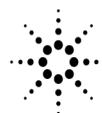
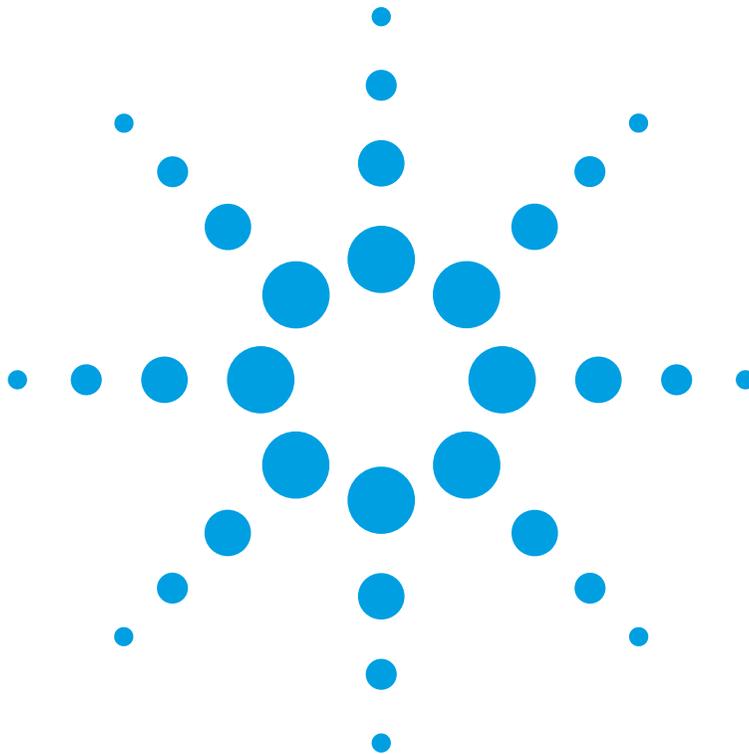


**Agilent 8703B Lightwave
Component Analyzer
Installation Guide**



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Agilent Technologies
Lightwave Division
3910 Brickway Boulevard
Santa Rosa, CA 95403, USA

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Safety Symbols. CAUTION

The *caution* sign denotes a hazard. It calls attention to a procedure which, if not correctly performed or adhered to, could result in damage to or destruction of the product. Do not proceed beyond a caution sign until the indicated conditions are fully understood and met.

WARNING

The *warning* sign 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 sign until the indicated conditions are fully understood and met.



The instruction manual symbol. The product is marked with this warning symbol when it is necessary for the user to refer to the instructions in the manual.



The laser radiation symbol. This warning symbol is marked on products which have a laser output.



The AC symbol is used to indicate the required nature of the line module input power.



The ON symbols are used to mark the positions of the instrument power line switch.



The OFF symbols are used to mark the positions of the instrument power line switch.



The CE mark is a registered trademark of the European Community.



The CSA mark is a registered trademark of the Canadian Standards Association.



The C-Tick mark is a registered trademark of the Australian Spectrum Management Agency.

ISM1-A

This text denotes the instrument is an Industrial Scientific and Medical Group 1 Class A product.

Typographical Conventions.

The following conventions are used in this book:

Key type for keys or text located on the keyboard or instrument.

Softkey type for key names that are displayed on the instrument's screen.

Display type for words or characters displayed on the computer's screen or instrument's display.

User type for words or characters that you type or enter.

Emphasis type for words or characters that emphasize some point or that are used as place holders for text that you type.

Additional Warranty Information

If repair is necessary, send the analyzer to the nearest Agilent Technologies service center with a description of any failed test and any error message. Ship the analyzer using the original packaging materials. Returning the analyzer in anything other than the original packaging may result in non-warranted damage. A table listing of Agilent Technologies sales and service offices is provided at the end of this document.

General Safety Considerations

This product has been designed and tested in accordance with IEC Publication 1010, Safety Requirements for Electronic Measuring Apparatus, and has been supplied in a safe condition. The instruction documentation contains information and warnings which must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

WARNING If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.

WARNING No operator serviceable parts inside. Refer servicing to qualified service personnel. To prevent electrical shock do not remove covers.

WARNING To prevent electrical shock, disconnect the instrument from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.

WARNING Install the instrument according to the enclosure protection provided. This instrument does not protect against the ingress of water. This instrument protects against finger access to hazardous parts within the enclosure.

CAUTION Do not use too much liquid in cleaning the instrument. Water can enter the front-panel keyboard, damaging sensitive electronic components.

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Installing Your Agilent 8703B

This chapter shows you how to install your Agilent 8703B and confirm the correct operation, by following the steps below:

WARNING This is a Safety Class I product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. Any interruption of the protective conductor, inside or outside the instrument, is likely to make the instrument dangerous. Intentional interruption is prohibited.

CAUTION Before switching on this instrument, make sure that the Agilent 8703B line voltage selector switch is set to the voltage of the power supply and the correct fuse is installed. Assure the supply voltage is in the specified range.

CAUTION If this product is to be energized via an autotransformer make sure the common terminal is connected to the neutral (grounded side of the mains supply).

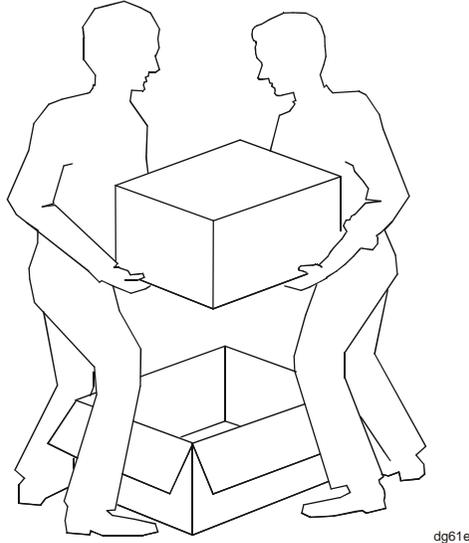
CAUTION This product is designed for use in Installation Category II and Pollution Degree 2 per IEC 61010-1 and 664 respectively.

CAUTION VENTILATION REQUIREMENTS: When installing the product in a cabinet, the convection into and out of the product must not be restricted. The ambient temperature (outside the cabinet) must be less than the maximum operating temperature of the product by 4° C for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is greater than 800 watts, then forced convection must be used.

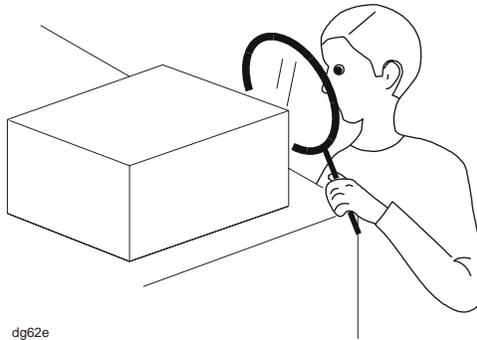
Step 1. Verify the Shipment

WARNING The Agilent 8703B weighs approximately 150 pounds with the packing materials. Use at least two people, and correct lifting techniques, to unpack the analyzer.

1. Unpack the contents of all the shipping containers.

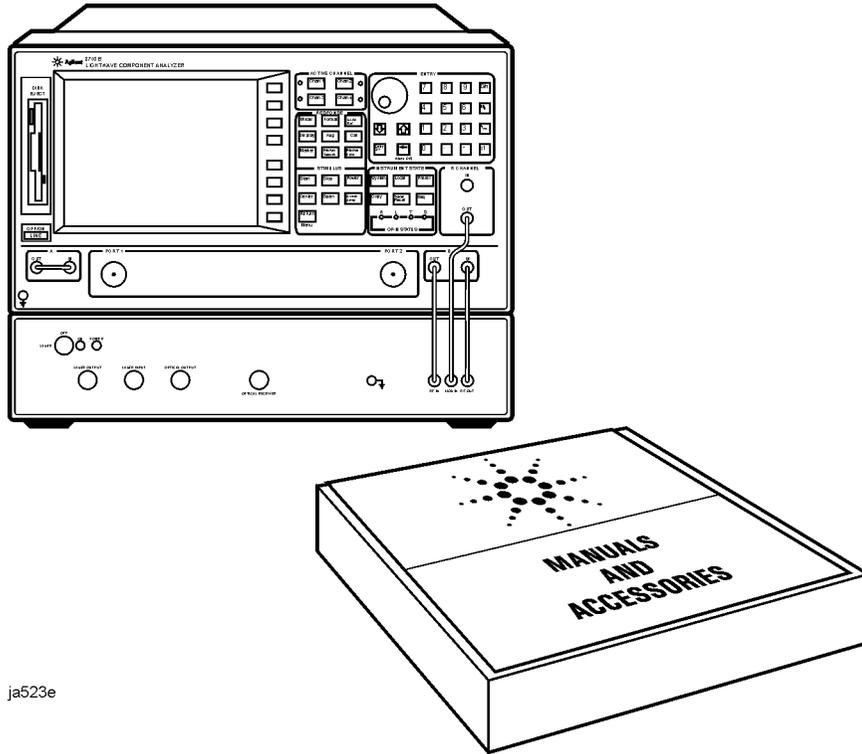


1. Carefully inspect the Agilent 8703B to ensure that it was not damaged during shipment.



NOTE If your Agilent 8703B was damaged during shipment, contact your nearest Agilent Technologies office or sales representative. A list of Agilent Technologies sales and service offices is provided in [“Agilent Technologies Service Offices” on page 30](#).

2. Verify that all the accessories have been included with the Agilent 8703B.

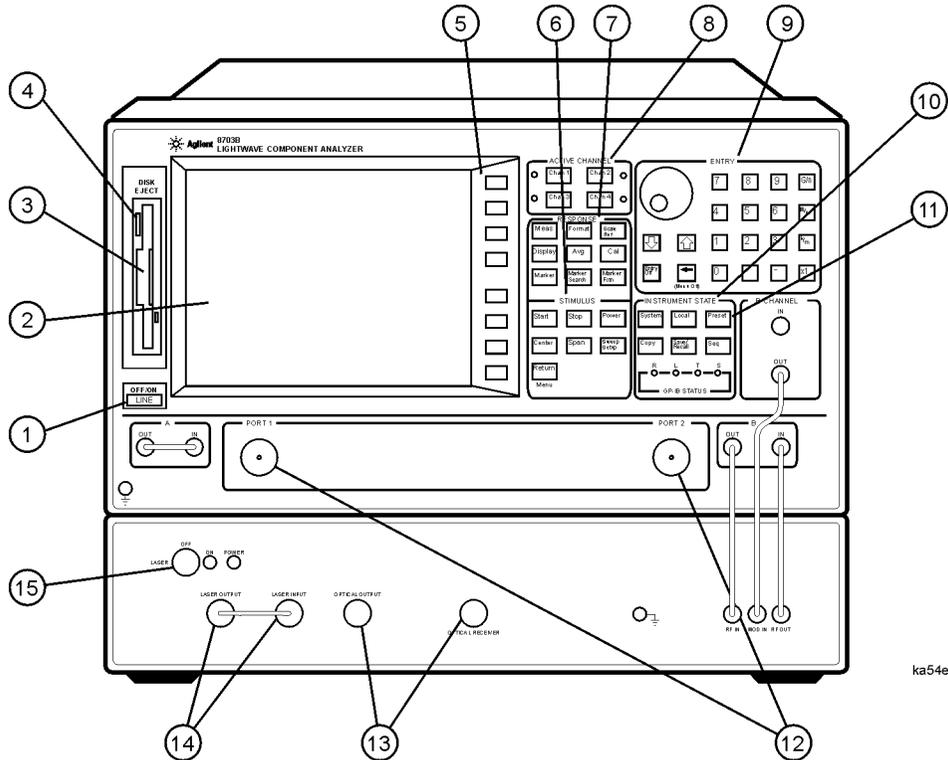


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| Item Number | Part Number | Description |
|-------------|-------------------|---|
| 1 | 08703-90203 | Installation Guide |
| 2 | 08703-90201 | User's Guide |
| 3 | 08720-90204 | Reference |
| 4 | 08703-90202 | Programmer's Guide |
| 5 | 08703-10202 | CD-ROM |
| 6 | 1005-0955 | Optical Cable SPC 0.4 M |
| 7 | 85131E | Test Port Cable 3.5 mm (Female) |
| 8 | unique to country | AC power cable |
| 9 | 5063-9212 | Rack Flange Kit (Option 908 only) 88.1mm High (2) |
| | 5063-9216 | 221.5mm High (2) |
| 10 | 5063-9220 | Rack Flange Kit with Handles (Option 909 only) 88.1mm High (2) |
| | 5063-9223 | 221.5mm High (2) |

Step 2. Familiarize Yourself with the Front and Rear Panels

Front Panel



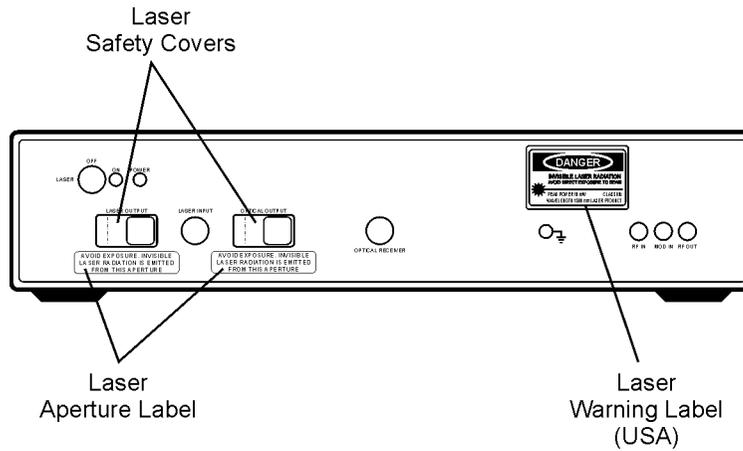
ka54e

CAUTION Do not mistake the line switch for the disk eject button. See the figure below. If the line switch is mistakenly pushed, the instrument will be turned off, losing all settings and data that have not been saved.

| | |
|------------------------------|--|
| 1 LINE (power on/off) switch | 9 ENTRY block |
| 2 Display | 10 INSTRUMENT STATE function block |
| 3 Disk drive | 11 Preset key |
| 4 Disk eject button | 12 PORT 1 and PORT 2 |
| 5 Softkeys | 13 OPTICAL OUTPUT and OPTICAL RECEIVER ports |
| 6 STIMULUS function block | 14 LASER OUTPUT and LASER INPUT ports |
| 7 RESPONSE function block | 15 Internal LASER ON/OFF switch |
| 8 ACTIVE CHANNEL keys | |

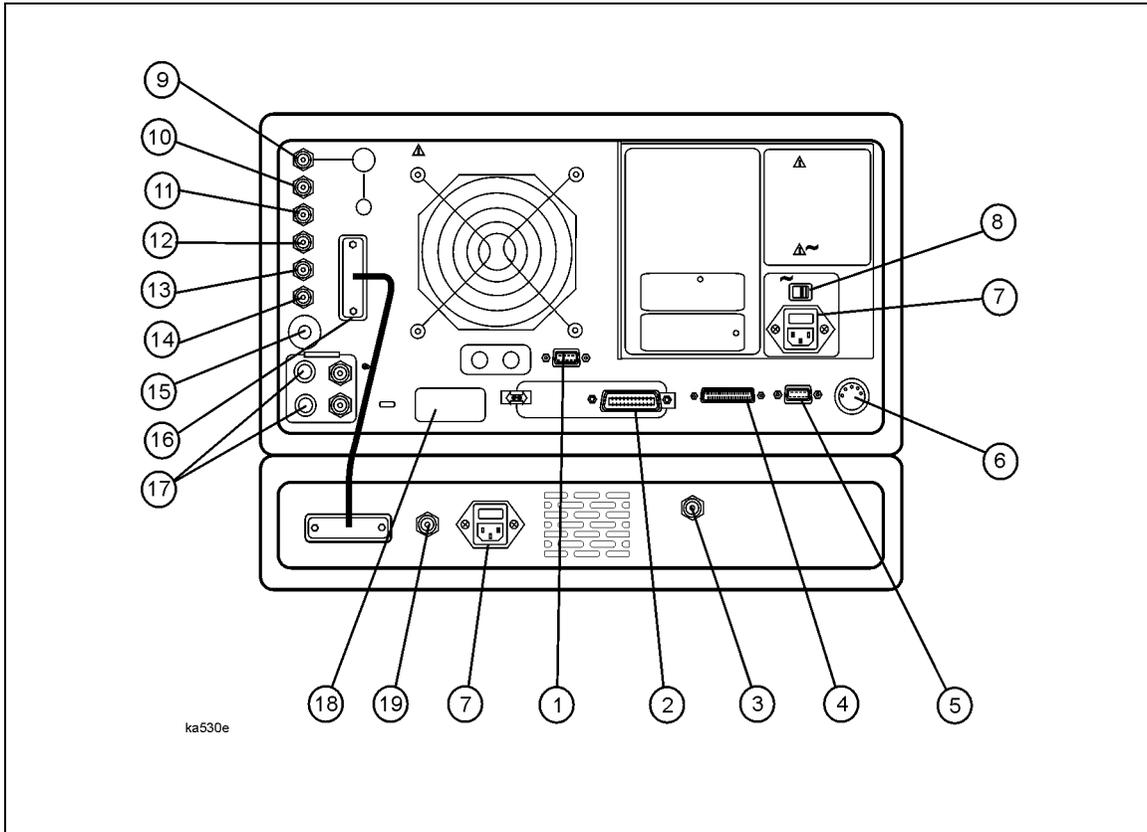
Laser Warning Labels

The 8703B is shipped with the following warning labels. For instruments used outside of the USA, both laser aperture and laser warning labels will be included with the shipment. (The labels are located in the same box as this manual.) Place these labels directly over the USA laser warning and aperture labels.



Iw_ts_labels

Rear Panel

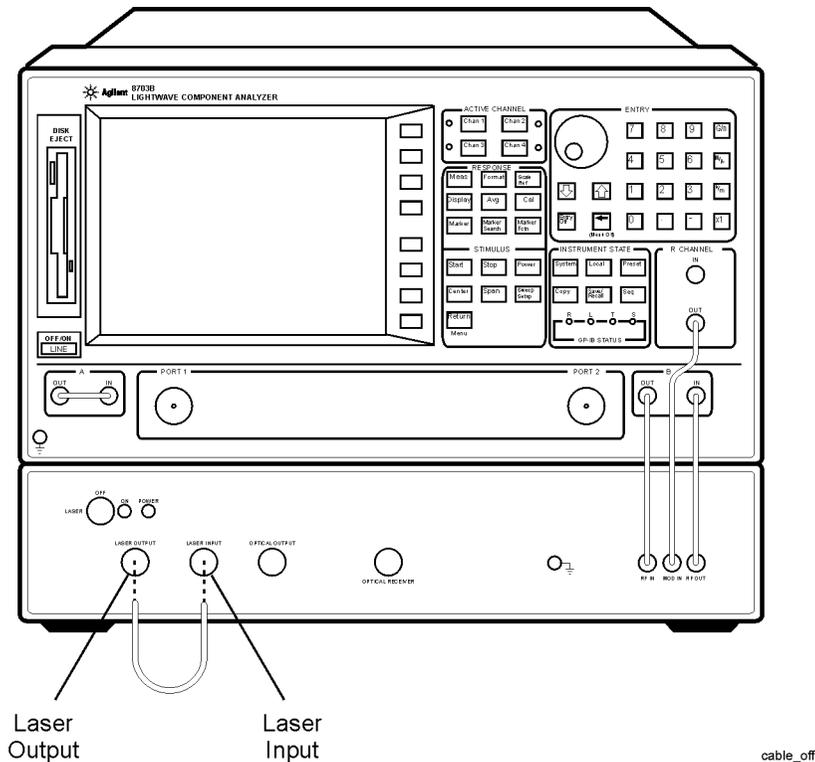


- | | |
|---|--------------------------------------|
| 1 EXTERNAL MONITOR: VGA | 11 EXTERNAL AM connector |
| 2 GPIB connector | 12 EXTERNAL TRIGGER connector |
| 3 EXT ALC INPUT | 13 TEST SEQUENCE connector |
| 4 PARALLEL interface | 14 LIMIT TEST connector |
| 5 RS-232 interface | 15 MEASURE RESTART connector |
| 6 KEYBOARD input (mini-DIN) | 16 TEST SET INTERCONNECT |
| 7 Power cord receptacle, with fuse | 17 BIAS INPUTS and fuses |
| 8 Line voltage selector switch | 18 Serial number plate |
| 9 EXTERNAL REFERENCE INPUT | 19 REMOTE SHUTDOWN |
| 10 AUXILIARY INPUT | |

Step 3. Install the Laser Output/Laser Input Cable

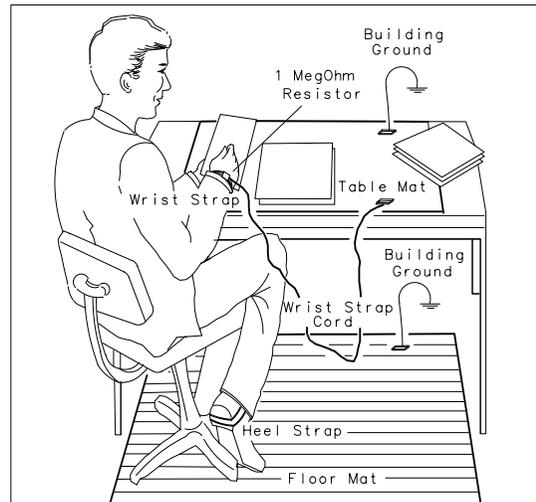
- Open the laser cover to access the laser output port, and connect the optical cable (part number 1005-0955) between LASER OUTPUT and LASER INPUT. The cable is part of the analyzer shipment.

WARNING To prevent accidental exposure to laser light, always verify the laser key-switch is in the OFF position before removing or connecting fiber-optic cables, adapters, or devices under test. Never remove or connect fiber-optic cables, adapters, or devices while a measurement is in progress.



Step 4. Set up a static-safe workstation

- Set up a static-safe workstation. Electrostatic discharge (ESD) can damage or destroy electronic components.



qg653d

- static-control table mat and earth ground wire: part number 9300-0797
- wrist-strap cord: part number 9300-0980
- wrist-strap: part number 9300-1367
- heel-straps: part number 9300-1308
- floor mat: not available through Agilent Technologies

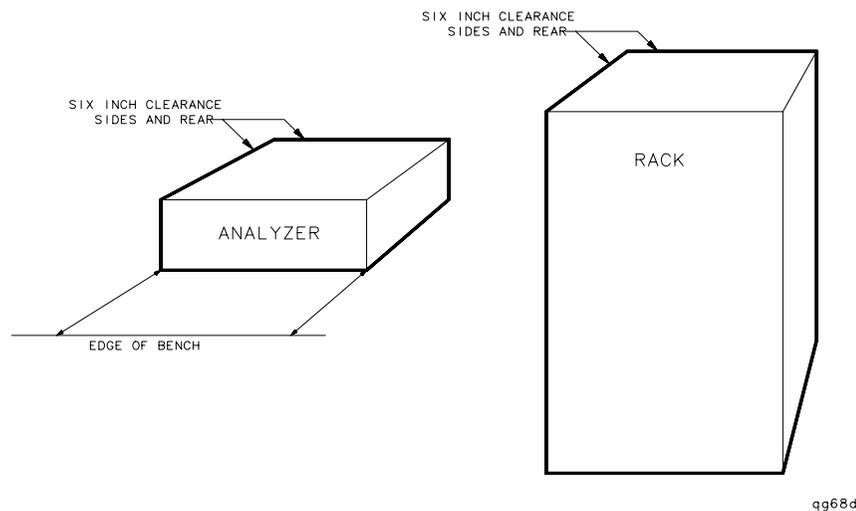
Step 5. Meet Environmental Requirements

CAUTION Install the instrument so that the ON/OFF switch is readily identifiable and is easily reached by the operator. The ON/OFF switch or the detachable power cord is the instrument disconnecting device. It disconnects the mains circuits from the mains supply before other parts of the instrument. Alternately, an externally installed switch or circuit breaker (which is readily identifiable and is easily reached by the operator) may be used as a disconnecting device.

1. Ensure the operating environment meets the following requirements. Some performance parameters are specified for $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. Refer to the *Reference* for information on the environmental compatibility of warranted performance.

| Requirements for Operating Environment | |
|--|--------------------------------------|
| Use | indoor |
| Temperature | +20 °C to +30 °C |
| Humidity | 5% to 95% at +30 °C (non-condensing) |
| Altitude | 0 to 4.5 km (15,000 ft) |

2. Ensure there are at least six inches of clearance between the sides and back of either the stand-alone analyzer or the system cabinet.



CAUTION The environmental temperature must be $4\text{ }^{\circ}\text{C}$ less than the maximum operating temperature of the analyzer for every 100 watts dissipated in the cabinet. If the total power dissipated in the cabinet is >800 watts, then you must provide forced convection.

Step 6. Meet Electrical Requirements

CAUTION Always use the three-prong AC power cord supplied with this product. Failure to ensure adequate earth grounding by not using this cord may cause product damage.

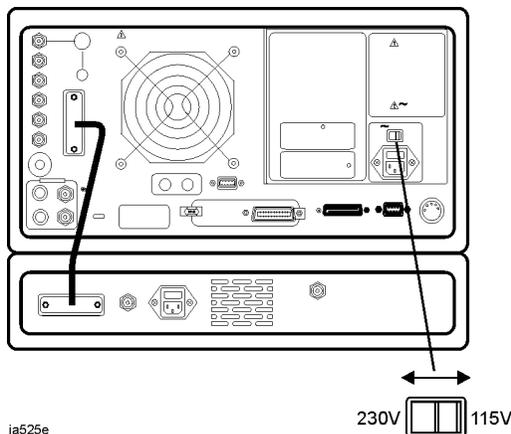
WARNING Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal, can result in personal injury, or may damage the analyzer.

1. Ensure the available AC power source meets the following requirements:

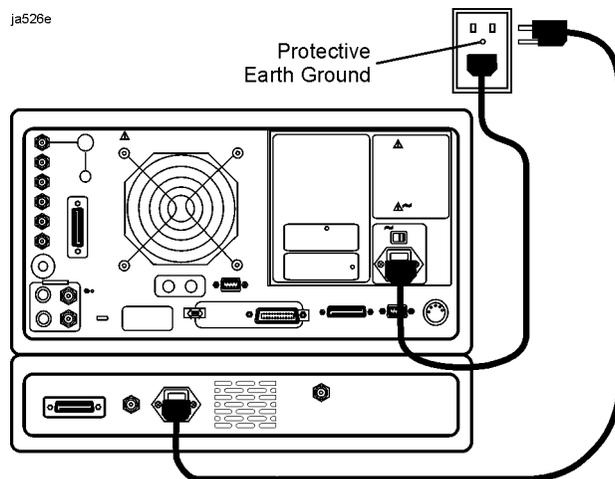
| Line Power Requirements | | |
|--------------------------|--------------------|--------------------|
| Description | Microwave Test Set | Lightwave Test Set |
| Frequency | 47 Hz to 63 Hz | 50 Hz to 60 Hz |
| Voltage at 115 V setting | 90 V to 132 V | 90 V to 132 V |
| Voltage at 230 V setting | 198 V to 265 V | 198 V to 265 V |
| VA/W Maximum | 450 VA maximum | 70 W maximum |

CAUTION The lightwave test set has an autoranging line voltage input, be sure the supply voltage is within the specified range.

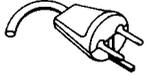
2. Set the line-voltage selector to the position that corresponds to the AC power source, and verify the correct fuse is installed.



3. Verify that the power cable is not damaged, and that the power-source outlet provides a protective earth contact. [“Available Line Cords”](#) on page 12 shows the available line cords.



Available Line Cords

| Plug Type | Cable Part No. | Plug Description | Length (in/cm) | Color | Country |
|---|----------------|---------------------------|----------------|------------|---|
|  | 8120-1351 | Straight *BS1363A | 90/228 | Gray | United Kingdom, Cyprus, Nigeria, Zimbabwe, Singapore |
| | 8120-1703 | 90° | 90/228 | Mint Gray | |
|  | 8120-1369 | Straight *NZSS198/ASC | 79/200 | Gray | Australia, New Zealand |
| | 8120-0696 | 90° | 87/221 | Mint Gray | |
|  | 8120-1689 | Straight *CEE7-Y11 | 79/200 | Mint Gray | East and West Europe, Saudi Arabia, So. Africa, India (unpolarized in many nations) |
| | 8120-1692 | 90° | 79/200 | Mint Gray | |
| | 8120-2857p | Straight (Shielded) | 79/200 | Coco Brown | |
|  | 8120-1378 | Straight *NEMA5-15P | 90/228 | Jade Gray | United States, Canada, Mexico, Philippines, Taiwan |
| | 8120-1521 | 90° | 90/228 | Jade Gray | |
| | 8120-1992 | Straight (Medical) UL544 | 96/244 | Black | |
|  | 8120-2104 | Straight *SEV1011 | 79/200 | Mint Gray | Switzerland |
| | 8120-2296 | 1959-24507 Type 12 90° | 79/200 | Mint Gray | |
|  | 8120-2956 | Straight *DHCK107 | 79/200 | Mint Gray | Denmark |
| | 8120-2957 | 90° | 79/200 | Mint Gray | |
|  | 8120-4211 | Straight SABS164 | 79/200 | Jade Gray | Republic of South Africa India |
| | 8120-4600 | 90° | 79/200 | Jade Gray | |
|  | 8120-4753 | Straight MITI | 90/230 | Dark Gray | Japan |
| | 8120-4754 | 90° | 90/230 | Dark Gray | |

* Part number shown for plug is the industry identifier for the plug only. Number shown for cable is the Agilent Technologies part number for the complete cable including the plug.

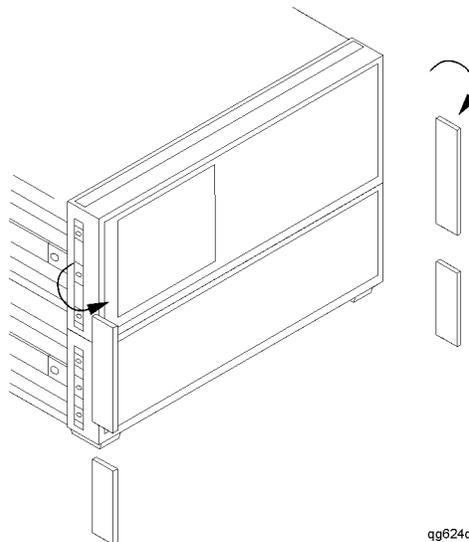
Step 7. Configuring for Bench Top or Rack Mount Use

There are two kits available for the analyzer:

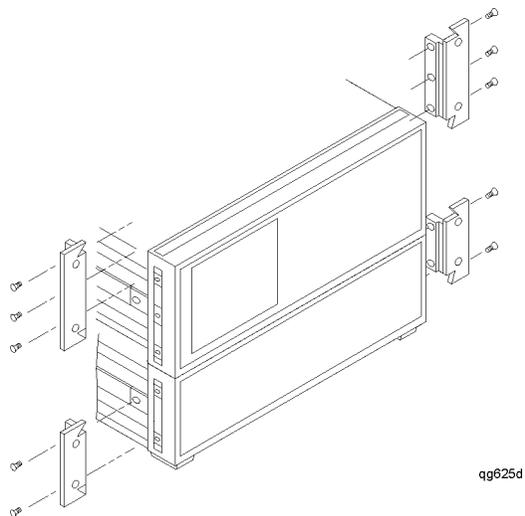
- Option 908: cabinet flange kit without front handles
- Option 909: cabinet flange kit with front handles

To Attach Cabinet Flanges without Front Handles (Option 908)

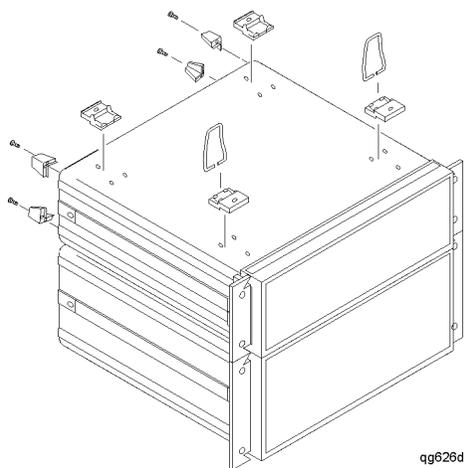
1. Ensure that the cabinet flange kit is complete.
 - cabinet mount flanges:
 - part number 5063-9212, 88.1 mm high, quantity of 2
 - part number 5063-9216, 221.5 mm high, quantity of 2
 - screws, quantity of 10
2. Remove the side trim strips.



3. Attach the cabinet flanges to the sides of the front panel. Use three screws for each of the analyzer top flanges, and use two screws each of the analyzer bottom flanges.

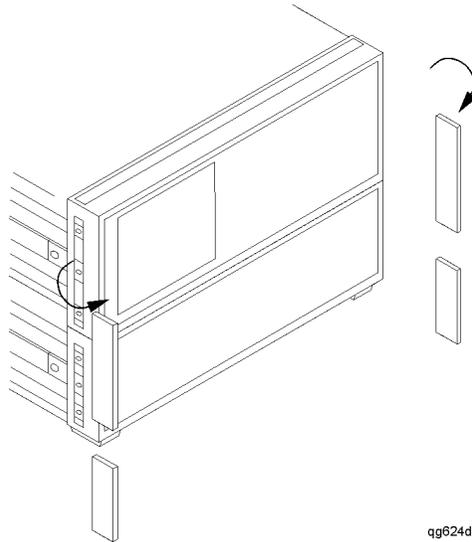


4. Remove the feet and the tilt stands before cabinet mounting the instrument.

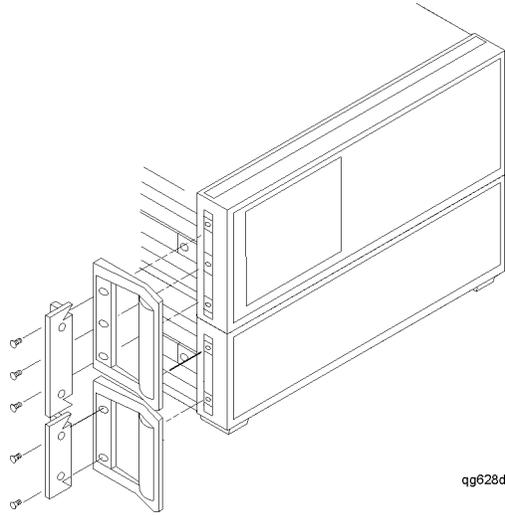


To Attach Cabinet Flanges with Front Handles to the Analyzer (Option 909)

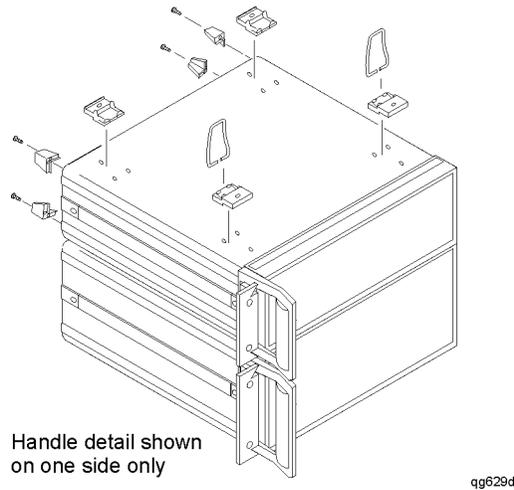
1. Ensure that the cabinet flange kit with handles is complete.
 - cabinet mount flanges with handles:
 - part number 5063-9220, 88.1 mm high, quantity of 2
 - part number 5063-9332, 221.5 mm high, quantity of 2
 - screws, quantity of 10
2. Remove the side trim strips.



3. Attach the cabinet mount flanges and the handles to the sides of the front panel. Use three screws for each of the analyzer top flange/handles, and use two screws for each of the analyzer bottom flanges/handle. (Attach the flanges to the outside of the handles.)

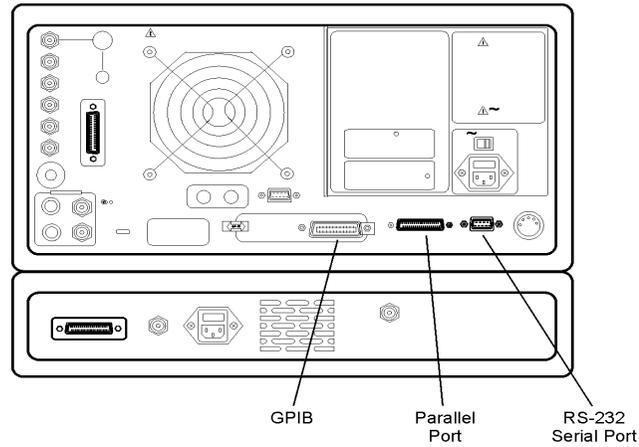


4. Remove the feet and the tilt stands before cabinet mounting the instrument.



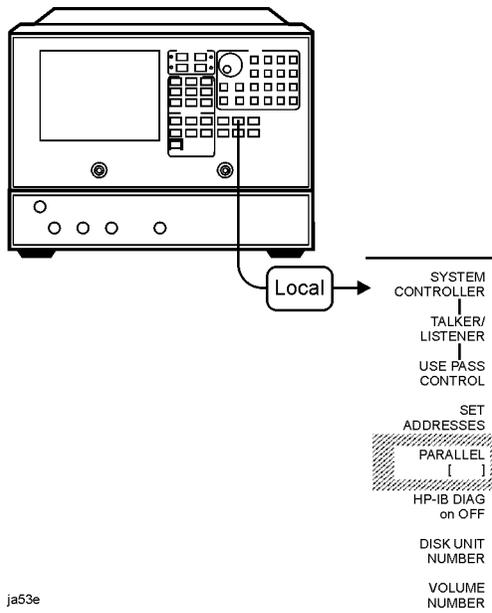
Step 8. Configuring for Printers or Plotters

1. Connect your printer or plotter to the corresponding interface.



ja528e

2. If you are using the parallel interface, press Local, and toggle **PARALLEL**, until your choice of **COPY** or **GPIO** appears.

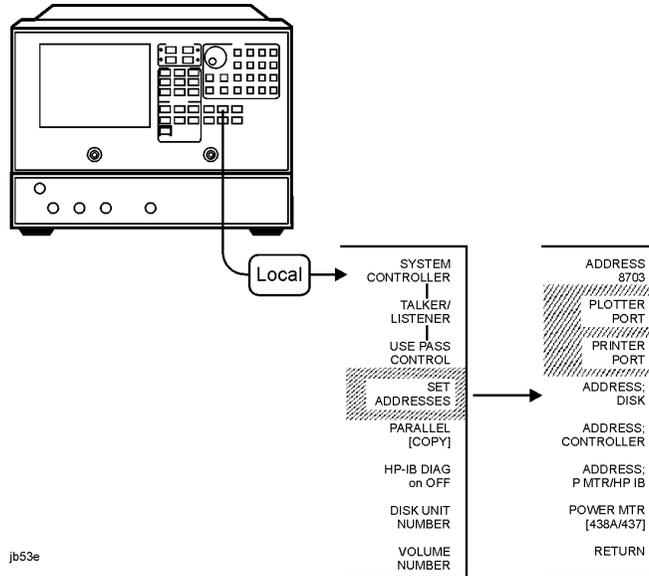


ja53e

If you choose:

- **COPY**, the parallel port is dedicated for normal copy device use (printers or plotters).
- **GPIO**, the parallel port is dedicated for general purpose I/O. The analyzer controls the data input or output through the sequencing capability of the analyzer.

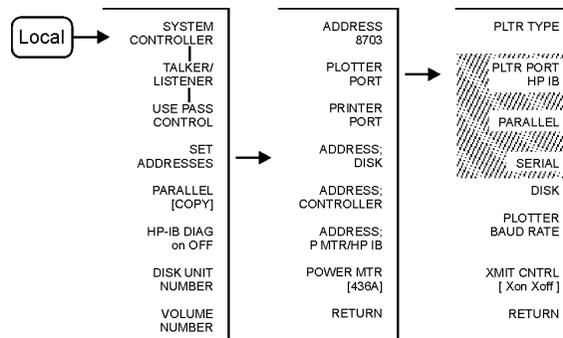
- Press **SET ADDRESSES**, and then choose either **PRINTER PORT**, or **PLOTTER PORT**, depending on your printer/plotter device. Or, if you are plotting your files to disk, press **SET ADDRESSES, PLOTTER PORT, DISK**.



jb53e

- Press the key that corresponds to your printer or plotter interface: **GPIB PARALLEL**, (parallel port), or **SERIAL**, (serial port).

NOTE The plotter menu is shown as an example. It will only appear if you select **PLOTTER PORT**. Similar interface choices will appear if you select **PRINTER PORT**.

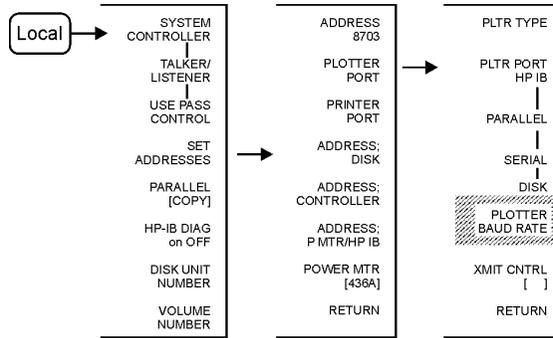


jb54e

- If you select **GPIB**, the GPIB address selection is active. Enter the GPIB address of your printer or plotter, followed by **x1**.
- If you have already selected the **PARALLEL [COPY]**, choice for the parallel-port configuration, you must also select **PARALLEL**, in this menu in order to generate a hardcopy.

- If you will be using the serial port, adjust the analyzer's baud rate until it is equal to the baud rate set on the peripheral by pressing **PLOTTER BAUD RATE**, or **PRINTER BAUD RATE**, and the **up**, and **down**, front panel keys.

NOTE The plotter menu is shown as an example. It will only appear if you select **PLOTTER PORT**.

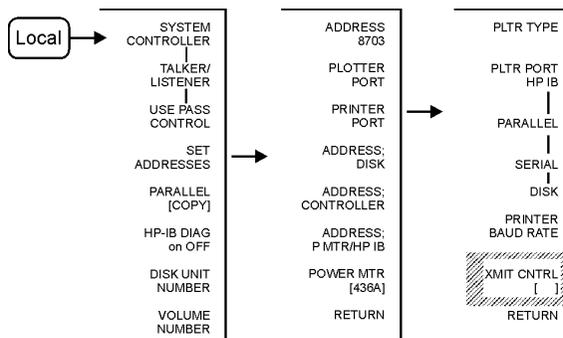


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You can set the analyzer to the following baud rates: 1200, 2400, 4800, 9600, and 19200

- Also, if you will be using the serial port, you must toggle the transmission control **XMIT CNTRL**, (handshaking protocol) until your choice of **Xon/Xoff**, or **DTR/DSR**, appears (equal to the transmission control set on the peripheral). The printer menu is shown as an example. It will only appear if you select **PLOTTER PORT**.

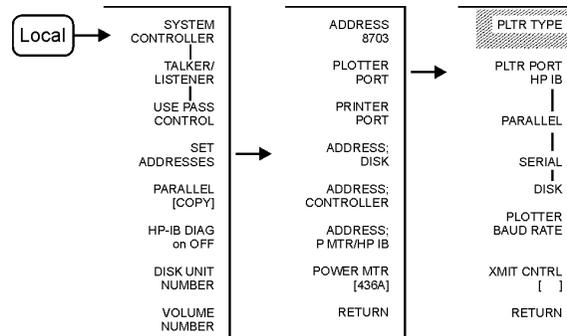
NOTE Transmission control for plotters is set programmatically.



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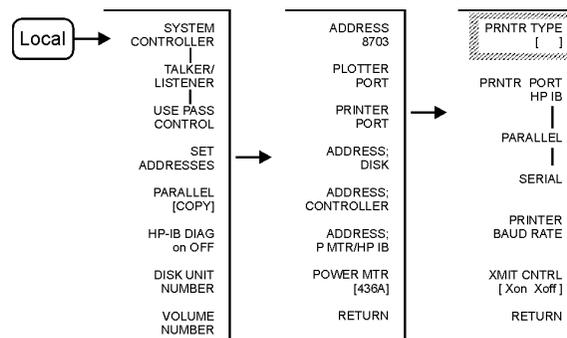
- Xon/Xoff**, sets transmission on/transmission off (software handshake).
- DTR/DSR**, sets data terminal ready/data set ready (hardware handshake).

7. If you will be creating a plot of the data, toggle **PLTR TYPE**, until your choice of **PLOTTER**, or **HPGL PRT**, appears.



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- Choose **PLOTTER**, for a pen plotter.
 - Choose **HPGL PRT**, for a PCL5 compatible printer.
8. If you will be using a printer, toggle **PRNTR TYPE**, until your printer choice appears.

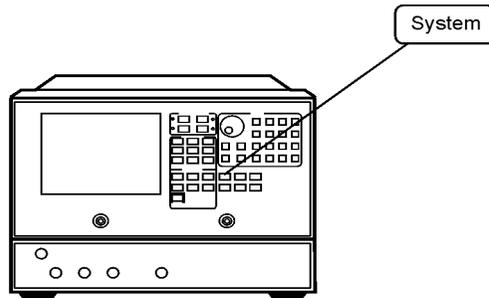


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- Choose your printer type from these Hewlett-Packard printers:
 - **THINKJET**
 - **DESKJET** (except for HP DeskJet 540 and Deskjet 850C)
 - **LASERJET**
 - **PAINTJET**
 - **DJ 540** (for use with HP DeskJet 540 and Deskjet 850C—converts 100 dpi raster information to 300 dpi raster format)
- Choose **EPSON-P2**, for Epson-compatible printers (ESC/P2 printer control language).

For a current printer compatibility guide, consult the Webpage at <http://www.agilent.com/find/pcg>.

9. Press **System**, **SET CLOCK**, to begin setting and activating the time stamp feature so the analyzer places the time and date on your hardcopies and disk directories.
10. Press each of the following softkeys to set the date and time, followed by **x1**.

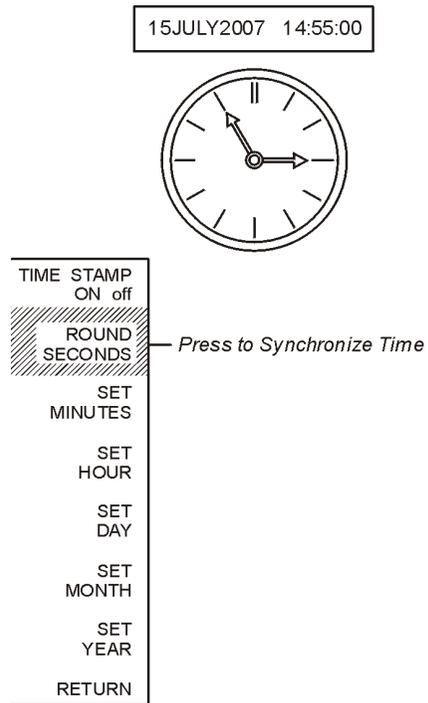


ja55e

| | | |
|------------|---------|--|
| TIME STAMP | ON off | |
| ROUND | SECONDS | |
| SET | MINUTES | — <i>Select Next Closest Minute</i> |
| SET | HOUR | — <i>Select a Number for 24 Hour Clock (0-24)</i> |
| SET | DAY | — <i>Select a Number for Calendar Date (1-31)</i> |
| SET | MONTH | — <i>Select a Number for Calendar Month (1-12)</i> |
| SET | YEAR | — <i>Select a Four Digit Number for Year</i> |
| RETURN | | |

dg616e

11. Press **ROUND SECONDS**, when the time is exactly as you have set it.

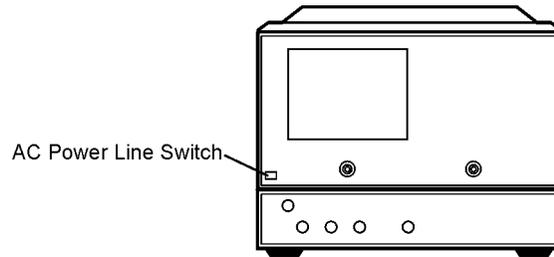


ja56e

Step 9. Perform the Self-Test

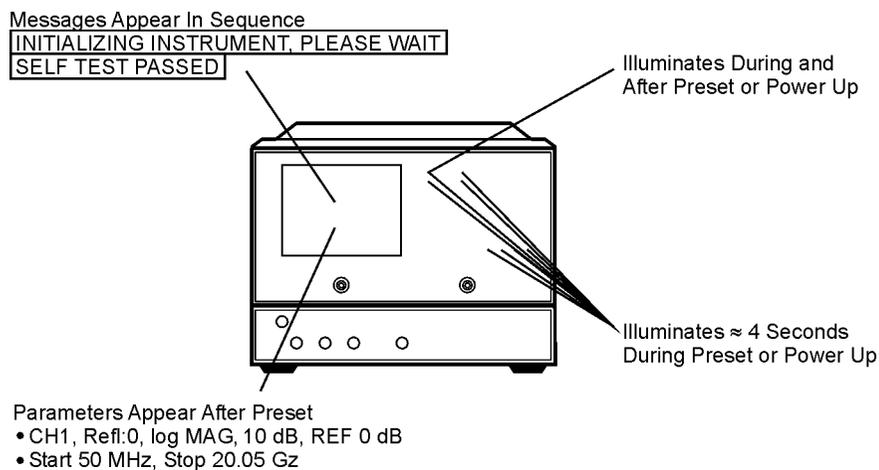
NOTE If the analyzer should fail any of the following tests, call the nearest Agilent Technologies sales or service office to determine the type of warranty you have. If repair is necessary, send the analyzer to the nearest Agilent Technologies service center with a description of any failed test and any error message. Ship the analyzer using the original packaging materials. Returning the analyzer in anything other than the original packaging may result in non-warranted damage.

1. Cycle the AC power using the LINE switch.



ja57e

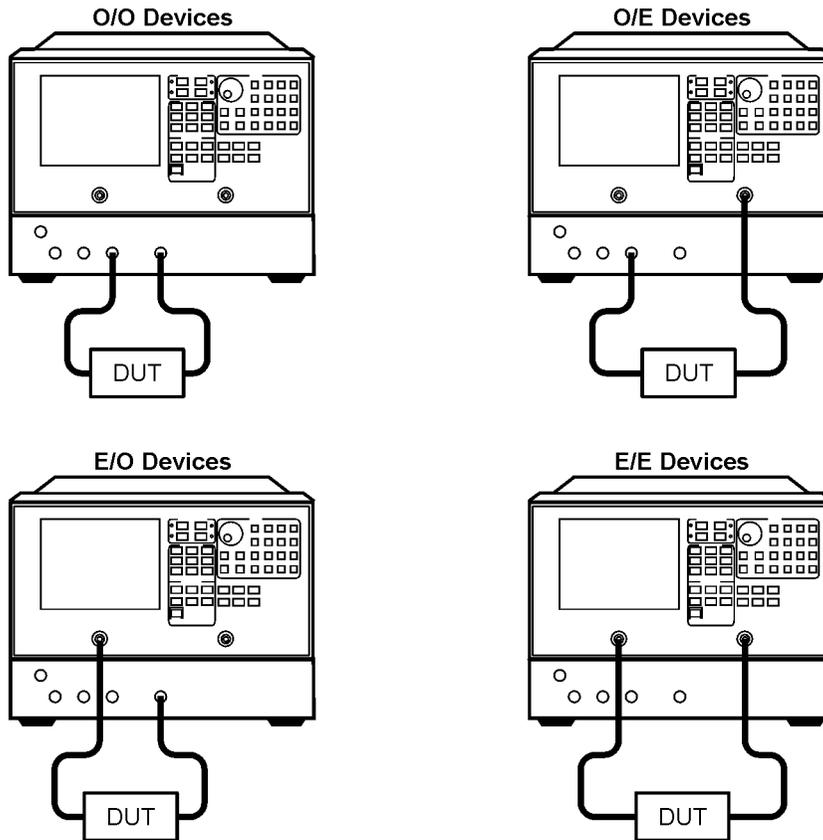
2. Watch for the following indications that the analyzer is operating correctly:



jb524e

Step 10. Configure the Agilent 8703B

- Connect test port cables and optional adapters if you are using other connector types.



- If you are ready to start making measurements, refer to the User's Guide.

If You Encounter a Problem

If you have difficulty when installing or using the analyzer, check the following list of commonly encountered problems and troubleshooting procedures. If the problem that you encounter is not in the following list, contact your nearest Agilent Technologies office for service, if necessary. A list of Agilent Technologies sales and service offices is provided at the end of this guide.

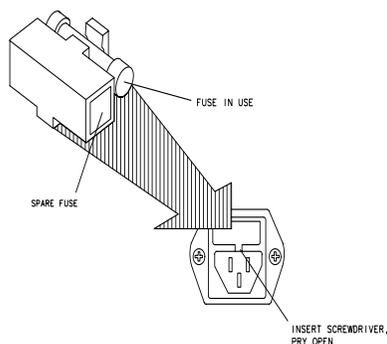
Power-Up Problems

If the analyzer display does not light:

1. Check that the power cord is fully seated in both the main power receptacle and the analyzer power module.
2. Check that the AC line voltage selector switch is in the appropriate position (230 V/115 V) for your available power supply.
3. Check that the analyzer AC line fuse is not open.

WARNING For continued protection against fire hazard, replace the fuse with the same type and rating.

- Refer to the following graphic to remove the fuse from the power module. You can use a continuity light or an ohmmeter to check the fuse. An ohmmeter should read very close to zero ohms if the fuse is good.
- In the microwave test set portion of the analyzer, for 115V operation, use fuse 5A, 125V, UL listed/CSA certified to 248 standard (part number 2110-1059).
- In the microwave test set portion of the analyzer, for 230V operation, use fuse 4A, 250V, built to IEC 127-2/5 standard (part number 2110-1036).
- In the lightwave test set portion of the analyzer, use fuse 3.15 A, 250V, (part number 2110-0957).



gg652d

If the display lights, but the ventilation fan does not start:

- Check that the fan is not obstructed. To check the fan, follow these steps:
 1. Switch the LINE power to the off position.
 2. Check that the fan blades are not jammed.

Contact the nearest Agilent Technologies office for service, if necessary. A list of Agilent Technologies sales and service offices is provided at the end of this guide.

Data Entry Problems**If the data entry controls (keypad, knob, arrow keys) do not respond:**

- Check that the **ENTRY OFF** function is not enabled.

The **ENTRY OFF** function is enabled after you press the **Entry Off** key. To return to normal entry mode, press any function key that has a numeric parameter associated with it, for example, **Start**.

- Check that none of the keys are stuck.
- Check that the selected function key accepts data.

For example, **Scale Ref** accepts data, but **System** does not.

- Check that the analyzer's "R" GPIB STATUS light is not illuminated.

If the analyzer's "R" GPIB STATUS light is illuminated, a test sequence may be running, or a connected computer controller may be sending commands or instructions to, or receiving data from, the analyzer. Press **Local** if you want to return to LOCAL control.

If the parameter you are trying to enter is not accepted by the analyzer:

- Ensure that you are not attempting to set the parameter greater than or less than its limit. Refer to the *User's Guide* for parameter limits.

No RF Output**If there is no RF signal at the front-panel port:**

- Check that the signal at the test port is switched on.
 1. Press **Power** and toggle **SOURCE PWR** to **ON**.

NOTE It is possible to set the source power to come from PORT 2 instead of PORT 1, so you must check the power at the correct port. With factory preset, the power comes from PORT 1.

- If you are applying external modulation (AM) to the analyzer, check the external modulating signal or external trigger signals for problems.
-

CAUTION If the error message:

CAUTION: OVERLOAD ON INPUT X, POWER REDUCED

appears on the analyzer display, too much source power is being applied at the input. In such a case, the input power will need to be reduced before the source power will remain on.

- If phase-lock error messages appear on the analyzer display, check that the front panel jumper is secure on the R CHANNEL connectors. If the jumper is secure and the error messages still appear, contact your nearest Agilent Technologies office for service. A list of Agilent Technologies sales and service offices is provided at the end of this guide.

Agilent Technologies Service Offices

Before returning an instrument for service, call the Agilent Technologies Instrument Support Center at (800) 403-0801, visit the Test and Measurement Web Sites by Country page at <http://www.tm.agilent.com/tmo/country/English/index.html>, or call one of the numbers listed below.

Ship the analyzer using the original packaging materials. Returning the analyzer in anything other than the original packaging may result in non-warranted damage. A table listing of Agilent Technologies sales and service offices is provided at the end of this document

Table 1-1. Agilent Technologies Service Numbers

| | |
|--------------------------|------------------|
| Austria | 01/25125-7171 |
| Belgium | 32-2-778.37.71 |
| Brazil | (11) 7297-8600 |
| China | 86 10 6261 3819 |
| Denmark | 45 99 12 88 |
| Finland | 358-10-855-2360 |
| France | 01.69.82.66.66 |
| Germany | 0180/524-6330 |
| India | 080-34 35788 |
| Italy | +39 02 9212 2701 |
| Ireland | 01 615 8222 |
| Japan | (81)-426-56-7832 |
| Korea | 82/2-3770-0419 |
| Mexico | (5) 258-4826 |
| Netherlands | 020-547 6463 |
| Norway | 22 73 57 59 |
| Russia | +7-095-797-3930 |
| Spain | (34/91) 631 1213 |
| Sweden | 08-5064 8700 |
| Switzerland | (01) 735 7200 |
| United Kingdom | 01 344 366666 |
| United States and Canada | (800) 403-0801 |

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