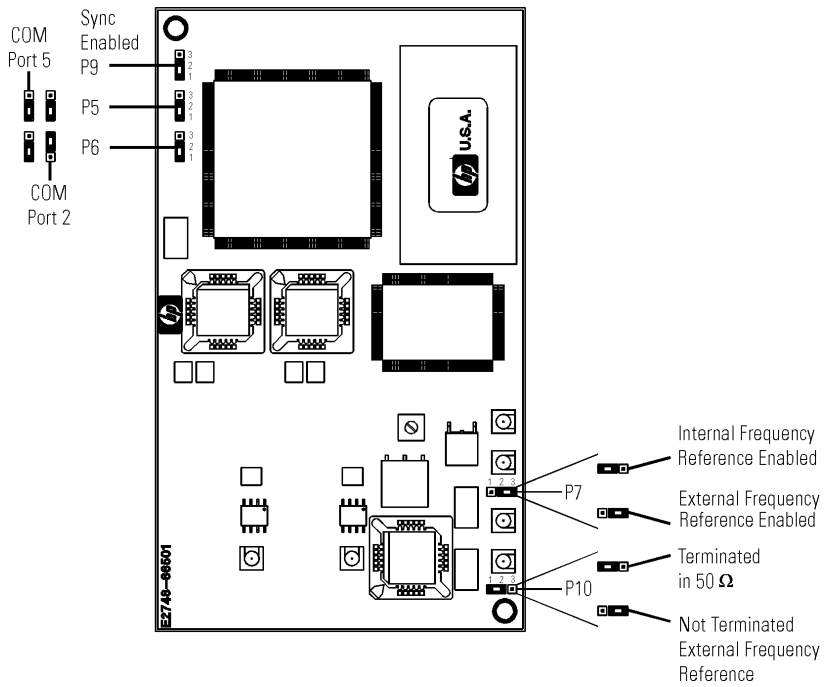


Figure 1-8 **HP E2748A Jumpers**

5. Check that jumpers connect P9 pins 1 and 2.

   P9 pins 1 and 2 enable P11 and P12 to receive a synchronization signal. P9 pins 2 and 3 are reserved for future use.

6. Reinstall the VXI DSP module's top shield (see the *VX8 Installation Guide*).

Step 5. Install DSP module in VXI mainframe

1. Set up your VXI mainframe. See the installation guide for your mainframe.
2. Select a slot in the VXI mainframe for the DSP module.
3. Set the mainframe's power switch to standby or off (⏻ or 0).

Caution Installing or removing the module with the power on may damage components in the module.

4. Place the module's card edges (top and bottom) into the module guides in the slot.
5. Slide the module into the mainframe until the module connects firmly with the backplane connectors. Make sure the module slides in straight.
6. Attach the module's front panel to the mainframe chassis using the module's captive mounting screws.
7. If you installed an HP E2748A in site C, connect a communication port cable from COM A3 to COM C2.
8. If you installed an HP E2748A in site D, connect a communication port cable from COM B3 to COM D2.

Step 6. Install software

If you previously installed the Vector Signal Generation Software and are just installing additional HP E2748As, you may skip this step and proceed to "Step 7. Configure software".

1. If you are installing the software on a Windows NT system, check that your user name belongs to the Administrators group.
   a. Select Start, Programs, Administrative Tools, User Manager to display the User Manager window.
   b. Double-click on Administrators to display the Local Group Properties window.
   c. Check that your user name is listed in the Member's field. If not listed, have your system administrator add your user name to the Administrators group.
2. Install the VX8 C4x Support Software and VX8 Instrument Drivers. See the *VX8 Carrier Board Installation Guide*.
3. Insert Disk 1 of the Vector Signal Generation Software into your computer's flexible disk drive.
4. Select Start, Run. Type "*drive*:\Setup.exe" and select OK. For example, if your flexible disk drive is A, type "A:\Setup.exe".
5. When the *Select Carrier Type* screen appears, select SCMVX008, then select Next.

   The NONE (Simulation only) selection allows you to operate the software when the HP E2748A hardware is not installed.
6. Insert Disk 2 and Disk 3 when prompted.

Step 7. Configure software

The Vector Waveform Generation Software provides a graphical user interface, the SCMVX008 Configuration Tool, to configure the HP E2748A waveform generators in your system. It creates the hptim40.cfg file.

1. Select HPE2748 Configure from the HP E2748A program group.
2. In the "Number of SCMVX008s" field, enter the number of DSP modules in your system.
3. If you have more than one DSP module in your system, select the DSP module you wish to configure in the "Active SCMVX008" field.
4. In the "Logical Address" field, enter the DSP module's logical address you set in "Step 1. Configure VXI DSP module" on page 1-6.
5. In the "Interrupt Level" field, enter an interrupt level between 1 and 7. All DSP modules in your system can have the same interrupt level or different interrupt levels.
6. Click on the box next to sites that contain an HP E2748A to make a check mark appear, then change the default name if you want to.
7. Accept the default Download files for site A and B. The defaults are `C:\Vxipnp\WinNT\Hpe2748\config\embeda.out` and ...`\embedb.out`. If you have compiled your own dsp code, use the Browse A or Browse B button to find it.
8. Repeat steps 3 through 7 for each DSP module in your system.
9. After you configure all modules in your system, select the "Build Configuration Files and Exit" button. This creates the hptim40.cfg file or modifies an existing hptim40.cfg file.

To install the HP E2748A in a PC

What You Need

- A Pentium class PC with:
  - Minimum 2 expansion slots available, with at least one PCI slot.
  - PC expansion bus environment: Ensure continuous, positive airflow over the PCI slot where the Dakar module is installed. This ordinarily requires a fan, or ducts and vents which ensure that air is specifically directed over the Dakar module and through the expansion bus area. The specific PC model HP ships with the HP E2747A Vector Waveform Generator is tested to meet this requirement. *Note: Unlike VXI systems, the PC thermal and electrical environment is not well specified. Because of this, it may be difficult to guarantee operability of the HP E2748A. Contact HP for the model of the currently shipping PC.*
  - Windows NT 4.0
- Dakar C44-Based PCI Processor module from Spectrum Signal Processing, Model F5M1S1, part number 600-00054. (Maximum 3 HP E2748As per Dakar, maximum 1 Dakar per PC.)
- HP E2748A Vector Waveform Generator Module (includes 2 nylon nuts (HP 0535-0161), 3 mini-to-SMB cables (HP E2748-61601), 2 mini-to-mini cables (HP 8120-8718), and 2 SMB-to-BNC cables (HP 8120-6269)).
- PC adapter plate assembly (HP E2748-60201)

Installation Overview

Step 1. Configure Dakar DSP module.

Step 2. Install HP E2748A in DSP module.

Step 3. Connect cables.

Step 4. Set jumpers on HP E2748A.

Step 5. Install DSP module and plate in PC.

Step 6. Install software.

Step 7. Configure software.

Step 1. Configure Dakar DSP module

Caution

To protect circuits from static discharge, observe anti-static techniques whenever handling the Dakar DSP module.

1. Check that a jumper is not connecting J24 pins 1 and 2.
2. Check that a jumper is connecting J25 pins 1 and 2, and J28 pins 1 and 2.

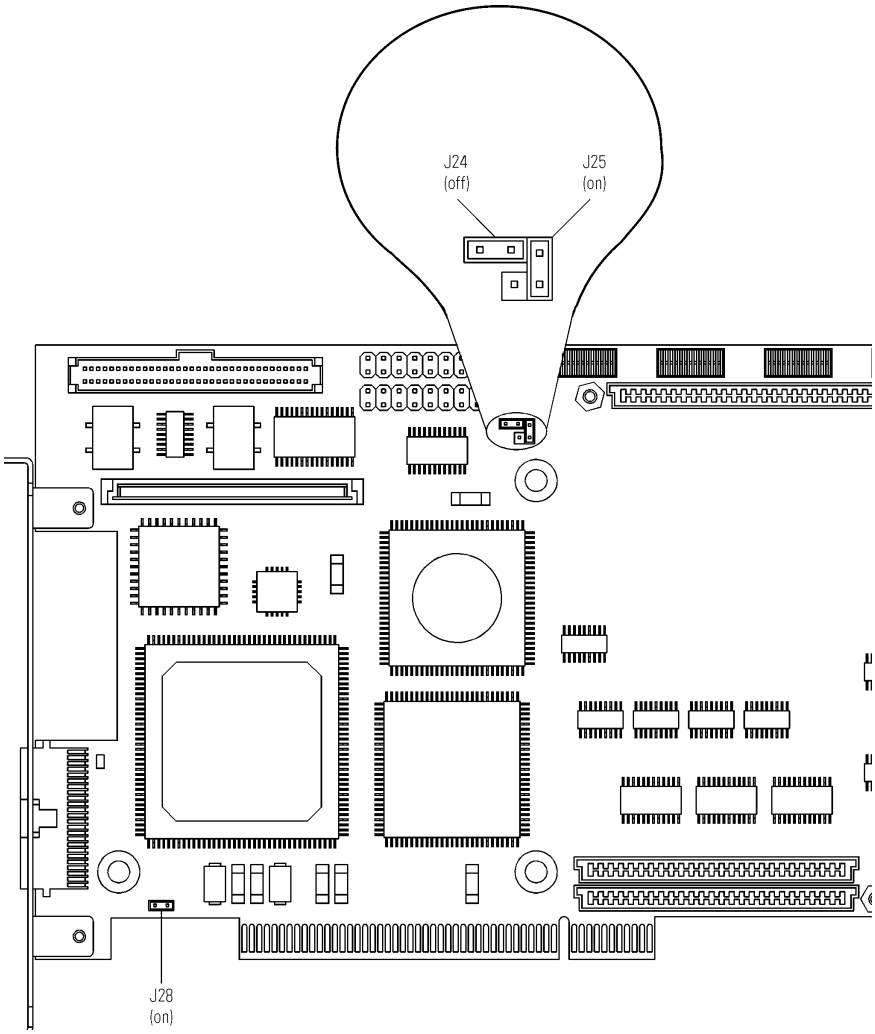


Figure 1-9 **Dakar DSP module jumpers**

Step 2. Install HP E2748A in DSP module

Three HP E2748A waveform generators can be installed in a Dakar DSP module.

Note

You should fill site B before sites C and D.

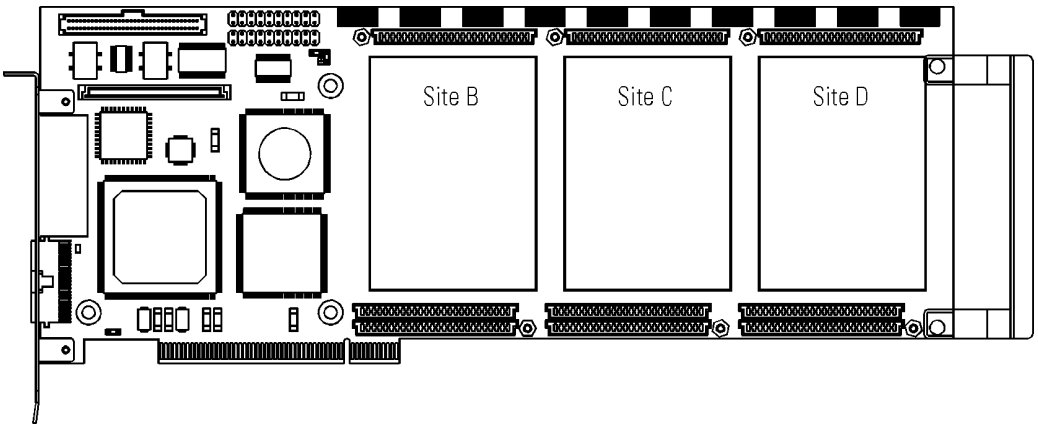


Figure 1-10 **TIM-40 sites on the Dakar DSP module**

For each HP E2748A, do the following:

1. Align the HP E2748A over the site ensuring that the connectors and nylon retaining posts are properly aligned (see Figure 1-11 on page 1-20).
2. Gently push the HP E2748A on to the connectors, applying pressure directly over the connectors to avoid bending the circuit board.
3. Using an open end wrench, fasten the HP E2748A to the DSP module with the provided nylon nuts. Do not over tighten.
4. Note the TIM-40 site you selected since you will be asked to specify which sites contain an HP E2748A in "Step 7. Configure software" on page 1-26.

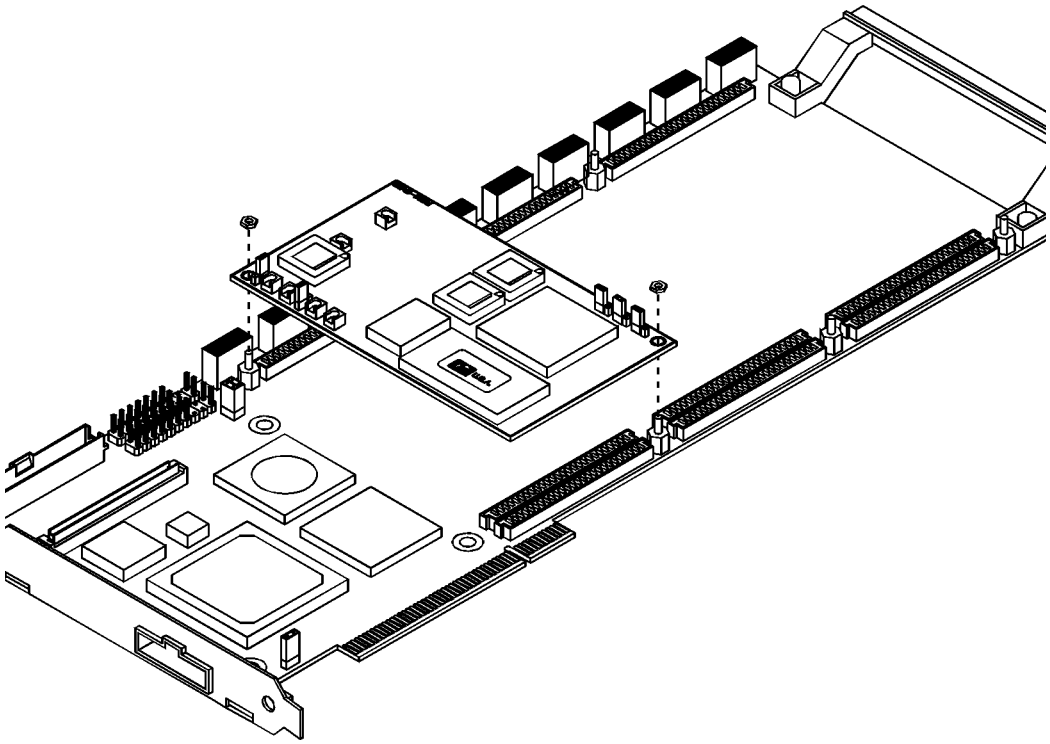


Figure 1-11 **Installing HP E2748A in Dakar DSP module**

Step 3. Connect cables

The HP E2748A waveform generator is tested with the mini-to-SMB cables already connected. Do not disconnect the cables unless absolutely necessary.

Caution

The mini cables and connectors can be easily damaged. To avoid damage, be extremely careful when connecting and disconnecting. When connecting, make sure you line up the cable with the slot in the connector, then press straight down. When disconnecting, slowly work the cable out of the connector by gently prying the cable up with a tweezer as shown.

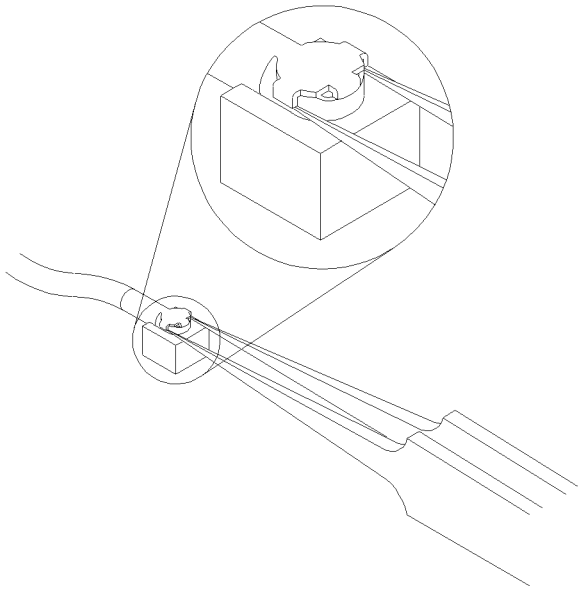


Figure 1-12 **Disconnecting mini cables**

To install the HP E2748A in a PC

1. If you will be using an external 10 MHz frequency reference, do the following:
   a. Connect the supplied mini-to-SMB cable from P8 or P13 to the connector labeled Ref on the PC adapter plate. P8 and P13 are connected, therefore it does not matter which one you choose.
   b. If you have more than one HP E2748A, connect the supplied mini-to-mini cable from P8 or P13 on the first HP E2748A to P8 or P13 on the second, from P8 or P13 on the second to P8 or P13 on the third. See Figure 1-14 on page 1-23 for an example of cable routing.
2. If you have more than one HP E2748A, connect their sync lines together by connecting the supplied mini-to-mini cable from P11 or P12 on the first HP E2748A to P11 or P12 on the second, from P11 or P12 on the second to P11 or P12 on the third.

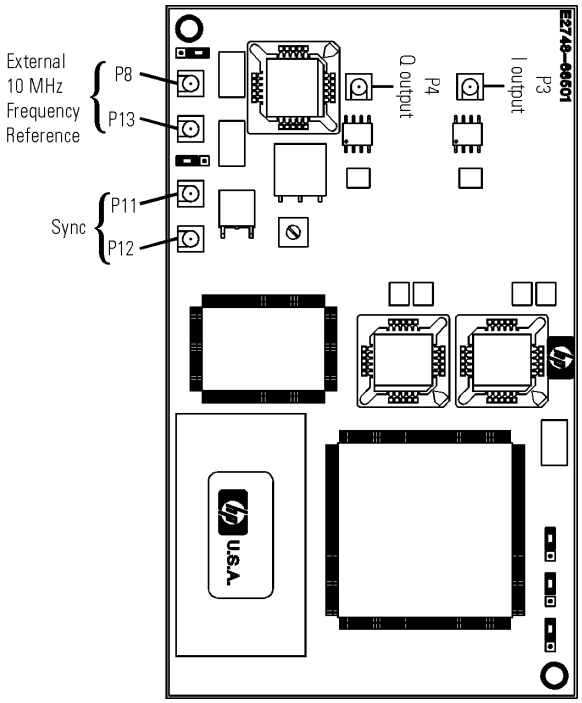


Figure 1-13 **HP E2748A connectors**

3. Connect the cable connected to P3 to the connector labeled B-I on the PC adapter plate.
4. Connect the cable connected to P4 to the connector labeled B-Q on the PC adapter plate.
5. If you have a second HP E2748A, repeat steps 3 and 4 connecting to C-I and C-Q.
6. If you have a third HP E2748A, repeat steps 3 and 4 connecting to D-I and D-Q.

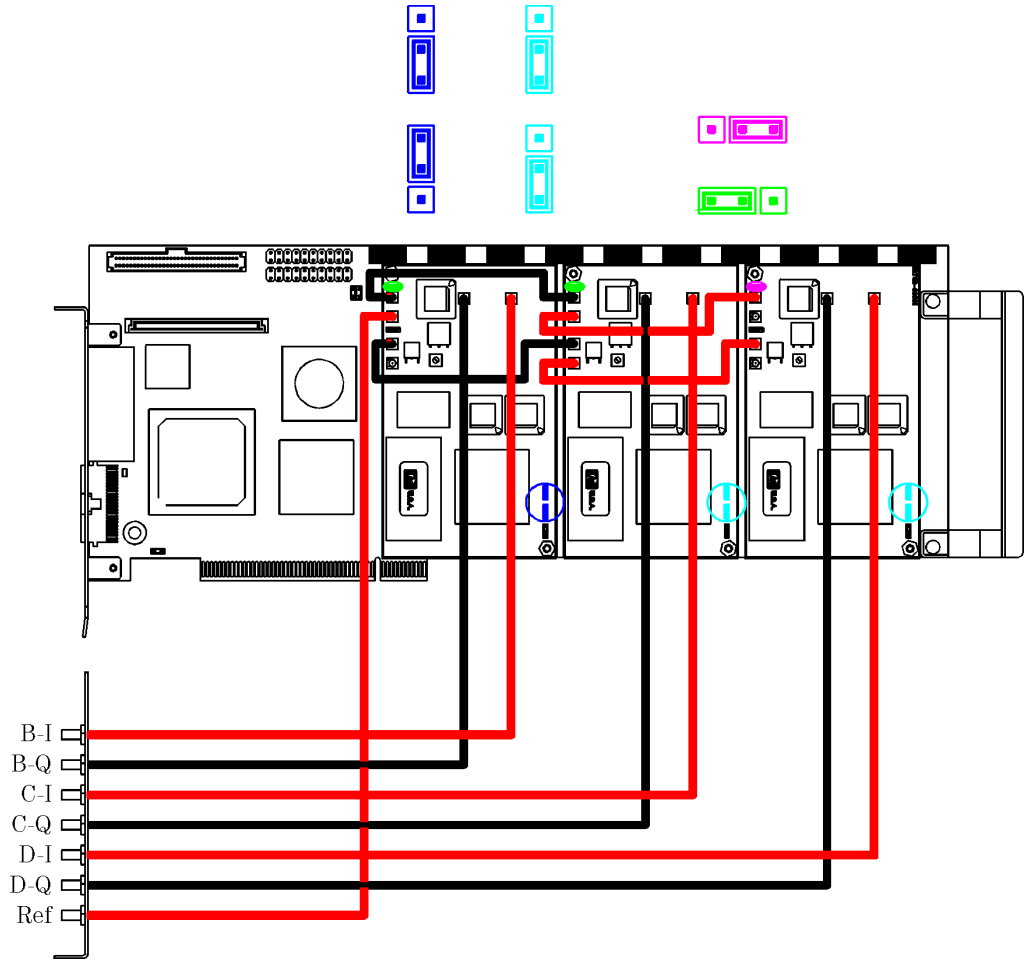


Figure 1-14 **Example showing 3 HP E2748As installed in Dakar PCI DSP module**

Step 4. Set jumpers on HP E2748A

1. If you will be using an external 10 MHz frequency reference, do the following:
   a. If you have only one HP E2748A installed in the DSP module, connect a jumper to P10 pins 1 and 2 to terminate the external frequency reference in 50 ohms.
   b. If you have multiple HP E2748As installed in the DSP module, connect a jumper to P10 pins 1 and 2 on the last HP E2748A in the frequency reference daisy chain to terminate the external frequency reference in 50 ohms. See Figure 1-14 on page 1-23 for an example of correct jumper positions.
   c. For all other HP E2748As, connect a jumper to P10 pins 2 and 3.

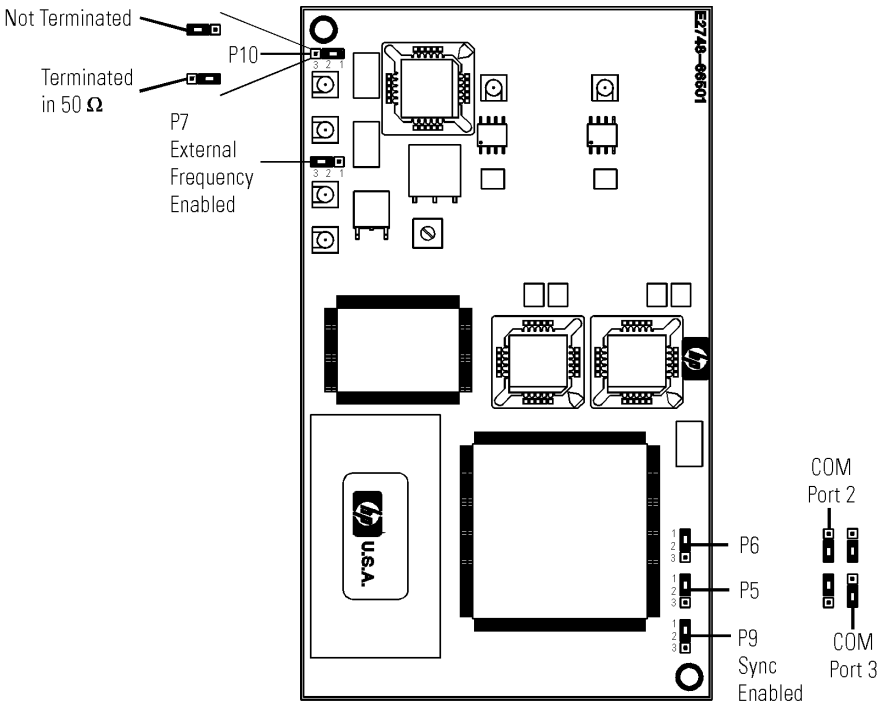


Figure 1-15 **HP E2748A jumpers**

2. For the HP E2748A installed in site B on the DSP module, set the COM port to 2 by connecting jumpers to P5 pins 1 and 2 and P6 pins 2 and 3.
3. For each HP E2748A installed in sites C or D on the DSP module, set the COM port to 3 by connecting a jumper to P5 pins 2 and 3 and to P6 pins 2 and 3.
4. Check that jumpers connect P7 pins 2 and 3, and P9 pins 1 and 2.

   P7 pins 2 and 3 enable P8 and P13 to receive the external 10 MHz frequency reference. P7 pins 1 and 2 are reserved for future use. P9 pins 1 and 2 enable P11 and P12 to receive a synchronization signal. P9 pins 2 and 3 are reserved for future use.

Step 5. Install DSP module and plate in PC

The Dakar DSP module must be installed in a PCI slot. The PC adapter plate can be installed in any expansion slot. To install the DSP module and plate in your PC, follow the setup instructions that came with your PC for installing an accessory board.

Step 6. Install software

If you previously installed the Vector Signal Generation Software and are just installing additional HP E2748As, you may skip this step and proceed to "Step 7. Configure software" on page 1-26.

1. Check that your user name belongs to the Administrators group.
   a. Select Start, Programs, Administrative Tools, User Manager to display the User Manager window.
   b. Double-click on Administrators to display the Local Group Properties window.
   c. Check that your user name is listed in the Member's field. If not listed, have your system administrator add your user name to the Administrators group.
2. If an older version of the Dakar drivers is already installed, uninstall the Dakar drivers then delete the Dakar driver directory including all the files in the directory (FSSDK is the default directory name).
3. Insert the Dakar Drivers Disk into your computer's flexible disk drive.
4. Select Start, Run. Type "*drive*:\Setup.exe" and select OK. For example, if your flexible disk drive is A, type "A:\Setup.exe".
5. After the drivers are installed, insert Disk 1 of the Vector Waveform Generation Software into your computer's flexible disk drive.
6. Select Start, Run. Type "*drive*:\Setup.exe" and select OK. For example, if your flexible disk drive is A, type "A:\Setup.exe".
7. When the *Select Carrier Type* screen appears, select DAKAR, then select Next.

   The NONE (Simulation only) selection allows you to operate the software when the HP E2748A hardware is not installed.
8. Insert Disk 2 and Disk 3 when prompted.

Step 7. Configure software

The Vector Waveform Generation Software provides a graphical user interface, the Dakar Configuration Tool, to configure the HP E2748A waveform generators in your system. It creates the hptim40.cfg file.

1. Select HPE2748 Configure from the HP E2748A program group.
2. Click on the box next to sites that contain an HP E2748A to make a check mark appear, then change the default name if you want to.
3. Accept the default DSP Load File value. The default value is `C:\Program Files\Hpe2748\config\dakarc4x.out`. If you have compiled your own, use the Browse button to find it.
4. Select the "Build Configuration Files and Exit" button. This creates the hptim40.cfg file or modifies an existing hptim40.cfg file.

To connect to a passive combiner

What you need

- Passive combiner (HP 0955-0857 for 3-to-1 combiner)
- one SMB-to-BNC cable (HP 8120-6269) for each signal connected to the combiner
- one 50 Ω terminator (HP 1250-0207) for each unused combiner input connector
- BNC-to-BNC cable (HP 8120-1839)

Procedure

1. Connect the desired outputs (e.g., two I analog outputs) to the passive combiner using the SMB-to-BNC cables.
2. Terminate any unused connectors on the combiner with a 50 Ω terminator.
3. Connect combiner output to your test device using a BNC cable.

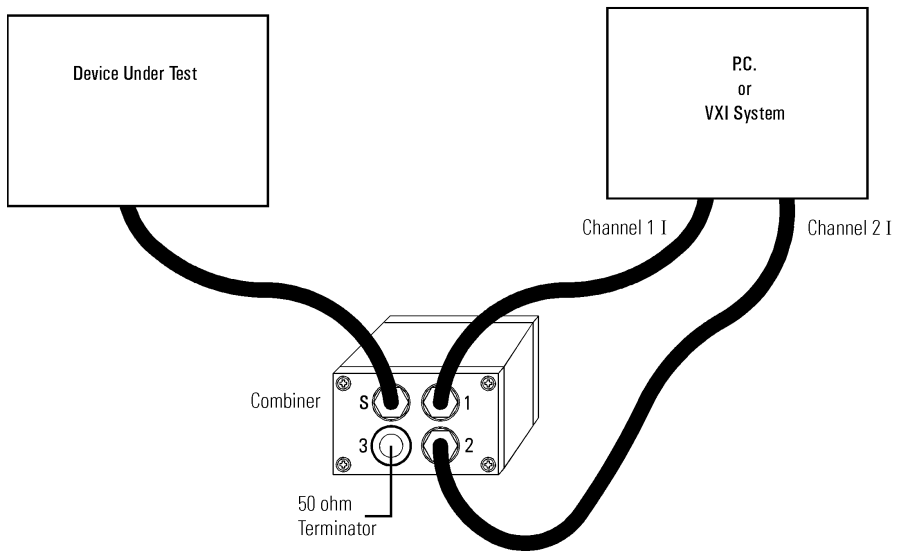


Figure 1-16 **Connecting HP E2747A or E2748A to passive combiner**

To connect to an HP 89431A with option AY8, RF Source

The HP 89431A with option AY8, the RF source, can upconvert the waveform generator's output to 2.65 GHz. The HP 89431A is the preferred solution for single and multiple-channel upconversion. The Vector Waveform Generation Software controls the HP 89431A.

What You Need

- HP 89431A with option AY8
- RS-232 cable (HP 8120-8734)
- SMB-to-BNC cable (HP 8120-6269)
- BNC-to-BNC adapter (HP 1250-0080)
- BNC-to-BNC cable (HP 8120-1839)
- 20 dB attenuator (HP 0955-0860)

Procedure

Warning

Keep away from live circuits. Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers or shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid dangerous electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.

Avertissement

N'intervenez pas sur les circuits sous tension: Le personnel d'exploitation ne doit pas retirer les capots ou blindage de l'équipement. Les procédures qui nécessitent le retrait de ces capots ou du blindage sont réservées aux techniciens de maintenance qualifiés. Dans certaines conditions, des tensions dangereuses peuvent subsister alors même que l'équipement a été mis hors tension. Pour éviter les risques d'électrocution, n'exéctez pas de procédures impliquant le démontage des capots ou du blindage à moins d'être dûment qualifié pour le faire.

Warnung

Gerät nicht öffnen: Das Betriebspersonal sollte die Geräte- oder Schutzabdeckungen nicht entfernen. Tätigkeiten, die ein Entfernen der Schutzabdeckungen erforderlich machen, müssen qualifiziertem Wartungspersonal vorbehalten bleiben. Unter bestimmten Bedingungen können selbst bie ausgeschaltetem Gerät gefährliche Spannungen vorhanden sein. Um einen elektrischen Schlag zu vermeiden, sollten Sie Tätigkeiten, die ein Entfernen der Geräte- and Schutzabdeckungen erforderlich machen, NUR bei entsprechender Qualifikation selbst durchführen.

警告

電源の入った状態で、回路に触れないでください。　装置のカバーまたはシールドを取り外さないようにしてください。　カバー、シールドの取り外し手順は、訓練を受けたサービスエンジニアのためのものです。　装置の電源が切れた状態でも、高電圧が存在することがあり危険です。　電気ショックの危険がありますので、該当する人以外は、カバー、シールドをはずさないでください。

1. Set the HP 89431A's power switch to standby (0), then unplug the power cord.
2. Using a torx screw driver, loosen the screw holding the top cover and remove the top cover.
3. Set the baud rate jumper to the DEBUG position as shown in Figure 1-17.

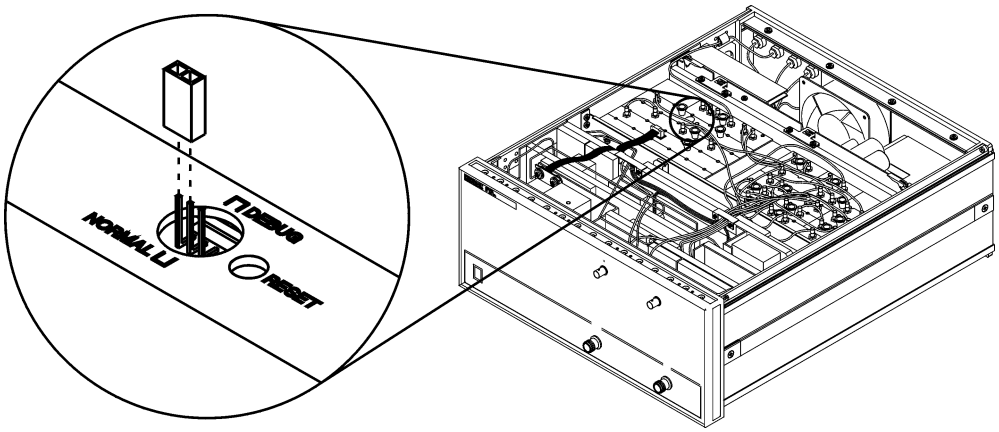


Figure 1-17 **HP 89431A in DEBUG position**

4. Replace the top cover and tighten the retaining screw using a torx screw driver.
5. Connect the RS-232 cable.
   - For a PC system, connect the RS-232 cable from the PC's RS-232 Serial Port connector to the HP 89431A's RS-232 connector.
   - For a VXI system, connect the RS-232 cable from the HP SCMVX008 VXI DSP module's RS-232 Serial port 1 connector to the HP 89431A's RS-232 connector.
6. Reconnect the HP 89431A's power cord and set its power switch to on (I).
7. Connect the desired output signal connector to the HP 89431A's Source IN connector using an SMB-to-BNC cable, BNC-to-BNC adapter, BNC-to-BNC cable, and a 50 Ω 20 dB attenuator.

Note

Signals may be combined, then connected to the HP 89431A (see "To connect to a passive combiner" on page 1-27).

8. Set the HP 89431As amplitude and frequency band using the Vector Waveform Generation Software's Modulate tab.

To connect to an HP E4432B ESG Series Signal Generator

The HP E4432B ESG-D Series RF Signal Generator, 250 kHz - 3 GHz, can upconvert the waveform generator's I and Q outputs to 3 GHz. The HP E4432B is the preferred solution for single channel upconversion. The Vector Waveform Generation Software controls the HP 89431A

What You Need

- HP E2748A installed in a PC or VXI system
- HP ESG E4432B RF Signal Generator
- 2 SMB-to-BNC cables (HP 8120-6269)
- 2 BNC-to-BNC cables (HP 8120-1839)
- 2 BNC-to-BNC adapters (HP 1250-0080)

Procedure

1. Connect the I output signal from the HP E2748A to the HP ESG E4432B's I input connector using an SMB-to-BNC cable, BNC-to-BNC adapter, and BNC-to-BNC cable.
2. Connect the Q output signal from the HP E2748A to the HP ESG E4432B's Q input connector using an SMB-to-BNC cable, BNC-to-BNC adapter, and BNC-to-BNC cable.

To store the waveform generator

Store the waveform generator in a clean, dry, and static free environment.

For other requirements, see storage and transport restrictions in the document: HP E2747/48A Technical Specifications.

To transport the waveform generator

Package the waveform generator using the original factory packaging or packaging identical to the factory packaging.

Containers and materials identical to those used in factory packaging are available through Hewlett-Packard offices.

If returning the waveform generator to Hewlett-Packard for service, attach a tag describing the following:

- Type of service required
- Return address
- Model number
- Full serial number

In any correspondence, refer to the waveform generator by model number and full serial number.

Mark the container FRAGILE to ensure careful handling.

If necessary to package the waveform generator in a container other than original packaging, observe the following (use of other packaging is not recommended):

- Wrap the waveform generator in heavy paper or anti-static plastic.
- Use a double-wall carton made of at least 350-pound test material.
- Cushion the waveform generator to prevent damage.

Caution

Do not use styrene pellets in any shape as packing material for the waveform generator. The pellets do not adequately cushion the waveform generator and do not prevent the waveform generator from shifting in the carton. In addition, the pellets create static electricity which can damage electronic components.

Declaration of Conformity

According to ISO/IEC Guide 22 and EN 45014

Manufacturer's name:	Hewlett-Packard Company
Manufacturer's address:	Lake Stevens Division 8600 Soper Hill Road Everett, Washington U.S.A. 98205-1298

declares, that the product

Product Name:	Baseband Vector Waveform Generator Module
Model Number:	E2747A
Options:	All

conforms to the following specifications:

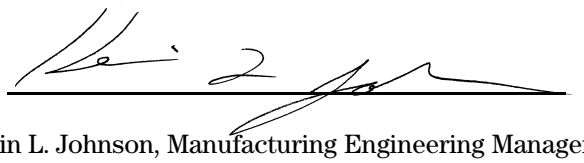
Safety:	EN61010-1:1993/IEC 61010-1:1990
EMC:	EN55011:1991/C1SPR11, Group1, Class A EN50082-1:1992 IEC 801-2:1984 4kV-CD, 8kV-AD IEC 801-3:1984 3V/m IEC 801-2:1995 0.5kV signal lines, 1kV powerlines

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23EEC and the EMC Directive 89/336/EEC accordingly.

This product consists of the following products: HP D4697N, HP D2835A/HP D2837A, HP 2748A, and F5 M1S1(Spectrum Signal, B.C., Canada).

Everett, Washington U.S.A. July 6, 1998



Kevin L. Johnson, Manufacturing Engineering Manager

Declaration of Conformity

According to ISO/IEC Guide 22 and EN 45014

Manufacturer's name:	Hewlett-Packard Company
Manufacturer's address:	Lake Stevens Division 8600 Soper Hill Road Everett, Washington U.S.A. 98205-1298

declares, that the product

Product Name:	Baseband Vector Waveform Generator
Model Number:	E2748A
Options:	All

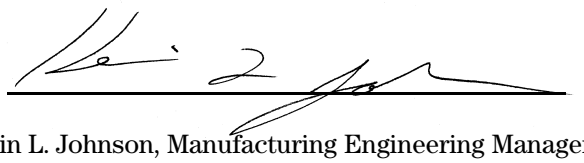
conforms to the following specifications:

Safety:	EN61010-1:1993/IEC 61010-1:1990
EMC:	EN55011:1991/C1SPR11, Group1, Class A EN50082-1:1992 IEC 801-2:1984 4kV-CD, 8kV-AD IEC 801-3:1984 3V/m IEC 801-2:1995 0.5kV signal lines, 1kV powerlines

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23EEC and the EMC Directive 89/336/EEC accordingly.

Everett, Washington U.S.A. July 6, 1998



Kevin L. Johnson, Manufacturing Engineering Manager

Need Assistance?

If you need assistance, contact your nearest Hewlett-Packard Service Office listed in the HP Catalog, or contact your nearest regional office listed at the back of this book. If you are contacting Hewlett-Packard about a problem with your HP E2747A or E2748A Baseband Vector Waveform Generator, please provide the following information:

- Model number:
- Software version:
- Serial number:
- Options:
- Date the problem was first encountered:
- Circumstances in which the problem was encountered:
- Can you reproduce the problem?
- What effect does this problem have on you?

About this edition

July 1998: First Edition.

February 1999: Second Edition