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Agilent E5061A/E5062A ENA Series RF Network Analyzers

Service Guide

Sixth Edition



Manufacturing No. E5061-90140
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Manual Printing History

The manual's printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates that are incorporated at reprint do not cause the date to change.) The manual part number changes when extensive technical changes are incorporated.

| | |
|----------------|---|
| February 2004 | First Edition |
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Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific WARNINGS elsewhere in this manual may impair the protection provided by the equipment. Such noncompliance would also violate safety standards of design, manufacture, and intended use of the instrument. Agilent Technologies assumes no liability for the customer's failure to comply with these precautions.

| | |
|-------------|---|
| NOTE | The E5061A/E5062A complies with INSTALLATION CATEGORY II as well as POLLUTION DEGREE 2 in IEC61010-1. The E5061A/E5062A is an INDOOR USE product. |
| NOTE | The LEDs in the E5061A/E5062A are Class 1 in accordance with IEC60825-1, CLASS 1 LED PRODUCT |
| NOTE | This equipment is MEASUREMENT CATEGORY I (CAT I). Do not use for CAT II, III, or IV. |
| NOTE | This equipment is tested with stand-alone condition or with the combination with the accessories supplied by Agilent Technologies against the requirement of the standards described in the Declaration of Conformity. If it is used as a system component, compliance of related regulations and safety requirements are to be confirmed by the builder of the system. |

- **Ground the Instrument**

To avoid electric shock, the instrument chassis and cabinet must be grounded with the supplied power cable's grounding prong.
- **DO NOT Operate in an Explosive Atmosphere**

Do not operate the instrument in the presence of inflammable gasses or fumes. Operation of any electrical instrument in such an environment clearly constitutes a safety hazard.
- **Keep Away from Live Circuits**

Operators must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous voltage levels may remain even after the power cable has been disconnected. To avoid injuries, always disconnect the power and discharge circuits before touching them.
- **DO NOT Service or Adjust the Instrument Alone**

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.
- **DO NOT Substitute Parts or Modify the Instrument**

To avoid the danger of introducing additional hazards, do not install substitute parts or perform unauthorized modifications to the instrument. Return the instrument to an

Agilent Technologies Sales and Service Office for service and repair to ensure that safety features are maintained in operational condition.

- Dangerous Procedure Warnings

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

WARNING

Dangerous voltage levels, capable of causing death, are present in this instrument. Use extreme caution when handling, testing, and adjusting this instrument.

- Do not connect the measuring terminals to mains.

Safety Symbol

General definitions of safety symbols used on the instrument or in manuals are listed below.



Instruction Manual symbol: the product is marked with this symbol when it is necessary for the user to refer to the instrument manual.



Alternating current.



Direct current.



On (Supply).



Off (Supply).



In position of push-button switch.



Out position of push-button switch.



Frame (or chassis) terminal. A connection to the frame (chassis) of the equipment which normally include all exposed metal structure.



Stand-by.

WARNING

This warning sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death to personnel.

CAUTION

This Caution sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

NOTE

Note denotes important information. It calls attention to a procedure, practice, condition or the like, which is essential to highlight.

Certification

Agilent Technologies certifies that this product met its published specifications at the time of shipment from the factory. Agilent Technologies further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by the Institution's calibration facility, or to the calibration facilities of other International Standards Organization members.

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For any assistance, contact your nearest Agilent Technologies Sales and Service Office. Addresses are provided at the back of this manual.

Typeface Conventions

Sample (bold)

Boldface type is used when a term is defined or emphasised.

Sample (Italic)

Italic type is used for emphasis.

Sample key

Indicates a hardkey (key on the front panel or external keyboard) labeled “Sample.” “key” may be omitted.

Sample menu/button/box

Indicates a menu/button/box on the screen labeled “Sample” which can be selected/executed by clicking. “menu,” “button,” or “box” may be omitted.

Sample block/toolbar

Indicates a block (group of hardkeys) or a toolbar (setup toolbar) labeled “Sample.”

Sample 1 - Sample 2 - Sample 3

Indicates a sequential operation of **Sample 1**, **Sample 2**, and **Sample 3** (menu, button, or box). “-” may be omitted.

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1 General Information

The Service Guide is a guide to servicing the E5061A/E5062A RF Network Analyzer. The guide contains information requisite to do performance tests, adjustments, troubleshooting, and repairs.

Precautions

This section describes cautions that must be observed in operating the E5061A/E5062A.

Software Installed

The Windows operating system installed in this machine is customized for more effective operation, and has different functions that are not part of the Windows operating system for ordinary PCs (personal computers).

Therefore, do not attempt to use the system in ways other than those described in this manual or to install Windows-based software for ordinary PCs as doing so may cause malfunctions.

Also note the followings.

- Do not attempt to update VBA (Visual Basic for Applications) software installed in this machine to its equivalent developed for ordinary PCs. Doing so will cause malfunctions.
- Do not allow any computer virus to infect the system. This machine has no virus check function nor anti-virus software installed.

For further detailed information, refer to the E5061A/62A Windows Support Information under the following web page http://www.agilent.com/find/ena_support/.

Agilent Technologies will not be held liable for any failure or damage arising from negligence regarding these prohibitions and warnings.

NOTE

If the pre-installed software is damaged somehow, resulting in errant behavior by the machine, perform a system recovery. For further details of system recovery, refer to Appendix B.

Organization of Service Guide

Tabs are used to divide the major chapter and appendix of this manual. The contents of each chapter and appendix in this manual is as follows;

Chapter 1 , “General Information,”

The Service Guide is a guide to servicing the E5061A/E5062A RF Network Analyzer. The guide contains information requisite to do performance tests, adjustments, troubleshooting, and repairs.

Chapter 2 , “Performance Tests,”

This chapter provides information on how to verify the E5061A/E5062A performance.

Chapter 3 , “Adjustment,”

This chapter provides the adjustment information for the E5061A/E5062A to ensure that it is within its specifications. The adjustment must be performed Agilent’s qualified service personnel. If you need the adjustment for your E5061A/E5062A, it should be sent to the nearest Agilent Technologies service office.

Chapter 4 , “Troubleshooting,”

This chapter provides the procedure to isolate a faulty assembly in the E5061A/E5062A.

Chapter 5 , “Replaceable Parts,”

This chapter contains information for ordering replacement parts for the E5061A/E5062A.

Chapter 6 , “Replacement Procedure,”

This chapter provides procedure for removing and replacing the major assemblies in the E5061A/E5062A.

Chapter 7 , “Post-Repair Procedures,”

This chapter lists the procedures required to verify the E5061A/E5062A operation after an assembly is replaced with a new one.

Appendix A , “Manual Changes,”

This appendix contains the information required to adapt this manual to versions or configurations of the E5061A/E5062A manufactured earlier than the current printing date of this manual. The information in this manual applies directly to E5061A/E5062A units with the serial number that is printed on the title page of this manual.

Appendix B , “System Recovery,”

This appendix describes how to recover the operating system (Windows 2000) when the operating system has been damaged.

Appendix C , “Firmware Update,”

General Information
Organization of Service Guide

This appendix describes how to update the E5061A/E5062A firmware. When you want to update the E5061A/E5062A firmware, refer to this appendix.

Appendix D , “Computer Virus Check,”

This appendix describes an example of how to check the system of E5061A/E5062A for computer viruses using computer viruses check software.

Appendix E , “Power Requirement,”

Appendix F, “Messages,”

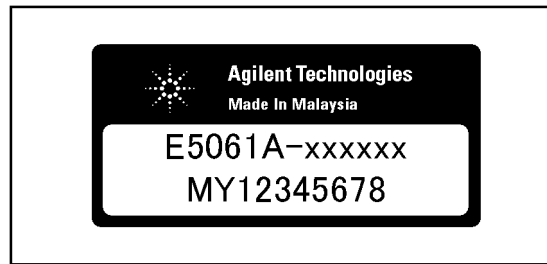
The E5061A/5062A can display error messages as well as messages that indicate the internal operating status of the equipment. This appendix explains what these messages mean. They are listed in alphabetical order.

Instrument Covered by This Manual

Agilent Technologies uses a two-part, ten-character serial number label (See Figure 1-1) attached to the instrument's rear panel. The first five characters are the serial prefix and the last five digits are the suffix.

Figure 1-1

Serial Number Label Example



e5061auj2001

An instrument manufactured after the printing date of this manual may have serial number prefix that is not listed on the title page. This unlisted serial number prefix indicates the instrument is different from those described in this manual. The manual for this new instrument may be accompanied by a yellow Manual Changes supplement or have a different manual part number. This sheet contains “change information” that explains how to adapt the manual to the newer instrument.

In addition to change information, the supplement may contain information for correcting errors (Errata) in the manual. To keep this manual as current and accurate as possible, Agilent Technologies recommends that you periodically request the latest Manual Changes supplement. The supplement for this manual is identified by this manual's printing data and is available from Agilent Technologies. If the serial prefix or number of an instrument is lower than that on the title page of this manual, see Appendix A, Manual Changes. For information concerning a serial number prefix that is not listed on the title page or in the Manual change supplement, contact the nearest Agilent Technologies office.

Required Equipment

Table 1-1 lists the recommended equipment for performing maintenance on the E5061A/E5062A.

Table 1-1 Recommended Test Equipment

| Equipment | Critical specifications | Recommended Model | Qty. | Use *1 |
|---------------------------|---|---|------|--------|
| Frequency Counter | Frequency: 50 MHz to 3 GHz Accuracy: < 2.5 ppm | Agilent 53131A with Opt.010 & 030* ² | 1 | P,A |
| Power Meter | No Substitute | Agilent E4419B with Opt. G12 or H12* ³ | 1 | P,A |
| Power Sensor | No Substitute | Agilent 8482A | 1 | P,A |
| Power Sensor (75 Ω) | No Substitute | Agilent 8483A with Opt. H03 | 1 | P |
| Dynamic Accuracy Test Kit | No substitute | Agilent Z5623A with Opt. H01 | 1 | P |
| Calibration Kit | No Substitute | Agilent 85032B | 1 | P,T |
| Calibration Kit | No Substitute | Agilent 85032F | 1 | A |
| Calibration Kit (75 Ω) | No Substitute | Agilent 85036B | 1 | P,A,T |
| Short | Type-N(m), N(f) | part of Agilent 85032B with Type-N adapter | 2 | P,T |
| Short (75 Ω) | Type-N(m), N(f) | part of Agilent 85036B with Type-N adapter | 2 | P,T |
| Fixed attenuator (6 dB) | 50 Ω, N(m)-N(f), VSWR ≤ 1.015 | Agilent 8491A w/Opt.006 and H60 | 1 | P,A |
| Minimum Loss Pad | 50 Ω N(f)-75 Ω N(m) | Agilent 11852B | 1 | P,A |
| Minimum Loss Pad | 50 Ω N(m)-75 Ω N(f) | Agilent 11852B Opt. 004 | 1 | P |
| Power Splitter | N(m) 50 Ω in, N(f) 50 Ω out | Agilent p/n 0955-0751 | 1 | A,T |
| Power splitter (75 Ω) | N(m) 75 Ω in, N(f) 75 Ω out | Agilent p/n 0955-0752 | 1 | A,T |
| Handler I/O Test Kit | No substitute | Agilent p/n E5070-65001 | 1 | T |

Table 1-1 Recommended Test Equipment

| Equipment | Critical specifications | Recommended Model | Qty. | Use* ¹ |
|-----------------------------------|---|--------------------------------|------|-------------------|
| Cable | BNC(m)-BNC(m) Cable, 30 cm | Agilent p/n 8120-1838 | 1 | P |
| | BNC(m)-BNC(m) Cable, 122 cm | Agilent p/n 8120-1840 | 1 | P,A |
| | Coaxial cable with Type-N (m) connectors, 61 cm (24 in), 2 ea. | Agilent N6314A (p/n 8120-8862) | 1 | P,A,T |
| | Coaxial cable with 75 Ω Type-N (m) connectors, 61 cm (24 in), 2ea | Agilent p/n 8120-8898 | 1 | P,A,T |
| Adapter | N(m)-N(m) 50 Ω Adapter | Agilent p/n 1250-0778 | 1 | A,T |
| | N(m)-N(m) 75 Ω Adapter | Agilent p/n 1250-1528 | 1 | A,T |
| | N(m) 50 Ω - N(f) 75 Ω Adapter | Agilent p/n 1250-0597 | 1 | P |
| | N(m)-BNC(f) Adapter | Agilent p/n 1250-0780 | 1 | P,A |
| | BNC(m)-BNC(m) | Agilent p/n 1250-0216 | 1 | P |
| | BNC Tee (m) (f) (f) | Agilent p/n 1250-0781 | 1 | P |
| Torque Wrench | Size: 3/4 inch Torque: 136 N-cm | Agilent p/n 8710-1766 | 1 | P,A |
| USB/GPIB Interface | No Substitute | Agilent 82357A | 1 | P,A |
| Personal Computer with GPIB board | Windows 2000 / XP, VEE 6.2 or VEE 7.xx | | 1 | P,A |

*1.P: Performance Tests, A: Adjustment, T: Troubleshooting

*2.Opt.050 and Opt.124 can be substituted for Opt.030. In this case, a N(m)-BNC(f) adapter is necessary.

*3.The accuracy of a standard E4419B of ±0.02 dB is adequate for all tests/adjustments except “Dynamic Accuracy Test”. This test requires a power meter with Option G12 or H12 that has been certified to a higher accuracy specification. If an Option G12 or H12 power meter is not available, a test is provide on “Power Meter Accuracy Test” on page 20 to verify the accuracy of a standard power meter.

Table 1-2 Alternative Test Equipment

| Equipment | Critical specifications | Model | Qty. | Use* ¹ |
|-------------------|---|--|------|-------------------|
| Frequency Counter | Frequency: 50 MHz to 3 GHz Accuracy: < 2.5 ppm | Agilent 53132A/181A with Opt.010 and 030* ² | 1 | P,A |
| Power Meter | No Substitute | Agilent E4419B* ³ | 1 | P,A |
| Calibration Kit | No Substitute | Agilent 85032F | 1 | T |
| Short | Type-N(m) | Agilent 11512A | 2 | P,T |

*1.P: Performance Tests, A: Adjustment, T: Troubleshooting

*2.Opt.050 and Opt.124 can be substituted for Opt.030. In this case, a N(m)-BNC(f) adapter is necessary.

*3.If an accurate measurement of the dynamic accuracy specification is not required, a standard E4419B can be used.

Power Meter Accuracy Test

This test is intended for power meters used in testing the E5061A/E5062A. The “Dynamic Accuracy Test” requires the use of a power meter that has been calibrated to a higher accuracy than the standard power meter.

Power meters with options G12 and H12 specify an improved instrument accuracy over a limited power range. (These power meters do not contain unique hardware.) A power meter may be returned to the factory to have one of these options added to an existing power meter or to renew the calibration for one of these options.

This test procedure is an alternative to returning the power meter to the factory. When a power meter passes this test, it is considered to be *calibrated* for the G12 or H12 option even though it has not been returned to the factory.

Power Meters That Can Be Tested Using This Procedure

This procedure assume that the E4419B power meter is being tested.

NOTE

It is recommended that the revision number for the power meter “Main Firmware” be Ax.03.00 or higher.

Equipment Used for the Power Meter Accuracy Test

| Equipment Type | Recommended Model or Part Number | Alternate Model or Part Number |
|--|----------------------------------|--|
| Range calibrator | Agilent 11683A | None |
| Precision digital voltmeter | Agilent 3458A | Any with the required accuracy and resolution *1 |
| Power sensor cable | Agilent 11730A, p/n 8120-8319 | Any equivalent |
| Cable, BNC, 50 Ω | Any | Any |
| Adapter for connecting BNC cable to DVM inputs | Any | Any |

*1. Required accuracy and resolution at the following voltage levels:

14 mV input: 0.0100% accuracy, 10 nV resolution

0.14 V input: 0.0050% accuracy, 100 nV resolution

0.45 V input: 0.0030% accuracy, 100 nV resolution

Description of the Test

The power meter accuracy is verified for various power inputs and the actual readings are recorded in a test record. A range calibrator is used to provide the reference inputs.

NOTE

It is recommended that a copy of the test record on page 24 be made, and the values be recorded on the copy, thus preserving the original for future use.

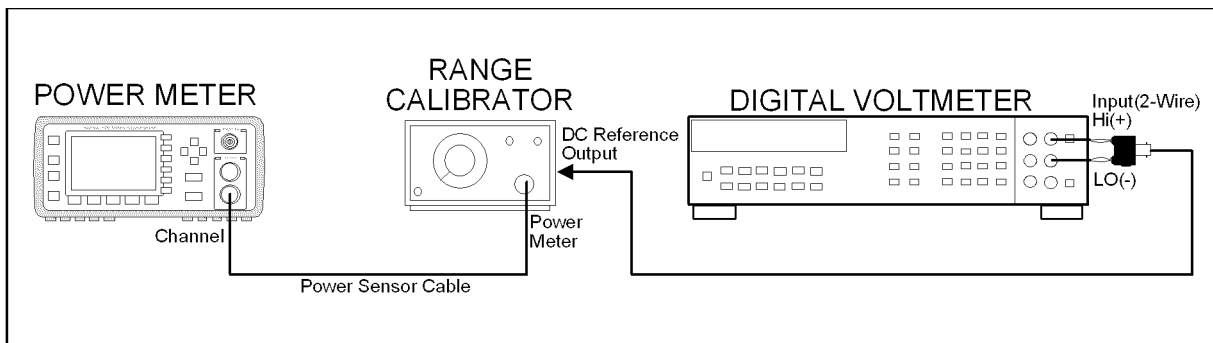
Test Procedure

NOTE

This procedure assumes the use of the recommended equipment model numbers. The actual step required, therefore, may differ for other model numbers of equipment used.

- Step 1.** Setup the equipment as shown in Figure 1-2.
- Connect the DC REFERENCE OUTPUT connector on the rear panel of the range calibrator to the DVM voltage input.
 - Connect the POWER METER output of the range calibrator to the input of the power meter being tested.
 - Switch on the power to the power meter, the range calibrator, and the digital voltmeter.

Figure 1-2 Setup for the Power Meter Accuracy Test



e5061ase037

- Step 2.** Press the power meter: Press [**Preset/Local**], then **Confirm**.
- Step 3.** Perform the following steps for each channel on the power meter:
- Set to read in dBm: Press [**dBm/W**], then **dBm**.
 - Set the ref cal factor to 100%: Press [**Zero/Cal**], **Cal**, **A/B Ref CF**, then set to **100.0**, if necessary.
 - Set the cal factor to 100%: Press [**Frequency/Cal Fac**], **A/B Cal Fac**, then set to **100.0**, if necessary.
 - Set readout to 0.001 dBm: Press [**Meas Setup**], then **Resolution 1234**, to highlight **4**.
 - Set filter step detect on and filter length to 512: Press [**System/Inputs**], channel **A or B Input Setting**, [**More**], **Ch A/B Filter**, **Step Det On**, **Filter On**, **Mode MAN**, **Length**, then set the filter length to **512**.
- Step 4.** Setup the digital voltmeter (DVM) as follows:
- Reset the DVM: Press the **blue key** followed by **Reset**.
 - Set the sample period to a value greater than one second: Press **NPLC, 5, 0**, then **Enter**.
- Step 5.** Set the range calibrator controls as follows:
- POLARITY: NORMAL
 - RANGE: 1 mW

General Information
Required Equipment

- FUNCTION: CALIBRATE

Step 6. Allow the equipment to warm up for approximately 30 minutes. Do not change any connections or control setting during this time.

Step 7. Zero and calibrate the power meter channel to which the range calibrator is connected:

- a. The range calibrator's RANGE switch should be set to 1 mW.
- b. Set the range calibrator's FUNCTION switch to STANDBY.
- c. Press [**Zero/Cal**], then **Zero A** or **Zero B** (as appropriate). Wait for the operation to complete.
- d. Set the range calibrator's FUNCTION switch to CALIBRATE.
- e. Press [**Zero/Cal**], **Cal**, then **Cal A** or **Cal B** (as appropriate). Wait for the operation to complete.

Step 8. Monitor the drift rate of the power meter reading: Five minutes following calibration, the meter must read 0.001, 0.000, or -0.001 dBm. If the power meter reading is not one of these values, allow additional warm up time, then check the drift rate again. The range calibrator must remain connected to the power meter during this warm up time.

Step 9. Zero and calibrate the power meter channel to which the range calibrator is connected:

NOTE

After a channel on the power meter is calibrated, do not allow more than 5 minutes to elapse before completing the remaining measurement steps for that channel.

- a. The range calibrator's RANGE switch should be set to 1 mW.
- b. Set the range calibrator's FUNCTION switch to STANDBY.
- c. Press [**Zero/Cal**], then **Zero A** or **Zero B** (as appropriate). Wait for the operation to be completed.
- d. Set the range calibrator's FUNCTION switch to CALIBRATE.
- e. Press [**Zero/Cal**], **Cal**, then **Cal A** or **Cal B** (as appropriate). Wait for the operation to complete.

Step 10. Record the DVM voltage reading as value A in the test record on page 24.

NOTE

All DVM readings in this procedure should be recorded showing five significant digits.

Step 11. The reading on the power meter should be 0.000 ± 0.001 dBm.

Step 12. Switch the range calibrator RANGE to 300 μ W.

Step 13. Record the DVM voltage reading as value B in the test record.

Step 14. Wait for the power meter reading to settle (no settling drift within 20 seconds).

Step 15. Record the power meter reading as value C in the test record.

Step 16. Switch the range calibrator RANGE to 100 μ W.

Step 17. Record the DVM voltage reading as value D in the test record.

Step 18. Wait for the power meter reading to settle (no settling drift within 20 seconds).

- Step 19.** Record the power meter reading as value E in the test record.
- Step 20.** If testing a dual-channel power meter, perform Step 7 through Step 19 for the other channel.
- Step 21.** Perform the pass/fail calculations indicated on the test record.

NOTE

If a channel of the power meter does not pass this test, the power meter cannot be used in applications that require Option G12 or H12. There are no adjustments that can be performed to improve the performance of the power meter. Typically, replacing the A6 measurement assembly associated with the failed channel will correct the problem.

General Information
Required Equipment

TEST RECORD FOR POWER METER ACCURACY TEST

| | | | |
|---------------------------|--|------------|--|
| Power Meter Tested | | | |
| Model Number: | | Test Date: | |
| Serial Number: | | Tested by: | |

Test Equipment Used

| | | | |
|--------------------------------------|--|-------------|--|
| Range Calibrator: Model No.: | | Serial No.: | |
| Digital Voltmeter: Model No.: | | Serial No.: | |

Test Results

| Range Calibrator: Setting | Channel A | | Channel B | |
|---------------------------|-------------------|---------------------------|-------------------|---------------------------|
| | DVM Reading (Vdc) | Power Meter Reading (dBm) | DVM Reading (Vdc) | Power Meter Reading (dBm) |
| 1 mW | A= | 0.00±0.001 | A= | 0.00±0.001 |
| 300 µW | B = | C = | B = | C= |
| 100 µW | D = | E= | D = | E = |

Pass/Fail Calculation

| | | |
|--------|--|--|
| 300 µW | $R=B/A =$ $S=10^{(C/10)} =$ $\% \text{ ERROR} = ((R-S)/R) \times 100 =$ Limits: ±0.13% Pass __ Fail __ | $R=B/A =$ $S=10^{(C/10)} =$ $\% \text{ ERROR} = ((R-S)/R) \times 100 =$ Limits: ±0.13% Pass __ Fail __ |
| 100 µW | $T=D/A =$ $U=10^{(E/10)} =$ $\% \text{ ERROR} = ((T-U)/T) \times 100 =$ Limits: ±0.10% Pass __ Fail __ | $T=D/A =$ $U=10^{(E/10)} =$ $\% \text{ ERROR} = ((T-U)/T) \times 100 =$ Limits: ±0.10% Pass __ Fail __ |

2 Performance Tests

This chapter provides information on how to verify the E5061A/E5062A performance.

Introduction

The performance tests for Agilent E5061A/E5062A make up the VBA performance test software program. The software is included in the E5061A/E5062A Opt.0BW(add service guide), it can not be ordered separately. This chapter shows how to run the software and describes a brief test procedure to test the performance of the E5061A/E5062A. The performance test names are listed in Table 2-1.

NOTE Allow the analyzer to warm up for at least 30 minutes before you execute any of the performance tests.

Perform all performance tests in an ambient temperature of 23 ± 5 °C

NOTE The performance tests should be performed periodically. The recommended test interval is 12 months.

The test interval depends on maintenance of use and the environmental conditions under which the instrument is used. You may find that the interval could be shortened or lengthened; however, such a decision should be based on substantial quantitative data.

Table 2-1 List of the E5061A/E5062A performance tests

| Para. | Title |
|-------|--|
| 1 | Frequency accuracy test |
| 2 | RF output level accuracy and flatness test |
| 3 | RF output level linearity test |
| 4 | Trace noise test |
| 5 | Crosstalk test & System dynamic range test |
| 6 | Dynamic accuracy test |
| 7 | Uncorrected system performance test |

Test Equipment Required

The required equipment for the performance test is listed on Table 1-1 and Table 1-2. Use only calibrated equipment when doing the performance test.

Instruction for Using the Performance Test Software

Setting system controller (USB/GPIB interface)

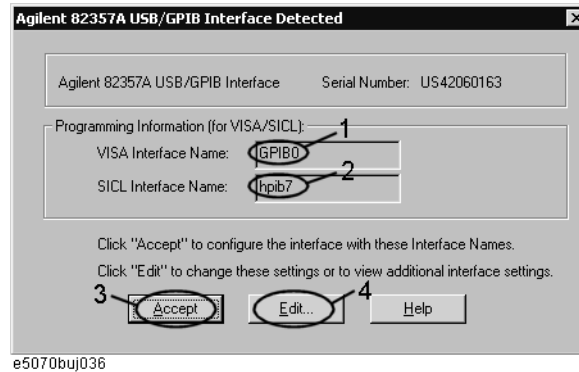
The test program needs a USB/GPIB interface to control the test equipment from the E5061A/E5062A.

Follow these steps to set the USB/GPIB interface:

- Step 1.** Connect the USB port of the E5061A/E5062A to the USB/GPIB interface. The USB/GPIB Interface Detected dialog box (Figure 2-1) appears.

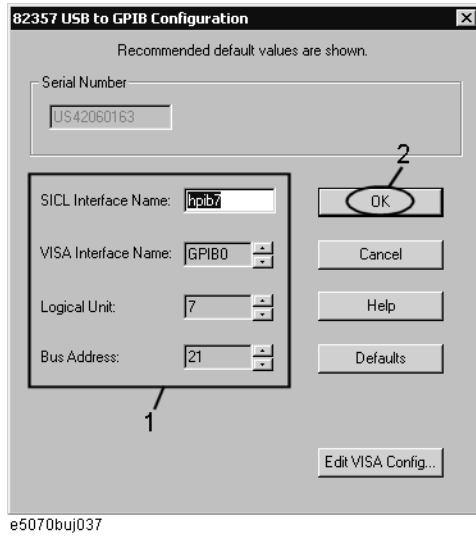
NOTE Do not connect two or more USB/GPIB interfaces.

Figure 2-1 USB/GPIB Interface Detected dialog box



- Step 2.** Confirm that VISA Interface Name is set to GPIB0 (1 in Figure 2-1) and SICL Interface Name is set to hpib7 (2 in Figure 2-1) and then click the **Accept** button (3 in Figure 2-1). If the setting is correct, the procedure is complete. If the setting is different, click the **Edit** button (4 in Figure 2-1).
- Step 3.** The USB to GPIB Configuration dialog box (Figure 2-2) appears. Make the setting enclosed in the thick lines in Figure 2-2 (1 in Figure 2-2) according to the figure and then click the **OK** button (2 in Figure 2-2).

Figure 2-2 USB to GPIB Configuration dialog box



If you need to check/change the setting of the USB/GPIB interface after connecting the USB/GPIB interface, follow these steps:

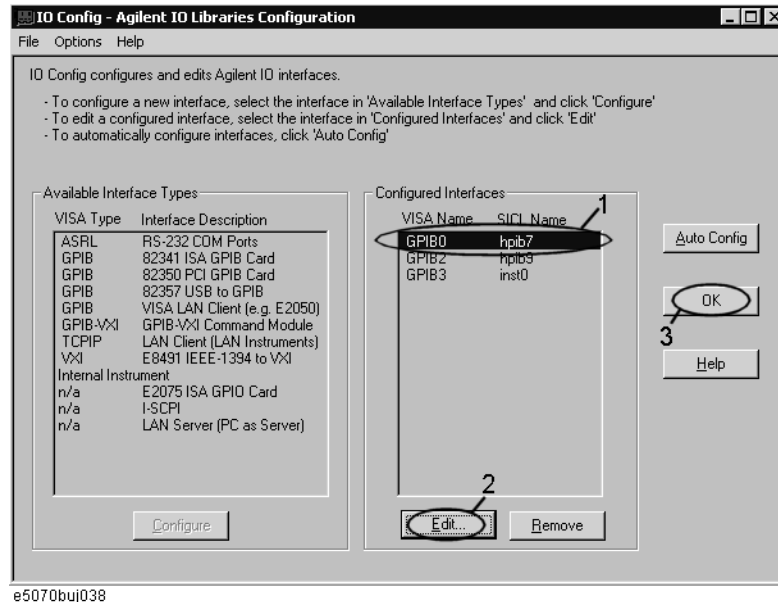
- Step 1.** Press **System**.
- Step 2.** Press **Misc Setup**.
- Step 3.** Press **GPIB Setup**.
- Step 4.** Press **System Controller Configuration**.
- Step 5.** The IO Config dialog box (Figure 2-3) appears. Select (highlight) **GPIB0 hpib7** (1 in Figure 2-3) and then click the **Edit** button (2 in Figure 2-3).

NOTE

In the IO Config dialog box, do not click buttons other than specified here or do not change other settings because doing so may cause serious damage to the functions of the E5061A/E5062A.

Figure 2-3

IO Config dialog box



2. Performance Test

Step 6. The USB to GPIB Configuration dialog box (Figure 2-2) appears. Check/change the setting of the USB/GPIB interface and then click the **OK** button (2 in Figure 2-2).

Step 7. In the USB to GPIB Configuration dialog box, click the **OK** button (3 in Figure 2-3).

Setting the GPIB address of the equipment

The test program needs the following GPIB address for the equipment.

- 53131A Frequency Counter --- 03
- E4419B Power Meter --- 13
- Z5623A Dynamic Accuracy Test Set --- 12

Setting up the E4419B Power Meter

You must set up the power meter before running the performance test program.

1. Connect the power sensor you use to the power meter's channel.
 - 8482A Power Sensor --- Connect to the channel A for testing the E5061A/E5062A option 150/250
 - 8483A Power Sensor --- Connect to the channel B for testing the E5061A/E5062A option 175/275
2. Edit a Sensor Calibration Table for your power sensor. If you have already edited the table for your power sensor, you can skip this step. Refer to the E4419B User's Guide for further information.
3. Select the Sensor Calibration Table for your power sensor. Refer to the E4419B User's Guide for further information.
4. Zero and calibrate the power meter. The reference calibration factor used during the

Performance Tests

Instruction for Using the Performance Test Software

calibration is automatically set by the power meter from the sensor calibration table you selected.

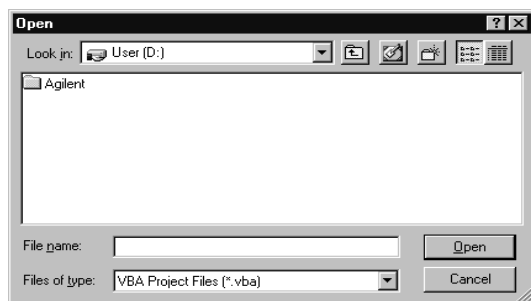
Running the Performance Tests

The program file name is "PerformanceTest.vba". To perform the performance test for the E5061A/E5062A, execute the program in accordance with the following procedure.

- Step 1.** Connect a mouse and an external keyboard to the E5061A/E5062A's rear panel connectors, then turn the E5061A/E5062A on.
- Step 2.** Insert the program disk.
- Step 3.** Press **Macro Setup** key.
- Step 4.** Press **Load Project** to select **Load Project** function. "Open" dialog box as shown below appears.

Figure 2-4

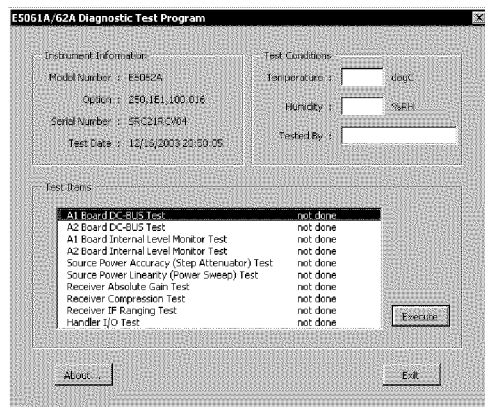
Open dialog box



- Step 5.** Select "User [A]" from menu in the "Look in:" box.
- Step 6.** Click "PerformanceTest.vba" program file.
- Step 7.** Click "Open" button to download the test program.
- Step 8.** Press **Select Macro** to select **Select Macro** function.
- Step 9.** Press **Module1 main** to open the **Module1 main** program file. "E5061A/62A Performance Test Program" dialog box (Main Menu) as shown below will appear.

Figure 2-5

Performance Test Program dialog box



e5061ase038

Step 10. To exit the program, click "Exit" button.

Program Overall

Instrument

Information The option and serial number for the E5061A/E5062A, and test date can be entered automatically.

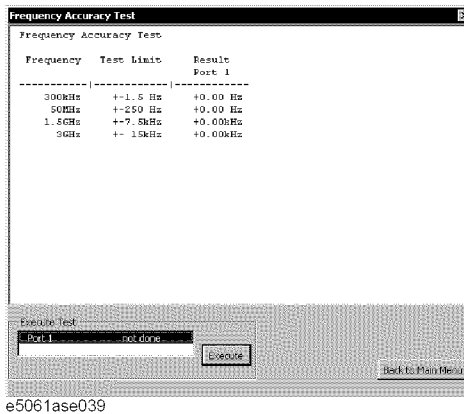
Test Conditions The test conditions, “Temperature”, “Humidity” and person doing the test (“Tested by”) can be entered.

Test Items The following test can be selected. To execute the test you select, click “Execute” button.

- Frequency Accuracy Test
- RF Output Level Accuracy Test
- RF Output Level Linearity Test
- Trace Noise Test
- Crosstalk & System Dynamic Range Test
- Dynamic Accuracy (Magnitude) Test
- Uncorrected System Performance Test

When each test is executed, the test dialog box is displayed. The following screen is an example of the test dialog box.

Figure 2-6 Test dialog box

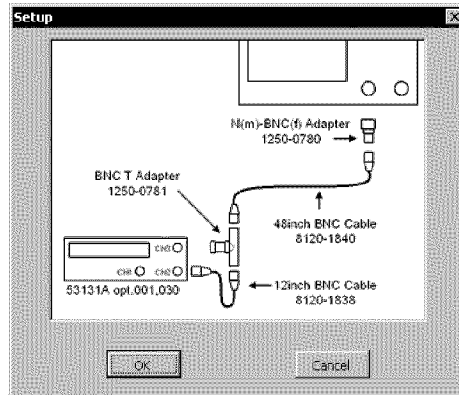


To execute the test, click “Execute” button. To return the E5061A/E5062A performance test program dialog box (Main Menu), click “Back to Main Menu”.

The test program will prompt you to connect cables and O/S/L terminations to the equipment or E5061A/E5062A. Follow the instructions as shown below on the E5061A/E5062A display for performing the test.

Performance Tests
Instruction for Using the Performance Test Software

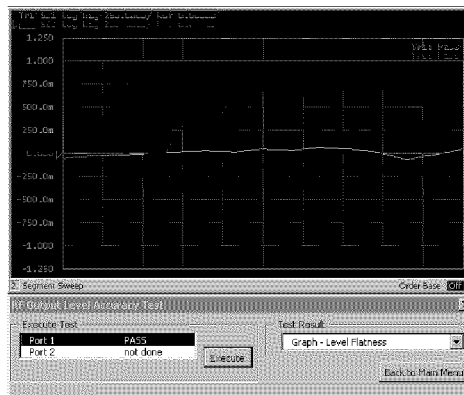
Figure 2-7 Setup dialog box



e5061ase040

The test result file named “resultPT.txt” is created on the drive D (D:\Agilent\Service\Log\) of the E5061A/E5062A after “Exit” button of the Main Menu is pressed. The text file can be read and edited with a PC. The test points of the test result correspond to the “E5061A Performance Test Record (for Option 150/250)” on page 37, “E5061A Performance Test Record (for Option 175/275)” on page 47, “E5062A Performance Test Record (for Option 150/250)” on page 57, or “E5062A Performance Test Record (for Option 175/275)” on page 69. You can record the test results in the Performance Test Record.

The test result of the tests except “Frequency Accuracy Test” can also be displayed as a graphic result as shown below by selecting “Graph” in the Test Result box.



e5061ase041

Individual Test Description

1. Frequency Accuracy Test

Description

This test checks the frequency accuracy of the E5061A/E5062A test port output signal. The frequency accuracy is checked at 300 kHz, 50 MHz, 1.5 GHz and 3 GHz (for E5062A) with a frequency counter. Since the E5061A/E5062A employs a PLL frequency synthesizer for the signal source, the frequency accuracy test at these frequency points can verify the accuracy for the entire frequency range.

Test equipment

| | |
|------------------------------------|--------------------------------------|
| Frequency Counter | Agilent 53131A with Opt. 010 and 030 |
| BNC Tee (m) (f) (f) | Agilent p/n 1250-0781 |
| BNC cable, 30 cm | Agilent p/n 8120-1838 |
| BNC cable, 122 cm | Agilent p/n 8120-1840 |
| N(m)-BNC(f) adapter | Agilent p/n 1250-0780 |
| BNC(m)-BNC(m) adapter | Agilent p/n 1250-0216 |
| Minimum Loss Pad (for opt.175/275) | Agilent 11852B |

2. RF Output Level Accuracy and Flatness Test

Description

This test checks the level accuracy and frequency flatness of the E5061A/E5062A test port output signal. The level accuracy is checked for an output power level setting of 0 dBm at 50 MHz using a power meter. The frequency flatness is tested by measuring the power level at the following frequency points and calculating the differences of the power meter readings from the level at 50 MHz.

E5061A: 300 k, 1.5 M, 3 M, 7 M, 15 M, 275 M, 575 M, 875 M, 1.175 G, 1.5 GHz

E5062A: 300 k, 1.5 M, 3 M, 7 M, 15 M, 275 M, 575 M, 875 M, 1.175 G, 1.5 G, 1.775 G, 2 G, 2.375 G (for opt. 150/250), 2.675 G (for opt. 150/250), 3 GHz (for opt. 150/250)

Test equipment

| | |
|---------------------------------|-----------------------------|
| Power meter | Agilent E4419B |
| Power sensor (for opt. 150/250) | Agilent 8482A |
| Power sensor (for opt. 175/275) | Agilent 8483A with Opt. H03 |

3. RF Output Level Linearity Test

Description

This test checks the level accuracy of the E5061A/E5062A test port output signal across the specified level range. The RF output level is measured for power level settings of -5 dBm to 10 dBm in 2.5 dB step increments at 300kHz, 50 MHz, 1.5 GHz, and 3 GHz (for E5062A).

Test equipment

| | |
|---------------------------------|-----------------------------|
| Power meter | Agilent E4419B |
| Power sensor (for opt. 150/250) | Agilent 8482A |
| Power sensor (for opt. 175/275) | Agilent 8483A with Opt. H03 |

4. Trace Noise Test

Description

This test checks the trace noise level for each test port of the E5061A/E5062A. The trace noise level for S21/S12 is quantified by performing a "through" measurement 32 times at 300 kHz to 1.5 GHz (for E5061A) or 3 GHz (for E5062A) frequency range, with a cable connected between two test ports. The trace noise level for S11(opt. 150/175) is quantified by performing a "Short" measurement 32 times at 300 kHz to 1.5GHz or 3 GHz frequency range, with a cable (terminated with "Short" device) connected to test port 1. Standard deviation of the measured values at each frequency is calculated and, then translated into a noise level expressed in dB rms / deg rms.

Test equipment

| | |
|---|--------------------------------|
| Coaxial cable with Type-N (m) connector, 50 Ω , 61 cm (24 in) (for opt. 150/250) | Agilent N6314A (p/n 8120-8862) |
| Coaxial cable with Type-N (m) connector, 75 Ω , 61 cm (24 in) (for opt. 175/275) | Agilent p/n 8120-8898 |
| Short termination 50 Ω (for opt. 150) | Agilent 85032B |
| Short termination 75 Ω (for opt. 175) | Agilent 85036B |

5. Crosstalk & System Dynamic Range Test

Description

The crosstalk test checks the crosstalks between test ports of the E5061A/E5062A. The crosstalk is tested by performing short-ended "isolation" measurements with the test ports terminated with Type-N "Short" devices. With segment sweep points for a specified frequency range, a swept measurement with the short-ended test ports is repeated 16 times and the measurement data is averaged. The worst crosstalk value in each test frequency range is determined from the peak value of the average data.

The system dynamic range test checks the system dynamic range for the receiver ports of

the E5061A/E5062A. The system dynamic range is tested by performing an "Isolation" measurement 16 times with segment sweep points for specified frequency ranges (same as the crosstalk test). The measurement data for each sweep frequency point is subtracted from the crosstalk data which is measured by the crosstalk test, and calculating the RMS deviation value from the 16 measurement data for each sweep frequency point. The maximum RMS deviation value in each frequency range is extracted to determine the system dynamic range performance.

Test equipment

| | |
|---|----------------|
| Short termination 50 Ω (for opt. 150/250) | Agilent 85032B |
| Short termination 75 Ω (for opt.175/275) | Agilent 85036B |

6. Dynamic Accuracy Test

Description

This test checks the dynamic accuracy of the E5061A/E5062A. The dynamic accuracy is tested at 1.195 GHz for each receiver port using the Agilent Z5623A (with option H01) Dynamic Accuracy Test Kit. The 1.195 GHz source signal of the E5061A/E5062A goes through the Z5623A's first attenuator variable from 0 dB to 11 dB in 1 dB steps and second attenuator variable up to 100 dB in 10 dB steps and is measured with the receiver port. The test procedure checks the measured receiver-input power for each 5 dB increment in the range from 10 dBm to 100 dBm. The ratios of the measured receiver-input powers to the reference input level of -10 dBm are calculated and compared to the attenuation values of the Z5623A. The 1.195 GHz signal flow is split with a power splitter present between the two attenuators in the Z5623A and measured with an external power meter to calibrate the attenuated power level.

NOTE

Since the dynamic accuracy does not have frequency dependence, this test is performed at 1.195 GHz only.

Test Equipment

| | |
|--|----------------------------------|
| Power meter | Agilent E4419B w/Opt. G12 or H12 |
| Power sensor | Agilent 8482A |
| Dynamic Accuracy Test Kit | Agilent Z5623A w/Opt. H01 |
| 6 dB fixed attenuator (for opt. 150/250) | Agilent 8491A w/Opt. 006 and H60 |
| Minimum Loss Pad (for opt. 175/275) | Agilent 11852B opt.004 |
| Coaxial cable with Type-N (m) connector, 50 Ω, 61 cm (24 in) (for opt. 150/250), 2 ea. | Agilent N6314A (p/n 8120-8862) |
| Coaxial cable with Type-N (m) connector, 75 Ω, 61 cm (24 in) (for opt. 175/275) | Agilent p/n 8120-8898 |

Performance Tests
Individual Test Description

| | |
|--|-----------------------|
| N(m) 50 Ω - N(f) 75 Ω adapter (for opt. 175/275) | Agilent p/n 1250-0597 |
|--|-----------------------|

7. Uncorrected System Performance Test

Description

This test checks the directivity, source match, load match, transmission tracking, and reflection tracking which are the key S-parameter measurement hardware characteristics. These characteristics are tested using the Agilent 85032B or 85036B Calibration Kit at 300 kHz to 1.5 GHz (up to 3 GHz for the E5062A). After an enhanced response calibration performed for each test port, the test software is executed to output the directivity, source match transmission tracking, and reflection tracking data. The load match for a response port is measured by a stimulus (source) port performed a 1-port calibration.

Test Equipment

| | |
|---|--------------------------------|
| Calibration Kit (for opt. 150/250) | Agilent 85032B |
| Coaxial cable with Type-N (m) connector, 50 Ω , 61 cm (24 in) (for opt. 150/250) | Agilent N6314A (p/n 8120-8862) |
| Calibration Kit (for opt. 175/275) | Agilent 85036B |
| Coaxial cable with Type-N (m) connector, 75 Ω , 61 cm (24 in) (for opt. 175/275) | Agilent p/n 8120-8898 |

E5061A Performance Test Record (for Option 150/250)

Agilent Technologies E5061A RF Network Analyzer

| | | | |
|----------------|--------|------------|--|
| Serial Number: | | Option: | |
| Temperature: | °C | Test Date: | |
| Humidity: | % R.H. | Tested by: | |

Frequency Accuracy Test

| Frequency [Hz] | Test limit [Hz] | Test result [Hz] | Measurement uncertainty [Hz] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.5 | | ± 0.056 |
| 50 M | ± 250 | | ± 9 |
| 1.5 G | ± 7.5 k | k | ± 0.28 k |

RF Output Level Accuracy and Flatness Test

Level Accuracy Test (@ Port 1)

| Power level [dBm] | Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|----------------|-----------------|------------------|------------------------------|
| 0 | 50 M | ± 0.8 | | ± 0.07 |

Level Flatness Test (@ Port 1) (at 0dBm, relative to 50 MHz reference)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.0 | | ± 0.27 |
| 1.5 M | ± 1.0 | | ± 0.07 |
| 3.00 M | ± 1.0 | | ± 0.07 |
| 7.00 M | ± 1.0 | | ± 0.07 |
| 15.0 M | ± 1.0 | | ± 0.07 |
| 275 M | ± 1.0 | | ± 0.07 |
| 575 M | ± 1.0 | | ± 0.07 |
| 875 M | ± 1.0 | | ± 0.07 |
| 1.175 G | ± 1.0 | | ± 0.07 |

Performance Tests

E5061A Performance Test Record (for Option 150/250)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 1.5 G | ± 1.0 | | ± 0.08 |

Level Accuracy Test (@ Port 2) (Option 250 only)

| Power level [dBm] | Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|----------------|-----------------|------------------|------------------------------|
| 0 | 50 M | ± 0.8 | | ± 0.07 |

Level Flatness Test (@ Port 2) (at 0dBm, relative to 50 MHz reference) (Option 250 only)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.0 | | ± 0.27 |
| 1.5 M | ± 1.0 | | ± 0.07 |
| 3.00 M | ± 1.0 | | ± 0.07 |
| 7.00 M | ± 1.0 | | ± 0.07 |
| 15.0 M | ± 1.0 | | ± 0.07 |
| 275 M | ± 1.0 | | ± 0.07 |
| 575 M | ± 1.0 | | ± 0.07 |
| 875 M | ± 1.0 | | ± 0.07 |
| 1.175 G | ± 1.0 | | ± 0.07 |
| 1.5 G | ± 1.0 | | ± 0.08 |

RF Output Level Linearity Test (@ Port1)

CW Frequency: 300 kHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 50 MHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 1.5 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

RF Output Level Linearity Test (@ Port2)(Option 250 only)

CW Frequency: 300 kHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |

2. Performance Test

Performance Tests

E5061A Performance Test Record (for Option 150/250)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 50 MHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 1.5 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

Trace Noise Test

Direction: S21 (Magnitude)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |

Direction: S21 (Phase)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |
| 1 M - 100 M | 3 k | ≤ 0.03 | |
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |

Direction: S12 (Magnitude) (Option 250 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |

Direction: S12 (Phase) (Option 250 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |
| 1 M - 100 M | 3 k | ≤ 0.03 | |
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |

Direction: S11 (Magnitude) (Option 150 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |

Direction: S11 (Phase) (Option 150 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |
| 1 M - 100 M | 3 k | ≤ 0.03 | |
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |

Performance Tests
E5061A Performance Test Record (for Option 150/250)

Crosstalk Test

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -110 | |
| 100 M - 1.5 G | 10 | ≤ -110 | |

Direction: S12 (Option 250 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -110 | |
| 100 M - 1.5 G | 10 | ≤ -110 | |

System Dynamic Range Test

For Serial Prefix : JP1KL or MY441

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -115 | |
| 100 M - 1.5 G | 10 | ≤ -115 | |
| 300 k - 100 M | 3 k | ≤ -90 | |
| 100 M - 1.5 G | 3 k | ≤ -90 | |

Direction: S12 (Options 250 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -115 | |
| 100 M - 1.5 G | 10 | ≤ -115 | |
| 300 k - 100 M | 3 k | ≤ -90 | |
| 100 M - 1.5 G | 3 k | ≤ -90 | |

For Serial Prefix : MY442 and above

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 1 M | 10 | ≤ -115 | |
| 1 M - 100 M | 10 | ≤ -120 | |

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 100 M - 1.5 G | 10 | ≤ -120 | |
| 300 k - 1 M | 3 k | ≤ -90 | |
| 1 M - 100 M | 3 k | ≤ -95 | |
| 100 M - 1.5 G | 3 k | ≤ -95 | |

Direction: S12 (Options 250 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 1 M | 10 | ≤ -115 | |
| 1 M - 100 M | 10 | ≤ -120 | |
| 100 M - 1.5 G | 10 | ≤ -120 | |
| 300 k - 1 M | 3 k | ≤ -90 | |
| 1 M - 100 M | 3 k | ≤ -95 | |
| 100 M - 1.5 G | 3 k | ≤ -95 | |

Dynamic Accuracy Test

@ Reference power level: -10 dBm

Direction: S21

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.303 | | ± 0.011 |
| 5 | ± 0.144 | | ± 0.011 |
| 0 | ± 0.090 | | ± 0.011 |
| -5 | ± 0.068 | | ± 0.011 |
| -15 | ± 0.065 | | ± 0.011 |
| -20 | ± 0.073 | | ± 0.011 |
| -25 | ± 0.080 | | ± 0.015 |
| -30 | ± 0.087 | | ± 0.015 |
| -35 | ± 0.095 | | ± 0.019 |
| -40 | ± 0.103 | | ± 0.019 |
| -45 | ± 0.111 | | ± 0.022 |
| -50 | ± 0.121 | | ± 0.022 |

Performance Tests

E5061A Performance Test Record (for Option 150/250)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -55 | ± 0.134 | | ± 0.024 |
| -60 | ± 0.150 | | ± 0.024 |
| -65 | ± 0.174 | | ± 0.026 |
| -70 | ± 0.211 | | ± 0.026 |
| -75 | ± 0.270 | | ± 0.028 |
| -80 | ± 0.371 | | ± 0.028 |
| -85 | ± 0.546 | | ± 0.030 |
| -90 | ± 0.841 | | ± 0.030 |
| -95 | ± 1.334 | | ± 0.032 |
| -100 | ± 2.141 | | ± 0.032 |

Direction: S12 (Option 250 only)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.303 | | ± 0.011 |
| 5 | ± 0.144 | | ± 0.011 |
| 0 | ± 0.090 | | ± 0.011 |
| -5 | ± 0.068 | | ± 0.011 |
| -15 | ± 0.065 | | ± 0.011 |
| -20 | ± 0.073 | | ± 0.011 |
| -25 | ± 0.080 | | ± 0.015 |
| -30 | ± 0.087 | | ± 0.015 |
| -35 | ± 0.095 | | ± 0.019 |
| -40 | ± 0.103 | | ± 0.019 |
| -45 | ± 0.111 | | ± 0.022 |
| -50 | ± 0.121 | | ± 0.022 |
| -55 | ± 0.134 | | ± 0.024 |
| -60 | ± 0.150 | | ± 0.024 |
| -65 | ± 0.174 | | ± 0.026 |
| -70 | ± 0.211 | | ± 0.026 |

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -75 | ± 0.270 | | ± 0.028 |
| -80 | ± 0.371 | | ± 0.028 |
| -85 | ± 0.546 | | ± 0.030 |
| -90 | ± 0.841 | | ± 0.030 |
| -95 | ± 1.334 | | ± 0.032 |
| -100 | ±2.141 | | ± 0.032 |

Uncorrected System Performance Test

@ Correction: Off

S21 or S11

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|-----------------------|----------------------|-----------------|------------------|
| Directivity | 300 k - 100 M | ≤ -25 | |
| Directivity | 100 M - 1.5 G | ≤ -25 | |
| Source match | 300 k - 100 M | ≤ -25 | |
| Source match | 100 M - 1.5 G | ≤ -25 | |
| Load match | 300 k - 100 M | ≤ -15 | |
| Load match | 100 M - 1.5 G | ≤ -15 | |
| Reflection Tracking | 300 k - 100 M | ± 1.0 | |
| Reflection Tracking | 100 M - 1.5 G | ± 1.0 | |
| Transmission Tracking | 300 k - 100 M | ± 1.0 | |
| Transmission Tracking | 100 M - 1.5 G | ± 1.0 | |

S12 or S22 (Option 250 only)

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|--------------------|----------------------|-----------------|------------------|
| Directivity | 300 k - 100 M | ≤ -25 | |
| Directivity | 100 M - 1.5 G | ≤ -25 | |
| Source match | 300 k - 100 M | ≤ -25 | |
| Source match | 100 M - 1.5 G | ≤ -25 | |

Performance Tests

E5061A Performance Test Record (for Option 150/250)

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|---------------------------|-----------------------------|------------------------|-------------------------|
| Load match | 300 k - 100 M | ≤ -15 | |
| Load match | 100 M - 1.5 G | ≤ -15 | |
| Reflection Tracking | 300 k - 100 M | ± 1.0 | |
| Reflection Tracking | 100 M - 1.5 G | ± 1.0 | |
| Transmission Tracking | 300 k - 100 M | ± 1.0 | |
| Transmission Tracking | 100 M - 1.5 G | ± 1.0 | |

E5061A Performance Test Record (for Option 175/275)

Agilent Technologies E5061A RF Network Analyzer

| | | | |
|----------------|--------|------------|--|
| Serial Number: | | Option: | |
| Temperature: | °C | Test Date: | |
| Humidity: | % R.H. | Tested by: | |

Frequency Accuracy Test

| Frequency [Hz] | Test limit [Hz] | Test result [Hz] | Measurement uncertainty [Hz] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.5 | | ± 0.056 |
| 50 M | ± 250 | | ± 9 |
| 1.5 G | ± 7.5 k | k | ± 0.28 k |

RF Output Level Accuracy and Flatness Test

Level Accuracy Test (@ Port 1)

| Power level [dBm] | Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|----------------|-----------------|------------------|------------------------------|
| 0 | 50 M | ± 0.8 | | ± 0.10 |

Level Flatness Test (@ Port 1) (at 0dBm, relative to 50 MHz reference)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.0 | | ± 0.34 |
| 1.5 M | ± 1.0 | | ± 0.10 |
| 3.00 M | ± 1.0 | | ± 0.10 |
| 7.00 M | ± 1.0 | | ± 0.10 |
| 15.0 M | ± 1.0 | | ± 0.10 |
| 275 M | ± 1.0 | | ± 0.10 |
| 575 M | ± 1.0 | | ± 0.10 |
| 875 M | ± 1.0 | | ± 0.10 |
| 1.175 G | ± 1.0 | | ± 0.10 |

Performance Tests

E5061A Performance Test Record (for Option 175/275)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 1.5 G | ± 1.0 | | ± 0.10 |

Level Accuracy Test (@ Port 2) (Option 275 only)

| Power level [dBm] | Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|----------------|-----------------|------------------|------------------------------|
| 0 | 50 M | ± 0.8 | | ± 0.10 |

Level Flatness Test (@ Port 2) (at 0dBm, relative to 50 MHz reference) (Options 250 and 275 only)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.0 | | ± 0.34 |
| 1.5 M | ± 1.0 | | ± 0.10 |
| 3.00 M | ± 1.0 | | ± 0.10 |
| 7.00 M | ± 1.0 | | ± 0.10 |
| 15.0 M | ± 1.0 | | ± 0.10 |
| 275 M | ± 1.0 | | ± 0.10 |
| 575 M | ± 1.0 | | ± 0.10 |
| 875 M | ± 1.0 | | ± 0.10 |
| 1.175 G | ± 1.0 | | ± 0.10 |
| 1.5 G | ± 1.0 | | ± 0.10 |

RF Output Level Linearity Test (@ Port1)

CW Frequency: 300 kHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 50 MHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 1.5 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

RF Output Level Linearity Test (@ Port2)(Option 275 only)

CW Frequency: 300 kHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |

2. Performance Test

Performance Tests

E5061A Performance Test Record (for Option 175/275)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 50 MHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 1.5 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

Trace Noise Test

Direction: S21 (Magnitude)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |

Direction: S21 (Phase)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |
| 1 M - 100 M | 3 k | ≤ 0.03 | |
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |

Direction: S12 (Magnitude) (Option 275 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |

Direction: S12 (Phase) (Option 275 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |
| 1 M - 100 M | 3 k | ≤ 0.03 | |
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |

Direction: S11 (Magnitude) (Option 175 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |

Direction: S11 (Phase) (Option 175 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |
| 1 M - 100 M | 3 k | ≤ 0.03 | |
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |

Performance Tests
E5061A Performance Test Record (for Option 175/275)

Crosstalk Test

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -110 | |
| 100 M - 1.5 G | 10 | ≤ -110 | |

Direction: S12 (Option 275 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -110 | |
| 100 M - 1.5 G | 10 | ≤ -110 | |

System Dynamic Range Test

For Serial Prefix : JP1KL or MY441

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -115 | |
| 100 M - 1.5 G | 10 | ≤ -115 | |
| 300 k - 100 M | 3 k | ≤ -90 | |
| 100 M - 1.5 G | 3 k | ≤ -90 | |

Direction: S12 (Option 275 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -115 | |
| 100 M - 1.5 G | 10 | ≤ -115 | |
| 300 k - 100 M | 3 k | ≤ -90 | |
| 100 M - 1.5 G | 3 k | ≤ -90 | |

For Serial Prefix : MY442 and above

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 1 M | 10 | ≤ -115 | |
| 1 M - 100 M | 10 | ≤ -120 | |

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 100 M - 1.5 G | 10 | ≤ -120 | |
| 300 k - 1 M | 3 k | ≤ -90 | |
| 1 M - 100 M | 3 k | ≤ -95 | |
| 100 M - 1.5 G | 3 k | ≤ -95 | |

Direction: S12 (Option 275 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 1 M | 10 | ≤ -115 | |
| 1 M - 100 M | 10 | ≤ -120 | |
| 100 M - 1.5 G | 10 | ≤ -120 | |
| 300 k - 1 M | 3 k | ≤ -90 | |
| 1 M - 100 M | 3 k | ≤ -95 | |
| 100 M - 1.5 G | 3 k | ≤ -95 | |

Dynamic Accuracy Test

@ Reference power level: -10 dBm

Direction: S21

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.303 | | ± 0.011 |
| 5 | ± 0.144 | | ± 0.011 |
| 0 | ± 0.090 | | ± 0.011 |
| -5 | ± 0.068 | | ± 0.011 |
| -15 | ± 0.065 | | ± 0.011 |
| -20 | ± 0.073 | | ± 0.011 |
| -25 | ± 0.080 | | ± 0.015 |
| -30 | ± 0.087 | | ± 0.015 |
| -35 | ± 0.095 | | ± 0.019 |
| -40 | ± 0.103 | | ± 0.019 |
| -45 | ± 0.111 | | ± 0.022 |
| -50 | ± 0.121 | | ± 0.022 |

Performance Tests

E5061A Performance Test Record (for Option 175/275)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -55 | ± 0.134 | | ± 0.024 |
| -60 | ± 0.150 | | ± 0.024 |
| -65 | ± 0.174 | | ± 0.026 |
| -70 | ± 0.211 | | ± 0.026 |
| -75 | ± 0.270 | | ± 0.028 |
| -80 | ± 0.371 | | ± 0.028 |
| -85 | ± 0.546 | | ± 0.030 |
| -90 | ± 0.841 | | ± 0.030 |
| -95 | ± 1.334 | | ± 0.032 |
| -100 | ±2.141 | | ± 0.032 |

Direction: S12 (Option 275 only)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.303 | | ± 0.011 |
| 5 | ± 0.144 | | ± 0.011 |
| 0 | ± 0.090 | | ± 0.011 |
| -5 | ± 0.068 | | ± 0.011 |
| -15 | ± 0.065 | | ± 0.011 |
| -20 | ± 0.073 | | ± 0.011 |
| -25 | ± 0.080 | | ± 0.015 |
| -30 | ± 0.087 | | ± 0.015 |
| -35 | ± 0.095 | | ± 0.019 |
| -40 | ± 0.103 | | ± 0.019 |
| -45 | ± 0.111 | | ± 0.022 |
| -50 | ± 0.121 | | ± 0.022 |
| -55 | ± 0.134 | | ± 0.024 |
| -60 | ± 0.150 | | ± 0.024 |
| -65 | ± 0.174 | | ± 0.026 |
| -70 | ± 0.211 | | ± 0.026 |

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -75 | ± 0.270 | | ± 0.028 |
| -80 | ± 0.371 | | ± 0.028 |
| -85 | ± 0.546 | | ± 0.030 |
| -90 | ± 0.841 | | ± 0.030 |
| -95 | ± 1.334 | | ± 0.032 |
| -100 | ±2.141 | | ± 0.032 |

Uncorrected System Performance Test

@ Correction: Off

S21 or S11

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|-----------------------|----------------------|-----------------|------------------|
| Directivity | 300 k - 100 M | ≤ -25 | |
| Directivity | 100 M - 1.5 G | ≤ -25 | |
| Source match | 300 k - 100 M | ≤ -25 | |
| Source match | 100 M - 1.5 G | ≤ -25 | |
| Load match | 300 k - 100 M | ≤ -15 | |
| Load match | 100 M - 1.5 G | ≤ -15 | |
| Reflection Tracking | 300 k - 100 M | ± 1.0 | |
| Reflection Tracking | 100 M - 1.5 G | ± 1.0 | |
| Transmission Tracking | 300 k - 100 M | ± 1.0 | |
| Transmission Tracking | 100 M - 1.5 G | ± 1.0 | |

S12 or S22 (Option 275 only)

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|--------------------|----------------------|-----------------|------------------|
| Directivity | 300 k - 100 M | ≤ -25 | |
| Directivity | 100 M - 1.5 G | ≤ -25 | |
| Source match | 300 k - 100 M | ≤ -25 | |
| Source match | 100 M - 1.5 G | ≤ -25 | |

Performance Tests

E5061A Performance Test Record (for Option 175/275)

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|---------------------------|-----------------------------|------------------------|-------------------------|
| Load match | 300 k - 100 M | ≤ -15 | |
| Load match | 100 M - 1.5 G | ≤ -15 | |
| Reflection Tracking | 300 k - 100 M | ± 1.0 | |
| Reflection Tracking | 100 M - 1.5 G | ± 1.0 | |
| Transmission Tracking | 300 k - 100 M | ± 1.0 | |
| Transmission Tracking | 100 M - 1.5 G | ± 1.0 | |

E5062A Performance Test Record (for Option 150/250)

Agilent Technologies E5062A RF Network Analyzer

| | | | |
|----------------|--------|------------|--|
| Serial Number: | | Option: | |
| Temperature: | °C | Test Date: | |
| Humidity: | % R.H. | Tested by: | |

Frequency Accuracy Test

| Frequency [Hz] | Test limit [Hz] | Test result [Hz] | Measurement uncertainty [Hz] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.5 | | ± 0.056 |
| 50 M | ± 250 | | ± 9 |
| 1.5 G | ± 7.5 k | k | ± 0.28 k |
| 3 G | ± 15 k | k | ± 0.55 k |

RF Output Level Accuracy and Flatness Test

Level Accuracy Test (@ Port 1)

| Power level [dBm] | Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|----------------|-----------------|------------------|------------------------------|
| 0 | 50 M | ± 0.8 | | ± 0.07 |

Level Flatness Test (@ Port 1) (at 0dBm, relative to 50 MHz reference)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.0 | | ± 0.27 |
| 1.5 M | ± 1.0 | | ± 0.07 |
| 3.00 M | ± 1.0 | | ± 0.07 |
| 7.00 M | ± 1.0 | | ± 0.07 |
| 15.0 M | ± 1.0 | | ± 0.07 |
| 275 M | ± 1.0 | | ± 0.07 |
| 575 M | ± 1.0 | | ± 0.07 |
| 875 M | ± 1.0 | | ± 0.07 |

Performance Tests

E5062A Performance Test Record (for Option 150/250)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 1.175 G | ± 1.0 | | ± 0.07 |
| 1.5 G | ± 1.0 | | ± 0.08 |
| 1.775 G | ± 1.0 | | ± 0.08 |
| 2 G | ± 1.0 | | ± 0.16 |
| 2.375 G | ± 1.0 | | ± 0.16 |
| 2.675 G | ± 1.0 | | ± 0.16 |
| 3 G | ± 1.0 | | ± 0.16 |

Level Accuracy Test (@ Port 2) (Option 250 only)

| Power level [dBm] | Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|----------------|-----------------|------------------|------------------------------|
| 0 | 50 M | ± 0.8 | | ± 0.07 |

Level Flatness Test (@ Port 2) (at 0dBm, relative to 50 MHz reference) (Option 250 only)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.0 | | ± 0.27 |
| 1.5 M | ± 1.0 | | ± 0.07 |
| 3.00 M | ± 1.0 | | ± 0.07 |
| 7.00 M | ± 1.0 | | ± 0.07 |
| 15.0 M | ± 1.0 | | ± 0.07 |
| 275 M | ± 1.0 | | ± 0.07 |
| 575 M | ± 1.0 | | ± 0.07 |
| 875 M | ± 1.0 | | ± 0.07 |
| 1.175 G | ± 1.0 | | ± 0.07 |
| 1.5 G | ± 1.0 | | ± 0.08 |
| 1.775 G | ± 1.0 | | ± 0.08 |
| 2 G | ± 1.0 | | ± 0.16 |
| 2.375 G | ± 1.0 | | ± 0.16 |
| 2.675 G | ± 1.0 | | ± 0.16 |

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 3 G | ± 1.0 | | ± 0.16 |

RF Output Level Linearity Test (@ Port1)

CW Frequency: 300 kHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 50 MHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 1.5 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |

Performance Tests
E5062A Performance Test Record (for Option 150/250)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 3 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

RF Output Level Linearity Test (@ Port2)(Option 250 only)

CW Frequency: 300 kHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 50 MHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 1.5 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 3 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

2. Performance Test

Trace Noise Test

Direction: S21 (Magnitude)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |
| 1.5 G - 3 G | 3 k | ≤ 0.005 | |

Performance Tests
E5062A Performance Test Record (for Option 150/250)

Direction: S21 (Phase)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |
| 1 M - 100 M | 3 k | ≤ 0.03 | |
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |
| 1.5 G - 3 G | 3 k | ≤ 0.03 | |

Direction: S12 (Magnitude) (Option 250 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |
| 1.5 G - 3 G | 3 k | ≤ 0.005 | |

Direction: S12 (Phase) (Option 250 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |
| 1 M - 100 M | 3 k | ≤ 0.03 | |
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |
| 1.5 G - 3 G | 3 k | ≤ 0.03 | |

Direction: S11 (Magnitude) (Option 150 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |
| 1.5 G - 3 G | 3 k | ≤ 0.005 | |

Direction: S11 (Phase) (Option 150 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |
| 1 M - 100 M | 3 k | ≤ 0.03 | |
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |
| 1.5 G - 3 G | 3 k | ≤ 0.03 | |

Crosstalk Test

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -110 | |
| 100 M - 1.5 G | 10 | ≤ -110 | |
| 1.5 G - 3 G | 10 | ≤ -110 | |

Direction: S12 (Options 250 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -110 | |
| 100 M - 1.5 G | 10 | ≤ -110 | |
| 1.5 G - 3 G | 10 | ≤ -110 | |

System Dynamic Range Test

For Serial Prefix : JP1KL or MY441

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -115 | |
| 100 M - 1.5 G | 10 | ≤ -115 | |
| 1.5 G - 3 G | 10 | ≤ -115 | |
| 300 k - 100 M | 3 k | ≤ -90 | |
| 100 M - 1.5 G | 3 k | ≤ -90 | |
| 1.5 G - 3 G | 3 k | ≤ -90 | |

Performance Tests
E5062A Performance Test Record (for Option 150/250)

Direction: S12 (Option 250 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -115 | |
| 100 M - 1.5 G | 10 | ≤ -115 | |
| 1.5 G - 3 G | 10 | ≤ -115 | |
| 300 k - 100 M | 3 k | ≤ -90 | |
| 100 M - 1.5 G | 3 k | ≤ -90 | |
| 1.5 G - 3 G | 3 k | ≤ -90 | |

For Serial Prefix : MY442 and above

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 1 M | 10 | ≤ -115 | |
| 1 M - 100 M | 10 | ≤ -120 | |
| 100 M - 1.5 G | 10 | ≤ -120 | |
| 1.5 G - 3 G | 10 | ≤ -120 | |
| 300 k - 1 M | 3 k | ≤ -90 | |
| 1 M - 100 M | 3 k | ≤ -95 | |
| 100 M - 1.5 G | 3 k | ≤ -95 | |
| 1.5 G - 3 G | 3 k | ≤ -95 | |

Direction: S12 (Option 250 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 1 M | 10 | ≤ -115 | |
| 1 M - 100 M | 10 | ≤ -120 | |
| 100 M - 1.5 G | 10 | ≤ -120 | |
| 1.5 G - 3 G | 10 | ≤ -120 | |
| 300 k - 1 M | 3 k | ≤ -90 | |
| 1 M - 100 M | 3 k | ≤ -95 | |
| 100 M - 1.5 G | 3 k | ≤ -95 | |
| 1.5 G - 3 G | 3 k | ≤ -95 | |

Dynamic Accuracy Test

@ Reference power level: -10 dBm

Direction: S21

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.303 | | ± 0.011 |
| 5 | ± 0.144 | | ± 0.011 |
| 0 | ± 0.090 | | ± 0.011 |
| -5 | ± 0.068 | | ± 0.011 |
| -15 | ± 0.065 | | ± 0.011 |
| -20 | ± 0.073 | | ± 0.011 |
| -25 | ± 0.080 | | ± 0.015 |
| -30 | ± 0.087 | | ± 0.015 |
| -35 | ± 0.095 | | ± 0.019 |
| -40 | ± 0.103 | | ± 0.019 |
| -45 | ± 0.111 | | ± 0.022 |
| -50 | ± 0.121 | | ± 0.022 |
| -55 | ± 0.134 | | ± 0.024 |
| -60 | ± 0.150 | | ± 0.024 |
| -65 | ± 0.174 | | ± 0.026 |
| -70 | ± 0.211 | | ± 0.026 |
| -75 | ± 0.270 | | ± 0.028 |
| -80 | ± 0.371 | | ± 0.028 |
| -85 | ± 0.546 | | ± 0.030 |
| -90 | ± 0.841 | | ± 0.030 |
| -95 | ± 1.334 | | ± 0.032 |
| -100 | ±2.141 | | ± 0.032 |

Direction: S12 (Option 250 only)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.303 | | ± 0.011 |
| 5 | ± 0.144 | | ± 0.011 |

2. Performance Test

Performance Tests

E5062A Performance Test Record (for Option 150/250)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 0 | ± 0.090 | | ± 0.011 |
| -5 | ± 0.068 | | ± 0.011 |
| -15 | ± 0.065 | | ± 0.011 |
| -20 | ± 0.073 | | ± 0.011 |
| -25 | ± 0.080 | | ± 0.015 |
| -30 | ± 0.087 | | ± 0.015 |
| -35 | ± 0.095 | | ± 0.019 |
| -40 | ± 0.103 | | ± 0.019 |
| -45 | ± 0.111 | | ± 0.022 |
| -50 | ± 0.121 | | ± 0.022 |
| -55 | ± 0.134 | | ± 0.024 |
| -60 | ± 0.150 | | ± 0.024 |
| -65 | ± 0.174 | | ± 0.026 |
| -70 | ± 0.211 | | ± 0.026 |
| -75 | ± 0.270 | | ± 0.028 |
| -80 | ± 0.371 | | ± 0.028 |
| -85 | ± 0.546 | | ± 0.030 |
| -90 | ± 0.841 | | ± 0.030 |
| -95 | ± 1.334 | | ± 0.032 |
| -100 | ±2.141 | | ± 0.032 |

Uncorrected System Performance Test

@ Correction: Off

S21 or S11

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|--------------------|----------------------|-----------------|------------------|
| Directivity | 300 k - 100 M | ≤ -25 | |
| Directivity | 100 M - 1.5 G | ≤ -25 | |
| Directivity | 1.5 G - 3 G | ≤ -25 | |
| Source match | 300 k - 100 M | ≤ -25 | |

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|---------------------------|-----------------------------|------------------------|-------------------------|
| Source match | 100 M - 1.5 G | ≤ -25 | |
| Source match | 1.5 G - 3 G | ≤ -25 | |
| Load match | 300 k - 100 M | ≤ -15 | |
| Load match | 100 M - 1.5 G | ≤ -15 | |
| Load match | 1.5 G - 3 G | ≤ -15 | |
| Reflection Tracking | 300 k - 100 M | ± 1.0 | |
| Reflection Tracking | 100 M - 1.5 G | ± 1.0 | |
| Reflection Tracking | 1.5 G - 3 G | ± 1.0 | |
| Transmission Tracking | 300 k - 100 M | ± 1.0 | |
| Transmission Tracking | 100 M - 1.5 G | ± 1.0 | |
| Transmission Tracking | 1.5 G - 3 G | ± 1.0 | |

S12 or S22 (Option 250 only)

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|---------------------------|-----------------------------|------------------------|-------------------------|
| Directivity | 300 k - 100 M | ≤ -25 | |
| Directivity | 100 M - 1.5 G | ≤ -25 | |
| Directivity | 1.5 G - 3 G | ≤ -25 | |
| Source match | 300 k - 100 M | ≤ -25 | |
| Source match | 100 M - 1.5 G | ≤ -25 | |
| Source match | 1.5 G - 3 G | ≤ -25 | |
| Load match | 300 k - 100 M | ≤ -15 | |
| Load match | 100 M - 1.5 G | ≤ -15 | |
| Load match | 1.5 G - 3 G | ≤ -15 | |
| Reflection Tracking | 300 k - 100 M | ± 1.0 | |
| Reflection Tracking | 100 M - 1.5 G | ± 1.0 | |
| Reflection Tracking | 1.5 G - 3 G | ± 1.0 | |
| Transmission Tracking | 300 k - 100 M | ± 1.0 | |

Performance Tests

E5062A Performance Test Record (for Option 150/250)

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|---------------------------|-----------------------------|------------------------|-------------------------|
| Transmission Tracking | 100 M - 1.5 G | ± 1.0 | |
| Transmission Tracking | 1.5 G - 3 G | ± 1.0 | |

E5062A Performance Test Record (for Option 175/275)

Agilent Technologies E5062A RF Network Analyzer

| | | | |
|----------------|--------|------------|--|
| Serial Number: | | Option: | |
| Temperature: | °C | Test Date: | |
| Humidity: | % R.H. | Tested by: | |

Frequency Accuracy Test

| Frequency [Hz] | Test limit [Hz] | Test result [Hz] | Measurement uncertainty [Hz] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.5 | | ± 0.056 |
| 50 M | ± 250 | | ± 9 |
| 1.5 G | ± 7.5 k | k | ± 0.28 k |
| 3 G | ± 15 k | k | ± 0.55 k |

RF Output Level Accuracy and Flatness Test

Level Accuracy Test (@ Port 1)

| Power level [dBm] | Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|----------------|-----------------|------------------|------------------------------|
| 0 | 50 M | ± 0.8 | | ± 0.10 |

Level Flatness Test (@ Port 1) (at 0dBm, relative to 50 MHz reference)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.0 | | ± 0.34 |
| 1.5 M | ± 1.0 | | ± 0.10 |
| 3.00 M | ± 1.0 | | ± 0.10 |
| 7.00 M | ± 1.0 | | ± 0.10 |
| 15.0 M | ± 1.0 | | ± 0.10 |
| 275 M | ± 1.0 | | ± 0.10 |
| 575 M | ± 1.0 | | ± 0.10 |
| 875 M | ± 1.0 | | ± 0.10 |

Performance Tests

E5062A Performance Test Record (for Option 175/275)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 1.175 G | ± 1.0 | | ± 0.10 |
| 1.5 G | ± 1.0 | | ± 0.10 |
| 1.775 G | ± 1.0 | | ± 0.10 |
| 2 G | ± 1.0 | | ± 0.10 |

Level Accuracy Test (@ Port 2) (Option 275 only)

| Power level [dBm] | Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|----------------|-----------------|------------------|------------------------------|
| 0 | 50 M | ± 0.8 | | ± 0.10 |

Level Flatness Test (@ Port 2) (at 0dBm, relative to 50 MHz reference) (Option 275 only)

| Frequency [Hz] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|----------------|-----------------|------------------|------------------------------|
| 300 k | ± 1.0 | | ± 0.34 |
| 1.5 M | ± 1.0 | | ± 0.10 |
| 3.00 M | ± 1.0 | | ± 0.10 |
| 7.00 M | ± 1.0 | | ± 0.10 |
| 15.0 M | ± 1.0 | | ± 0.10 |
| 275 M | ± 1.0 | | ± 0.10 |
| 575 M | ± 1.0 | | ± 0.10 |
| 875 M | ± 1.0 | | ± 0.10 |
| 1.175 G | ± 1.0 | | ± 0.10 |
| 1.5 G | ± 1.0 | | ± 0.10 |
| 1.775 G | ± 1.0 | | ± 0.10 |
| 2 G | ± 1.0 | | ± 0.10 |

RF Output Level Linearity Test (@ Port1)

CW Frequency: 300 kHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 50 MHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 1.5 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

Performance Tests

E5062A Performance Test Record (for Option 175/275)

CW Frequency: 3 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

RF Output Level Linearity Test (@ Port2)(Option 275 only)

CW Frequency: 300 kHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 50 MHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 1.5 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

CW Frequency: 3 GHz (relative to 0 dBm reference)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -5 | ± 0.75 | | ± 0.03 |
| -2.5 | ± 0.75 | | ± 0.03 |
| 2.5 | ± 0.75 | | ± 0.03 |
| 5 | ± 0.75 | | ± 0.03 |
| 7.5 | ± 0.75 | | ± 0.03 |
| 10 | ± 0.75 | | ± 0.03 |

Trace Noise Test

Direction: S21 (Magnitude)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |
| 1.5 G - 3 G | 3 k | ≤ 0.005 | |

Direction: S21 (Phase)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |

Performance Tests

E5062A Performance Test Record (for Option 175/275)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 1 M - 100 M | 3 k | ≤ 0.03 | |
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |
| 1.5 G - 3 G | 3 k | ≤ 0.03 | |

Direction: S12 (Magnitude) (Option 275 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |
| 1.5 G - 3 G | 3 k | ≤ 0.005 | |

Direction: S12 (Phase) (Option 275 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |
| 1 M - 100 M | 3 k | ≤ 0.03 | |
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |
| 1.5 G - 3 G | 3 k | ≤ 0.03 | |

Direction: S11 (Magnitude) (Option 175 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB rms] | Test result [dB rms] |
|----------------------|-------------------|---------------------|----------------------|
| 300 k - 1 M | 3 k | ≤ 0.008 | |
| 1 M - 100 M | 3 k | ≤ 0.005 | |
| 100 M - 1.5 G | 3 k | ≤ 0.005 | |
| 1.5 G - 3 G | 3 k | ≤ 0.005 | |

Direction: S11 (Phase) (Option 175 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 300 k - 1 M | 3 k | ≤ 0.05 | |
| 1 M - 100 M | 3 k | ≤ 0.03 | |

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [deg rms] | Test result [deg rms] |
|----------------------|-------------------|----------------------|-----------------------|
| 100 M - 1.5 G | 3 k | ≤ 0.03 | |
| 1.5 G - 3 G | 3 k | ≤ 0.03 | |

Crosstalk Test

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -110 | |
| 100 M - 1.5 G | 10 | ≤ -110 | |
| 1.5 G - 3 G | 10 | ≤ -110 | |

Direction: S12 (Option 275 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -110 | |
| 100 M - 1.5 G | 10 | ≤ -110 | |
| 1.5 G - 3 G | 10 | ≤ -110 | |

System Dynamic Range Test

For Serial Prefix : JP1KL or MY441

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -115 | |
| 100 M - 1.5 G | 10 | ≤ -115 | |
| 1.5 G - 3 G | 10 | ≤ -115 | |
| 300 k - 100 M | 3 k | ≤ -90 | |
| 100 M - 1.5 G | 3 k | ≤ -90 | |
| 1.5 G - 3 G | 3 k | ≤ -90 | |

Direction: S12 (Option 275 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 100 M | 10 | ≤ -115 | |

Performance Tests

E5062A Performance Test Record (for Option 175/275)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 100 M - 1.5 G | 10 | ≤ -115 | |
| 1.5 G - 3 G | 10 | ≤ -115 | |
| 300 k - 100 M | 3 k | ≤ -90 | |
| 100 M - 1.5 G | 3 k | ≤ -90 | |
| 1.5 G - 3 G | 3 k | ≤ -90 | |

For Serial Prefix : MY442 and above

Direction: S21

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 1 M | 10 | ≤ -115 | |
| 1 M - 100 M | 10 | ≤ -120 | |
| 100 M - 1.5 G | 10 | ≤ -120 | |
| 1.5 G - 3 G | 10 | ≤ -120 | |
| 300 k - 1 M | 3 k | ≤ -90 | |
| 1 M - 100 M | 3 k | ≤ -95 | |
| 100 M - 1.5 G | 3 k | ≤ -95 | |
| 1.5 G - 3 G | 3 k | ≤ -95 | |

Direction: S12 (Option 275 only)

| Frequency range [Hz] | IF bandwidth [Hz] | Test limit [dB] | Test result [dB] |
|----------------------|-------------------|-----------------|------------------|
| 300 k - 1 M | 10 | ≤ -115 | |
| 1 M - 100 M | 10 | ≤ -120 | |
| 100 M - 1.5 G | 10 | ≤ -120 | |
| 1.5 G - 3 G | 10 | ≤ -120 | |
| 300 k - 1 M | 3 k | ≤ -90 | |
| 1 M - 100 M | 3 k | ≤ -95 | |
| 100 M - 1.5 G | 3 k | ≤ -95 | |
| 1.5 G - 3 G | 3 k | ≤ -95 | |

Dynamic Accuracy Test

@ Reference power level: -10 dBm

Direction: S21

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.303 | | ± 0.011 |
| 5 | ± 0.144 | | ± 0.011 |
| 0 | ± 0.090 | | ± 0.011 |
| -5 | ± 0.068 | | ± 0.011 |
| -15 | ± 0.065 | | ± 0.011 |
| -20 | ± 0.073 | | ± 0.011 |
| -25 | ± 0.080 | | ± 0.015 |
| -30 | ± 0.087 | | ± 0.015 |
| -35 | ± 0.095 | | ± 0.019 |
| -40 | ± 0.103 | | ± 0.019 |
| -45 | ± 0.111 | | ± 0.022 |
| -50 | ± 0.121 | | ± 0.022 |
| -55 | ± 0.134 | | ± 0.024 |
| -60 | ± 0.150 | | ± 0.024 |
| -65 | ± 0.174 | | ± 0.026 |
| -70 | ± 0.211 | | ± 0.026 |
| -75 | ± 0.270 | | ± 0.028 |
| -80 | ± 0.371 | | ± 0.028 |
| -85 | ± 0.546 | | ± 0.030 |
| -90 | ± 0.841 | | ± 0.030 |
| -95 | ± 1.334 | | ± 0.032 |
| -100 | ±2.141 | | ± 0.032 |

Direction: S12 (Option 275 only)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| 10 | ± 0.303 | | ± 0.011 |
| 5 | ± 0.144 | | ± 0.011 |
| 0 | ± 0.090 | | ± 0.011 |
| -5 | ± 0.068 | | ± 0.011 |

2. Performance Test

Performance Tests

E5062A Performance Test Record (for Option 175/275)

| Power level [dBm] | Test limit [dB] | Test result [dB] | Measurement uncertainty [dB] |
|-------------------|-----------------|------------------|------------------------------|
| -15 | ± 0.065 | | ± 0.011 |
| -20 | ± 0.073 | | ± 0.011 |
| -25 | ± 0.080 | | ± 0.015 |
| -30 | ± 0.087 | | ± 0.015 |
| -35 | ± 0.095 | | ± 0.019 |
| -40 | ± 0.103 | | ± 0.019 |
| -45 | ± 0.111 | | ± 0.022 |
| -50 | ± 0.121 | | ± 0.022 |
| -55 | ± 0.134 | | ± 0.024 |
| -60 | ± 0.150 | | ± 0.024 |
| -65 | ± 0.174 | | ± 0.026 |
| -70 | ± 0.211 | | ± 0.026 |
| -75 | ± 0.270 | | ± 0.028 |
| -80 | ± 0.371 | | ± 0.028 |
| -85 | ± 0.546 | | ± 0.030 |
| -90 | ± 0.841 | | ± 0.030 |
| -95 | ± 1.334 | | ± 0.032 |
| -100 | ±2.141 | | ± 0.032 |

Uncorrected System Performance Test

@ Correction: Off

S21 or S11

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|--------------------|----------------------|-----------------|------------------|
| Directivity | 300 k - 100 M | ≤ -25 | |
| Directivity | 100 M - 1.5 G | ≤ -25 | |
| Directivity | 1.5 G - 3 G | ≤ -25 | |
| Source match | 300 k - 100 M | ≤ -25 | |
| Source match | 100 M - 1.5 G | ≤ -25 | |
| Source match | 1.5 G - 3 G | ≤ -25 | |

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|---------------------------|-----------------------------|------------------------|-------------------------|
| Load match | 300 k - 100 M | ≤ -15 | |
| Load match | 100 M - 1.5 G | ≤ -15 | |
| Load match | 1.5 G - 3 G | ≤ -15 | |
| Reflection Tracking | 300 k - 100 M | ± 1.0 | |
| Reflection Tracking | 100 M - 1.5 G | ± 1.0 | |
| Reflection Tracking | 1.5 G - 3 G | ± 1.0 | |
| Transmission Tracking | 300 k - 100 M | ± 1.0 | |
| Transmission Tracking | 100 M - 1.5 G | ± 1.0 | |
| Transmission Tracking | 1.5 G - 3 G | ± 1.0 | |

S12 or S22 (Option 275 only)

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|---------------------------|-----------------------------|------------------------|-------------------------|
| Directivity | 300 k - 100 M | ≤ -25 | |
| Directivity | 100 M - 1.5 G | ≤ -25 | |
| Directivity | 1.5 G - 3 G | ≤ -25 | |
| Source match | 300 k - 100 M | ≤ -25 | |
| Source match | 100 M - 1.5 G | ≤ -25 | |
| Source match | 1.5 G - 3 G | ≤ -25 | |
| Load match | 300 k - 100 M | ≤ -15 | |
| Load match | 100 M - 1.5 G | ≤ -15 | |
| Load match | 1.5 G - 3 G | ≤ -15 | |
| Reflection Tracking | 300 k - 100 M | ± 1.0 | |
| Reflection Tracking | 100 M - 1.5 G | ± 1.0 | |
| Reflection Tracking | 1.5 G - 3 G | ± 1.0 | |
| Transmission Tracking | 300 k - 100 M | ± 1.0 | |
| Transmission Tracking | 100 M - 1.5 G | ± 1.0 | |

Performance Tests

E5062A Performance Test Record (for Option 175/275)

| System performance | Frequency range [Hz] | Test limit [dB] | Test result [dB] |
|---------------------------|-----------------------------|------------------------|-------------------------|
| Transmission Tracking | 1.5 G - 3 G | ± 1.0 | |

3 Adjustment

This chapter provides the adjustment information for the E5061A/E5062A to ensure that it is within its specifications. The adjustment must be performed Agilent's qualified service personnel. If you need the adjustment for your E5061A/E5062A, it should be sent to the nearest Agilent Technologies service office.

Safety Considerations

This manual contains NOTES, CAUTIONs, and WARNINGs that must be followed to ensure the safety of the operator and to keep the instrument in a safe and serviceable condition. The adjustment must be performed by Agilent's qualified service personnel.

WARNING

Any interruption of the protective ground conductor (inside or outside the equipment) or disconnection of the protective ground terminal can make the instrument dangerous. Intentional interruption of the protective ground system for any reason is prohibited.

Warm-up for Adjustment

Warm-up the E5061A/E5062A for at least 30 minute before performing any of the following Adjustment procedures to ensure proper results and correct instrument operation.

Required Equipment

Table 1-1 on page 18 lists the equipment required to perform the Adjustment procedures described in this chapter. Use only calibrated test equipment when adjusting the E5061A/E5062A.

Required Adjustment after Replacing Assembly

After replacing the following assembly, the adjustment items described in Table 3-1 must be required. The adjustment must be performed Agilent's qualified service personnel. If you need the adjustment for your E5061A/E5062A, it should be sent to the nearest Agilent Technologies service office.

Table 3-1 Required Adjustment Item after Replacing Assembly

| Replaced Assembly | Adjustment Item | | | | | | |
|---------------------------------------|-----------------|--------------------------------|-----------------------------|-------------------------------|--------------------------------|------------------------------|---|
| | Writing ID | Frequency Reference Adjustment | Synthesizer Gain Adjustment | Local Output Power Adjustment | Source Output Power Adjustment | Receiver IF Range Adjustment | Receiver Ports Characteristics Adjustment |
| Source Board | | | √ | √ | √ | √ | √ |
| Receiver Board | | √ | | √ | √ | √ | √ |
| Hard Disk Drive | | | | | | | |
| Analog Interface Board (PCI DSP Card) | √ | | | | | | |

3. Adjustment

Writing ID

This item writes the serial number and the option structure into the E5061A/E5062A.

Required equipment for the writing ID

None

Frequency Reference Adjustment

The purpose of this procedure is to adjust the 10 MHz frequency reference on the receiver board.

Adjustment

Required Adjustment after Replacing Assembly

Required equipment for frequency reference adjustment

| Description | Recommended Model |
|-----------------------------|-------------------------|
| Frequency Counter | Agilent 53131A Opt. 010 |
| BNC(m)-BNC(m) Cable, 122 cm | Agilent p/n 8120-1840 |

Synthesizer Gain Adjustment

The purpose of this procedure is to adjust the synthesizer gain of the source board.

Required equipment for the synthesizer gain adjustment

| Description | Recommended Model |
|-------------|-------------------|
| None | None |

Local Output Power Adjustment

The purpose of this procedure is to adjust the local output power of the source board.

Required equipment for the local output power adjustment

| Description | Recommended Model |
|-------------|-------------------|
| None | None |

Source Output Power Adjustment

The purpose of this procedure is to adjust the output level from the source board.

Required equipment for the source output power adjustment for opt. 150/250

| Description | Recommended Model |
|--------------|-------------------|
| Power Meter | Agilent E4419B |
| Power Sensor | Agilent 8482A |

Required equipment for the source output power adjustment for opt. 175/275

| Description | Recommended Model |
|------------------|-------------------|
| Power Meter | Agilent E4419B |
| Power Sensor | Agilent 8482A |
| Minimum Loss Pad | Agilent 11852B |

Receiver IF Range Adjustment

The purpose of this procedure is to adjust the IF range of the receiver board.

Required equipment for the receiver IF range adjustment for opt. 150/250

| Description | Recommended Model |
|-----------------|--------------------------------|
| Power Splitter | Agilent p/n 0955-0751 |
| N(m)-N(m) Cable | Agilent N6314A (p/n 8120-8862) |

Required equipment for the receiver IF range adjustment for opt. 175/275

| Description | Recommended Model |
|-----------------------------|-----------------------|
| Power Splitter 75 Ω | Agilent p/n 0955-0752 |
| N(m)-N(m) Cable 75 Ω | Agilent p/n 8120-8898 |

Receiver Ports Characteristics Adjustment

The purpose of this procedure is to adjust source match, directivity and tracking.

Adjustment

Required Adjustment after Replacing Assembly

Required equipment for the receiver port characteristics adjustment for opt. 150/250

| Description | Recommended Model |
|--------------------|--------------------------------|
| Calibration Kit | Agilent 85032F |
| N(m)-N(m) Cable | Agilent N6314A (p/n 8120-8862) |

Required equipment for the receiver port characteristics adjustment for opt. 175/275

| Description | Recommended Model |
|-----------------------------|--------------------------|
| Calibration Kit 75 Ω | Agilent 85036B |
| N(m)-N(m) Cable 75 Ω | Agilent p/n 8120-8898 |

4 Troubleshooting

This chapter provides the procedure to isolate a faulty assembly in the E5061A/E5062A.

Introduction

WARNING These servicing instructions are for use by qualified personnel only. To avoid possible electrical shock, do not perform any servicing unless you are qualified to do so.

WARNING The opening of covers or removal of parts is likely to expose dangerous voltages. Disconnect the instrument from its power supply beforehand.

CAUTION Many of the assemblies in the instrument are very susceptible to damage from ESD (electrostatic discharge). Perform the following procedures only at a static-safe workstation and wear a grounding strap.

CAUTION DO NOT operate without following instructions. Programs or files in the instrument may be broken.

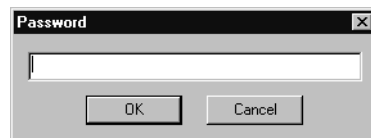
How to exit from the E5061A/E5062A Measurement View

You need to exit from the E5061A/E5062A Measurement View to perform some troubleshooting. The following is the procedure to exit from the E5061A/E5062A Measurement View.

- Step 1.** Connect the mouse and external keyboard to the connectors on the E5061A/E5062A rear panel.
- Step 2.** Turn the instrument on.
- Step 3.** Press **System** key.
- Step 4.** Click **Service Menu - Service Function**. Password dialog box opens as shown in Figure 4-1.

Figure 4-1

Password dialog box



- Step 5.** Enter the password **kid** in the Password box and then click "OK" button.
- Step 6.** Click **Exit** in Service Functions Menu. Then the E5061A/E5062A exit the Measurement View, then windows desktop screen appears with 4 icons (My Computer, Recycle Bin, My Network Places, and Network Analyzer.)

NOTE If you wish to return to the Measurement View, double-click "Network Analyzer" icon.

NOTE If you need to shut down the E5061A/E5062A and again turn on, perform in accordance with the following procedure.

- a. To get "Start" menu bar displayed, move the pointer to the bottom of the screen with mouse.
- b. Click "Start" and "Shut Down..." in the pull down menu. "Shut Down Windows" dialog box opens.
- c. Select "Shut down" button in the pull down menu.
- d. Click "OK" button in the dialog box.

To Troubleshoot the Instrument

This section describes basic procedural flow of troubleshooting when servicing the E5061A/E5062A. The primary procedural tool in this section is the flowchart. The flowchart contains entire troubleshooting path from a failure symptom to the isolation of faulty assembly, and will direct you to the completion of repair in an ordinary manner through the possible failure symptoms. Reference letters (Yes/No) on the flowcharts point to procedural steps that briefly explain the troubleshooting method to be performed next.

Primary Trouble Isolation

The primary trouble isolation procedure can be performed without disassembling the E5061A/E5062A. Figure 4-2 shows the trouble isolation flow chart.

Step 1. Turn the instrument power on

About a few minutes after the E5061A/E5062A is turned on, the measurement view is displayed on the screen. The display on the screen should be similar to Figure 4-9, “Measurement view,” on page 99.

Step 2. Check the display

- If no display appears on the LCD after the E5061A/E5062A is turned on, go to “No Display troubleshooting” on page 92.
- If the E5061A/E5062A stops in booting process despite something being displayed on the LCD, go to “Booting Process Troubleshooting” on page 95.
- The power-on self test is performed once automatically after the E5061A/E5062A measurement view is displayed. If the power-on self test fails, go to “Troubleshooting Using Diagnostic Test” on page 100.

Step 3. Check the basic function

If the front-panel/keyboard/mouse controls, LCD display, data storage, remote interface or another function (except for measurement part) does not work correctly, go to “Function Specific Troubleshooting” on page 106.

Step 4. Check the measurement function

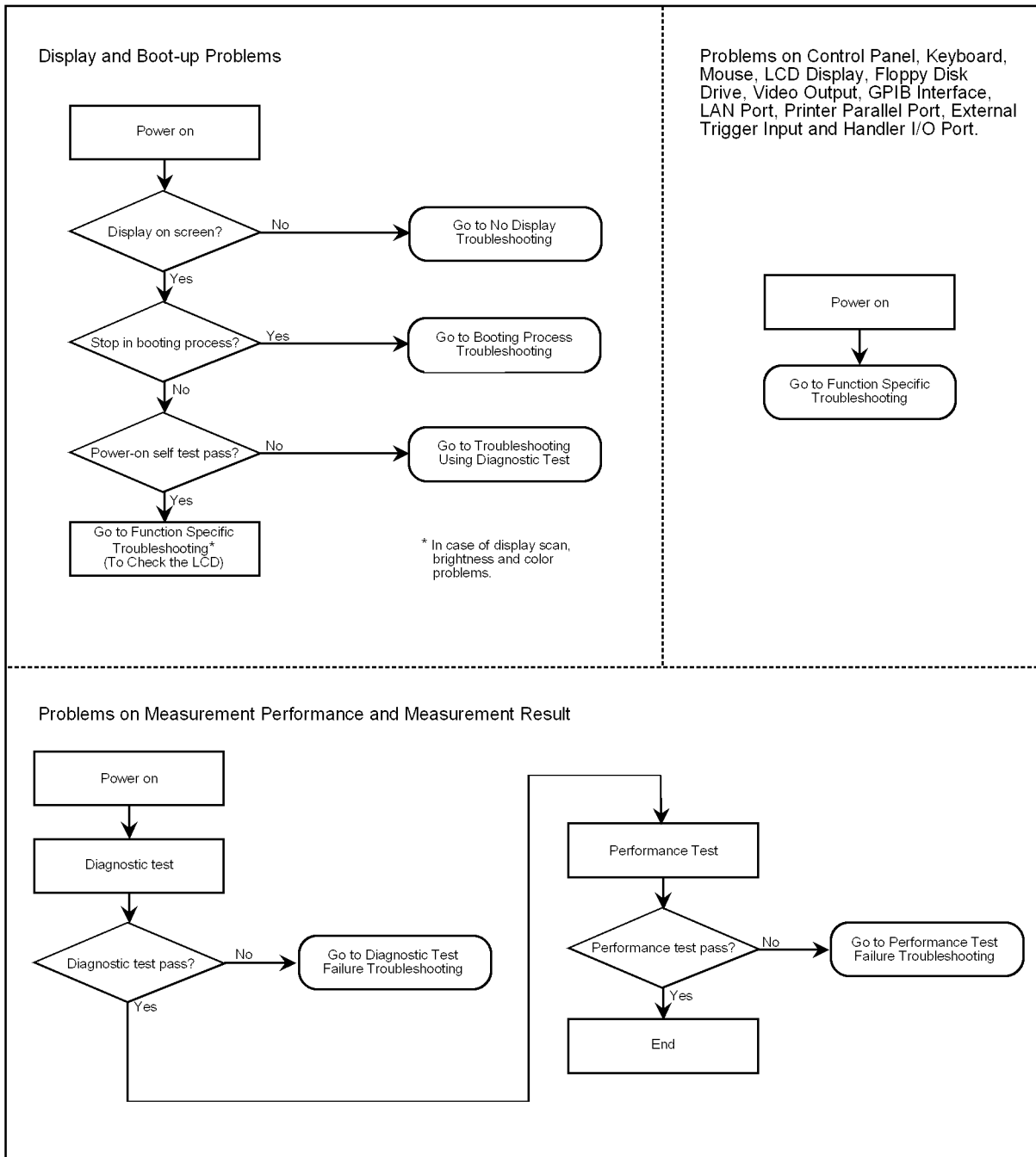
If the instrument fails performance tests, go to “Performance test failure troubleshooting” on page 118.

If the measurement function does not work correctly, perform the diagnostic test provided in the E5061A/E5062A's service function. When the diagnostic test fails, go to “Diagnostic Test Failure Troubleshooting” on page 104.

NOTE

The diagnostic test includes some unique measurement function tests in addition to the tests that are common to the power-on self test. Thus, it is necessary to perform the diagnostic test even if the power-on self test passed.

Figure 4-2 Primary trouble isolation flowchart



e5061ase033

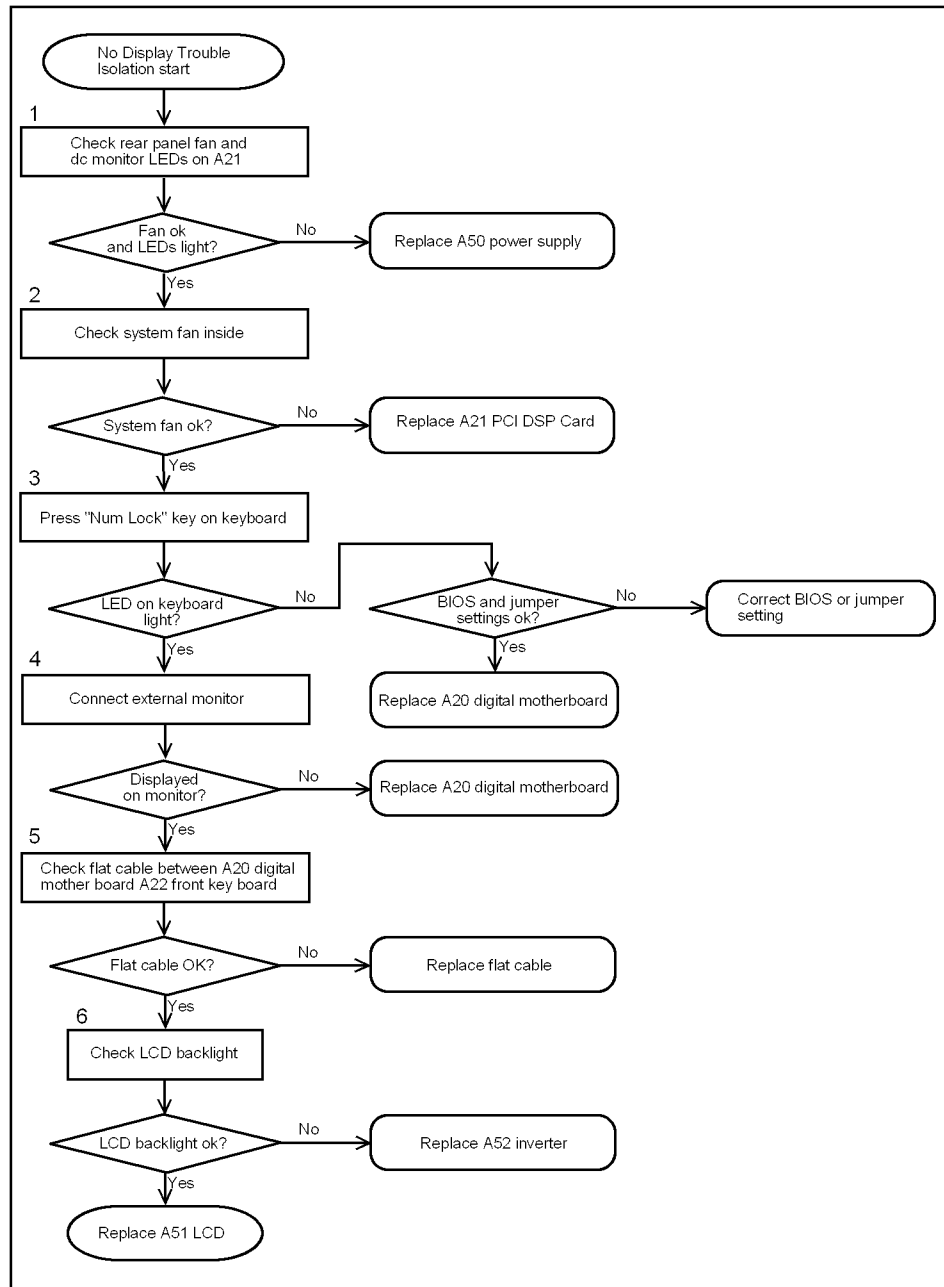
No Display troubleshooting

If the E5061A/E5062A displays nothing despite it is powered from proper ac power line, isolate the failure in accordance with the procedure shown in Figure 4-3.

Connect the keyboard to the E5061A/E5062A rear panel connector, turn the power on and start trouble isolation. The methods of trouble isolation are described in the procedural step 1 to 6.

Figure 4-3

No display trouble isolation procedure



e5061ase034

Step 1. Check fan operation and DC monitor LED

If the rear panel fan (blower) doesn't run, a failure in A50 ATX power supply is assumed. Remove the E5061A/E5062A outer cover and check if the following LEDs light:

- +3.3 V and +5 V dc monitor LEDs on A21 PCI DSP card

NOTE

To check all the outputs of the A50, measure the dc voltages at the output lead connectors with a DMM. The dc output voltages and lead color information is provided in the module cover label of the A50.

Step 2. Check system fan inside.

If the system fan on the chassis inside the E5061A/E5062A don't run, problem seems in the A21 PCI DSP card or the flat cable between the A21 and the A22 front panel keyboard. In this case, remove the E5061A/E5062A outer cover and make sure whether the fan run or not.

If a beep and a power shutdown occur immediately after power is turned on, there is a possibility that the fan won't run. The power shutdown occurs the moment the system fan stops by any anomaly. In this case, check the fan that doesn't run.

If the power shutdown occurs without a beep, the problem seems in the A21 or the A20 digital motherboard.

NOTE

Before replacing the board, check if the jumper setting on the A20 is correct as described in "Configure the Motherboard" on page 120.

Step 3. Check LED of "Num Lock" key

Press "Num Lock" key on the keyboard. If the LED in the key doesn't light as shown in Figure 4-4, a problem seems in the A20 digital motherboard.

Figure 4-4

LED of the Num Lock key



e5061ase048

Make sure the following before replacing the A20.

- Whether all the connections to the A20 are normal or not. Check if there is any disconnection or connection working loose.
- Whether the jumper setting on the A20 is correct or not as described in "Configure the Motherboard" on page 120.

Troubleshooting

No Display troubleshooting

- Whether BIOS options are correct or not as described in “To Confirm or Set the BIOS Options” on page 121.

Step 4. Checking with the external monitor

Connect an external VGA monitor to the VIDEO output on the E5061A/E5062A rear panel.

- If something is displayed on the external monitor, the problem is present around the LCD. Also check the A21 and A22 because the ON/OFF setting of the LCD backlight is controlled by the A21 through the A22.
- If nothing is displayed even on the external monitor, the problem seems in the A20 digital motherboard.

Step 5. Checking flat cable

Check a flat cable between the A20 and A22.

Step 6. Check around the backlight

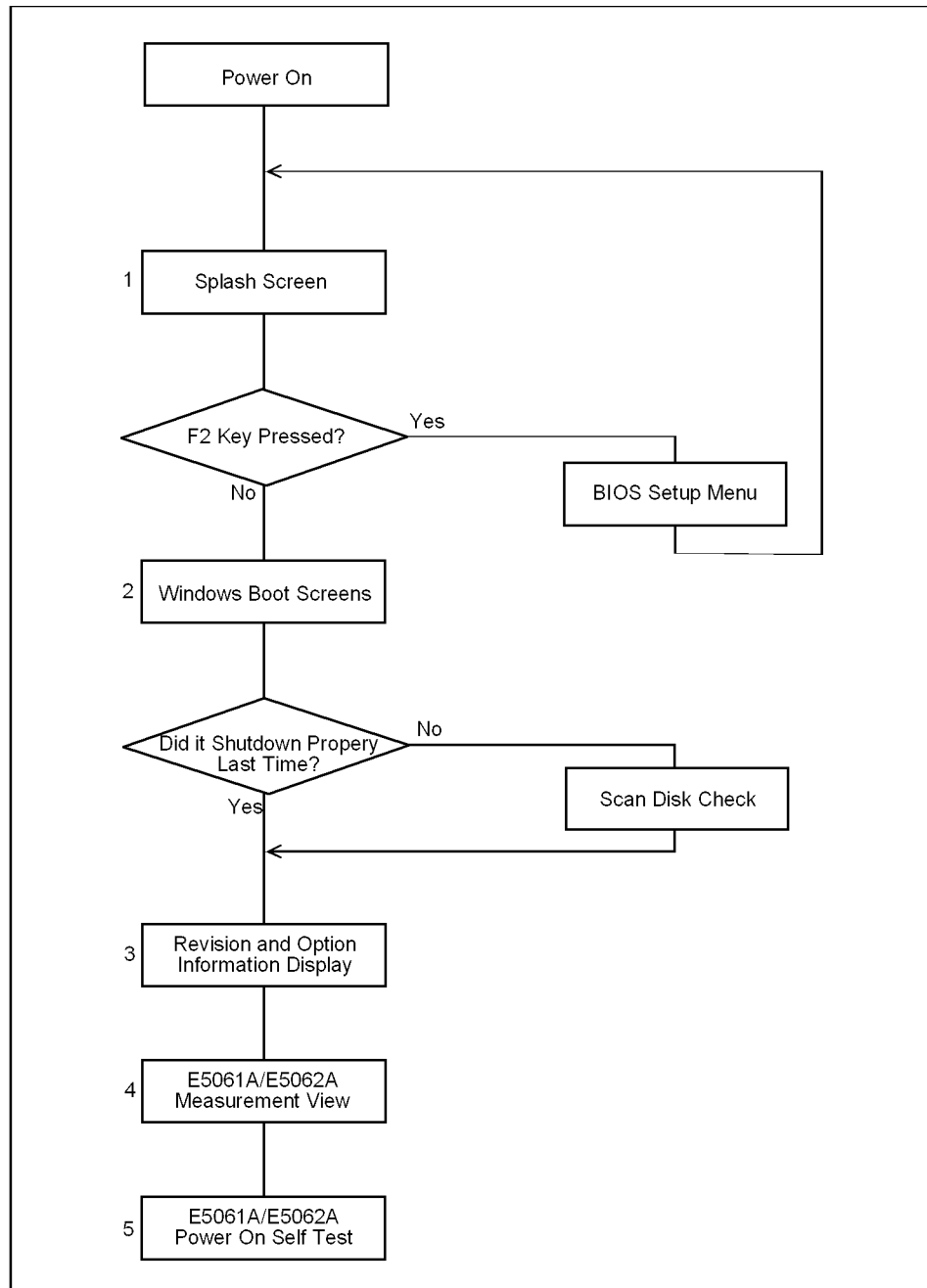
Check A52 inverter board and a cable between the A52 and A22. Also check the cables between the A51 LCD and A52. If the cables are normal, check the A51 LCD.

Booting Process Troubleshooting

Figure 4-5 represents the booting process flow in the E5061A/E5062A. If the E5061A/E5062A stops in the booting process, troubleshoot using the following step-by-step procedure.

Figure 4-5

Booting process flowchart



e5061ase047

Step 1. Splash Screen

The splash screen is displayed with Agilent logo as shown in Figure 4-6.

If the splash screen is displayed, you can assume that the A20 digital motherboard is functioning correctly.

NOTE

While the splash screen is displayed, if you want to run the BIOS setup utility, push F2 key as soon as in the screen.

Figure 4-6

Splash Screen

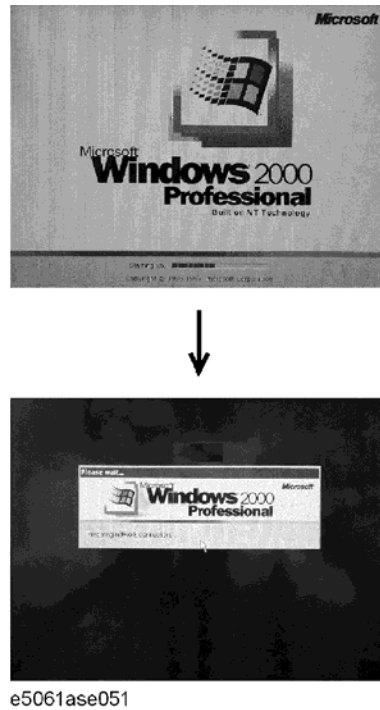


Step 2. Windows boot screens

The Windows boot screens are displayed. The Windows boot screens consists of two screens. Each screen is displayed in the order as shown in Figure 4-7. If the Windows boot screens are displayed, it is assumed that the A27 HDD works. While the Window screens are displayed, Windows operating system is starting up.

Figure 4-7

Windows boot screens



If you encounter the following problems, try to reinstall the operating system before replacing the A27.

- "xxx file is missing" is displayed on DOS screen.
- The Window boot screen is not displayed after the splash screen is displayed.
- Windows always boots up with Safe Mode.

NOTE

If the E5061A/E5062A was turned off without shutdown process, Microsoft Scandisk runs while the windows boot screens are displayed. If a serious problem is found in the scandisk, reinstall the operating system. For details of the operating system installation, refer to Appendix B, "System Recovery," on page 203. If the operating system still doesn't boot up properly after reinstallation, replace the A27.

NOTE

The operating system automatically checks the device drivers, which are necessary to use the E5061A/E5062A functions and are installed in the system before the E5061A/E5062A is shipped from Agilent factory. If the operating system doesn't detect them, a message box is displayed. In this case, install the device driver.

Step 3. Revision and option information

The firmware revision and hardware option information along with copyright declaration is displayed as shown in Figure 4-8. The E5061A/E5062A firmware quickly starts up just before this display appears. While the revision and option information is displayed, the applications of various devices in the system are initialized.

Figure 4-8

Firmware revision and option information



e5061ase050

If the display whited out, entirely blued or appeared with a dialog box, a mass storage problem is suspected. Try to perform the mass storage recovery procedure.

NOTE

If a message of "Will Shut Down in Five Seconds" is displayed in place of "Initializing.." and the shutdown occurs, the A21 board fails in starting up. The following message may be displayed before the shutdown occurs:

"Fatal Error: Failed to Initialize DSP Driver":

or "Fatal Error: Failed to Initialize DSP":

This message indicates that the A21 board doesn't work or is not properly connected to the A20.

"Fatal Error: Failed to Update DSP Code":

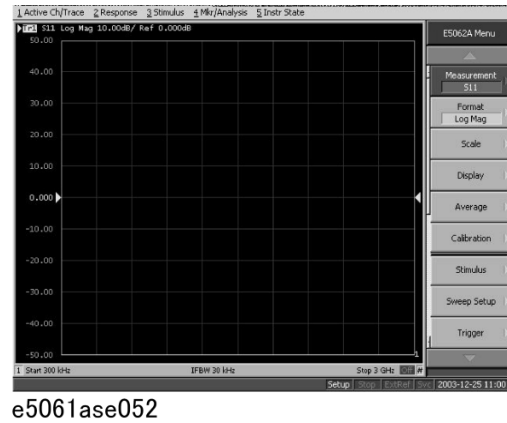
If this happened, the A21 board failed in writing DSP program into flash ROM when the firmware was installed first or updated to the newest version. A problem in the A21 or A20 is suspected.

Step 4. Measurement view

The measurement view as shown in Figure 4-9 is displayed after the system initialization is completed without problem.

Figure 4-9

Measurement view



Step 5. Power-on self test

The power-on self test is executed once automatically before the measurement starts. While the power-on self test is in progress, "Power on test" is displayed at the left in the instrument status bar. If the power-on test fails, an error message is displayed there. For more details, refer to "Troubleshooting Using Diagnostic Test" on page 100.

Troubleshooting Using Diagnostic Test

The Agilent E5061A/E5062A has an diagnostic test function to diagnose the analog measurement section and internal dc power supply voltages. The diagnostic test makes it possible to isolate a faulty board assembly. The following paragraphs describe the procedure to perform the diagnostic test.

Power On Self Test

Power-on self-test always takes place once the E5061A/E5062A is turned on. When a failure is detected, a message "Power on self test failed" is displayed. The content of the power-on self-test is the same as a part of the diagnostic test program and includes the dc power supply voltage, source PLL synthesizer and level controller (ALC) tests. When the self-test failed, perform the diagnostic test to break down into the individual tests and narrow down failure possibilities.

NOTE

The following procedure can be used to restart the power-on self test as required.

- a. Press **System** key.
- b. Click **Service Menu** and, then, **Test Menu** in the softkeys.
- c. Click **Power On Test** to restart the test. Wait until the power-on test ends.
- d. The test result (OK or Failed) is displayed in the **Power On Test** key.

PLL unlock

When a PLL of the frequency synthesizers is unlocked, not the "Power on self test failed" but "Phase lock loop unlocked" message is displayed. If it occurs, A1 Source board may be faulty.

Contents of the diagnostic test

The diagnostic test contains 10 test groups shown in Table 4-1. Each test group can be performed independently and verifies one of various operating characteristics of the analog measurement section.

Table 4-1 Diagnostic test group menu

| | |
|---|--|
| 1 | A1 Board DC-BUS Test |
| 2 | A2 Board DC-BUS Test |
| 3 | A1 Board Internal Level Monitor Test |
| 4 | A2 Board Internal Level Monitor Test |
| 5 | Source Power Accuracy (Step Attenuator) Test |
| 6 | Source Power linearity (Power sweep) Test |
| 7 | Receiver Absolute Gain Test |

Table 4-1 Diagnostic test group menu

| | |
|----|---------------------------|
| 8 | Receiver Compression Test |
| 9 | Receiver IF Ranging Test |
| 10 | Handler I/O Test |

Test equipment required for diagnostic test

Table 4-2 shows the equipment required for performing the diagnostic test.

Table 4-2 Required equipment

| Required test equipment | Qty | Recommended model |
|---|-----|------------------------------------|
| Coaxial cable with N type (m) connectors, 61 cm (24 in) | 1 | N6314A, 8120-8898(for 75 Ω) |
| Calibration kit | 1 | 85032B/F, 85036B(for 75 Ω) |
| Type-N coaxial Short termination | 2 | part of 85032B/F, 85036B(for 75 Ω) |
| Power splitter | 1 | 0955-0751, 0955-0752(for 75 Ω) |
| Handler I/O test kit | 1 | E5070-65001 |

To Execute the Diagnostic Test

To isolate faulty board assembly in analog section, execute the diagnostic test in accordance with the following procedure. The test procedure needs to be performed using a mouse and an external keyboard in addition to the front panel keys.

NOTE To perform the diagnostic test properly, the following conditions must be met:

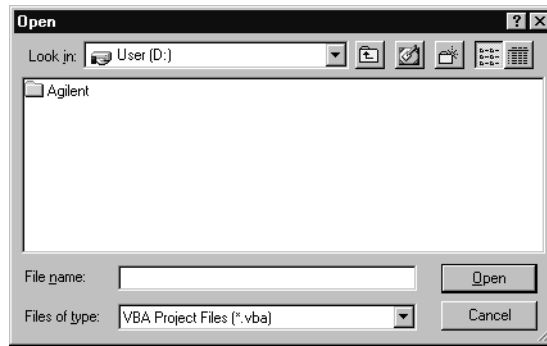
1. Environmental temperature: 23°C ± 5°C

NOTE Do not operate front panel keys, keyboard and mouse during the diagnostic test. Changing the instrument settings while the diagnostic test is in progress will cause incorrect test results.

- Step 1.** Connect a mouse and an external keyboard to the E5061A/E5062A's rear panel connector.
- Step 2.** Press Macro Setup key.
- Step 3.** Press **Load Project** to select **Load Project** function."Open" dialog box will be displayed as shown in Figure 4-10.

Figure 4-10

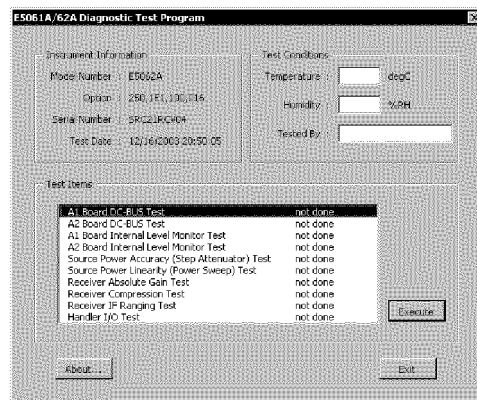
Open dialog box



- Step 4.** Select "User [D]" (preset state) from menu in the "Look in:" box.
- Step 5.** Double-click "Agilent" folder to open it and to access its menu.
- Step 6.** Double-click "Service" folder to open it.
- Step 7.** Click "DiagnosticTest. VBA" program file to select it from program menu.
- Step 8.** Click "Open" button to download the diagnostic test program.
- Step 9.** Press **Select Macro** to select **Select Macro** function.
- Step 10.** Press **Module1 main** to open the **Module1 main** program file. "Diagnostic Test Program" dialog box (Main Menu) will appear as shown in Figure 4-11.

Figure 4-11

Diagnostic Test dialog box



e5061ase042

- Step 11.** To exit the diagnostic test, click "Exit" button.

Program Overall

Instrument Information

The option and serial number for the E5061A/E5062A, and test date can be entered automatically.

Test Conditions

The test conditions, "Temperature", "Humidity" and person doing the test ("Tested by") can be entered.

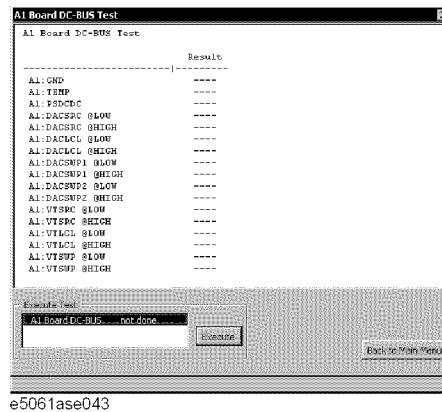
Test Items

The following test can be selected. To execute the test you select, click “Execute” button.

- A1 Board DC-BUS Test
- A2 Board DC-BUS Test
- A1 Board Internal Level Monitor Test
- A2 Board Internal Level Monitor Test
- Source Power Accuracy (Step Attenuator) Test
- Source Power Linearity (Power sweep) Test
- Receiver Absolute Gain Test
- Receiver Compression Test
- Receiver IF Range Test
- Handler I/O Test

When each test is executed, the test dialog box is displayed. The following screen is an example of the test dialog box.

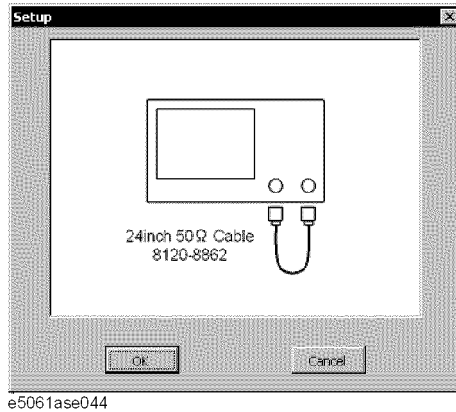
Figure 4-12 Test dialog box



To execute the test, click “Execute” button. To return the E5061A/E5062A Diagnostic test program dialog box (Main Menu), click “Back to Main Menu”.

The test program will prompt you to connect cables or Short termination to the E5061A/E5062A. Follow the instructions as shown below on the E5061A/E5062A display for performing the test.

Figure 4-13 Setup dialog box



The test result file named “resultDT.txt” is created on the drive D (D:\Agilent\Service\Log\) of the E5061A/E5062A after “Exit” button of the Main Menu is pressed. The text file can be read and edited with a PC.

Diagnostic Test Failure Troubleshooting

Table 4-3 represents the contents of the diagnostic tests and the relationships of failed tests to probable faulty board assemblies. If the instrument fails the diagnostic test, replace the faulty board assembly as shown in Table 4-3.

Table 4-3

Diagnostic tests failure troubleshooting information

| Test No. | Test group | Probable faulty board assembly | | | |
|----------|--|--------------------------------|-------------|-------------|------------------|
| | | A1 Source | A2 Receiver | A25 Handler | Correc. Constant |
| 1 | A1 Board DC-BUS Test | ### | # | | |
| 2 | A2 Board DC-BUS Test | | ### | | |
| 3 | A1 Board Internal Level Monitor Test | ### | # | | # |
| 4 | A2 Board Internal Level Monitor Test | ## | ## | | # |
| 5 | Source Power Accuracy (step Attenuator) Test | ### | # | | # |
| 6 | Source Power Linearity (power Sweep) Test | ### | # | | |
| 7 | Receiver Absolute Gain Test | ## | ### | | # |

Table 4-3 Diagnostic tests failure troubleshooting information

| Test No. | Test group | Probable faulty board assembly | | | |
|----------|---------------------------|--------------------------------|-------------|-------------|------------------|
| | | A1 Source | A2 Receiver | A25 Handler | Correc. Constant |
| 8 | Receiver Compression Test | # | ### | | # |
| 9 | Receiver IF Ranging Test | # | ### | | ### |
| 10 | Handler I/O Test | | | ### | |

###: Most suspicious assembly

##: Suspicious assembly

#: Possible faulty assembly

NOTE

Diagnostic tests 1 and 2 are common to the power on self test.

Function Specific Troubleshooting

If the E5061A/E5062A exhibits a failure symptom that is related to a specific function or control such as a front panel key control, display, data storage, remote control interface, printer interface, external trigger, external keyboard or mouse, isolate the trouble using the Function Specific Troubleshooting procedures described below. The major functions of the E5061A/E5062A and the troubleshooting procedure for each function are shown in Table 4-4.

Table 4-4 Major functions and troubleshooting procedures

| Function | Description | Troubleshooting |
|------------------------|--|--|
| Front panel keys | All the E5061A/E5062A functions except for VBA and service functions can be set and controlled via the front panel keys. | Refer to “To Check the Front Panel” on page 109. |
| Touch panel | The E5061A/E5062A equipped with option 016 has a touch screen display that allows all the functions in the menu bars, setup windows and dialog boxes to be set by a touch to the screen panel. | Refer to “To Check the Touch Panel (Option 016 only)” on page 110. |
| LCD display | Almost all the information including the measurement value, setup state, result data processing, menu bar, softkey label and others are indicated on the 10.4-inch color LCD display. | Refer to “To Check the LCD” on page 110. |
| External keyboard | The external keyboard can be used for the entry of numerical and character data when it is connected to the keyboard interface connector (PS-2) on the rear panel. | Refer to “To Check the External Keyboard” on page 111. |
| Mouse | The mouse can be used to move the pointer on the LCD display, select a function and change a setting, when it is connected to the mouse interface connector (PS-2) on the rear panel. | Refer to “To Check the Mouse” on page 111. |
| Floppy disk drive | The 3.5-inch floppy disk drive on the front panel is used to save the E5061A/E5062A setup state and measurement data in a 3.5-inch, 1.4 MB floppy disk in MS-DOS compatible format. | Refer to “To Check the FDD” on page 111. |
| Video output | An external color monitor can be used to display the same information as the E5061A/E5062A LCD display, when it is connected to the Video output connector (24-pin D-Sub) on the rear panel. | Refer to “To Check the Video output” on page 112. |
| External trigger input | The external trigger input terminal (BNC) on the rear panel allows an external trigger source to be used for measurement trigger. | Refer to “To Check the External Trigger Input” on page 112. |

Table 4-4 Major functions and troubleshooting procedures

| Function | Description | Troubleshooting |
|-----------------------|--|--|
| LAN port | The LAN interface port on the rear panel allows the E5061A/E5062A to be connected to 10/100 Base-T Ethernet. | Refer to “To Check the LAN” on page 112. |
| Printer parallel port | A specified printer can be used to print the E5061A/E5062A measurement display, setup display and others, when it is connected to the Printer port (36-pin D-Sub) on the rear panel. | Refer to “To Check the Printer Parallel Port” on page 116. |
| GPIB Interface | The GPIB compatibility allows the E5061A/E5062A to be operated as a talker/listener on IEEE 488 interface bus. | Refer to “To Check the GPIB” on page 116. |
| Handler I/O port | The Handler I/O port can be used to transfer a comparator decision output data to and perform timing synchronization with an external handler. | Refer to in “To Execute the Diagnostic Test” on page 101 . |

To Check the Device Driver

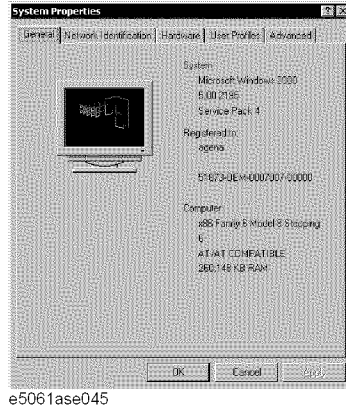
Make sure first whether the E5061A/E5062A device drivers are installed properly or not by the following procedure, if a function of specific device in the E5061A/E5062A doesn't work.

- Step 1.** Exit from the E5061A/E5062A measurement view in accordance with the procedure described in “How to exit from the E5061A/E5062A Measurement View” on page 89. Then, Windows desktop screen is displayed.
- Step 2.** Click "My Computer" with the right button and select "Properties" as shown in Figure 4-14. Then, the System Properties(Figure 4-15) will appear.

Figure 4-14 Opening System Property Window

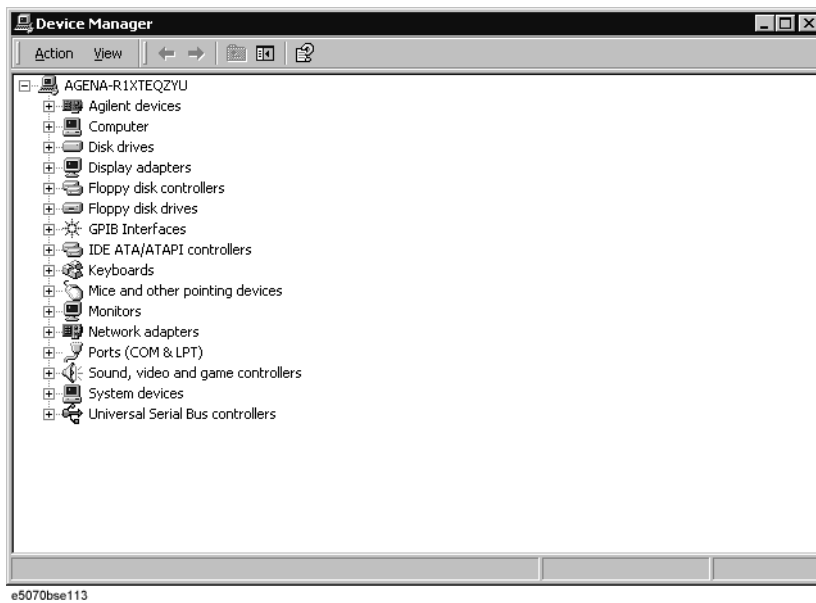


Figure 4-15 System Properties Window (General)



Step 3. Click Hardware tab and Device Manager button. The operating system detects all the necessary device drivers and displays the device names as shown in Figure 4-16.

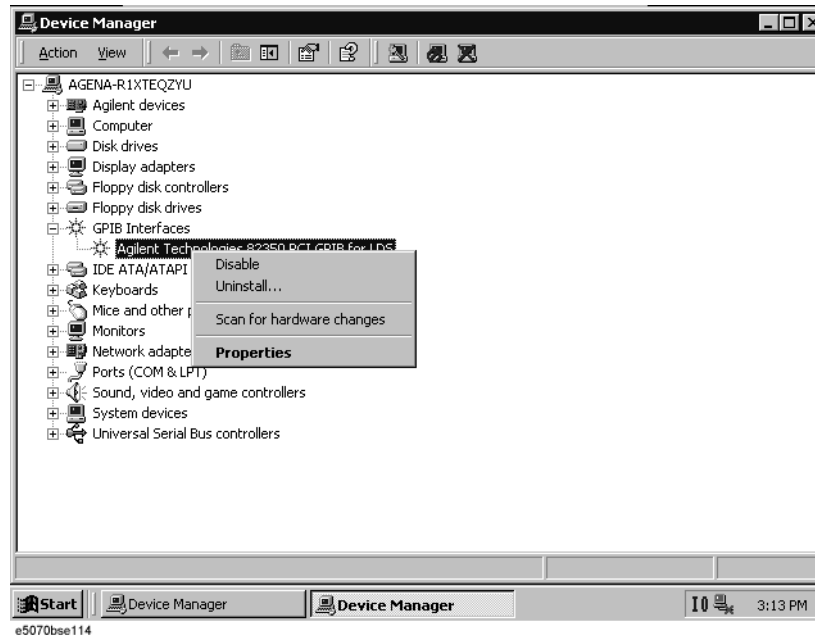
Figure 4-16 System Properties Window (Hardware)



Click the icon with the right button and click Property to show the detail of the status. as shown in Figure 4-17.

Figure 4-17

Opening Device Driver Property



To Check the Front Panel

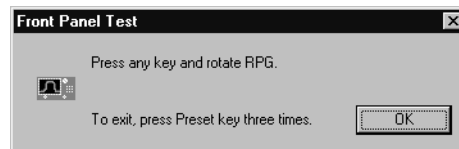
Procedure

Randomly press the front panel keys and rotate the knob to verify that they work normally.

- Step 1.** Press **System** key.
- Step 2.** Click **Service Menu** and, then, **Test Menu** in the softkeys.
- Step 3.** Click **Front Panel** in the test menu. This opens "Front Panel Test" dialog box as shown in Figure 4-18.

Figure 4-18

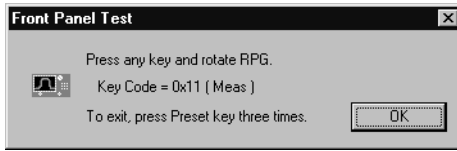
Front Panel Test dialog box



- Step 4.** Randomly press the front panel keys. The key code along with the name of the pressed key are displayed in the dialog box as shown in Figure 4-19. Turn the rotary knob clockwise or counterclockwise. The dialog box indicates the direction of the turned knob and a count of RPG output.

Figure 4-19

Key code and key name display example



Step 5. To exit the front panel test, press **Preset** key three times.

- If multiple keys fail to work, a problem in A22 front panel keyboard or A21 PCI DSP card is suspected. Also check the flat cable between the A21 and A22.
- If only a specific key doesn't work, check first if the key is subsided in the panel.
- If the rotary knob doesn't work, check the A22 board involving the RPG.

To Check the Touch Panel (Option 016 only)

Procedure

By touching the LCD display panel, select or change the setting of a function in the softkey menu and, then, perform the same operation with hardkeys.

- If the touch panel doesn't work correctly whereas the hardkeys function normally, a failure seems in the touch screen controller assembly (5183-4184) or touch-panel LCD assembly (E5070-60102). (The touch panel is not replaceable independently of the LCD.)
- Check the cable between the touch screen controller and the serial interface connector on the A20 digital motherboard.
- If no problem is found in the above checks, a failure in the A20 digital motherboard is suspected.

To Check the LCD

Procedure

Step 1. Press **System** key.

Step 2. Click **Service Menu** and, then, **Test Menu** in the softkeys menu.

Step 3. Click **Display** in the test menu. The whole of the LCD screen turns Red, Green, Blue, White and Black every 2 seconds and returns to the measurement view. If the color test screen doesn't appear correctly, perform step 4.

Step 4. Connect an external VGA monitor to the VIDEO output port on the E5061A/E5062A rear panel.

- If the monitor screen view is the same as the LCD display, the problem seems in the A20 board.
- If only the LCD display has a problem, check the flat cable between the A22 front panel keyboard and A31 LCD connector.
- If the LCD is not illuminated with backlight, check A52 inverter board and the cable

between the A52 and A22. Also check the cables between the A51 LCD and A52.

- If the cables are normal, check the A51 LCD.

To Check the External Keyboard

Procedure

- Step 1.** Connect the external keyboard to the E5061A/E5062A rear panel connector.
- Step 2.** Turn the instrument on.
- Step 3.** Press **Meas** key.
- Step 4.** Press **↑** and **↓** keys on the external keyboard, and verify that the cursor on the menu bar moves up and down. If it doesn't work, the external keyboard or the A20 digital motherboard may be faulty.

To Check the Mouse

Procedure

- Step 1.** Connect the mouse to the E5061A/E5062A rear panel connector.
- Step 2.** Turn the instrument on.
- Step 3.** Move the mouse and verify that the mouse pointer moves smoothly. If it doesn't move smoothly, check first whether a foreign substance (dust, lint, etc.) is in the track ball hole of the mouse or not.
- Step 4.** Verify that the mouse buttons work normally. If any button doesn't work or the mouse pointer doesn't move, a failure in the mouse or the A20 digital motherboard is suspected.

To Check the FDD

Procedure

- Step 1.** Connect the external keyboard to the E5061A/E5062A rear panel connector.
- Step 2.** Turn the instrument on.
- Step 3.** Insert a 1.44 MB floppy disk, formatted in DOS format, into the FDD slot.
- Step 4.** Press **Save/Recall** key, and click **Save State** in the menu bar.
- Step 5.** Click **File Dialog...** to open the "Save As" dialog box.
- Step 6.** Select 3 1/2 Floppy [A:] from "Save in" pull-down menu.
- Step 7.** Enter **e5061a** in the file name box from the keyboard.
- Step 8.** Click "Save" button.
- Step 9.** Press **Save/Recall** key, and click **Recall State** in the menu bar.
- Step 10.** Click **File Dialog...** to open the "Open" dialog box.

Troubleshooting

Function Specific Troubleshooting

- Step 11.** Select 3 1/2 Floppy [A:] from "Look in" pull-down menu.
- Step 12.** Select e5070b file from the file menu or enter **e5061a** in the file name box.
- Step 13.** Click "Open" button.

If the file save or recall operation fails, a failure in the A28 FDD or the flat cable between the A28 and A20 digital motherboard is suspected.

To Check the Video output

Procedure

- Step 1.** Connect an external VGA color monitor to the Video output port on the E5061A/E5062A rear panel.
- Step 2.** Turn the external monitor on.
- Step 3.** Verify that the monitor screen view is the same as the display on the LCD. If the monitor screen view is abnormal, a failure seems in the A20 digital motherboard.

To Check the External Trigger Input

Procedure

- Step 1.** Press **[Preset]** key to initialize the E5061A/E5062A.
- Step 2.** Press **[Trigger]** key.
- Step 3.** Click **Trigger Source** and, then, **External** in the menu bar to set the trigger mode to "External".
- Step 4.** Connect a BNC Short or 50 Ω termination to the Ext Trig connector on the rear panel and disconnect it. Thereby a measurement trigger should be generated and a measurement result (trace) should be refreshed.
- Step 5.** If no trigger occurs, a failure in the A21 PCI DSP card is suspected.

To Check the LAN

Procedure

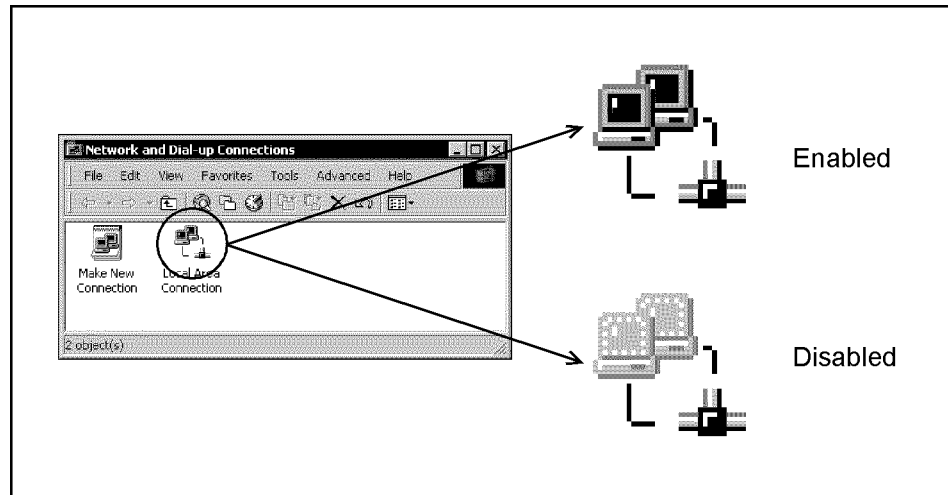
- Step 1.** Connect a LAN cable between the LAN port on the rear panel and an external computer (PC).

NOTE

Use a crossed LAN cable to enable the peer-to-peer communication between the E5061A/E5062A and the PC. If the E5061A/E5062A needs to be connected to the PC via a multi port Hub, use a straight LAN cable.

- Step 2.** Press **[System]** key.
- Step 3.** Click - **Misc Setup - Network Setup - Network Configuration** in the softkey menu to show the Network and Dial-up Connections window as shown in the left of Figure 4-20.

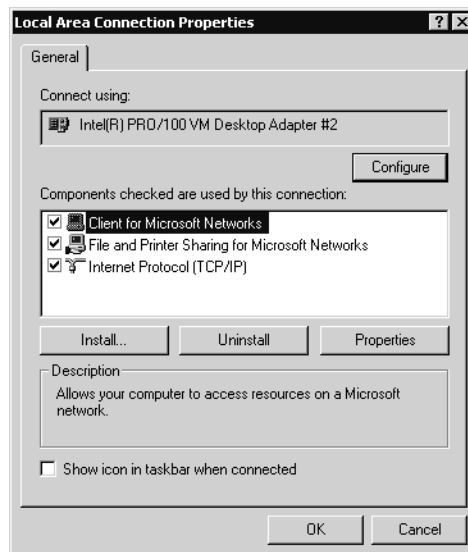
Figure 4-20 Network and Dial-up Connections window



e5070bse117

- Step 4.** Check the Local Area Connection icon to confirm whether the network connection is enabled or disabled. The meaning of the icon is shown in the right of Figure 4-20. If the connection is disabled, Double-click the Local Area Connection icon.
- Step 5.** Set up the IP address/subnet mask as follows.
- a. Click the Local Area Connection icon with the right button and click "Properties". This opens the "Local Area Connection Properties" dialog box as shown in Figure 4-21.

Figure 4-21 Network dialog box

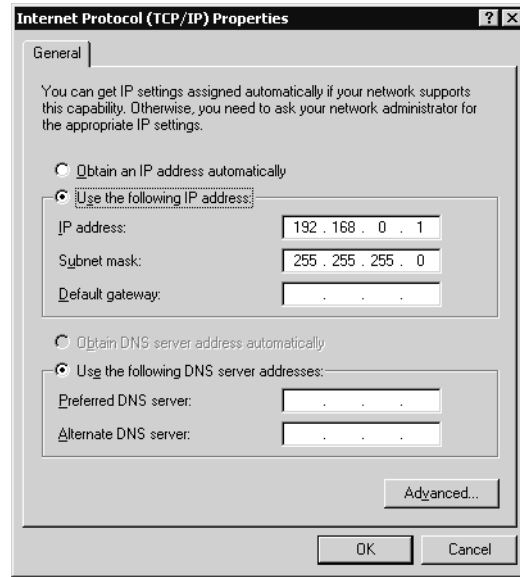


e5070bse115

- b. Click "Internal Protocol (TCP/IP)" icon.
- c. Click the "Properties" button. This opens the "TCP/IP Properties" dialog box as shown in Figure 4-22.

Figure 4-22

TCP/IP Properties dialog box (IP Address tab)



- d. If the IP Address and the Subnet Mask are already assigned, go to Step 6. If they are not assigned yet, enter them as follows:

IP Address 192.168.0.1
Subnet Mask 255.255.255.0
Default Gateway blank

To enter a specific IP Address and Subnet Mask, click "Use the following IP address" option button to select it. Input your IP address in the "IP Address" box and your subnet mask in the Subnet Mask box (overwrite the initial values).

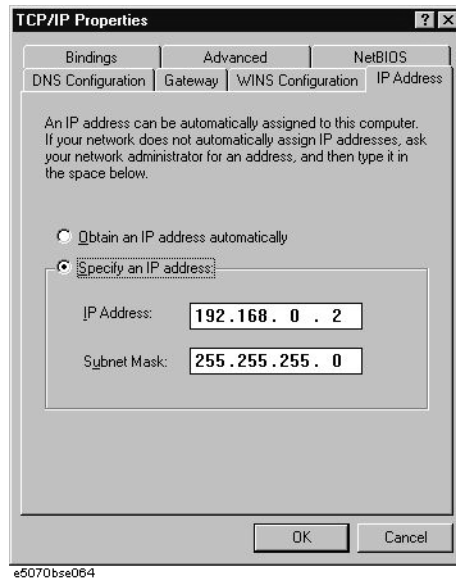
- e. Double-click "My Computer" icon on Windows desktop of the external PC. And double-click **Control Panel**. The Control Panel window will appear.

NOTE

From Step e to Step h are procedures for Windows

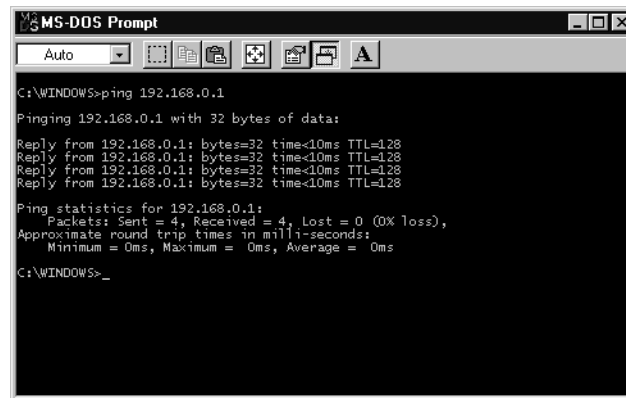
- f. In the Control Panel window, double-click **Network**. The Network dialog box shown in fig will appear. In the **Configuration** tab, select **TCP/IP** (display it in reverse video) and press the **Properties** button.
- g. The dialog box appears. If **Specify an IP address** has been selected, record the IP address and subnet mask.
- h. If the **Obtain an IP address automatically** has been selected, select the **Specify an IP address**. Enter the IP address xxx.xxx.xxx.y and subnet mask xxx.xxx.xxx.xxx as shown in Figure 4-23. The letters x represent the IP address and subnet mask of the E5061A/E5062A. The letter y is different from the IP address of the E5061A/E5062A. Press the **OK** button.

Figure 4-23 Network Dialog Box (“IP Address” Tab)



- Step 6.** By clicking “OK” button, the network settings take effect. Verify the E5061A/E5062A LAN settings and response to a command from the external computer as follows:
- On the external computer, click "Start" button in the Windows Start menu bar using a mouse.
 - Click "Programs" and "MS-DOS Prompt" (or "Command Prompt") to open the DOS (Command) Prompt window.
 - Type a ping command followed by the E5061A/E5062A IP address as "ping xxx.xxx.xxx.xxx" (where, xxx.xxx.xxx.xxx is the IP address such as 192.168.0.1 assigned in step 3-d.) Press **Enter** key on the keyboard.
 - The external computer displays a message of ping command response from the E5061A/E5062A. Figure 4-24 shows an example of normal result that indicates the IP address, packet size, and a response time counted by the computer. The ping command is repeated 4 times.

Figure 4-24 Example of normal ping command test result



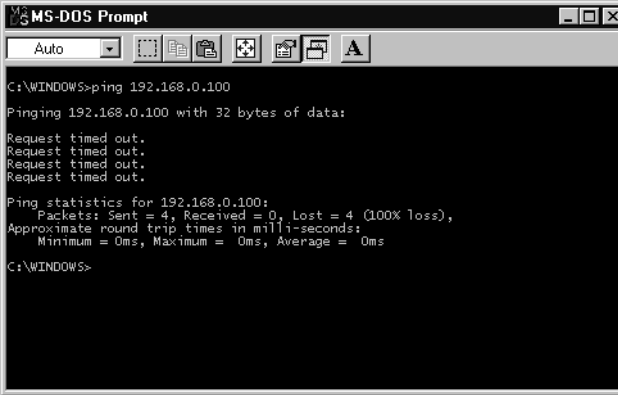
If the E5061A/E5062A doesn't return the response, the external computer displays a

Troubleshooting

Function Specific Troubleshooting

message of "Request timed out" as shown in Figure 4-25. In this case, a failure in the A20 digital motherboard is suspected.

Figure 4-25 Example of no response for ping command



```
MS-DOS Prompt
Auto
C:\WINDOWS>ping 192.168.0.100
Pinging 192.168.0.100 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 192.168.0.100:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
    Approximate round trip times in milliseconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\WINDOWS>
```

To Check the Printer Parallel Port

Test equipment

It is recommended that the following compatible printer be used.

| Manufacturer | Recommended printer (as of Feb. 2004) |
|-----------------|---------------------------------------|
| Hewlett Packard | HP DeskJet 5650 |

Printer cable: Parallel cable

Procedure

- Step 1.** Connect the printer cable between the printer and the E5061A/E5062A printer parallel port. Turn the printer on.
- Step 2.** Press **[Preset]** key to initialize the E5061A/E5062A.
- Step 3.** Press **[System]** key.
- Step 4.** Click **Printer Setup** in the softkey menu.
- Step 5.** Depending on the printer used, Click "hp deskjet 5650" icon with the right button in the Property window. Then, click "Set as Default Printer" button.
- Step 6.** Click **Print** in the softkey menu. Confirm the printout of the display image.
- Step 7.** If the printer fails to work, the problem seems in the A20 digital motherboard, printer driver or connection of the printer cable.

To Check the GPIB

Procedure

Perform the E5061A/E5062A performance test program. If the controller cannot detect the

E5061A/E5062A, the problem seems in the A24 GPIB card or the connection of the GPIB cable.

Performance test failure troubleshooting

This section describes the adjustment and troubleshooting procedures used when the E5061A/E5062A fails the performance tests. If the performance of the instrument is critical for the test limits and seems to be adjustable, perform first the adjustment(s) related to the failed test. When the test result is far from the tolerance of the test or the performance is not adjustable, isolate the faulty assembly in accordance with the "Performance tests failure troubleshooting procedure".

Recommended adjustment for performance test failure

Table 4-5 shows the recommended adjustments when the performance test fails. Select the adjustment program corresponding to the recommended adjustment and perform the adjustment.

Table 4-5

Recommended adjustment for performance test failure

| Test Num. | First failed test | Recommended adjustment | |
|-----------|--|------------------------|-------------|
| | | A1 Source | A2 Receiver |
| 1 | Frequency accuracy test | | √ |
| 2 | RF output level accuracy and flatness test | √ | |
| 3 | RF output level linearity test | √ | |
| 4 | Trace noise test | | √ |
| 5 | Crosstalk & System Dynamic Range test | | √ |
| 6 | Dynamic accuracy test | | √ |
| 7 | Uncorrected system performance test | | √ |

Performance test failure troubleshooting

Table 4-6 represents the relationships between the failed test and probable faulty assembly. If the performance test failure cannot be removed by a proper adjustment, replace the assembly shown in this table.

Note that this table lists some typical cases. There are possibilities that other assembly may be faulty. To troubleshoot further, perform the diagnostic test procedures.

NOTE

When Crosstalk, System dynamic range or Uncorrected system performance test fails, check first whether the connections of the RF semi-rigid cables between the suspicious assembly and others are tight or loose. Also check for possible disconnection (impairment)

of the cables and connectors.

Table 4-6 Performance test failure troubleshooting information

| Test Num | First failed test | Probable faulty board assembly | |
|----------|--|--------------------------------|-------------|
| | | A1 Source | A2 Receiver |
| 1 | Frequency accuracy test (Standard) | ## | ## |
| 2 | RF output level accuracy and flatness test | ### | |
| 3 | RF output level linearity test | ### | |
| 4 | Trace noise test | ## | ## |
| 5 | Crosstalk & System dynamic range test | ## | ## |
| 6 | Dynamic accuracy test | # | ### |
| 7 | Uncorrected system performance test | # | ## |

###: Most suspicious assembly

##: Suspicious assembly

#: Possible faulty assembly

To configure the A20 Digital Motherboard and BIOS

When you replace the A20 digital motherboard, you need to confirm the jumper settings for the specific CPU installed. The jumper settings information is provided in “Configure the Motherboard” on page 120.

You also need to confirm the BIOS options using the BIOS setup utility procedure. The BIOS setup procedure is described in “To Confirm or Set the BIOS Options” on page 121.

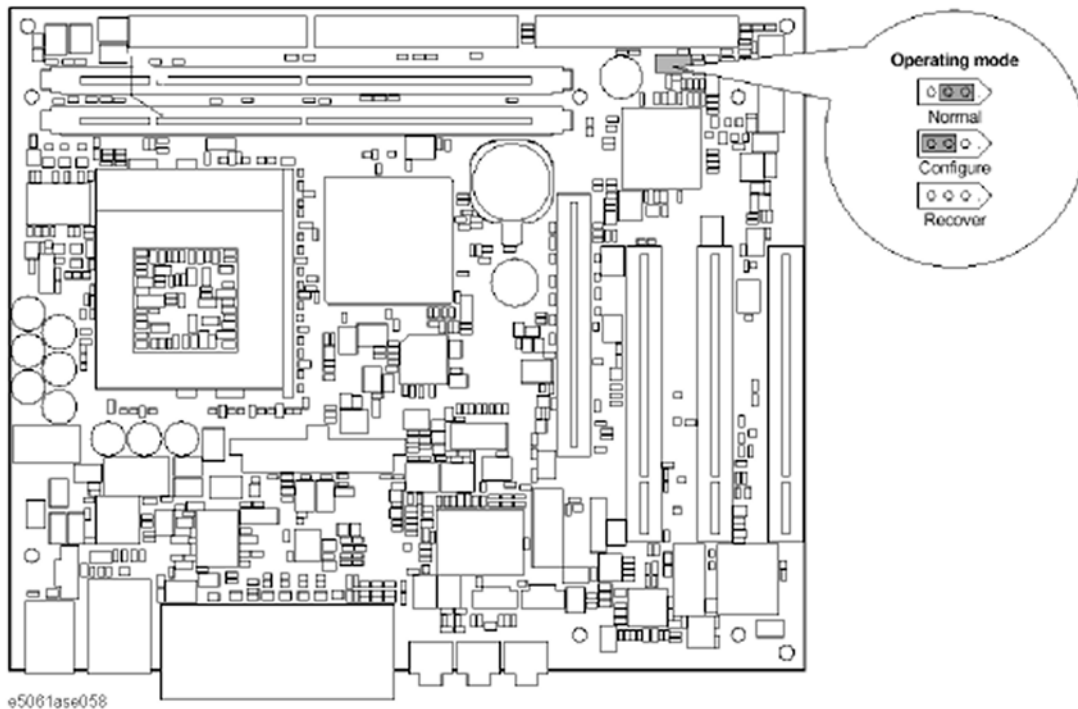
To Identify the Motherboard Installed

Confirm the splash screen is displayed in the beginning of the boot process as shown in Figure 4-6.

Configure the Motherboard

There is a jumper on the A20 digital motherboard that must be configured to the correct setting. Confirm that the jumper setting is “Normal” as shown in Figure 4-26.

Figure 4-26 A20 digital motherboard jumpers location and settings



Testing DRAM on the Motherboard

When the A20 digital motherboard is replaced with a new one, it is advisable to perform the DRAM test before proceeding to the BIOS setup utility procedure. Confirm the DRAM count in accordance with the following procedure.

Step 1. Connect the external keyboard and mouse to the E5061A/E5062A rear panel connectors.

- Step 2.** Turn the instrument on. Wait until the E5061A/E5062A boots up. Do not press any key until the E5061A/E5062A measurement view appears.
- Step 3.** Press **[System]** key on the front panel.
- Step 4.** Click **Misc Setup** in the softkey menu.
- Step 5.** Click **Control Panel...** in the softkey menu.
- Step 6.** Scroll the function viewer to find "System" icon and double-click "System". This opens "System Properties" window as shown in Figure 4-27.

Figure 4-27

System Properties window

- Step 7.** Verify that "260,148 KB RAM" is displayed in the Computer profile as shown in Figure 4-27. If it is not correct, the A20 board is faulty.
- Step 8.** Click "OK" button to close the window.
- Step 9.** Turn the E5061A/E5062A off before proceeding to the next step "To Confirm or Set the BIOS Options".

To Confirm or Set the BIOS Options

BIOS is the PC's built-in program describing the standard procedure of basic inputs and outputs for the system hardware. BIOS involves the system BIOS, start-up program and BIOS setup utility. The E5061A/E5062A starts up first with the BIOS when the power is turned on. Use the following procedure to confirm or set the BIOS options, known as the BIOS setup utility.

Run the BIOS setup utility

Use the external keyboard to select and set various options in the BIOS setup utility. Do not operate the E5061A/E5062A front panel until you exit the BIOS option setup procedure.

- Procedure**
- Step 1.** Connect the external keyboard to the E5061A/E5062A rear panel connector.
 - Step 2.** Turn the instrument on.
 - Step 3.** Press F2 key as soon as the splash screen as shown in Figure 4-6 is displayed. Wait a few seconds until the message "Enter CURRENT Password:" appears.

Troubleshooting
To configure the A20 Digital Motherboard and BIOS



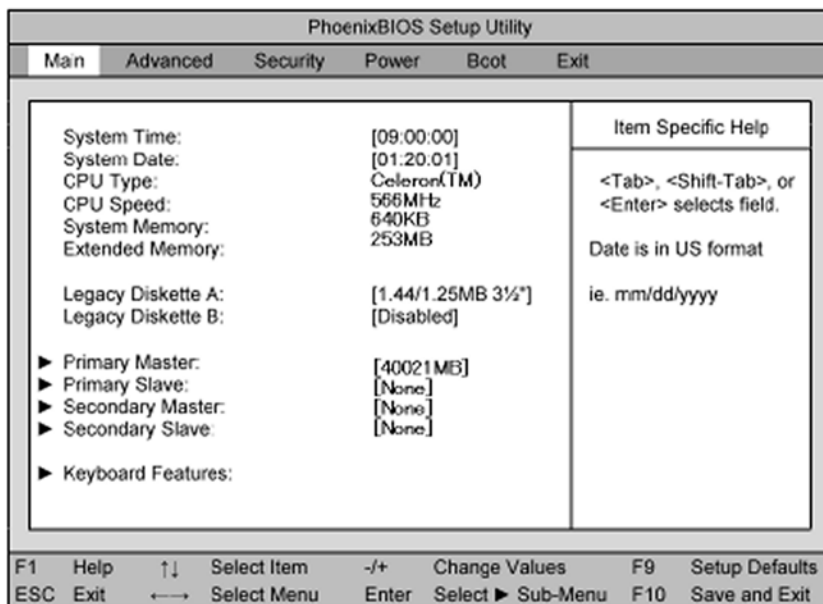





- Step 4.** Press  key (The LED in the key lights.)
- Step 5.** Enter password "e506xa" and press . Then BIOS setup utility main menu is displayed as shown in Figure 4-28.

Figure 4-28 BIOS setup utility main menu



- Step 6.** The BIOS setup utility has primary menus, most of which have sub-menus. Brief descriptions and reference pages for these menus are provided in Table 4-7. The details of the BIOS option settings in each menu and sub-menus are described on the page listed in the table.
- Step 7.** Select a desired menu using   keys. Select a item in the menu or sub-menu window using   keys. To perform an operation, use  key.


NOTE If you want to quit the BIOS option setting and exit the BIOS setup utility without saving changes in the setup, select "Exit Discarding Changes" and press  key at the Exit Menu.

Table 4-7 BIOS setup utility primary menus and references

| Menu | Options | Ref. page |
|------|---|-------------|
| Main | Product description including processor and memory fitted Date and time IDE disks found and sub-menus for extra configuration | on page 121 |

Table 4-7 BIOS setup utility primary menus and references

| Menu | Options | Ref. page |
|----------|--|-------------|
| Advanced | Start-up display mode (silent-boot etc.) Operating system type (ACPI etc.) Advanced chipset configuration Processor cache control PCI space configuration I/O devices configuration Advanced hard disk drive options System monitoring Version information | on page 124 |
| Security | Passwords and permissions | on page 126 |
| Power | Action after AC-reconnect Power savings modes and timers | - |
| Boot | Selects device boot order | on page 125 |
| Exit | Save with or without changes Load/save default settings (from flash ROM) | on page 126 |

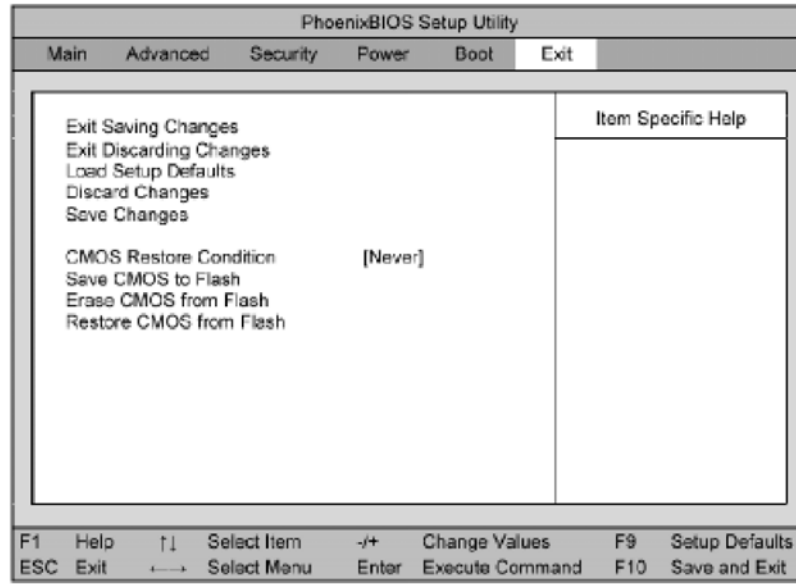
Load Setup Defaults

NOTE Perform the following procedure only when the A20 digital motherboard is replaced. Jump to “Advanced Menu” when you check whether the BIOS options are correctly set or not.

Exit menu shown below is displayed by choosing "Exit" using keys and by pressing key at the BIOS Setup Utility main menu. Select “Load Setup Default” using keys. The dialog box “Setup Confirmation” prompts you to select Y (Yes) or N (No). Press and to load the manufacture Setup Defaults into the BIOS ROM. As a result, almost all of the BIOS options are automatically configured to the optimal settings for the E5061A/E5062A.

Figure 4-29

Exit menu (for Load Setup Defaults)



e5061ase057

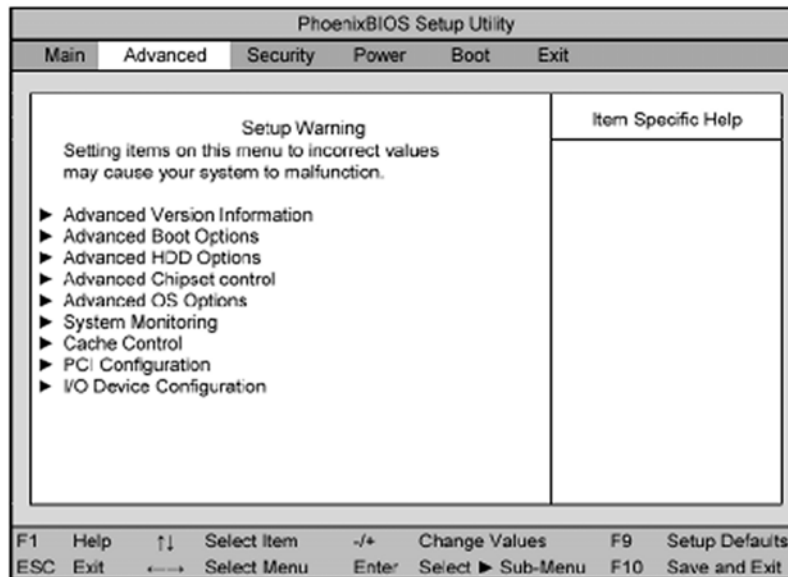
Advanced Menu

The Advanced Menu shown below is displayed by choosing "Advanced" using keys and by pressing key at the BIOS Setup Utility main menu. Select "Advanced OS Options" using keys. The current setup states are displayed as shown in Figure 4-31. If "Installed OS" or "Enable ACPI" is incorrect, select it using keys, and change the setting by pressing keys.

If you want to exit from this page and return to main menu, press key.

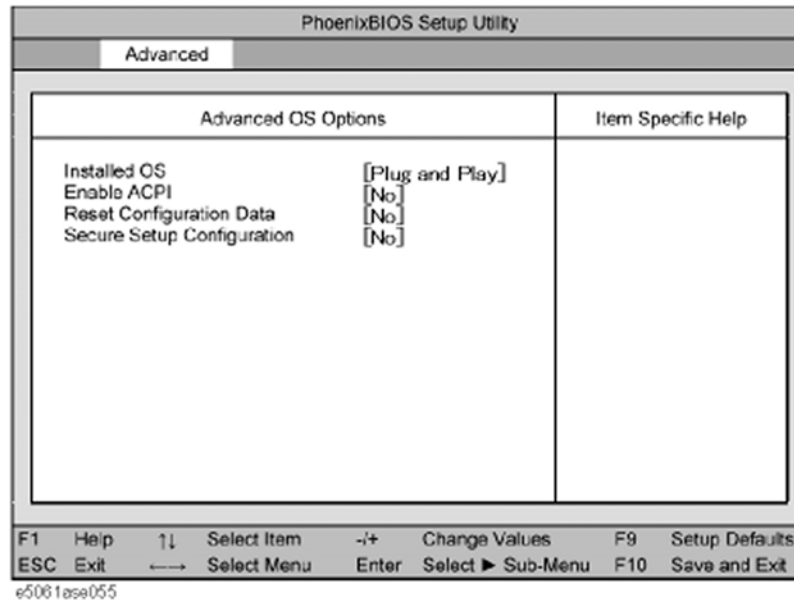
Figure 4-30

Advanced Menu



e5061ase054

Figure 4-31 **Advanced OS Options Sub-menu**

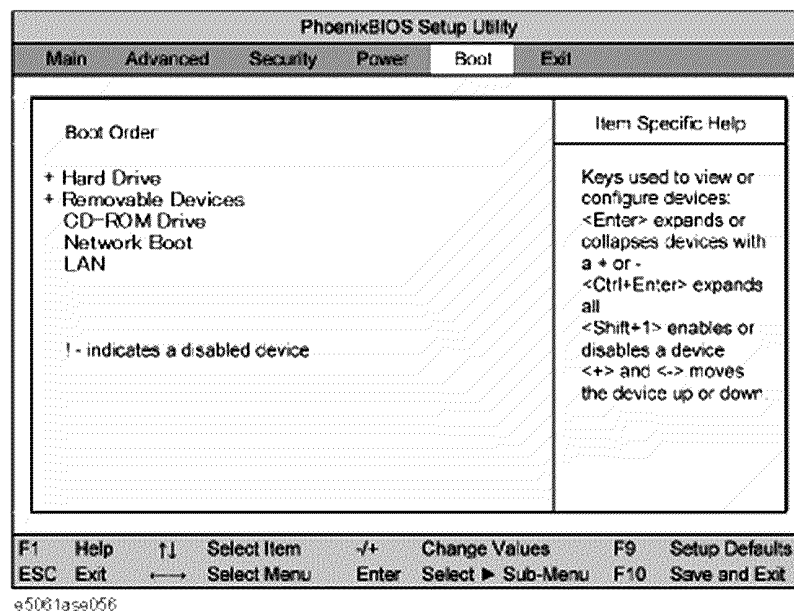


Boot Menu

The Boot Menu shown below is displayed by choosing "Boot" using **←** **←** keys and by pressing **Enter** key at the BIOS Setup Utility main menu. The current setup states are displayed as shown in Figure 4-32. If the setup is incorrect, select it using **↑** **↓** keys, and change the setting by pressing **+** **-** keys.

If you want to exit from this page and return to main menu, press **Esc** key.

Figure 4-32 **Boot Menu**



4. Troubleshooting

Change Supervisor Password

A password needs to be entered to execute the BIOS setup utility. If a password has not been assigned in the E5061A/E5062A, set the password using this BIOS setup utility as follows.

- a. Select "Security" using keys at the BIOS Setup Utility main menu and press key.
- b. Select "Set Supervisor password" using keys and press key.
- c. Enter the password of "e506xa". Never set another password.
- d. Press key.
- e. If a message of "New supervisor password installed. Press any key to continue" is displayed, press key.

Save & Exit Setup

When you want to change and save a BIOS option, Select "Exit" using keys at the BIOS Setup Utility main menu and press key. Select "Save CMOS to Flash" using and press key. Then select "Exit Saving Changes" using and press key. A message of "SAVE to CMOS and EXIT (Y/N)?" is displayed. Press and keys.

The BIOS setup utility is closed after the current settings are saved.

Exit Without Saving

If you cancel the changes in the BIOS option settings, select "Exit Discarding Change" using keys at the Exit Menu and press key. Then, a message of "Quit Without Saving (Y/N)?" is displayed. Press and keys.

The BIOS setup utility is closed without saving the current settings.

5 **Replaceable Parts**

This chapter contains information for ordering replacement parts for the E5061A/E5062A.

Ordering Information

To order a part in the replaceable parts lists, quote the Agilent Technologies part number, indicate the quantity required, and address the order to the nearest Agilent Technologies Sales Office.

To order a part not listed in the replaceable parts lists, include the instrument model number, the description and function of the part, and the quantity of parts required. Address the order to the nearest Agilent Technologies Sales Office.

Direct Mail Order System

Within the USA, Agilent Technologies can supply parts through a direct mail order system. There are several advantages to this system:

- Direct ordering and shipping from the Agilent Technologies parts center in California, USA.
- No maximum or minimum on any mail order. (There is a minimum amount for parts ordered through a local Agilent Technologies Sales Office when the orders require billing and invoicing.)
- Prepaid transportation. (There is a small handling charge for each order.)
- No invoices.

In order for Agilent Technologies to provide these advantages, please send a check or money order with each order.

Mail order forms and specific ordering information are available through your local Agilent Technologies Sales Office. Addresses and telephone numbers are located in a separate document shipped with the manuals.

Exchange Assemblies

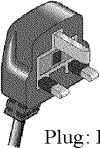
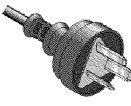
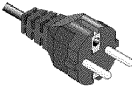
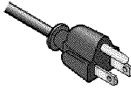

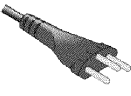
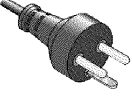
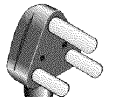
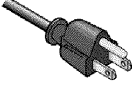
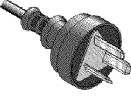
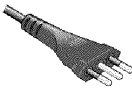

Under the rebuilt-exchange assembly program, certain factory-repaired and tested assemblies are available on a trade-in basis. These assemblies are offered at lower cost than a new assembly, but meet all factory specifications required of a new assembly.

The defective assembly must be returned for credit under the terms of the rebuilt-exchange assembly program. Any spare assembly stock desired should be ordered using the new assembly part number.

Replaceable Parts List

Power Cables and Plug Configurations

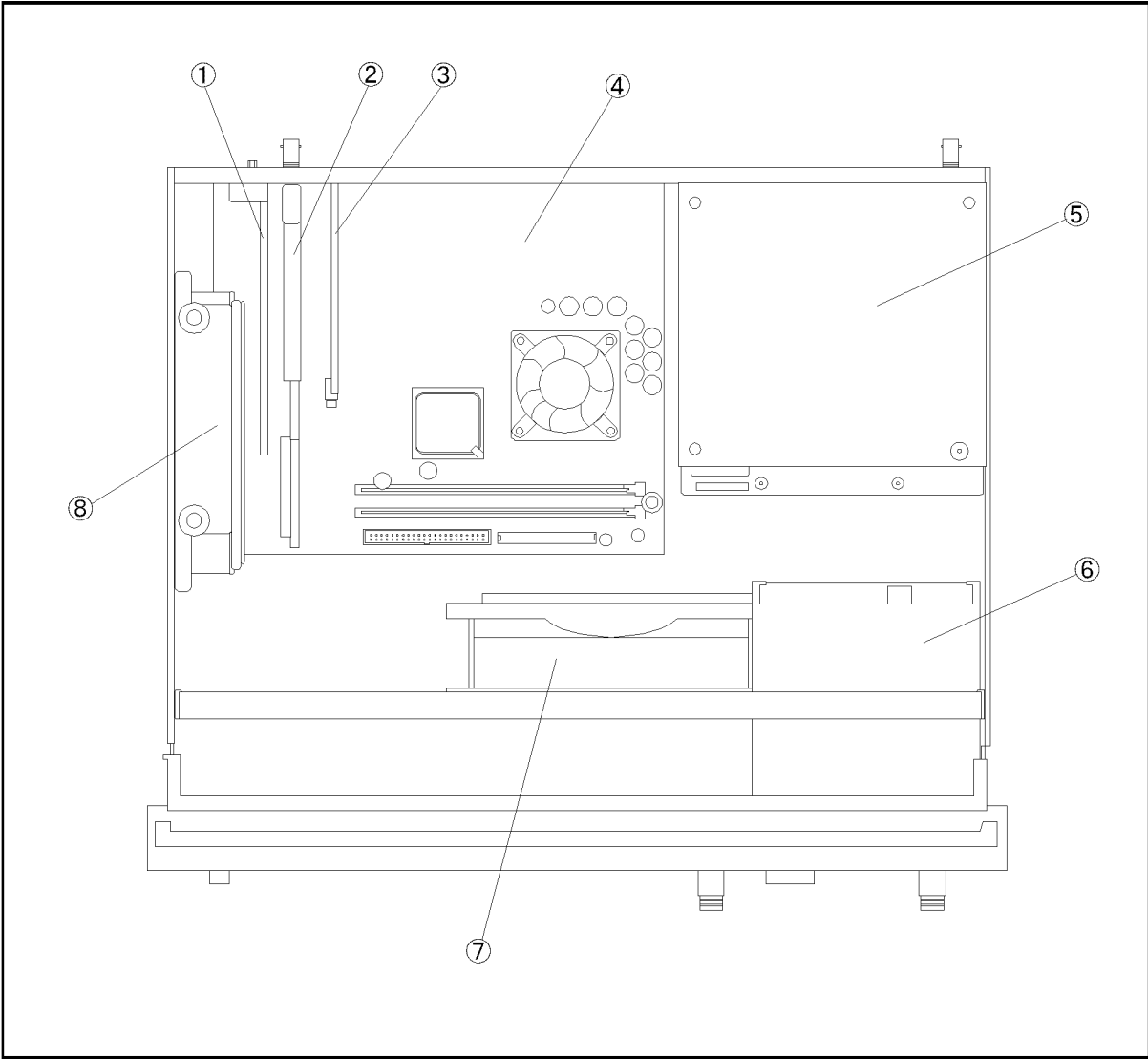
Figure 5-1 Power Cables and Plug Configurations

| | |
|--|--|
| <p>OPTION 900</p>  <p>United Kingdom</p> <p>Plug: BS 1363/A, 250V, 10A Cable: 8120-1351, 8120-8705</p> | <p>OPTION 901</p>  <p>Australia/New Zealand</p> <p>Plug: AS 3112, 250V, 10A Cable: 8120-1369</p> |
| <p>OPTION 902</p>  <p>Continental Europe</p> <p>Plug: CEE 7 Standard Sheet VII, 250V, 10A Cable: 8120-1689</p> | <p>OPTION 903</p>  <p>U.S./Canada</p> <p>Plug: NEMA 5-15P, 125V, 10A Cable: 8120-1378</p> |
| <p>OPTION 904</p>  <p>U.S./Canada</p> <p>Plug: NEMA 6-15P, 250V, 6A Cable: 8120-0698</p> | <p>OPTION 906</p>  <p>Switzerland</p> <p>Plug: SEV Type 12, 250V, 10A Cable: 8120-2104</p> |
| <p>OPTION 912</p>  <p>Denmark</p> <p>Plug: SR 107-2-D, 250V, 10A Cable: 8120-2956</p> | <p>OPTION 917</p>  <p>India/Republic of S. Africa</p> <p>Plug: IEC 83-B1, 250V, 10A Cable: 8120-4211</p> |
| <p>OPTION 918</p>  <p>Japan</p> <p>Plug: JIS C 8303, 125V, 12A Cable: 8120-4753</p> | <p>OPTION 920</p>  <p>Argentina</p> <p>Plug: Argentine Resolution 63, Annex IV, 250V, 10A Cable: 8120-6870</p> |
| <p>OPTION 921</p>  <p>Chile</p> <p>Plug: CEI 23-16, 250V, 10A Cable: 8120-6978</p> | <p>OPTION 922</p>  <p>China</p> <p>Plug: GB 1002, 250V, 10A Cable: 8120-8376</p> |
| <p>NOTE: Each option number includes a 'family' of cords and connectors of various materials and plug body configurations (straight, 90° etc.).</p> | |

power_e

Top View (Major Assemblies)

Figure 5-2 Top View (Major Assemblies)



e5061ase017.drw

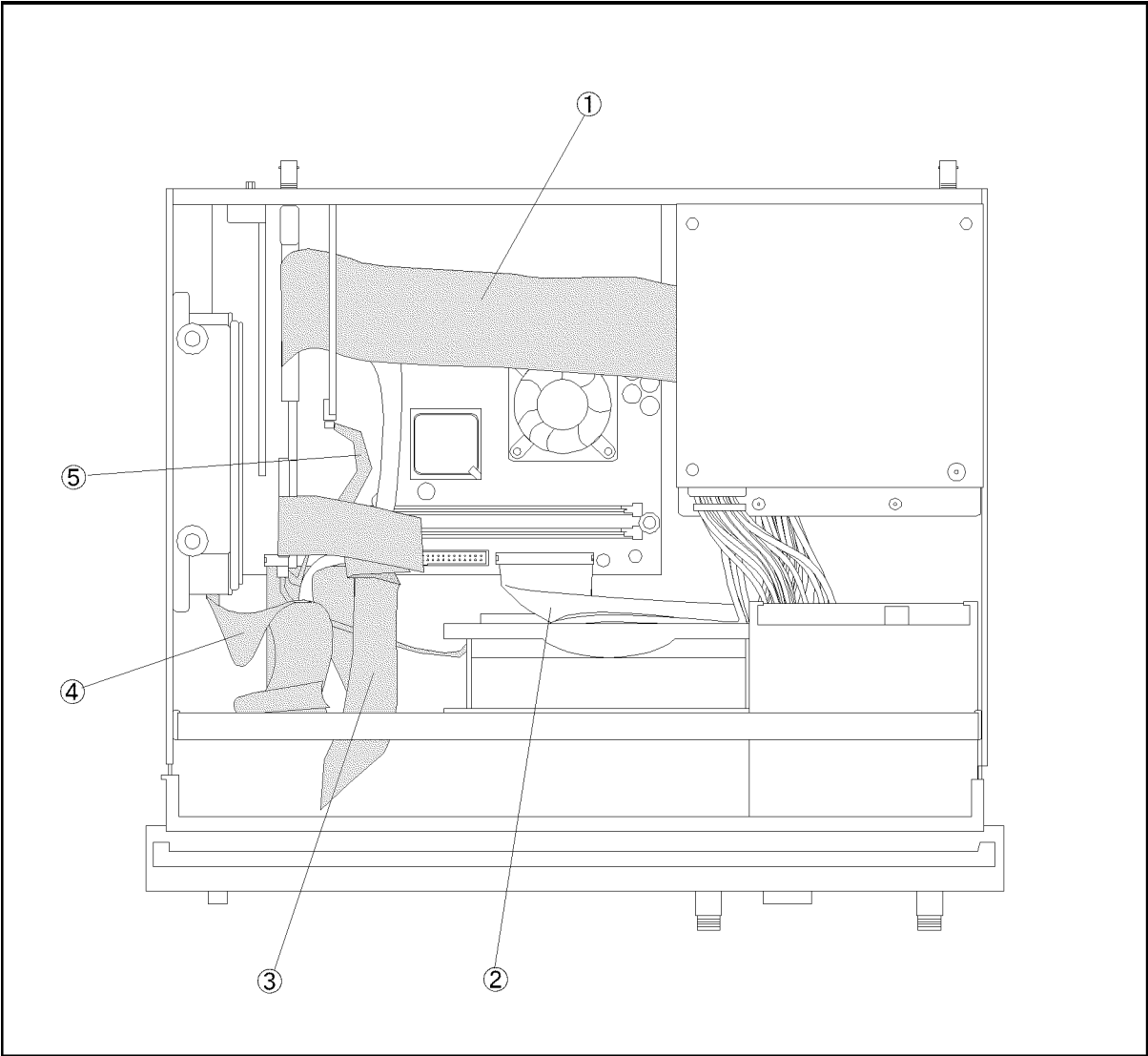
Table 5-1 Top View (Major Assemblies)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|--------------------|----------------------------|-------------|----------------------------|
| 1 | See Table 5-13 | 1 | A24 PCI GPIB CARD ASSEMBLY |
| 2 | See Table 5-13 | 1 | A21 PCI DSP CARD ASSEMBLY |
| 3 | E5070-66525 | 1 | HANDLER I/O BOARD |
| 4 | E5062-62003 | 1 | A20 DIGITAL MOTHERBOARD |
| 5 | See Table 5-15 | 1 | A50 POWER SUPPLY ASSEMBLY |
| 6 | See Table 5-11 | 1 | A28 FDD ASSEMBLY |
| 7 | E5062-61001 | 1 | FAN ASSEMBLY |
| 8 | See Table 5-12 | 1 | A27 HDD ASSEMBLY |

Replaceable Parts
Replaceable Parts List

Top View (Cables)

Figure 5-3 Top View (Cables)



e5061ase018

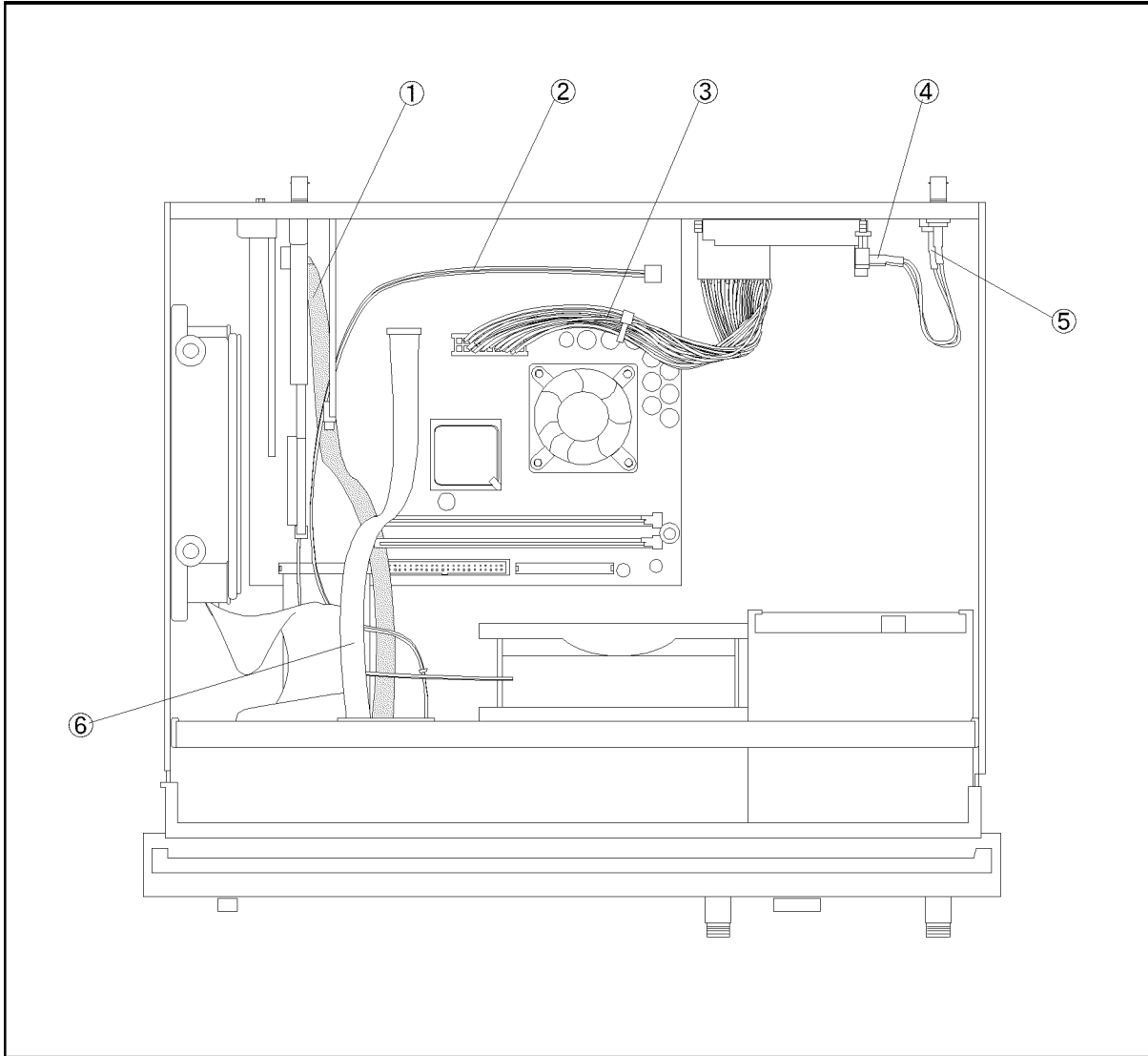
Table 5-2 **Top View (Cables)**

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|--------------------|----------------------------|-------------|---------------------|
| 1 | E5062-61614 | 1 | FLAT CABLE ASSEMBLY |
| 2 | E5070-61623 | 1 | FLAT CABLE ASSEMBLY |
| 3 | E5062-61615 | 1 | FLAT CABLE ASSEMBLY |
| 4 | E5070-61624 | 1 | FLAT CABLE ASSEMBLY |
| 5 | E5070-61616 | 1 | FLAT CABLE ASSEMBLY |

**Top View (Under Power Supply) for E5061A : JP1KLxxxxx,
MY44101900 and below, E5062A : JP1KLxxxxx, MY44102842 and
below.**

Figure 5-4

**Top View (Under Power Supply) for E5061A : JP1KLxxxxx, MY44101900 and below,
E5062A : JP1KLxxxxx, MY44102842 and below.**



e5061ase019.drw

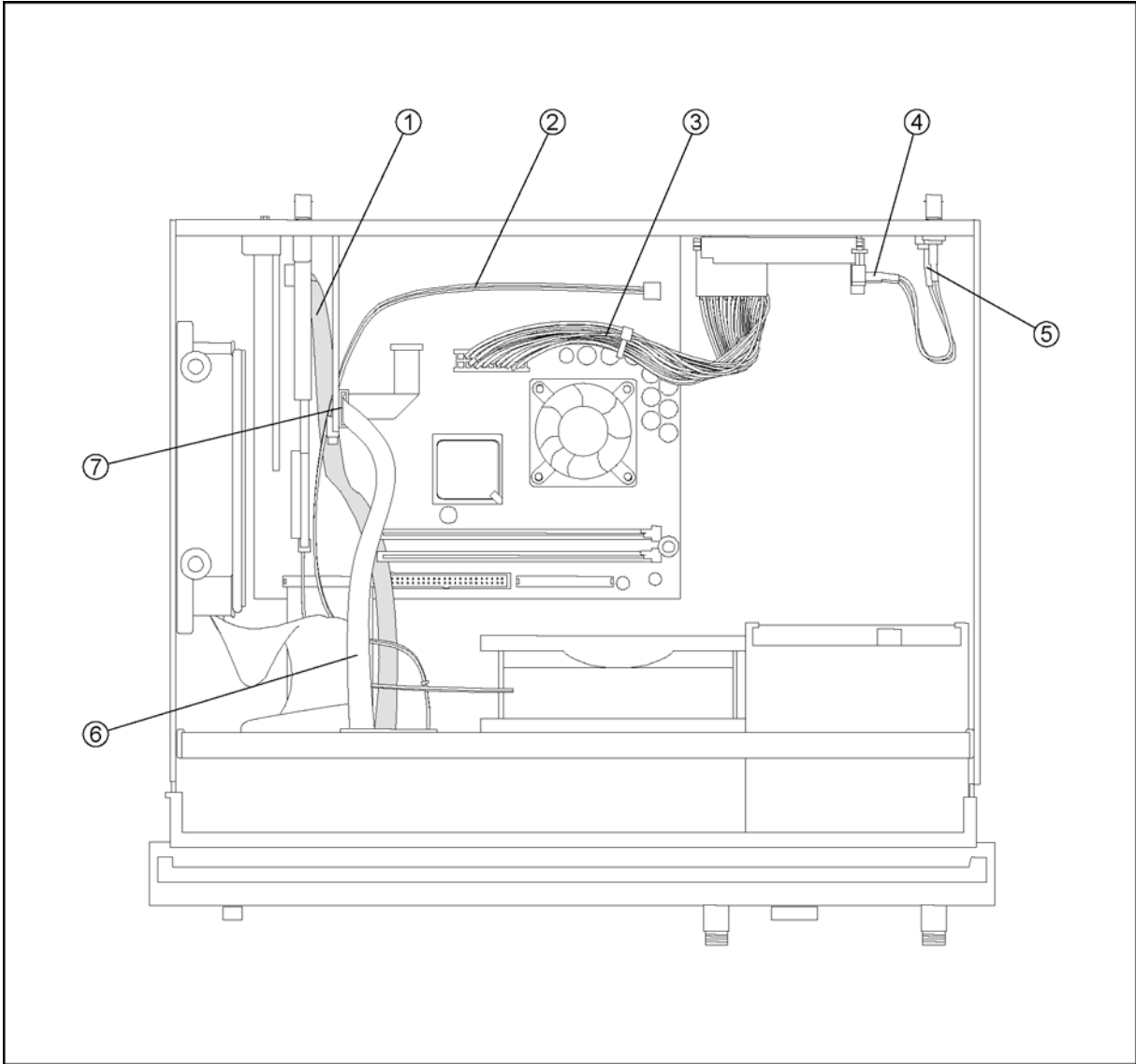
Table 5-3 Top View (Under Power Supply) for E5061A : JP1KLxxxxx, MY44101900 and below, E5062A : JP1KLxxxxx, MY44102842 and below.

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|--------------------------------|
| 1 | E5070-61664 | 1 | FLAT CABLE ASSEMBLY (Opt. 016) |
| 2 | E5062-61610 | 1 | WIRE ASSEMBLY USB |
| 3 | E5070-61626 | 1 | WIRE ASSEMBLY |
| 4 | 43521-61622 | 1 | RF CABLE ASSEMBLY |
| | 1250-0252 | 1 | BNC CONNECTOR |
| | 2950-0035 | 1 | NUT-HEX-DBL- CHAM |
| | 2190-0102 | 1 | WSHR-LK INTL T |
| 5 | 43521-61622 | 1 | RF CABLE ASSEMBLY |
| | 1250-0252 | 1 | BNC CONNECTOR |
| | 2950-0035 | 1 | NUT-HEX-DBL- CHAM |
| | 2190-0102 | 1 | WSHR-LK INTL T |
| 6 | E5052-61626 | 1 | FLAT CABLE DVI |

Replaceable Parts
Replaceable Parts List

**Top View (Under Power Supply) for E5061A : MY44101901 and above,
E5062A : MY44102843 and above**

Figure 5-5 Top View (Under Power Supply) for E5061A : MY44101901 and above, E5062A : MY44102843 and above.



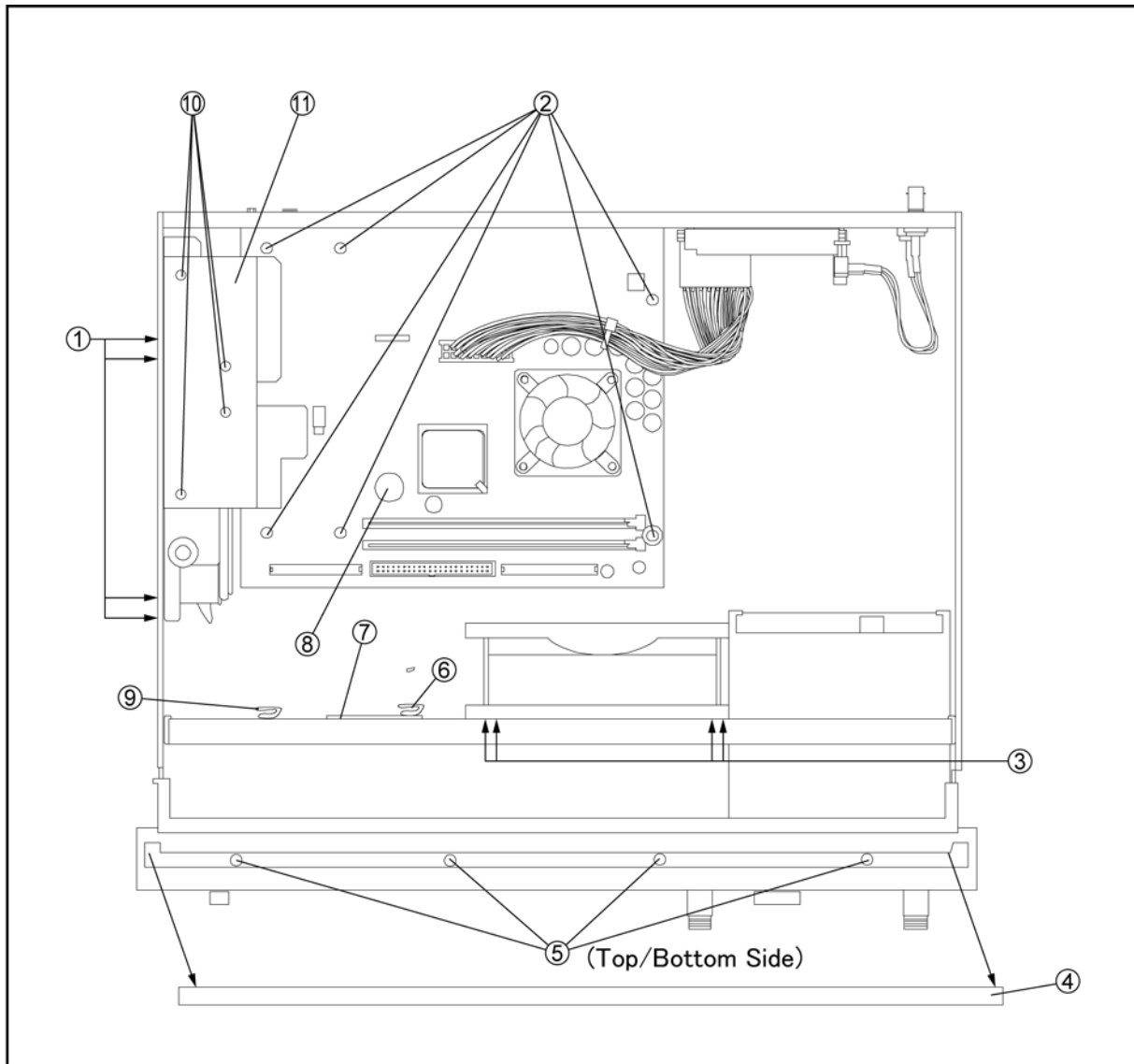
e5061ase5001

**Table 5-4 Top View (Under Power Supply) for E5061A : MY44101901 and above,
 E5062A : MY44102843 and above**

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|--------------------------------|
| 1 | E5070-61664 | 1 | FLAT CABLE ASSEMBLY (Opt. 016) |
| 2 | E5062-61610 | 1 | WIRE ASSEMBLY USB |
| 3 | E5070-61626 | 1 | WIRE ASSEMBLY |
| 4 | 43521-61622 | 1 | RF CABLE ASSEMBLY |
| | 1250-0252 | 1 | BNC CONNECTOR |
| | 2950-0035 | 1 | NUT-HEX-DBL- CHAM |
| | 2190-0102 | 1 | WSHR-LK INTL T |
| 5 | 43521-61622 | 1 | RF CABLE ASSEMBLY |
| | 1250-0252 | 1 | BNC CONNECTOR |
| | 2950-0035 | 1 | NUT-HEX-DBL- CHAM |
| | 2190-0102 | 1 | WSHR-LK INTL T |
| 6 | E5052-61626 | 1 | FLAT CABLE DVI |
| 7 | 1400-3361 | 1 | CLAMP CABLE |

Top View (Miscellaneous Parts)

Figure 5-6 Top View (Miscellaneous Parts)



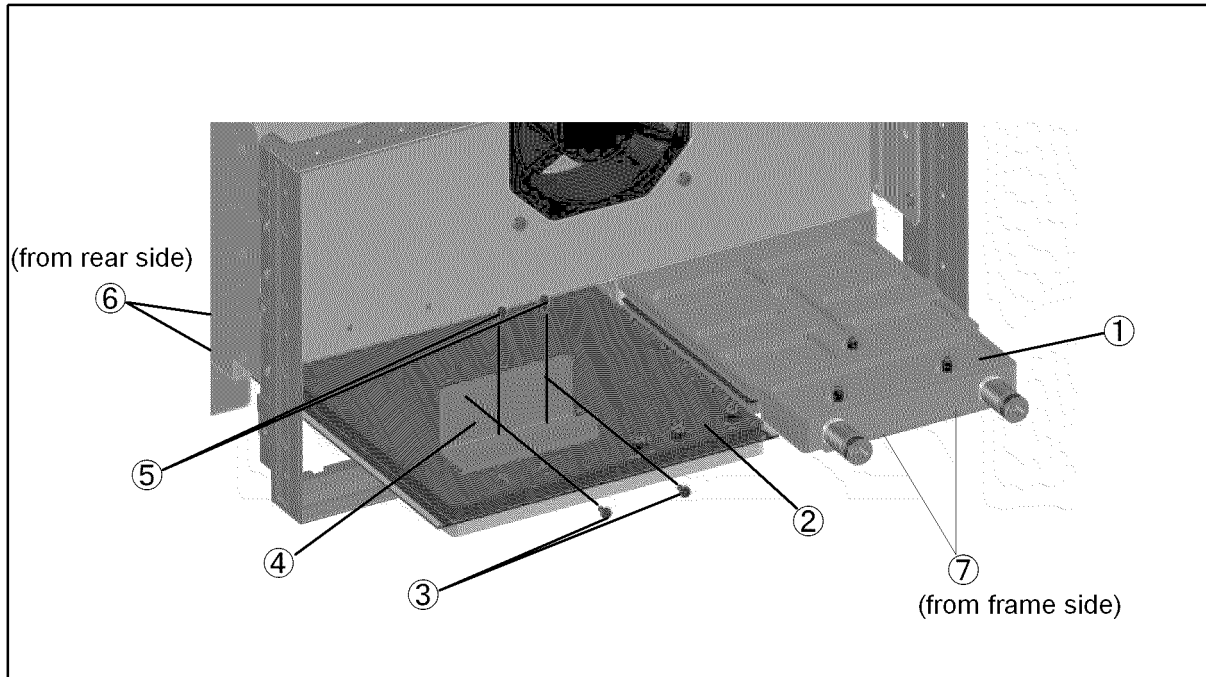
e5061ase3001

Table 5-5 Top View (Miscellaneous Parts)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|--------------------|----------------------------|-------------|---------------------------------------|
| 1 | 0515-0372 | 4 | SCREW-MACH M3.0 x L8 PN T10 |
| 2 | 0515-0372 | 6 | SCREW-MACH M3.0 x L8 PN T10 |
| 3 | 0361-1875 | 4 | RIVET (PLASTIC) |
| 4 | 5041-9176 | 1 | TRIM STRIP |
| 5 | 0515-1382 | 8 | SCREW-MACH M3.5 x L6 FL T15 |
| 6 | 1400-0611 | 1 | CLAMP CABLE |
| 7 | 0400-0254 | 1 | GROMMET |
| 8 | 1420-0356 | 1 | BATTERY LITHIUM (CR2032), 3V, .22A-HR |
| 9 | 1400-0611 | 1 | CLAMP CABLE |
| 10 | 0515-0430 | 4 | SCREW-MACH M3.0 x L6 PN T10 |
| 11 | E5062-01207 | 1 | ANGLE PCI |

Front View (Analog Boards)

Figure 5-7 Front View (Analog Boards)



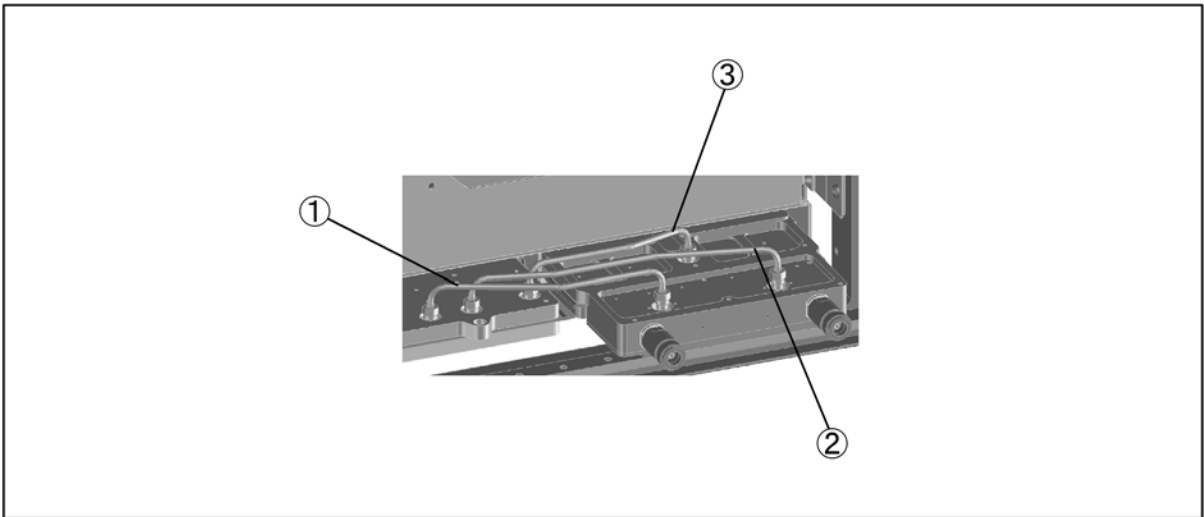
e5061ase031

Table 5-6 Front View (Analog Boards)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|---|
| 1 | E5062-62011 | 1 | A2 RECEIVER 50 Ω (Opt. 150, 250) |
| | E5062-69011 | 1 | A2 RECEIVER 50 Ω (Opt. 150, 250) (Exchange) |
| | E5062-62012 | 1 | A2 RECEIVER 75 Ω (Opt. 175, 275) |
| | E5062-69012 | 1 | A2 RECEIVER 75 Ω (Opt. 175, 275) (Exchange) |
| 2 | E5062-62111 | 1 | A1 SOURCE BOARD |
| | E5062-69111 | 1 | A1 SOURCE BOARD (Exchange) |
| 3 | 0515-0372 | 2 | SCREW-MACH M3.0 x L8 PN T10 |
| 4 | E5062-01205 | 1 | SOURCE BOARD ANGLE |
| 5 | 0515-0430 | 2 | SCREW-MACH M3.0 x L6 PN T10 |
| 6 | 0515-0372 | 2 | SCREW-MACH M3.0 x L8 PN T10 |
| 7 | 0515-1382 | 2 | SCREW-MACH M3.5 x L6 FL T15 |

Front View (Semirigid Cables)

Figure 5-8 Front View (Semirigid Cables)



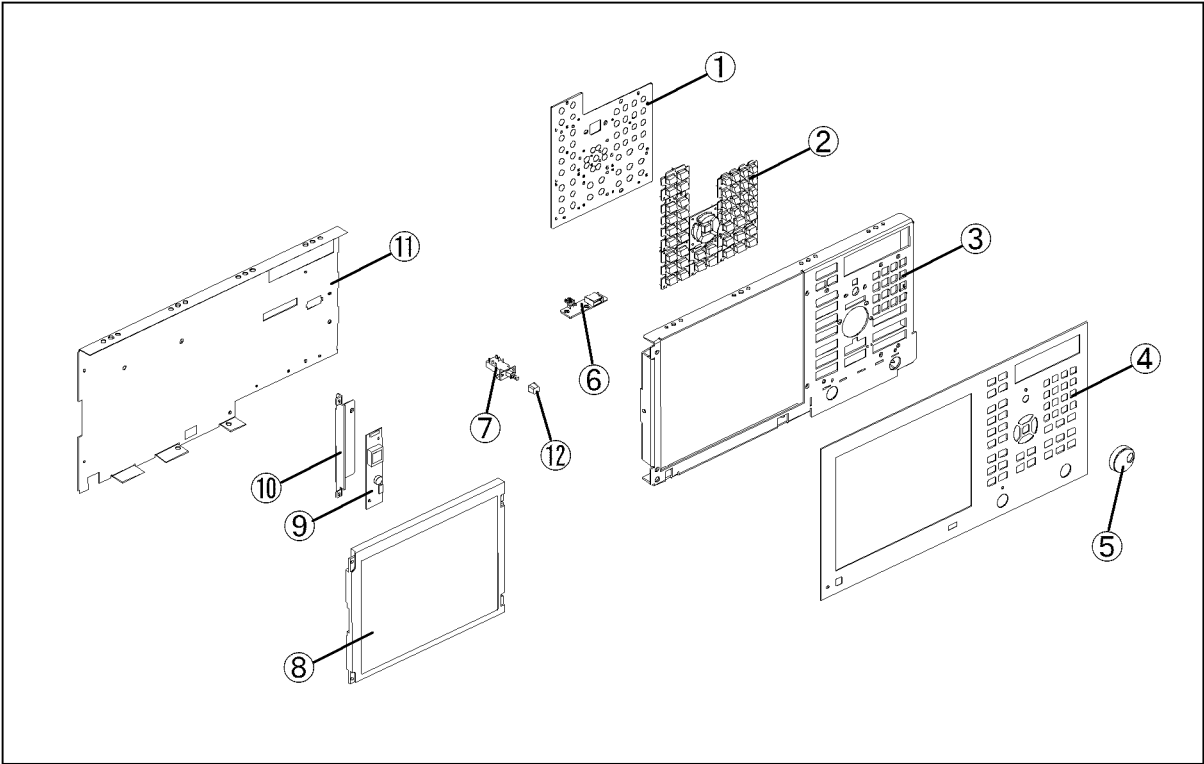
e5061ase015

Table 5-7 Front View (Semirigid Cables)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|------------------------|
| 1 | E5062-61601 | 1 | RF CABLE ASSEMBLY SRGD |
| 2 | E5062-61602 | 1 | RF CABLE ASSEMBLY SRGD |
| 3 | E5062-61603 | 1 | RF CABLE ASSEMBLY SRGD |

Front Panel

Figure 5-9 Front Panel



e5061ase013

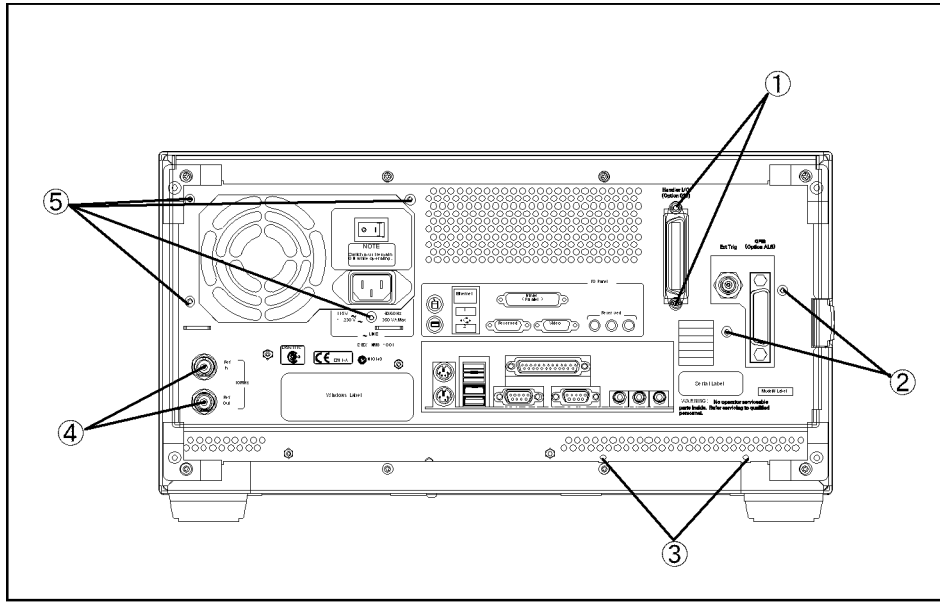
Table 5-8 Front Panel

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|--------------------|----------------------------|-------------|--|
| 1 | E5062-66522 | 1 | A22 FRONT PANEL KEYBOARD |
| 2 | E5070-25101 | 1 | KEYPAD RUBBER |
| 3 | E5062-00202 | 1 | PANEL SUB |
| 4 | E5061-00201 | 1 | PANEL FRONT (E5061A Opt. 250) |
| | E5061-00203 | 1 | PANEL FRONT (E5061A Opt. 150) |
| | E5061-00204 | 1 | PANEL FRONT (E5061A Opt. 275) |
| | E5061-00205 | 1 | PANEL FRONT (E5061A Opt. 175) |
| | E5062-00201 | 1 | PANEL FRONT (E5062A Opt. 250) |
| | E5062-00203 | 1 | PANEL FRONT (E5062A Opt. 150) |
| | E5062-00204 | 1 | PANEL FRONT (E5062A Opt. 275) |
| | E5062-00205 | 1 | PANEL FRONT (E5062A Opt. 175) |
| 5 | 5182-7594 | 1 | KNOB |
| 6 | E5062-66532 | 1 | FRONT USB BOARD |
| | E5062-04003 | 1 | COVER USB SMALL (See Service Note E506xA-07) |
| 7 | E5070-61901 | 1 | STANDBY SWITCH ASSEMBLY |
| 8 | E5070-60101 | 1 | LCD-FILTER ASSEMBLY (Standard) |
| | E5070-60102 | 1 | LCD-TPANEL ASSEMBLY (Opt. 016) |
| | 2090-0888 | 1 | BACKLIGHT (included in LCD ASSEMBLY) |
| 9 | 0950-4091 | 1 | A52 INVERTER LS700 |
| 10 | E5070-01211 | 1 | BRACKET INVERTER |
| 11 | E5062-00603 | 1 | COVER SHIELD |
| 12 | 0371-3953 | 1 | KEY CAP |

Replaceable Parts
 Replaceable Parts List

Rear View

Figure 5-10 Rear View



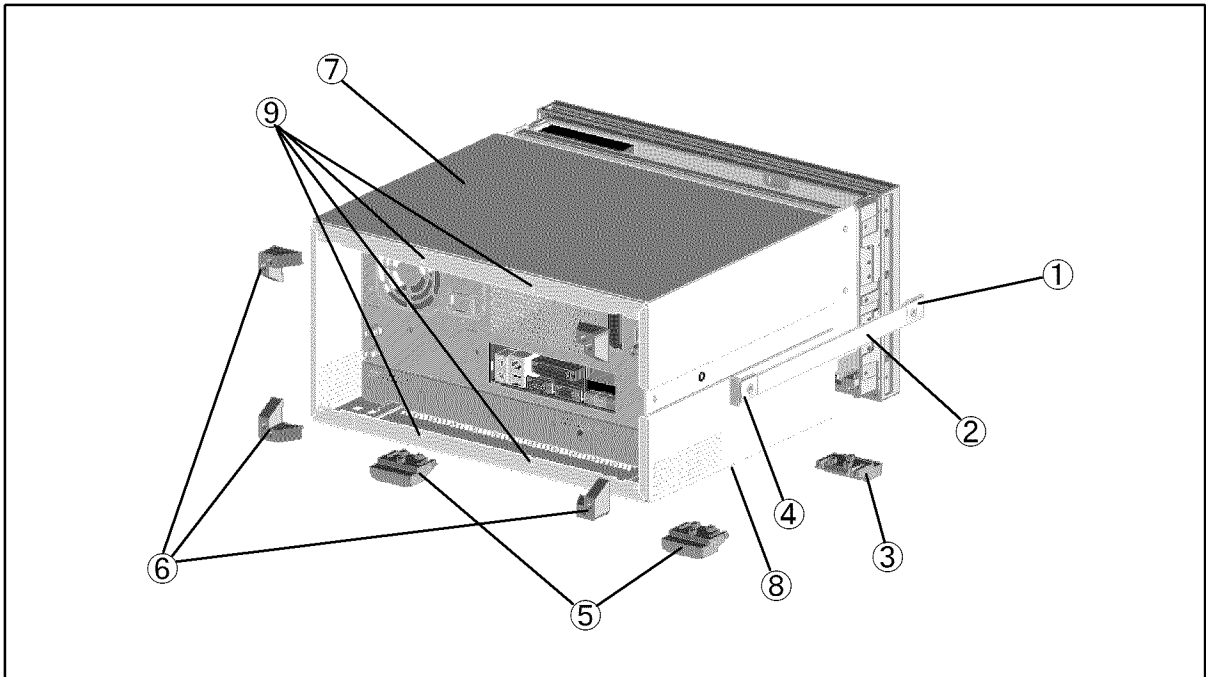
e5061ase0071

Table 5-9 Rear View

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|-----------------------------|
| 1 | 0515-0372 | 2 | SCREW-MACH M3.0 x L8 PN T10 |
| 2 | 0515-0372 | 2 | SCREW-MACH M3.0 x L8 PN T10 |
| 3 | 0515-0372 | 2 | SCREW-MACH M3.0 x L8 PN T10 |
| 4 | 2950-0035 | 2 | NUT-HEX-DBL-CHAM |
| | 2190-0102 | 2 | WSHR-LK INTL T |
| 5 | 0515-0372 | 4 | SCREW-MACH M3.0 x L8 PN T10 |

Cover Assembly

Figure 5-11 Cover Assembly



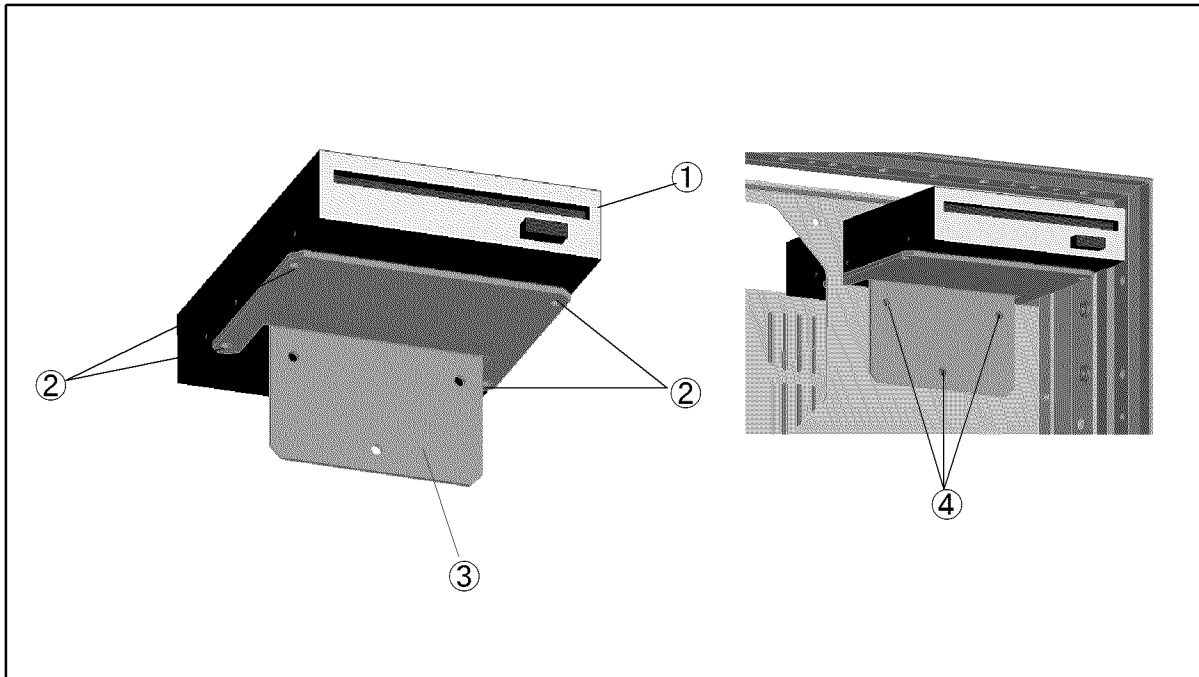
e5061ase016

Table 5-10 Cover Assembly

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|------------------------------|
| 1 | 5041-9186 | 1 | STRAP HANDLE FRT |
| | 0515-2049 | 1 | SCREW-MACH M5.0 x L16 FL T20 |
| 2 | 5063-9208 | 1 | STRAP HANDLE |
| 3 | 5041-9167 | 2 | FOOT FL |
| | 1460-1345 | 2 | WIREFORM |
| 4 | 5041-9187 | 1 | STRAP HANDLE REAR |
| | 0515-2049 | 2 | SCREW-MACH M5.0 x L16 FL T20 |
| 5 | 5041-9167 | 2 | FOOT FL |
| 6 | E5100-40002 | 4 | STANDOFF |
| | 0515-1402 | 4 | SCREW-MACH M3.5 x L8 PN T15 |
| 7 | E5062-60002 | 1 | COVER ASSEMBLY |
| 8 | 0515-1402 | 3 | SCREW-MACH M3.5 x L8 PN T15 |
| 9 | 0515-1402 | 4 | SCREW-MACH M3.5 x L8 PN T15 |

A28 FDD Assembly

Figure 5-12 A28 FDD Assembly



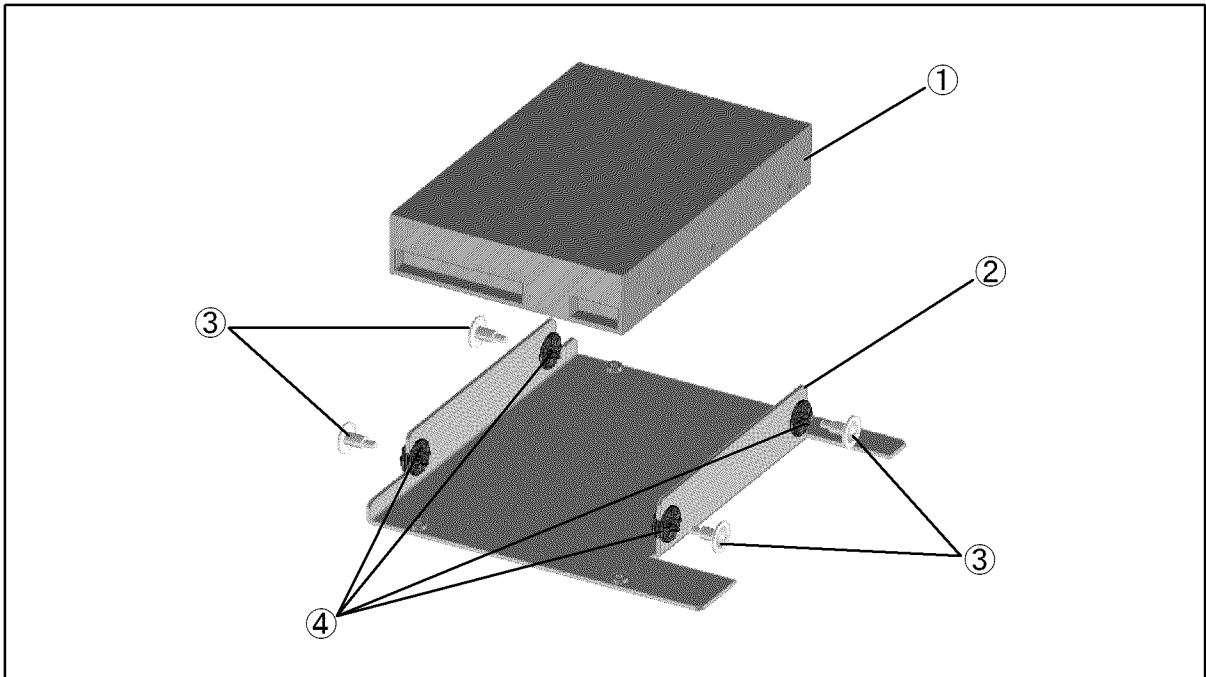
e5061ase025

Table 5-11 A28 FDD Assembly

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|-----------------------------|
| 1 | 0950-5083 | 1 | A28 FDD 3.5 |
| 2 | 0515-0430 | 4 | SCREW-MACH M3.0 x L6 PN T10 |
| 3 | E5062-01202 | 1 | ANGLE FDD |
| 4 | 0515-2143 | 3 | SCREW-MACH M4.0 x L8 PN T20 |

A27 HDD Assembly

Figure 5-13 A27 HDD Assembly



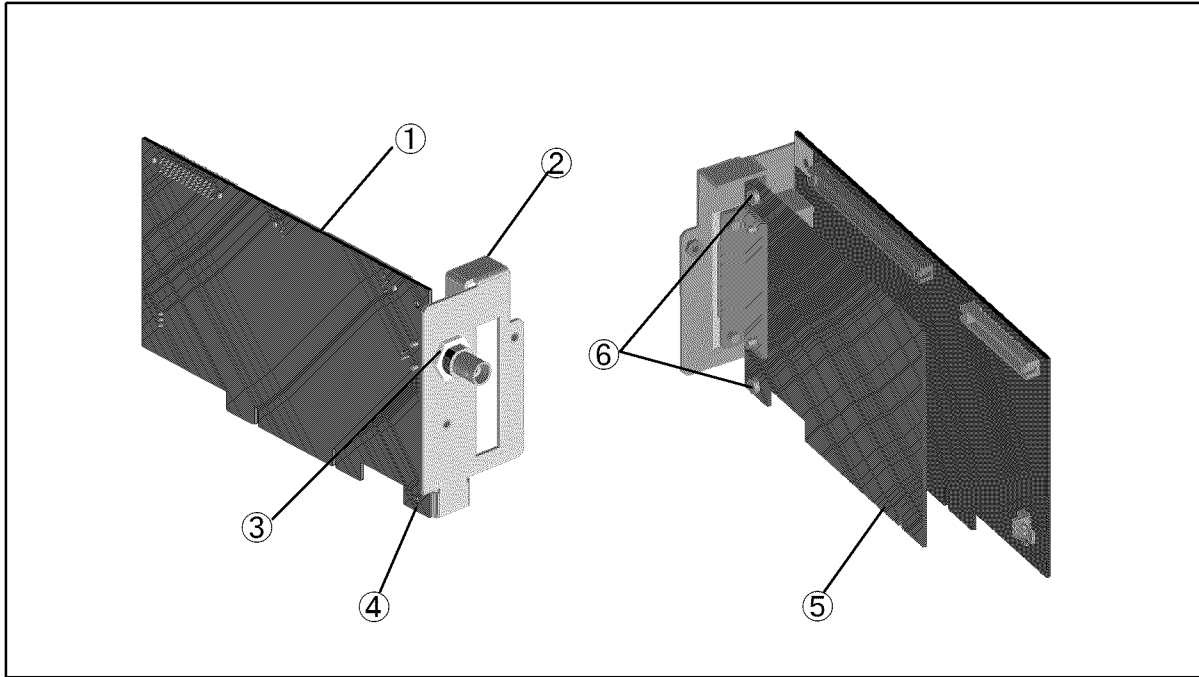
e5061ase026

Table 5-12 A27 HDD Assembly

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|-------------------|
| 1 | E5062-83102 | 1 | A27 HDD INSTALLED |
| 2 | E5062-01206 | 1 | ANGLE HDD |
| 3 | 3030-1245 | 4 | SCREW-SHLDR 6-32 |
| 4 | 0400-0356 | 4 | GROMMET-RND |

A21 PCI DSP CARD / A24 GPIB CARD Assembly

Figure 5-14 A21 PCI DSP CARD / A24 GPIB CARD Assembly



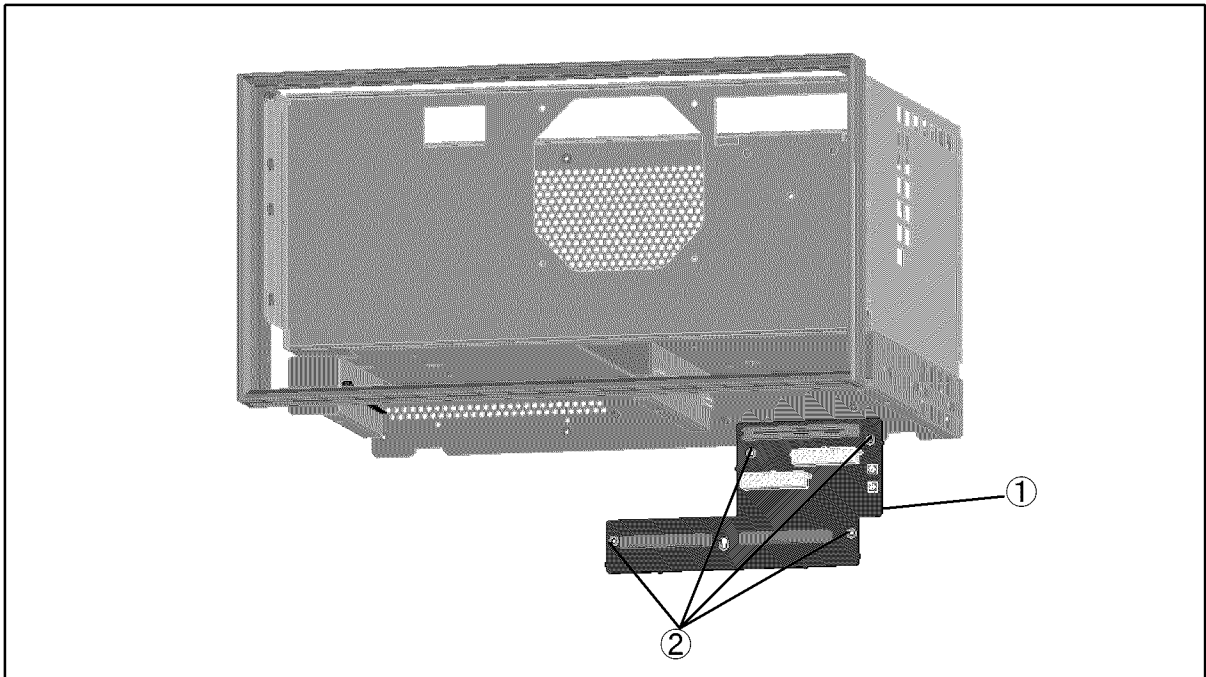
e5061ase027

Table 5-13 A21 PCI DSP CARD / A24 GPIB CARD Assembly

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|------------------------------|
| 1 | E5062-66521 | 1 | PCI DSP CARD |
| 2 | E5062-01204 | 1 | ANGLE PCI W/GPIB |
| 3 | 2950-0054 | 1 | NUT-HEX-DBL-CHAM |
| | 2190-0054 | 1 | WSHR-LK INTL T |
| 4 | 0515-0430 | 1 | SCREW-MACH M3.0 x L6 PAN T10 |
| 5 | E5062-65000 | 1 | PCI GPIB CARD |
| 6 | 0515-0430 | 2 | SCREW-MACH M3.0 x L6 PAN T10 |

Analog Mother Board Assembly

Figure 5-15 Analog Mother Board Assembly



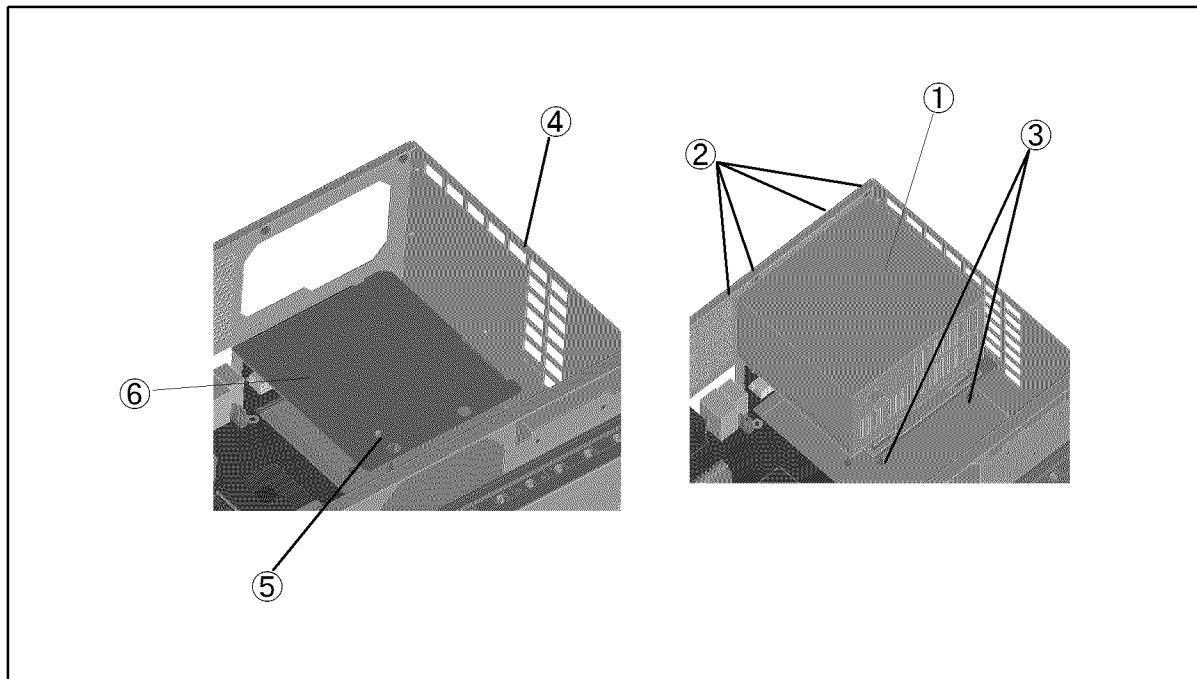
e5061ase028

Table 5-14 Analog Mother Board Assembly

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|-----------------------------|
| 1 | E5062-66510 | 1 | ANALOG MOTHER BOARD |
| 2 | 0515-0372 | 4 | SCREW-MACH M3.0 x L8 PN T10 |

Power Supply Assembly

Figure 5-16 Power Supply Assembly



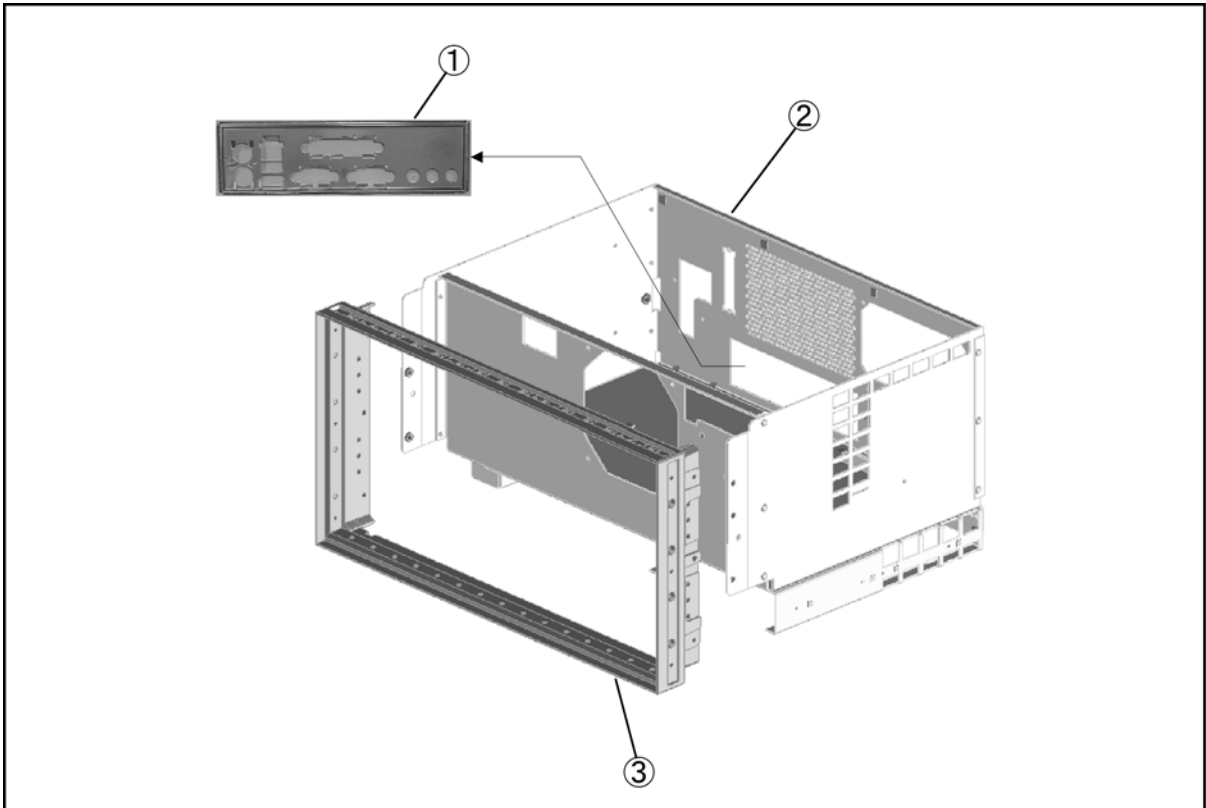
e5061ase029

Table 5-15 Power Supply Assembly

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|-----------------------------|
| 1 | 0950-4773 | 1 | A50 POWER SUPPLY |
| 2 | 0515-0372 | 4 | SCREW-MACH M3.0 x L8 PN T10 |
| 3 | 0515-2143 | 2 | SCREW-MACH M4.0 x L8 PN T20 |
| 4 | 0515-0372 | 1 | SCREW-MACH M3.0 x L8 PN T10 |
| 5 | 0515-1946 | 1 | SCREW-MACH M3.0 x L8 FL T10 |
| 6 | E5062-00602 | 1 | PLATE PS |

Chassis Assembly

Figure 5-17 Chassis Assembly



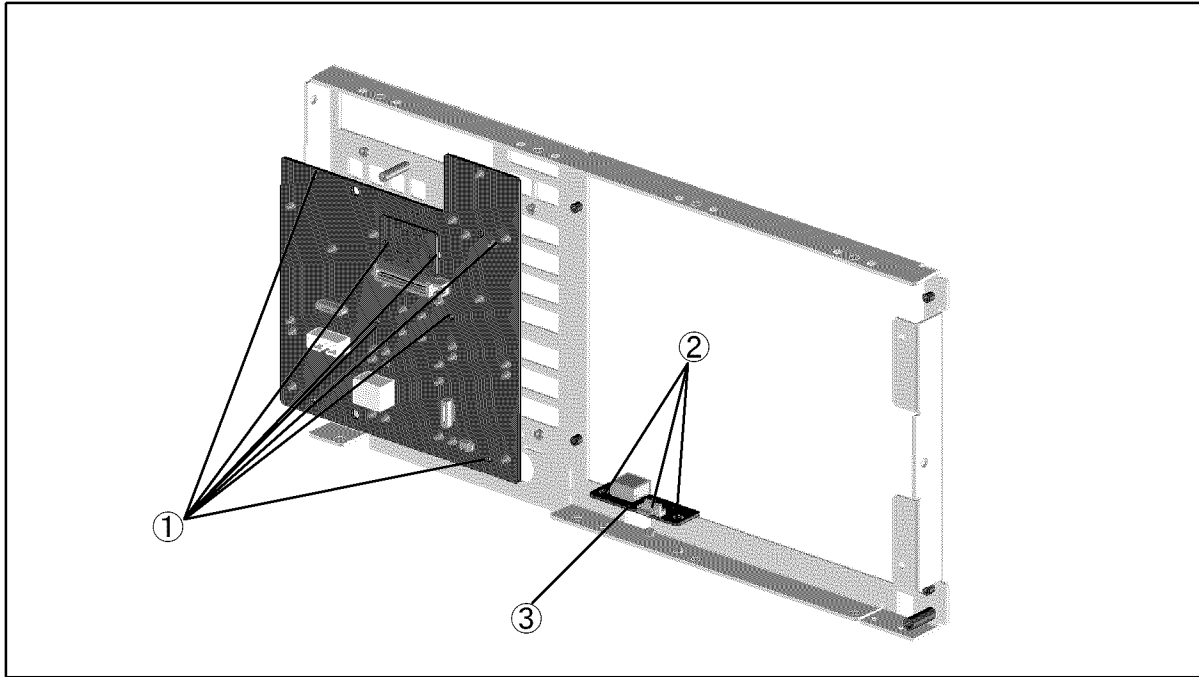
e5061ase014

Table 5-16 Chassis Assembly

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|-----------------------------|
| 1 | 8160-1630 | 1 | I/O SHIELD |
| 2 | E5062-60001 | 1 | CHASSIS ASSEMBLY |
| 3 | 5022-1190 | 1 | FRONT FRAME |
| | 0515-2143 | 6 | SCREW-MACH M4.0 x L8 PN T20 |
| | 8160-0641 | 1 | GASKET BRAID (125 cm) |

Front Assembly (Front Keyboard / USB)

Figure 5-18 Front Assembly (Front Keyboard / USB)



e5061ase021

Table 5-17 Front Assembly (Front Keyboard / USB)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|--|
| 1 | 0515-0430 | 8 | SCREW-MACH M3.0 x L6 PN T10 |
| 2 | 0515-0430 | 3 | SCREW-MACH M3.0 x L6 PN T10 |
| 3 | E5062-66532 | 1 | FRONT USB BOARD |
| 4 | E5062-04003 | 1 | COVER USB SMALL (See Service Note E506xA-07) |

Front Assembly (Inverter)

Figure 5-19 Front Assembly (Inverter)

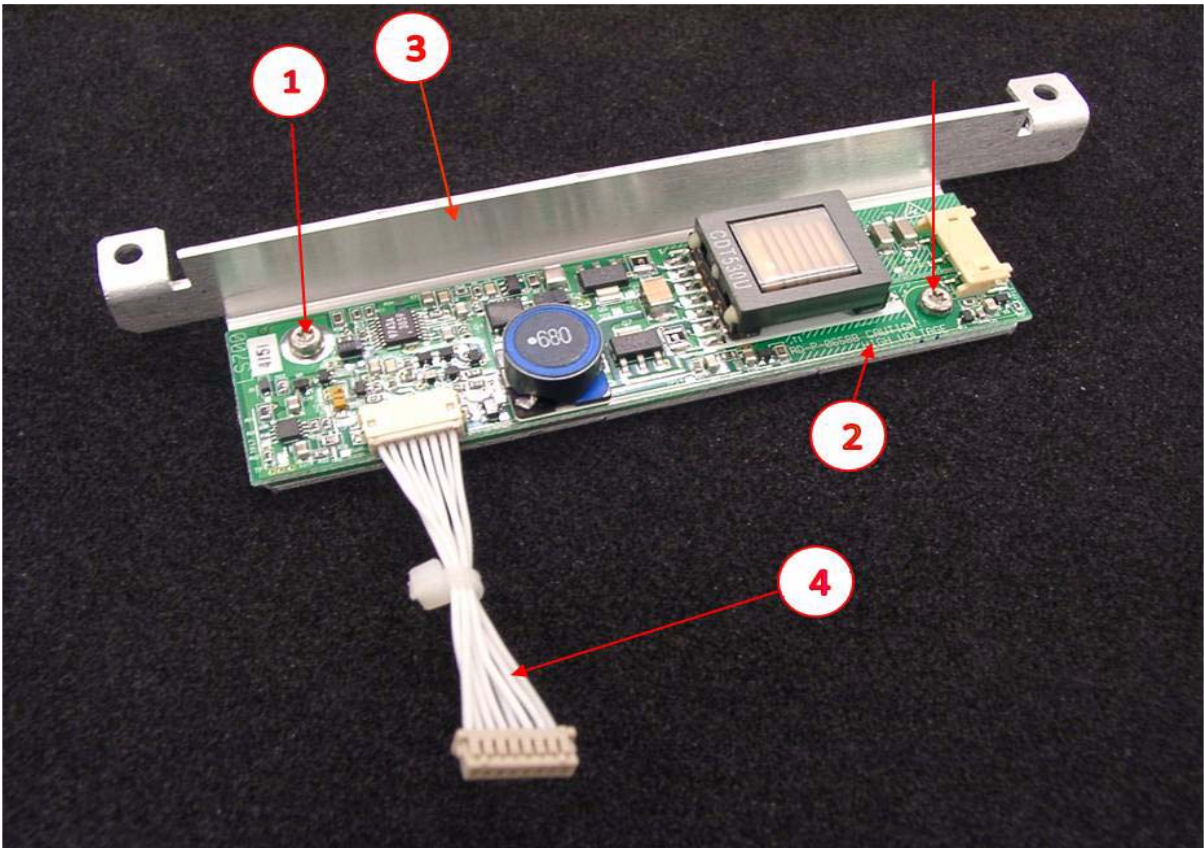
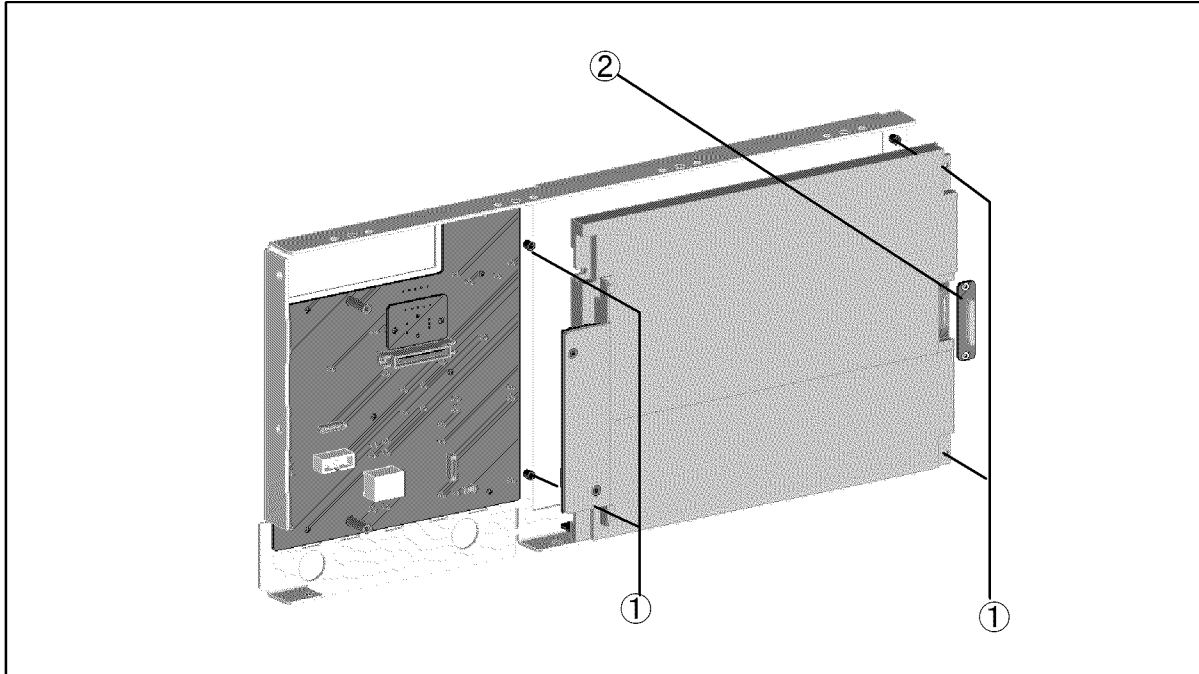


Table 5-18 Front Assembly (Inverter)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|----------------------------|
| 1 | 0515-1974 | 2 | SCREW-MACH M2.5 x L4 PN T8 |
| 2 | 0950-4091 | 1 | INVERTER |
| 3 | E5070-01211 | 1 | BRACKET INVERTER |
| 4 | E5070-61627 | 1 | WIRE ASSY |

Front Assembly (LCD) for E5061A : JP1KLxxxxx, MY44101900 and below, E5062A : JP1KLxxxxx, MY44102842 and below

Figure 5-20 Front Assembly (LCD)



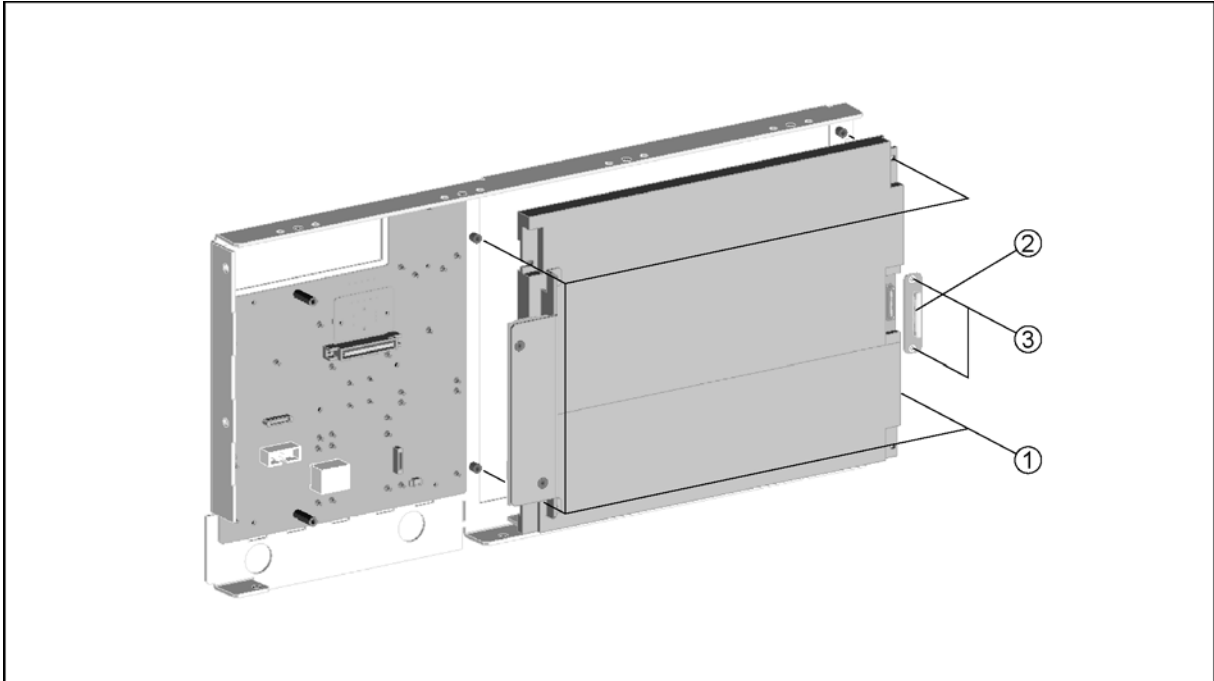
e5061ase022

Table 5-19 Front Assembly (LCD)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|-----------------------------|
| 1 | 0515-1402 | 4 | SCREW-MACH M3.5 x L8 PN T15 |
| 2 | E5070-66531 | 1 | LCD ADAPTER |

Front Assembly (LCD) for E5061A : MY44101901 and above, E5062A : MY44102843 and above

Figure 5-21 Front Assembly (LCD)



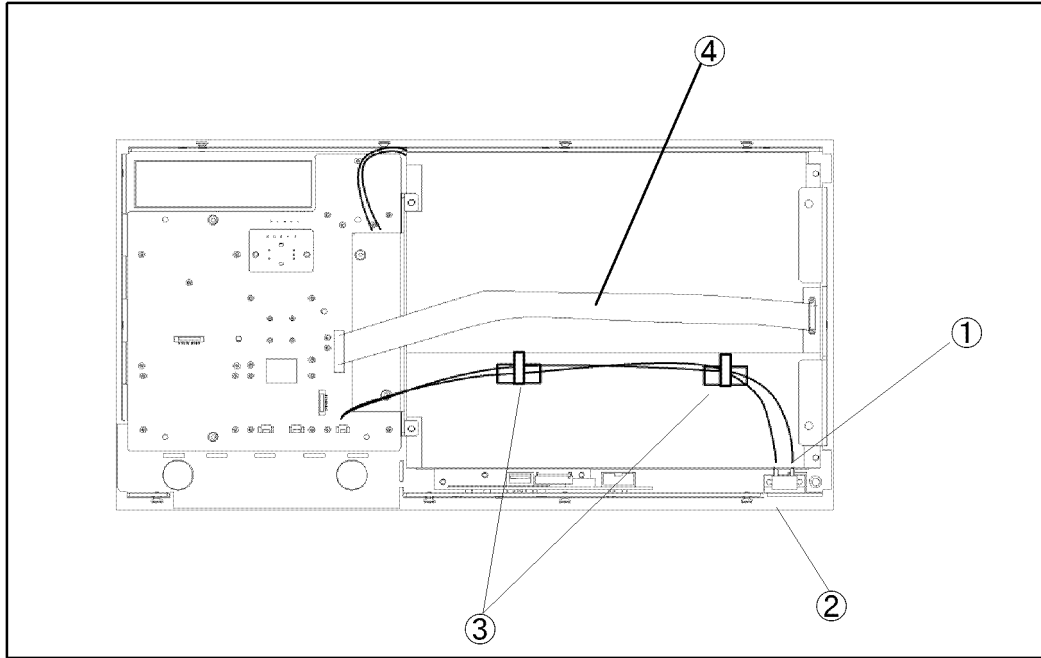
e5061ase5002

Table 5-20 Front Assembly (LCD)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|-----------------------------|
| 1 | 0515-1402 | 4 | SCREW-MACH M3.5 x L8 PN T15 |
| 2 | E5070-66531 | 1 | LCD ADAPTER |
| 3 | 5188-4418 | 2 | SELF-TAPPING SCREW M2-L4 |

**Front Assembly (Standby Switch / LCD Cable) for E5061A :
 JP1KLxxxxx, MY44101900 and below, E5062A : JP1KLxxxxx,
 MY44102842 and below**

Figure 5-22 Front Assembly (Standby Switch / LCD Cable)



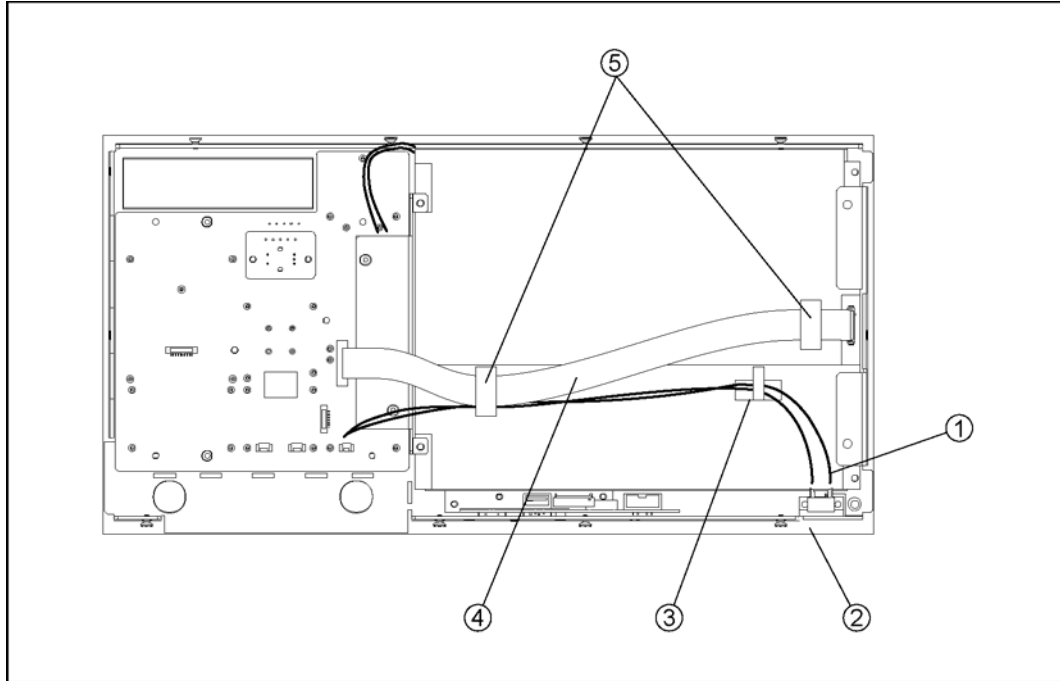
e5061ase061

Table 5-21 Front Assembly (Standby Switch / LCD Cable)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|--------------------------------|
| 1 | E5070-61901 | 1 | WIRE ASSEMBLY W/STANDBY SWITCH |
| | 0371-3953 | 1 | KEY CAP |
| 2 | 0515-2028 | 2 | SCREW-MACH M2.5 x L6 FL T8 |
| 3 | 1400-1334 | 2 | CLAMP-CABLE |
| 4 | E5062-61612 | 1 | FLAT CABLE |

**Front Assembly (Standby Switch / LCD Cable) for E5061A :
 MY44101901 and above, E5062A : MY44102843 and above**

Figure 5-23 Front Assembly (Standby Switch / LCD Cable)



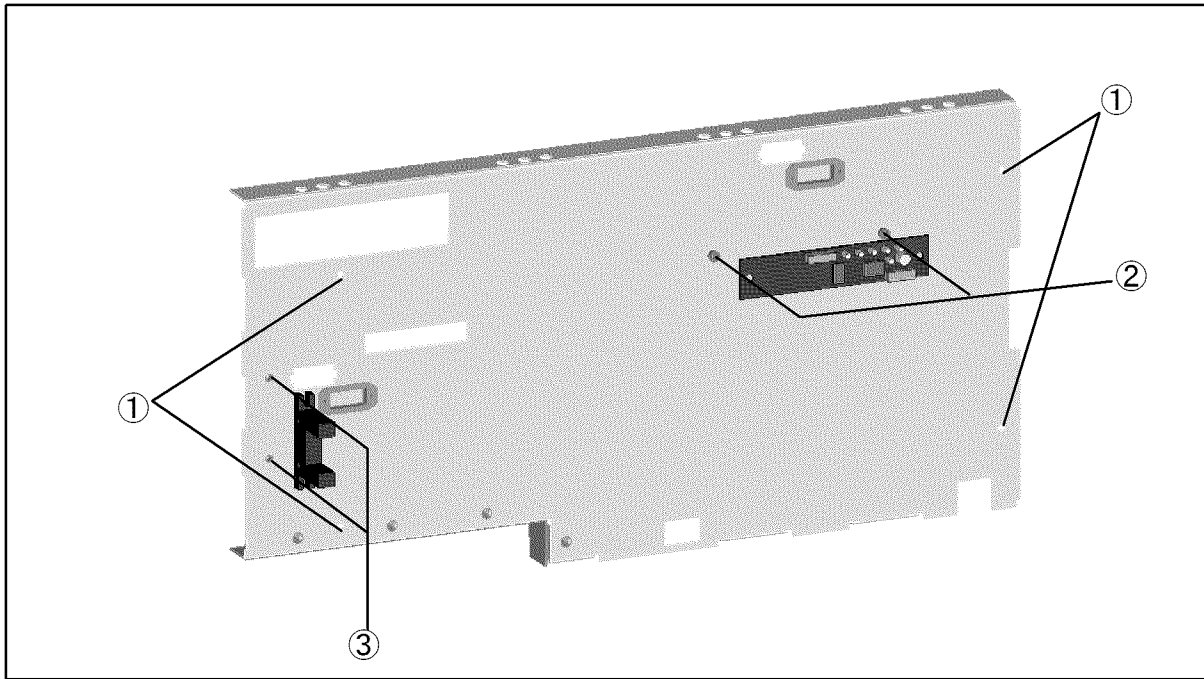
e5061ase5003

Table 5-22 Front Assembly (Standby Switch / LCD Cable)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|--------------------------------|
| 1 | E5070-61901 | 1 | WIRE ASSEMBLY W/STANDBY SWITCH |
| | 0371-3953 | 1 | KEY CAP |
| 2 | 0515-2028 | 2 | SCREW-MACH M2.5 x L6 FL T8 |
| 3 | 1400-1334 | 1 | CLAMP-CABLE |
| 4 | E5062-61612 | 1 | FLAT CABLE |
| 5 | 1400-3360 | 2 | CLAMP-CABLE |

Front Assembly (Cover 1)

Figure 5-24 Front Assembly (Cover 1)



e5061ase023

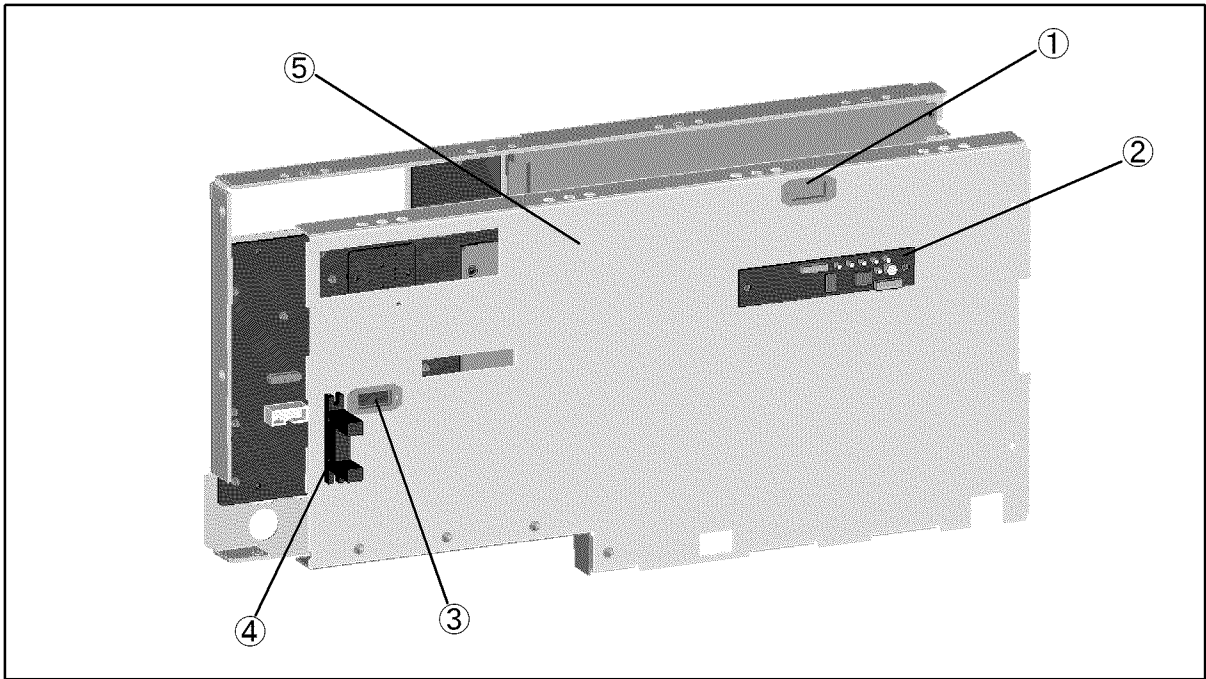
Table 5-23 Front Assembly (Cover 1)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|---|
| 1 | 0515-0430 | 4 | SCREW-MACH M3.0 x L6 PN T10 |
| 2 | 0515-0430 | 2 | SCREW-MACH M3.0 x L6 PN T10 (Opt. 016) |
| 3 | 0515-0374 | 2 | SCREW-MACH M3.0 x L10 PN T10 (Opt. 016) |

Front Assembly (Cover 2)

Figure 5-25

Front Assembly (Cover 2)



e5061ase024

Table 5-24

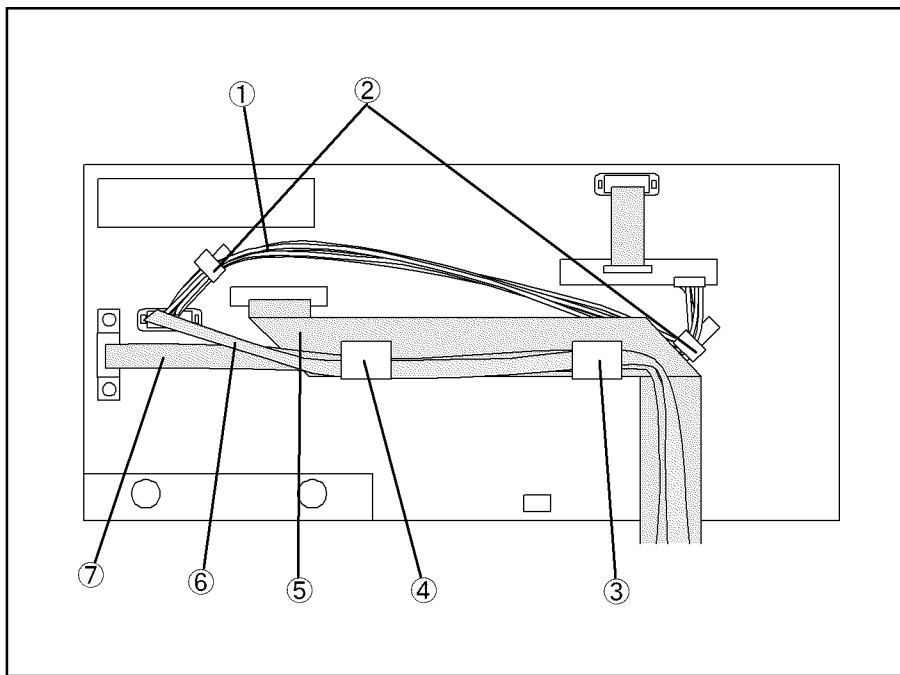
Front Assembly (Cover 2)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|--------------------------------|
| 1 | 1400-3156 | 1 | SADDLE EDGE (Opt. 016) |
| 2 | 5183-4184 | 1 | CNTR TOUCH PANEL (Opt. 016) |
| 3 | 1400-3156 | 2 | SADDLE EDGE |
| 4 | E5070-61657 | 1 | FLAT CABLE ASSEMBLY (Opt. 016) |
| 5 | E5062-00603 | 1 | COVER |

Front Assembly (Cover 3)

Figure 5-26

Front Assembly (Cover 3)



e5061ase032

Table 5-25 Front Assembly (Cover 3)

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|------|------------------------------|
| 1 | E5070-61628 | 1 | WIRE ASSEMBLY (Opt. 016) |
| 2 | 1400-1334 | 2 | CLAMP-CABLE |
| 3 | 1400-0611 | 1 | CLAMP-CABLE |
| 4 | 1400-0611 | 1 | CLAMP-CABLE |
| 5 | E5062-61615 | 1 | FLAT CABLE ASSEMBLY |
| 6 | E5052-61626 | 1 | FLAT CABLE DVI |
| 7 | E5070-61664 | 1 | FLAT CBL ASSEMBLY (Opt. 016) |

Label on Rear Face

Figure 5-27

Label on Rear Face

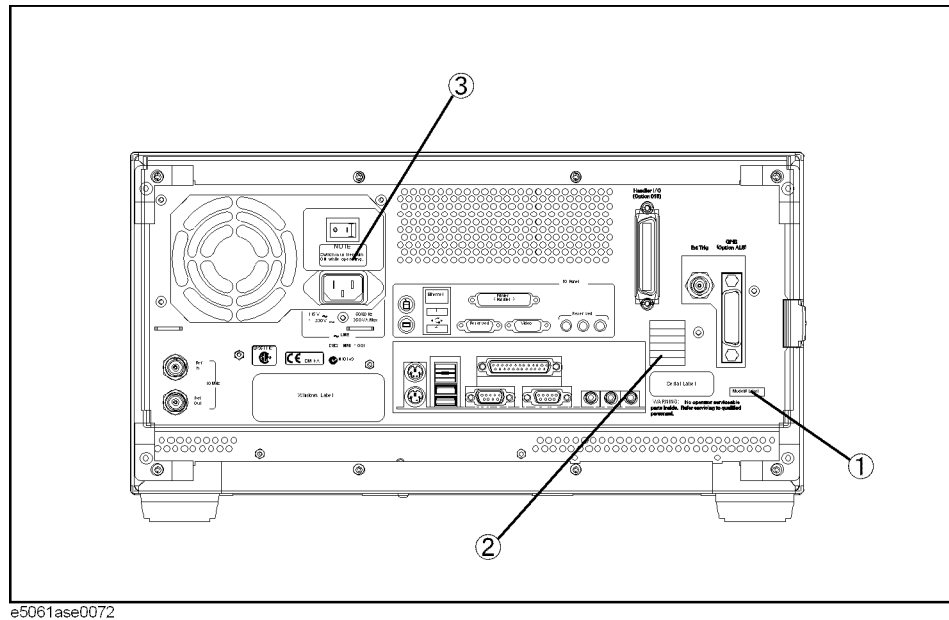


Table 5-26

Label on Rear Face

| Ref. Desig. | Agilent Part Number | Qty. | Description |
|-------------|---------------------|-------------|--------------------|
| 1 | E5061-87101 | 1 | LABEL (E5061A) |
| | E5062-87102 | 1 | LABEL (E5062A) |
| 2 | 5185-3780 | 1 | LABEL (OPTION 250) |
| | 5185-3778 | 1 | LABEL (OPTION 150) |
| | 5185-3781 | 1 | LABEL (OPTION 275) |
| | 5185-3779 | 1 | LABEL (OPTION 175) |
| | 5185-3782 | 1 | LABEL (OPTION 1E1) |
| | 5185-3719 | 1 | LABEL (OPTION 015) |
| | 5185-3720 | 1 | LABEL (OPTION 016) |
| | 5185-3734 | 1 | LABEL (OPTION 100) |
| | 3 | E5070-87103 | 1 |

Other Parts

Table 5-27 Other Parts

| Agilent Part Number | Qty. | Description |
|----------------------------|-------------|------------------------------------|
| E5061-900x0 ^{*1} | 1 | USER'S GUIDE |
| E5061-900x1 ^{*1} | 1 | INSTALLATION AND QUICK START GUIDE |
| E5061-900x2 ^{*1} | 1 | PROGRAMMER'S GUIDE |
| E5061-900x3 ^{*1} | 1 | VBA PROGRAMMER'S GUIDE |
| E5061-901x0 ^{*1} | 1 | SERVICE GUIDE |
| E5061-9050x ^{*1} | 1 | CD-ROM (DOCUMENTATION) |
| 1150-7799 | 1 | MOUSE |
| 1150-7970 | 1 | KEYBOARD |

*1. The number indicated by "x" in the part number of each manual, sample program disk, or CD-ROM, 0 for the first edition, is incremented by 1 each time a revision is made. The latest edition comes with the product.

6 Replacement Procedure

This chapter provides procedure for removing and replacing the major assemblies in the E5061A/E5062A.

Replacing an Assembly

The following steps show the sequence for replacing an assembly in a E5061A/E5062A RF Network Analyzer.

1. Identify the faulty group. Refer to Chapter 4, “Troubleshooting.”
2. Order a replacement assembly. Refer to Chapter 5, “Replaceable Parts.”
3. Replace the faulty assembly and determine what adjustments are necessary. Refer to This chapter and Chapter 7, “Post-Repair Procedures.”
4. Perform the necessary adjustments. Refer to Chapter 3, “Adjustment.”
5. Perform the necessary performance tests. Refer to Chapter 2, “Performance Tests.”

WARNING

These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing unless you are qualified to do so.

WARNING

The opening of covers or removal of parts is likely to expose dangerous voltages. Disconnect the instrument from its power supply.

CAUTION

Many of the assemblies in this instrument are very susceptible to damage from ESD(electrostatic discharge). Perform the following procedures only at a static-safe workstation and wear a grounding strap.

Required Tools

The following tools are required for repair of E5061A/E5062A.

Table 6-1 Required Tools

| Assembly | TORX screwdriver | | | | flat edge screwdriver | torque screwdriver TORX T10 | pozidriv screwdriver | hex key | open wrench | | open torque wrench |
|----------------------|------------------|-----|-----|-----|-----------------------|-----------------------------|----------------------|---------|-------------|---------|--------------------|
| | T8 | T10 | T15 | T20 | | | | 1.5 mm | 9/16 in. | 5/8 in. | 5/16 in. |
| Outer Cover | | | √ | √ | | | | | | | |
| Front Panel | | | √ | √ | √ | | | | | | |
| HDD | | √ | √ | √ | | | √ | | | | |
| FDD | | √ | √ | √ | | | | | | | |
| Power Supply | | √ | √ | √ | | √ | | | | | |
| Handler I/O | | √ | √ | √ | | | | | | | |
| Digital Mother Board | | √ | √ | √ | | | | | | | |
| Source Board | | √ | √ | √ | √ | | | | | | √ |
| Receiver Board | | √ | √ | √ | √ | | | | | | √ |
| Fan | | | √ | √ | √ | | | √ | | | |
| Analog Motherboard | | √ | √ | √ | √ | | | | | | √ |
| PCI DSP Card | | √ | √ | √ | | | | | | √ | |
| GPIB Card | | √ | √ | √ | | | | | | | |
| Front Keyboard | | √ | √ | √ | √ | | | √ | | | |
| Inverter | √ | √ | √ | √ | √ | | | | | | |
| LCD | | √ | √ | √ | √ | | | | | | |
| LCD Backlight | | √ | √ | √ | √ | | | | | | |

Outer Cover Removal

Tools Required

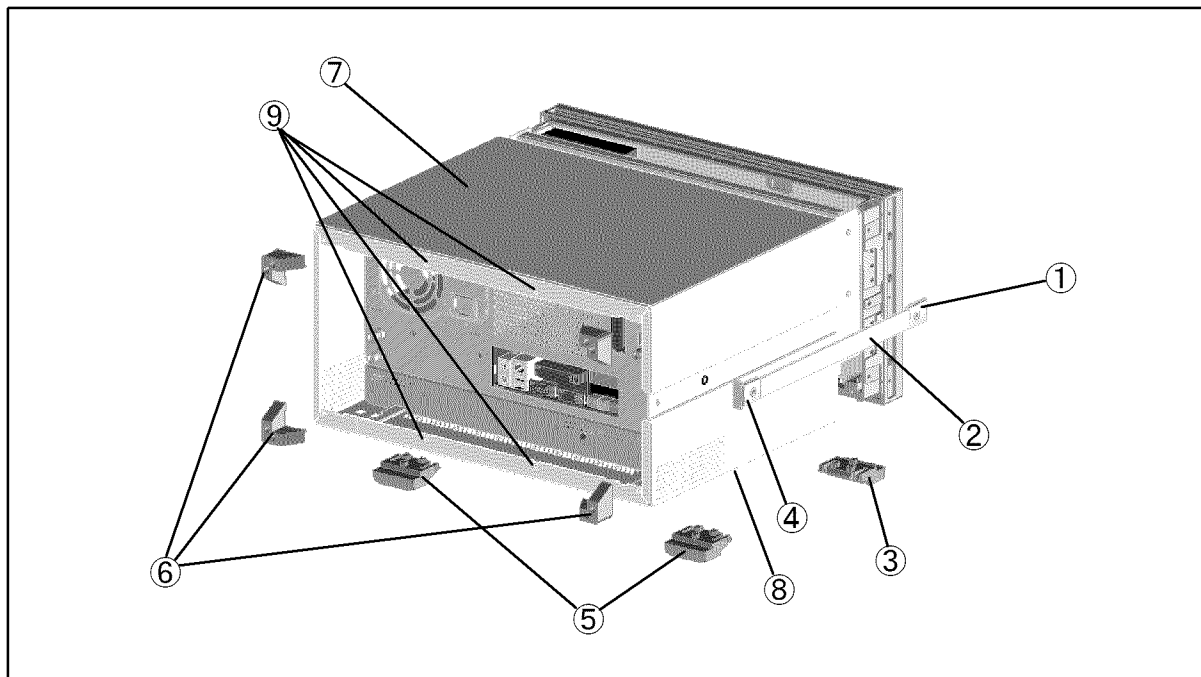
- TORX screwdriver, T15 and T20

Procedure

Refer to Figure 6-1 for this procedure.

- Step 1.** Disconnect the power cable from the E5061A/E5062A.
- Step 2.** Remove the four TORX T15 screws (item 6) fastening the four rear foot
- Step 3.** Remove the four TORX T15 screws (item 9) fastening the cover.
- Step 4.** Remove the two TORX T20 screws (item 1,4) fastening the side strap handles.
- Step 5.** Remove the four bottom feet (item 3, 5).
- Step 6.** Remove the three TORX T15 screws (item 8) from the bottom.
- Step 7.** Slide the outer cover and remove it carefully.

Figure 6-1 Outer Cover Removal



e5061ase016

Front Panel Removal

Tools required

- TORX screwdriver T15 and T20
- Flat edge screwdriver

Procedure

Refer to Figure 6-2 for this procedure.

- Step 1.** Remove the outer cover as described in “Outer Cover Removal” on page 166.
- Step 2.** Release the cables from the cable clamp (item 1).
- Step 3.** Remove the top trim (item 2) using a flat edge driver.
- Step 4.** Remove the eight TORX T15 screws (item 3) fastening front panel.
- Step 5.** Gradually push the front panel assembly towards the outside.
- Step 6.** Release the mylar cable and flat cables from the cable clamps (item 6).
- Step 7.** Disconnect the three cables (item 4, 5 and 8) from the front panel.

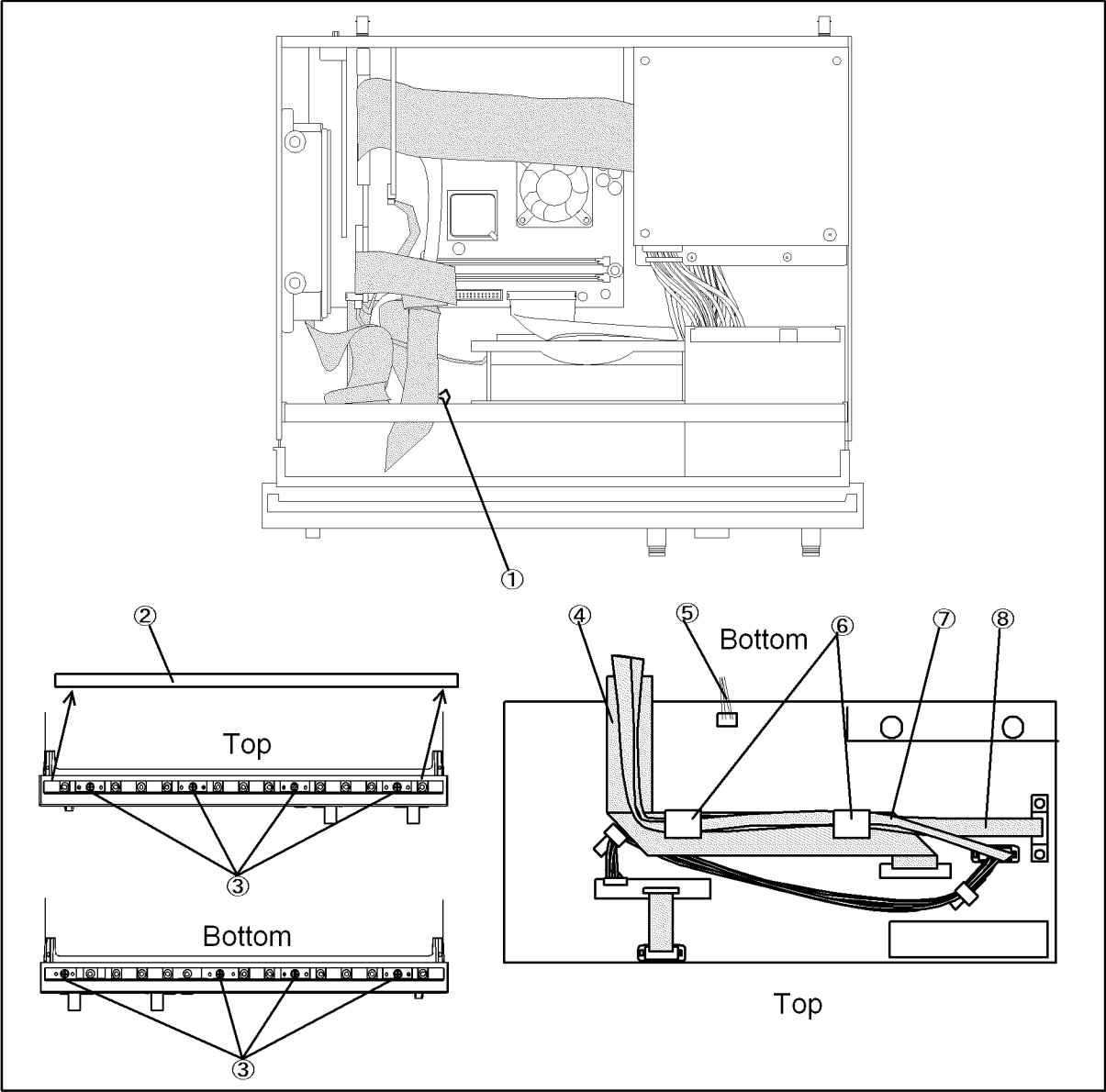
NOTE

Keep the mylar cable (item 7) connected.

The mylar cable and its connector are very fragile. It’s recommended to replace the mylar cable when the cable is disconnected and connected frequently.

Replacement Procedure
Front Panel Removal

Figure 6-2 Front Panel Removal



e5061ase062

A27 HDD (Hard Disk Drive) Replacement

Tools Required

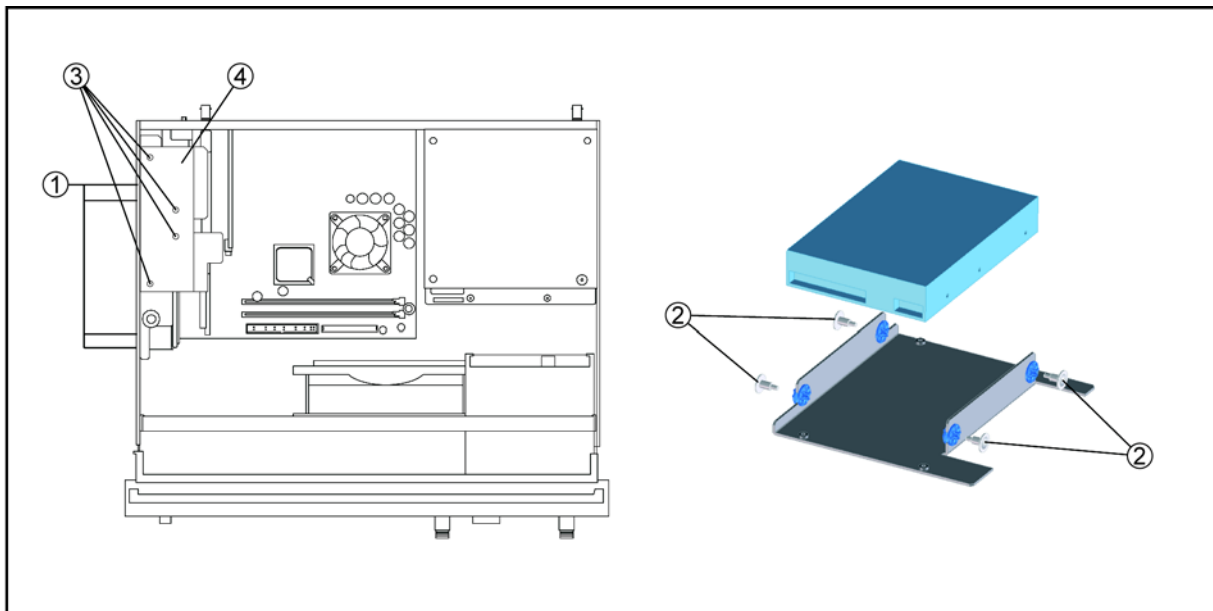
- TORX screwdriver, T10, T15, and T20
- Pozidriv screwdriver, pt size #2 (medium)

Removal Procedure

Refer to Figure 6-3 for this procedure.

- Step 1.** Remove the outer cover as described in “Outer Cover Removal” on page 166.
- Step 2.** If the PCI angle (item 4) is attached, remove the four TORX T10 screws (item 3) and remove the PCI angle.
- Step 3.** Remove the four TORX T10 screws (item 1) fastening the A27 HDD assembly.
- Step 4.** Disconnect the power supply cable from the HDD.
- Step 5.** Disconnect the flat cable from the HDD.
- Step 6.** Lift the HDD assembly.
- Step 7.** Remove the four screws (item 2) fastening the A27 HDD.

Figure 6-3 A27 HDD Removal



e5061ase3003

Replacement Procedure

- Step 1.** Reverse the order of the removal procedure.
- Step 2.** Restore backup files onto the new mass storage disk drive as described in “Restore Backup Files onto the New HDD” on page 170
- Step 3.** Calibrate the touch screen as described in “Calibration of the Touch Screen” on page 170

Restore Backup Files onto the New HDD

The Backup files is stored in the flash ROM on the A21 PCI DSP card. The file must be restored in the new mass storage disk drive with the adjustment program. For detail of the adjustment program, refer to Chapter 3, “Adjustment,” on page 81.

- Step 1.** Run the adjustment program.
- Step 2.** Input the GPIB address of the E5061A/E5062A.
- Step 3.** Input the serial number of the E5061A/E5062A.
- Step 4.** Choose Spot Adjustment.
- Step 5.** Choose HDD.

Calibration of the Touch Screen

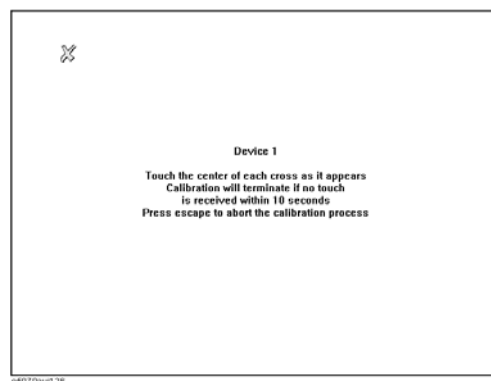
When you have replaced the HDD on a E5061A/E5062A equipped with an Option 016 touch screen, you have to calibrate the touch screen. Follow the procedure described below to calibrate the touch screen.

- Step 1.** Press **[System]**.
- Step 2.** Press **Service Menu**.
- Step 3.** Press **Test Menu**.
- Step 4.** Press **Adjust Touch Screen**.

The touch screen calibration screen (Figure 6-4) appears.

Figure 6-4

Touch Panel Calibration Screen



- Step 5.** Touch the x mark on the upper left with your finger. The mark x appears also on the lower

left, upper right, and lower right. Touch the x marks in that order with your finger.

Touching the four locations described above with your finger automatically concludes the touch screen calibration.

NOTE

With no operation on the touch screen calibration screen for a preset time, it automatically closes and the previous measurement screen reappears.

A28 FDD (Floppy Disk Drive) Replacement

Tools Required

- TORX screwdriver, T10, T15, and T20

Removal procedure

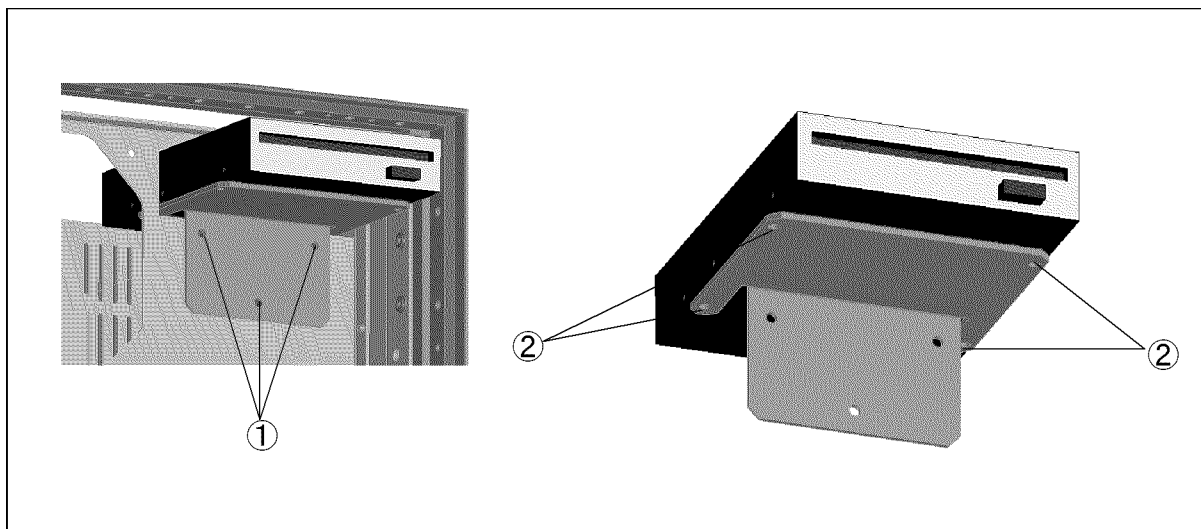
Refer to Figure 6-5 for this procedure.

- Step 1.** Remove the outer cover as described in “Outer Cover Removal” on page 166.
- Step 2.** Remove the front panel as described in “Front Panel Removal” on page 167.
- Step 3.** Disconnect the power supply cable from the FDD.
- Step 4.** Disconnect the flat cable from the FDD.
- Step 5.** Remove three TORX T20 screws (item 1) fastening the FDD assembly.
- Step 6.** Slide the A28 FDD assembly forward.
- Step 7.** Remove the four TORX T10 screws (item 2) fastening the FDD to the mount.

Replacement Procedure

- Step 1.** Fasten the angle to the new FDD, and then fasten it to the mount as shown in Figure 6-5.
- Step 2.** Reverse the order of the removal procedure.

Figure 6-5 A28 FDD Removal



A50 ATX Power Supply Assembly Replacement

Tools Required

- TORX screwdriver, T10, T15, and T20
- torque screwdriver, TORX T10 (set to 7 in-lb)

Removal Procedure

Refer to Figure 6-6 for this procedure.

- Step 1.** Remove the outer cover as described in “Outer Cover Removal” on page 166.
- Step 2.** Disconnect the power supply cables for the FDD and HDD.
- Step 3.** Remove the two TORX T20 screws (item 1) fastening the plate for power supply.
- Step 4.** Remove the four TORX T10 screws (item 2) from the rear panel.
- Step 5.** Lift the A50 ATX power supply assembly (item 3) toward front side.
- Step 6.** Remove the one TORX T10 screw (item 4) from the chassis.
- Step 7.** Remove the one TORX T10 screw (item 5) from the plate.
- Step 8.** Remove the plate (item 6) from the chassis.
- Step 9.** Disconnect the power supply cable from the A10 analog motherboard.

Replacement Procedure

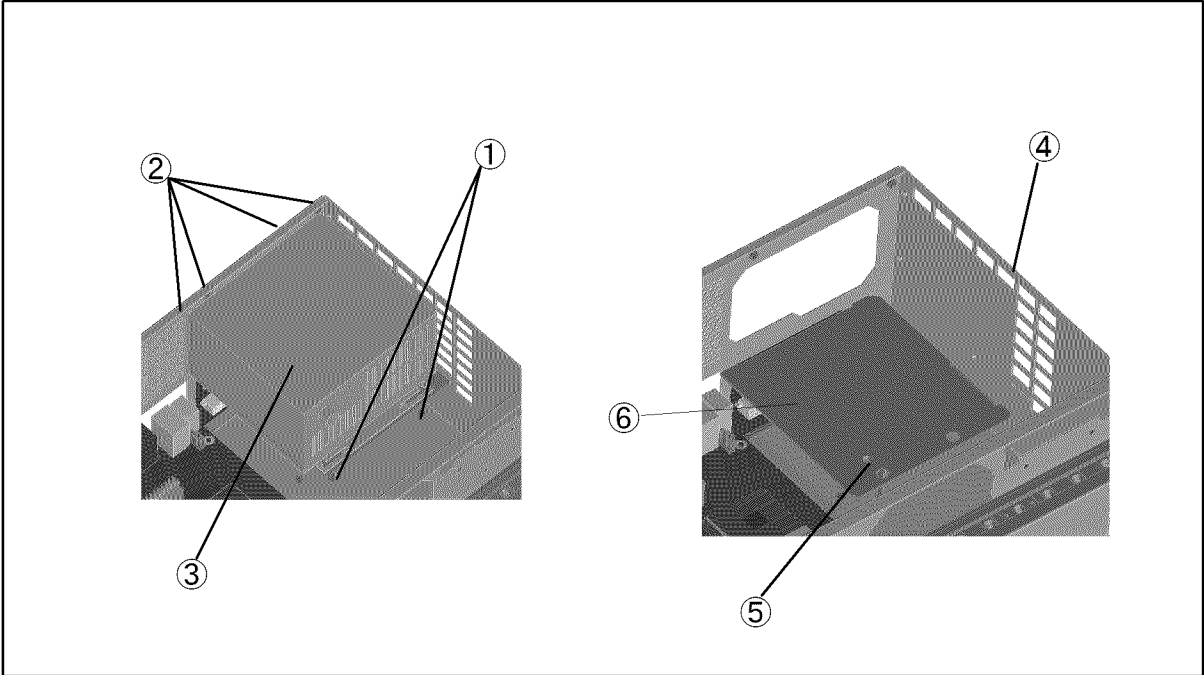
- Step 1.** Reverse the order of the removal procedure.

NOTE

Fasten the TORX T10 screws (item 2) using a torque screwdriver.

Replacement Procedure
A50 ATX Power Supply Assembly Replacement

Figure 6-6 A50 ATX Power Supply Assembly Removal



e5061ase065

A25 Handler I/O Board Replacement

Tools Required

- TORX screwdriver, T10, T15, and T20

Removal Procedure

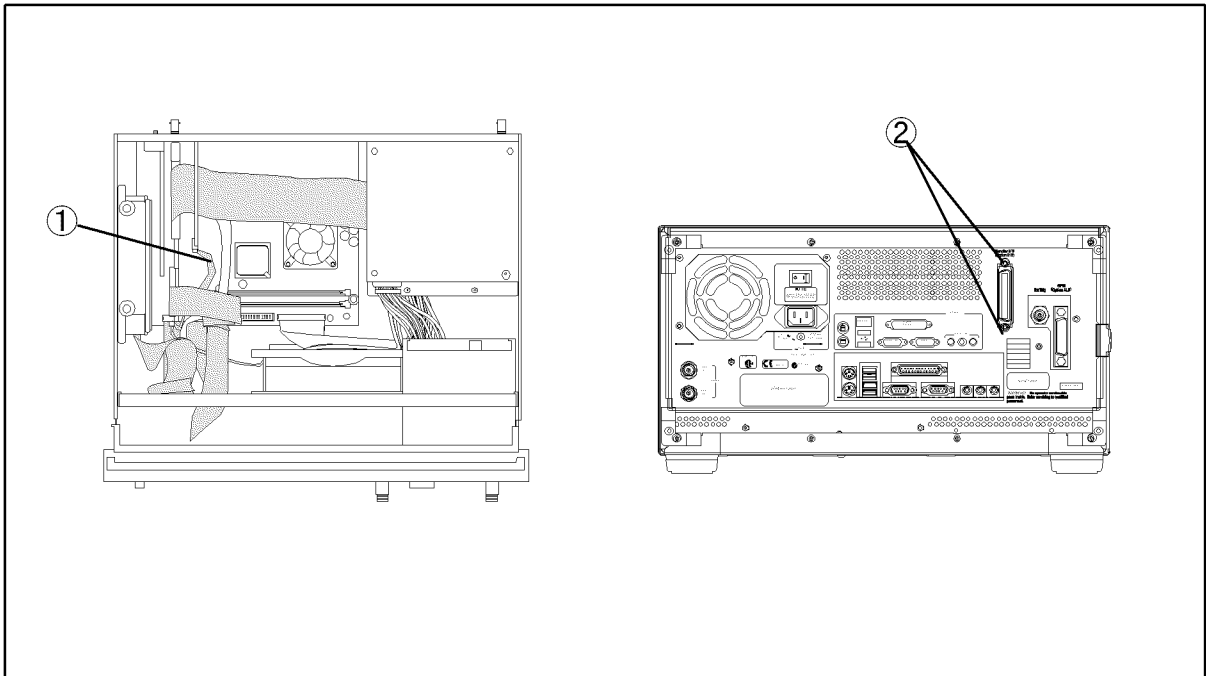
Refer to Figure 6-7 for this procedure.

- Step 1.** Remove the outer cover as described in “Outer Cover Removal” on page 166.
- Step 2.** Disconnect the flat cable (item 1) from the A25 handler I/O board.
- Step 3.** Remove the two TORX T10 screws (item 2) fastening the A25 handler I/O board.
- Step 4.** Slide the A25 handler I/O board.

Replacement Procedure

- Step 1.** Reverse the order of the removal procedure.

Figure 6-7 A25 Handler I/O Board Removal



e5061ase066

A20 Digital Motherboard Replacement

Tools Required

- TORX screwdriver, T10, T15, and T20

Removal Procedure

Refer to Figure 6-8 for this procedure.

- Step 1.** Remove the mouse, the external keyboard and the parallel printer cable if they are connected to the rear panel.
- Step 2.** Remove the outer cover as described in “Outer Cover Removal” on page 166.
- Step 3.** Remove the following assemblies.
- A25 Handler I/O board (refer to “A25 Handler I/O Board Replacement” on page 175.)
 - A21 PCI DSP CARD/A24 GPIB Card assembly (refer to “A21 PCI DSP Card / A24 GPIB Card Replacement” on page 185.)
- Step 4.** Disconnect the following cables.
- Connected to the Front Panel (touch screen, opt. 016) (item 1)
 - Connected to the A32 USB connector (item 2)
 - Connected to the A10 Analog Mother Board (item 3).
 - Connected to the A28 FDD (item 4).
 - Connected to the A27 HDD (item 6)
 - Connected to the Front Panel (display) (item 5)

NOTE

The mylar cable (item 5) and its connector are very fragile. It’s recommended to replace the mylar cable when the cable is disconnected and connected frequently.

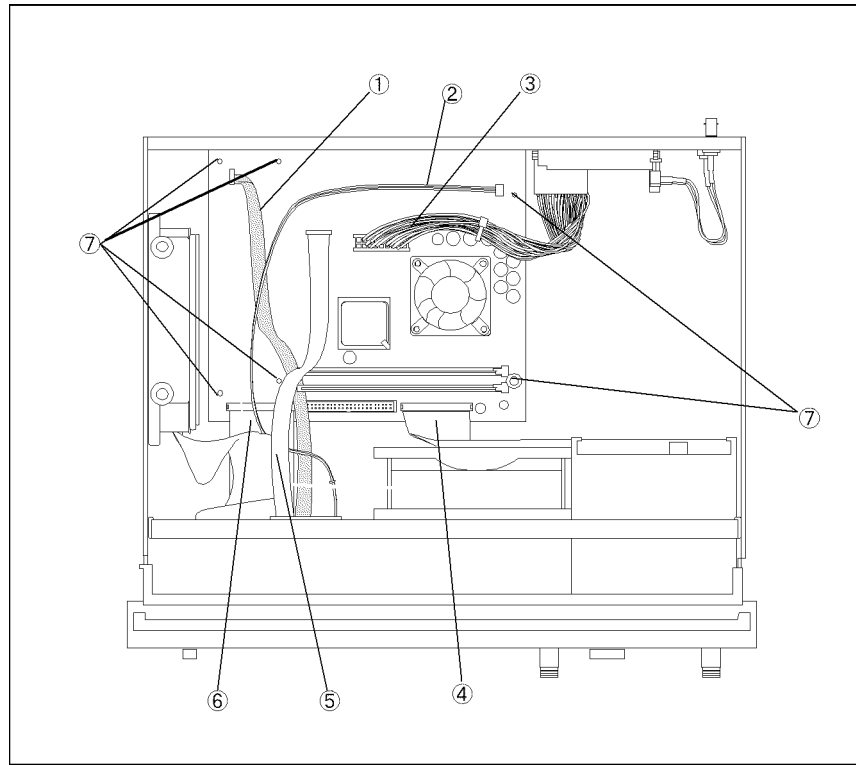
- Step 5.** Remove six TORX T10 screws (item 7) fastening the digital motherboard.
- Step 6.** Lift the digital motherboard.

Replacement Procedure

- Step 1.** Reverse the order of the removal procedure.

Figure 6-8

A20 Digital Motherboard Removal



e5061ase068

A1 Source Board Replacement

Tools Required

- TORX screwdriver, T10, T15, and T20
- Flat edge screwdriver
- Open-end torque wrench, 5/16 inch (set to 10 in-lb); or 8mm with 9.5in-lbs can be alternatively used (for reconnecting SMA connector)

Removal Procedure

Refer to Figure 6-9 for this procedure.

- Step 1.** Remove the outer cover as described in “Outer Cover Removal” on page 166
- Step 2.** Remove the front panel as described in “Front Panel Removal” on page 167.
- Step 3.** Remove the two TORX T10 screws (item 1) fastening the A1 source board on the rear panel.
- Step 4.** Disconnect the all semi-rigid cables (item 2).

NOTE The label on the semi-rigid cable shows the last two digits of the part number.

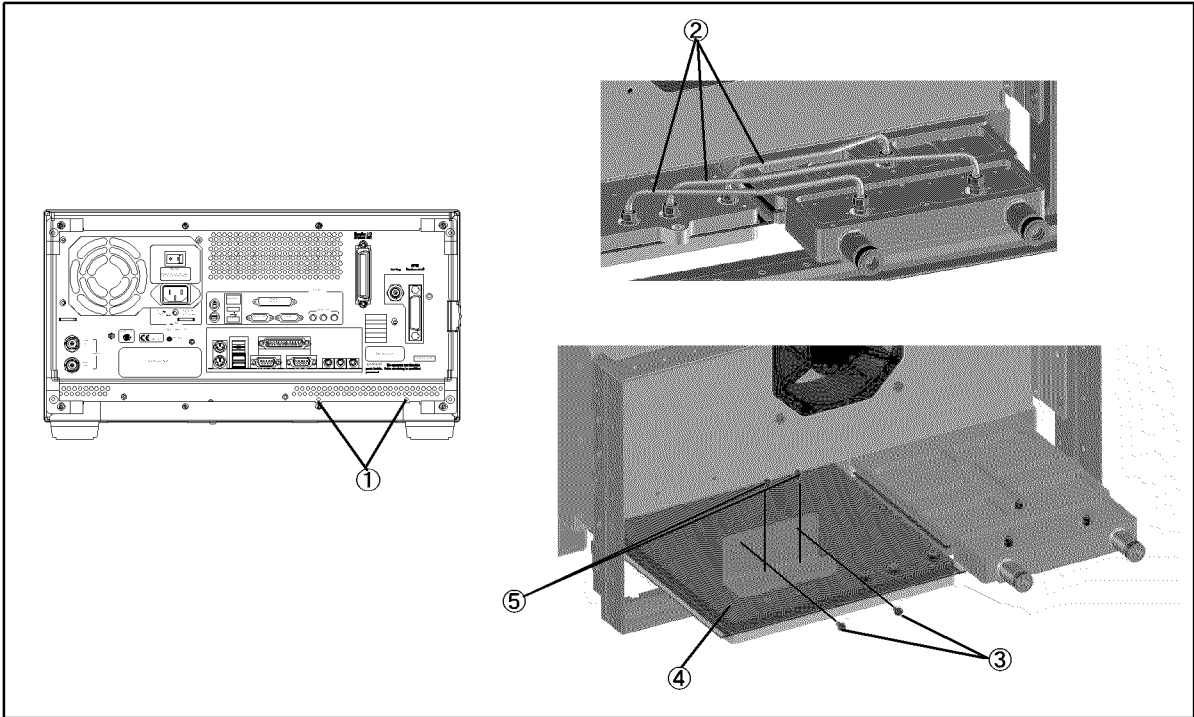
- Step 5.** Remove the two TORX T10 screws fastening the source board angle (item 3).
- Step 6.** Slide out the A1 source board (item 4).
- Step 7.** Remove the two TORX T10 screws fastening the source board angle (item 5)

Replacement Procedure

- Step 1.** Reverse the order of the removal procedure.

NOTE Fasten the semi rigid cable using a torque wrench for replacement.

Figure 6-9 A1 Source Board Removal



e5061ase069

A2 Receiver Board Replacement

Tools Required

- TORX screwdriver, T10, T15, and T20
- Flat edge screwdriver
- Open-end torque wrench, 5/16 inch (set to 10 in-lb); or 8mm with 9.5in-lbs can be alternatively used (for reconnecting SMA connector)

Removal Procedure

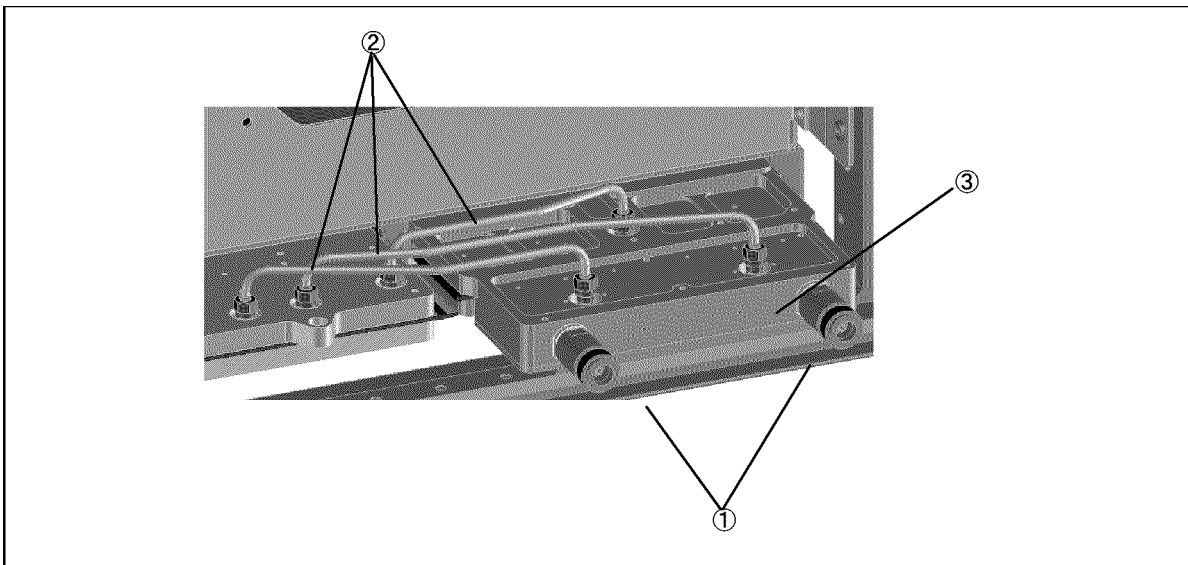
Refer to Figure 6-10 for this procedure.

- Step 1.** Remove the outer cover as described in “Outer Cover Removal” on page 166
- Step 2.** Remove the front panel as described in “Front Panel Removal” on page 167.
- Step 3.** Remove two TORX T15 screws (item 1).
- Step 4.** Disconnect the all semi-rigid cables (item 2).

NOTE The label on the semi-rigid cable shows the last two digits of the part number.

- Step 5.** Slide out the A2 receiver board (item 3).

Figure 6-10 A2 Receiver Removal



e5061ase070

Replacement Procedure

- Step 1.** Reverse the order of the removal procedure.

NOTE Fasten the semi rigid cable using a torque wrench for replacement.

Fan Replacement

Tools Required

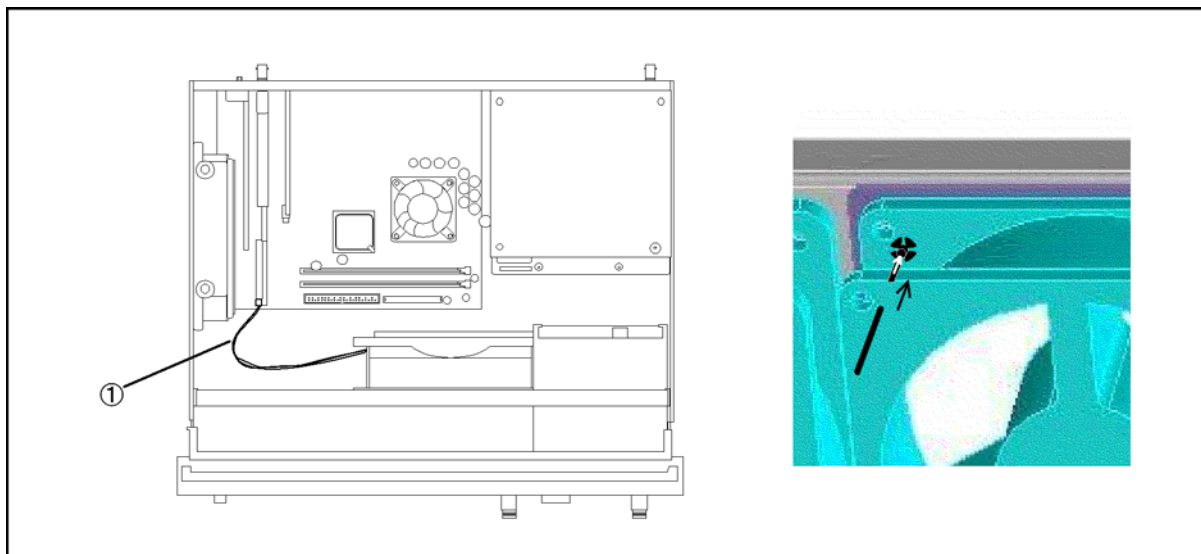
- TORX screwdriver, T15 and T20
- Flat edge screwdriver
- A fine stick such as Hex key, 1.5 mm

Removal Procedure

Refer to Figure 6-11 for this procedure.

- Step 1.** Remove the outer cover as described in “Outer Cover Removal” on page 166.
- Step 2.** Remove the front panel as described in “Front Panel Removal” on page 167.
- Step 3.** Disconnect the fan cable (item 1) from the A21 PCI DSP Card.
- Step 4.** Remove the four rivets (plastic) fastening the fan.

Figure 6-11 Fan Removal



e5061ase071

Replacement Procedure

- Step 1.** Reverse the order of the removal procedure.

A10 Analog Motherboard Replacement

Tools Required

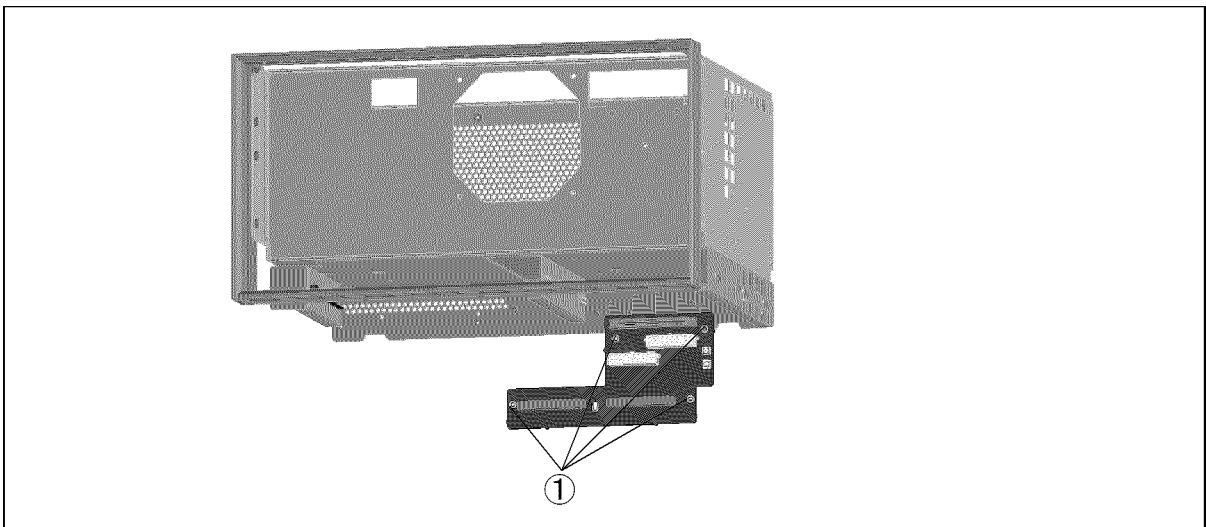
- TORX screwdriver, T10, T15, and T20
- Flat edge screwdriver
- Open-end wrench, 5/16 inch
- Open-end torque wrench, 5/16 inch (set to 10 in-lb); or 8mm with 9.5in-lbs can be alternatively used (for reconnecting SMA connector)

Removal Procedure

Refer to Figure 6-12 for this procedure.

- Step 1.** Remove the outer cover as described in “Outer Cover Removal” on page 166.
- Step 2.** Remove the front panel as described in “Front Panel Removal” on page 167.
- Step 3.** Remove the source board as described in “A1 Source Board Replacement” on page 178.
- Step 4.** Remove the receiver board as described in “A2 Receiver Board Replacement” on page 180.
- Step 5.** Remove the power supply as described in “A50 ATX Power Supply Assembly Replacement” on page 173
- Step 6.** Disconnect the cables connected to the A10 analog motherboard.
- Step 7.** Remove the four TORX T10 screws (item 1) fastening the A10 analog mother board.

Figure 6-12 A10 Analog Motherboard Removal



e5061ase072

Replacement Procedure

Step 1. Reverse the order of the removal procedure.

A21 PCI DSP Card / A24 GPIB Card Replacement

Tools Required

- TORX screwdriver, T10, T15, and T20
- Open-end wrench, 5/8 inch

Removal Procedure

Refer to Figure 6-13 for this procedure.

- Step 1.** Remove the outer cover as described in “Outer Cover Removal” on page 166.
- Step 2.** If the PCI angle (item 10) is attached, remove the four TORX T10 screws (item 9) and remove the PCI angle.
- Step 3.** Disconnect the cables (item 1, 2, 3 and 4) from the A21 PCI DSP Card.
- Step 4.** Remove two TORX T10 screws (item 5) fastening the PCI DSP Card/GPIB Card assembly to the rear panel.
- Step 5.** Disconnect the assembly from the A20 Digital Motherboard and Lift it.
- Step 6.** Remove the A21 PCI DSP Card or GPIB Card.

For removing the A21 PCI DSP Card.

- Remove a 5/8 inch nut (item 6) fastening the angle.
- Remove a TORX T10 screw (item 7) fastening the angle.

For removing the GPIB Card.

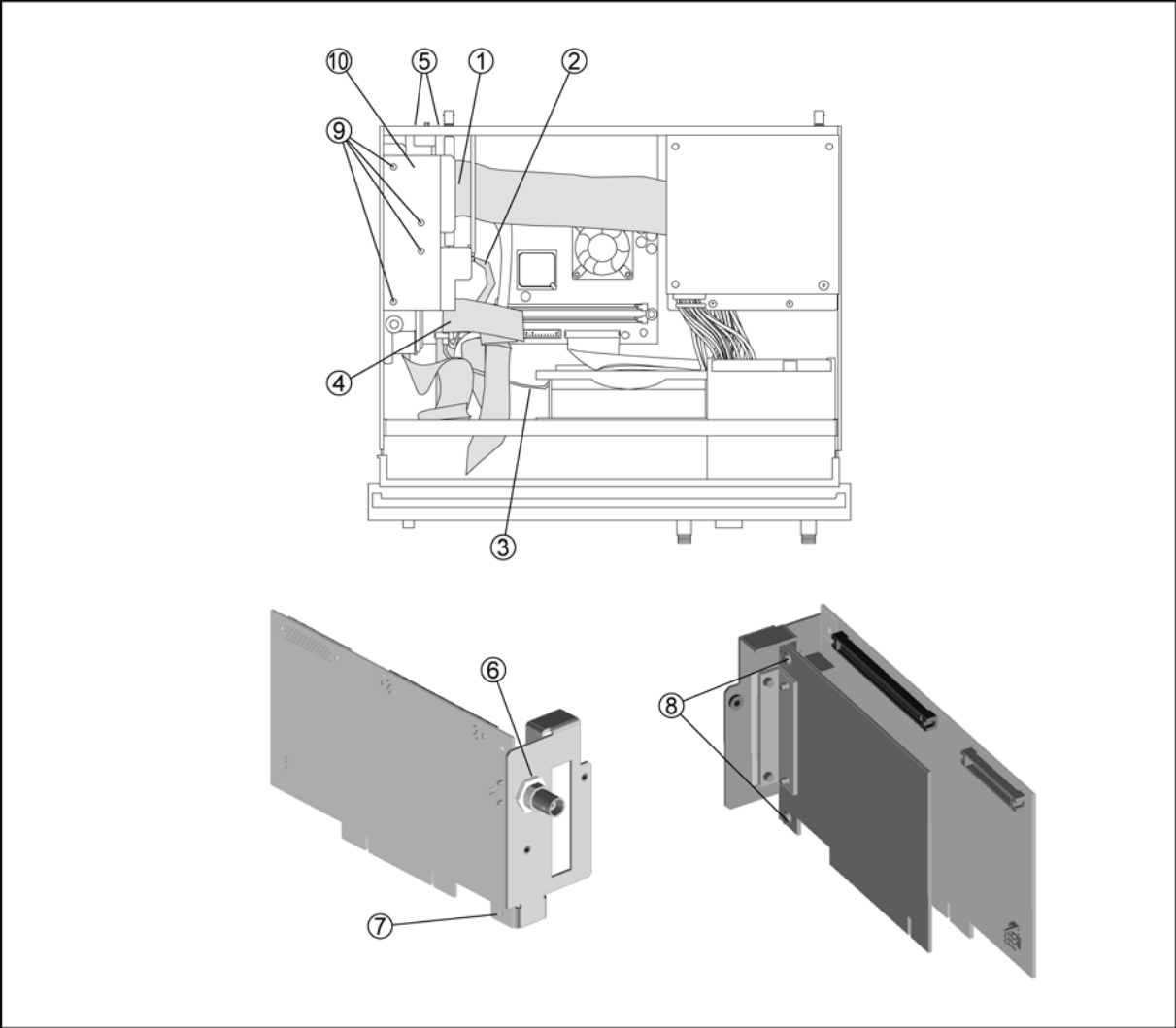
- Remove two TORX T10 screws (item 8) fastening the angle.

Replacement Procedure

- Step 1.** Reverse the order of the removal procedure.

Replacement Procedure
A21 PCI DSP Card / A24 GPIB Card Replacement

Figure 6-13 A21 PCI DSP Card / A24 GPIB Card Removal



e5061ase3002

A22 Front Panel Keyboard Replacement

Tools Required

- TORX screwdriver, T10, T15, and T20
- Flat edge screwdriver
- Hex key, 1.5 mm

Removal Procedure

Refer to Figure 6-14 for this procedure.

- Step 1.** Remove the front panel as described in “Front Panel Removal” on page 167.
- Step 2.** Release the clamped cables from the clamps (item 1) on the cover.
- Step 3.** Disconnect the cables (item 4, 5).

NOTE Keep the mylar cable (item 6) connected.

- Step 4.** Disconnect the cables (item 2, 3, and 7) from the touch screen controller if the option 016 is installed.
- Step 5.** Remove the four TORX T10 screws (item 8) fastening the cover to the front panel.
- Step 6.** Disconnect the cable (item 12) of connector for the cable (item 7).

NOTE The connector for the cable (item 7) is not connected in the E5061A/E5062A without the option 016.

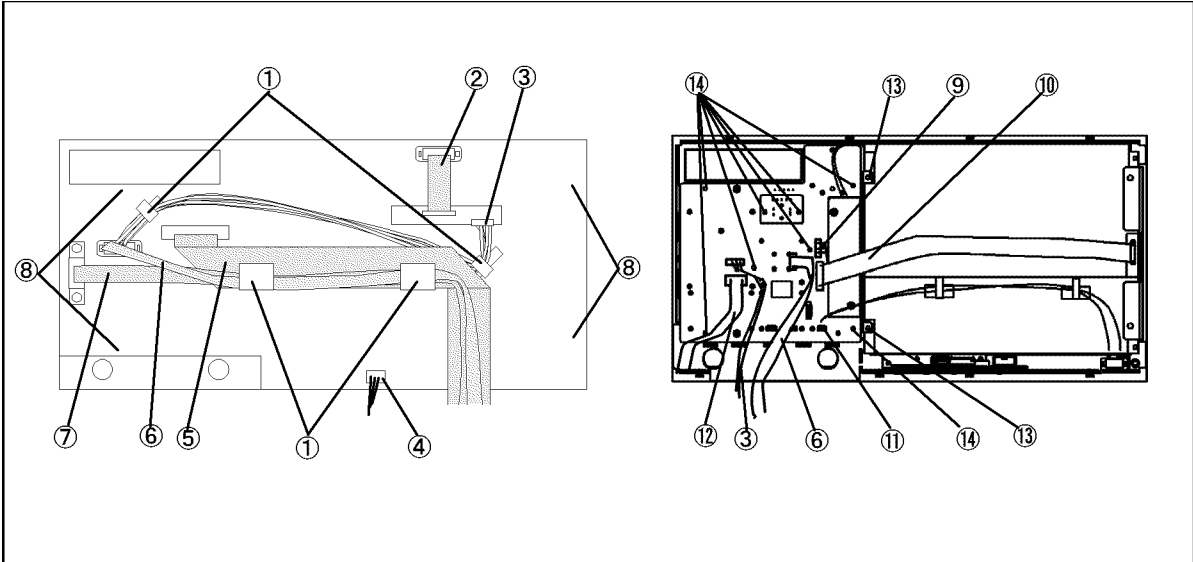
- Step 7.** Disconnect the cables (item 3, 6, 9, 10 and 11) from the front keyboard.
- Step 8.** Remove the knob from the front panel with a 1.5 mm hex key.
- Step 9.** Remove the two TORX T15 screws (item 13) fastening the inverter assembly.
- Step 10.** Remove the eight TORX T10 screws (item 14) fastening the A22 front panel keyboard.
- Step 11.** Separate the keyboard into the board and the rubber key.

Replacement Procedure

- Step 1.** Insert the whole jut of the rubber key into the hole on the new A22 front panel keyboard.
- Step 2.** Reverse the order of removal procedure.

Replacement Procedure
A22 Front Panel Keyboard Replacement

Figure 6-14 A22 Front Panel Keyboard Removal



e5061ase074

A52 Inverter Board Replacement

Tools Required

- TORX screwdriver, T8, T10, T15, and T20
- Flat edge screwdriver

Removal Procedure

Refer to Figure 6-15 for this procedure.

- Step 1.** Remove the front panel as described in “Front Panel Removal” on page 167.
- Step 2.** Release the clamped cables from the clamps (item 1) on the cover.
- Step 3.** Disconnect the cables (item 4, 5).

NOTE Keep the mylar cable (item 6) connected.

- Step 4.** Disconnect the cables (item 2, 3, and 7) from the touch screen controller if the option 016 is installed.
- Step 5.** Remove the four TORX T10 screws (item 8) fastening the cover to the front panel.
- Step 6.** Disconnect the cable of connector for the cable (item 7).

NOTE The connector for the cable (item 7) is not connected in the E5061A/E5062A without the option 016.

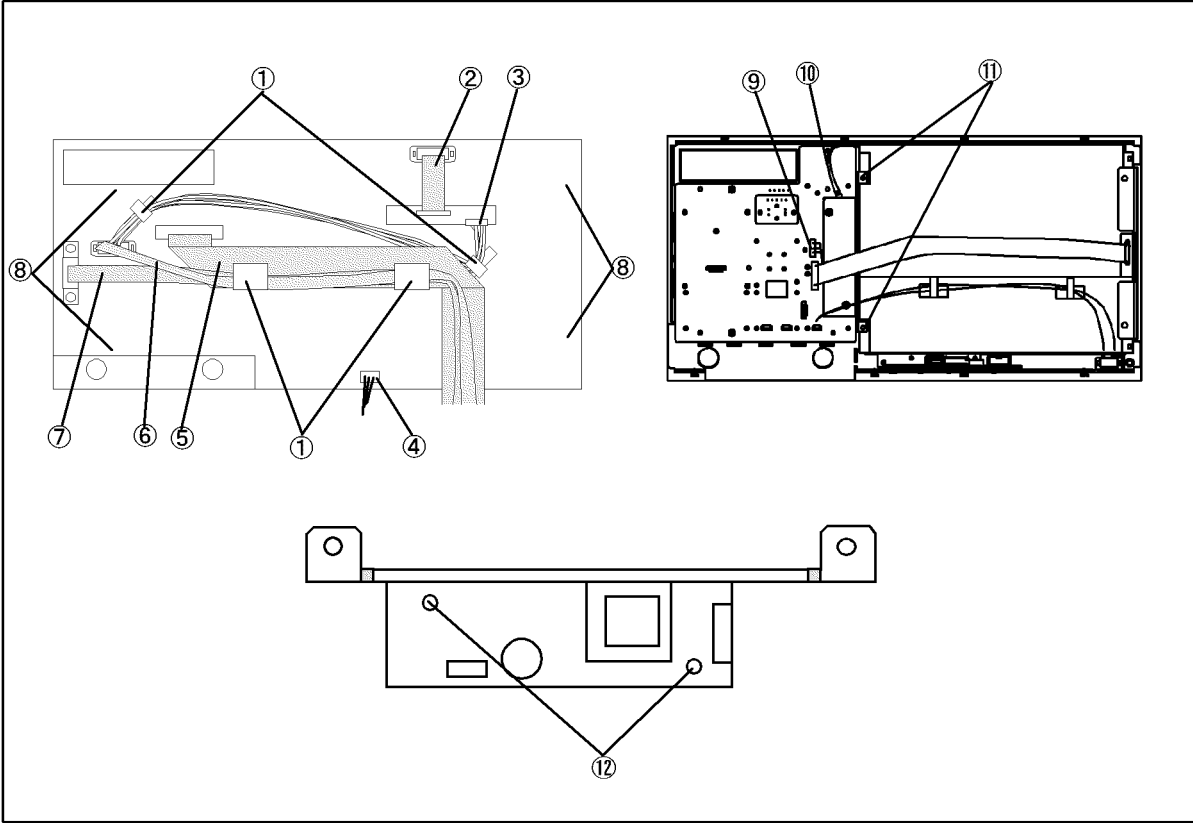
- Step 7.** Disconnect the cables (item 9,10).
- Step 8.** Remove the two TORX T15 screws (item 11) fastening the inverter assembly.
- Step 9.** Remove the two TORX T8 screws (item 12) fastening the inverter to the bracket.

Replacement Procedure

- Step 1.** Fasten the new A52 Inverter board to the bracket.
- Step 2.** Reverse the order of the removal procedure.

Replacement Procedure
A52 Inverter Board Replacement

Figure 6-15 A52 Inverter Board Removal



e5061ase075

A51 LCD Display Replacement

Tools Required

- TORX screwdriver, T10, T15, and T20
- Flat edge screwdriver

Removal Procedure

Refer to Figure 6-16 for this procedure.

- Step 1.** Remove the front panel as described in “Front Panel Removal” on page 167.
- Step 2.** Release the clamped cables from the clamps (item 1) on the cover.
- Step 3.** Disconnect the cables (item 4, 5).

NOTE Keep the mylar cable (item 6) connected.

- Step 4.** Disconnect the cables (item 2, 3, and 7) from the touch screen controller if the option 016 is installed.
- Step 5.** Remove the four TORX T10 screws (item 8) fastening the cover to the front panel.
- Step 6.** Disconnect the cable of connector for the cable (item 7).

NOTE The connector for the cable (item 7) is not connected in the E5061A/E5062A without the option 016.

- Step 7.** Release the cable from the clamps (item 9) on the LCD.
- Step 8.** Disconnect the cables (item 10).
- Step 9.** Remove the four TORX T15 screws (item 11) fastening the A51 LCD display to the front panel.
- Step 10.** Disconnect the connector (item 12) from the A51.

Replacement Procedure

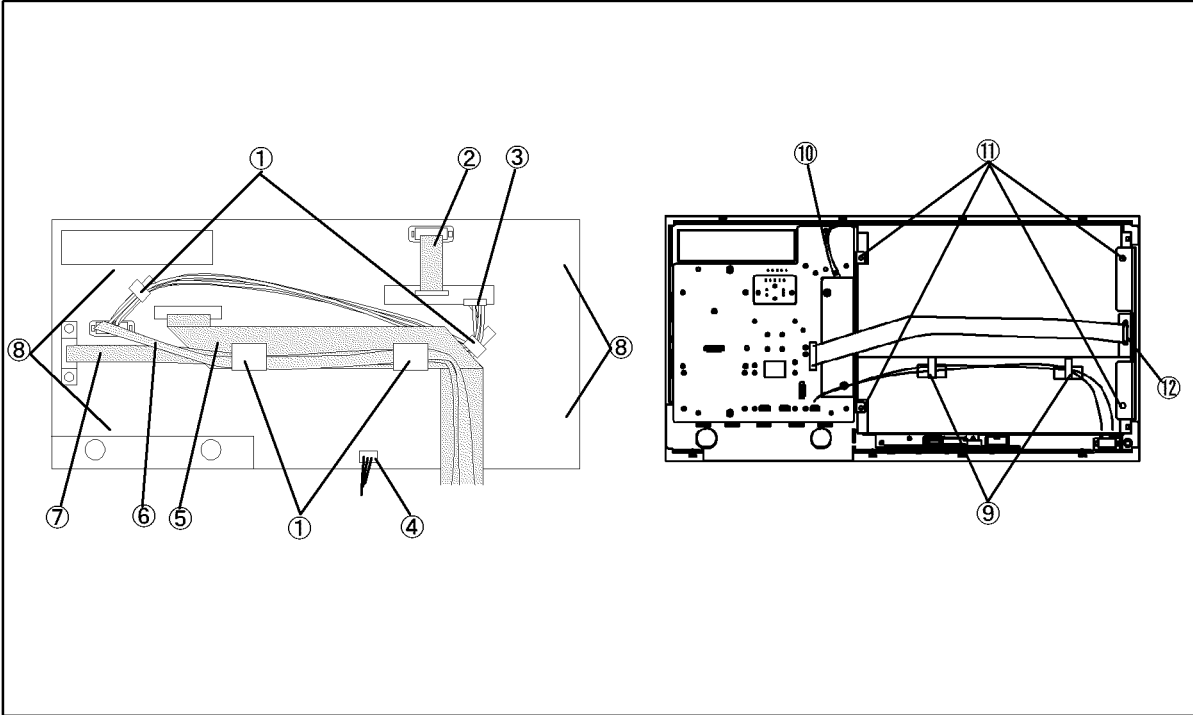
- Step 1.** Reverse the order of the removal procedure.

NOTE Fasten the TORX T15 screws (item 11) using a torque screwdriver (set to 1.02 N-m / 9.0 lb-in).

- Step 2.** When you have replaced the LCD on a E5061A/E5062A equipped with an Option 016 touch screen, you have to calibrate the touch screen. Follow the procedure described on “Calibration of the Touch Screen” on page 170.

Replacement Procedure
A51 LCD Display Replacement

Figure 6-16 A51 LCD Removal



e5061ase076

LCD Backlight Replacement

Tools Required

- TORX screwdriver, T10, T15, and T20
- Flat edge screwdriver

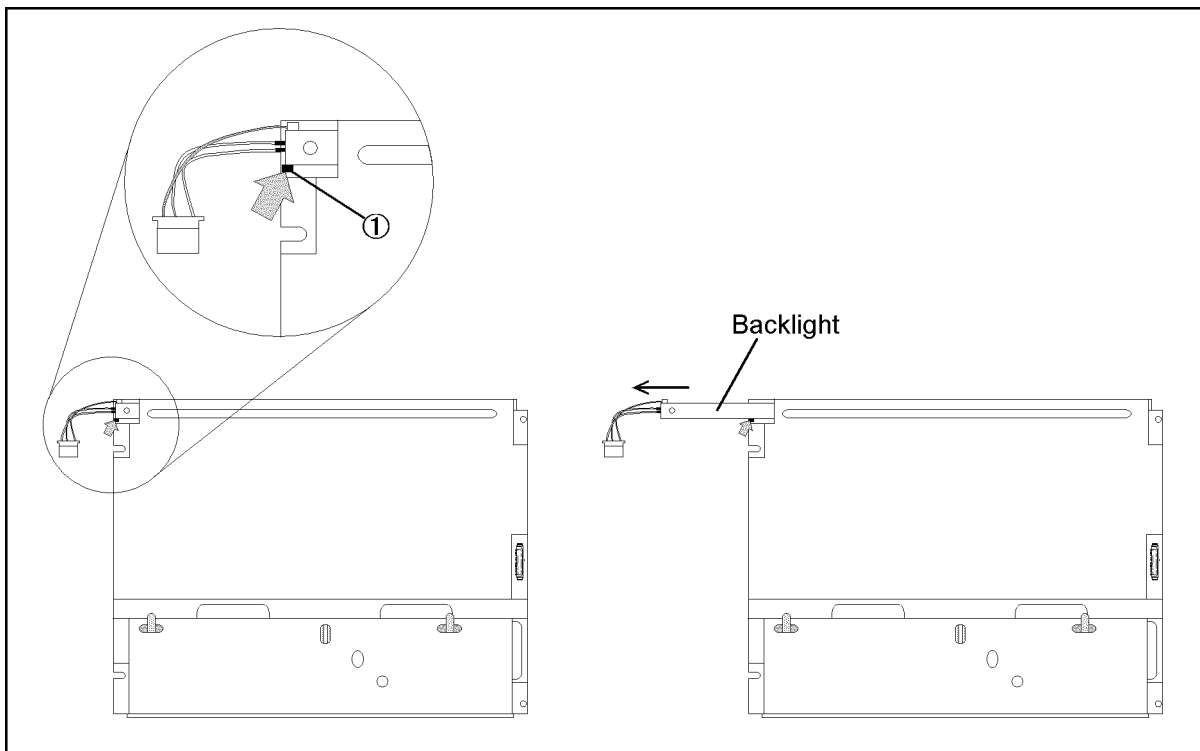
Removal Procedure

Refer to Figure 6-17 for this procedure.

Step 1. Remove the A51 LCD display as described in “A51 LCD Display Replacement” on page 191.

Step 2. Push the stopper (item 1) and slide the backlight as shown in Figure 6-17.

Figure 6-17 LCD Backlight Removal



e5070bse100

Replacement Procedure

Step 1. Reverse the order of the removal procedure.

Replacement Procedure
LCD Backlight Replacement

7**Post-Repair Procedures**

This chapter lists the procedures required to verify the E5061A/E5062A operation after an assembly is replaced with a new one.

Post-Repair Procedures

Table 7-1 *Post Repair Procedures* lists the required procedures that must be performed after the replacement of an assembly. These are the recommended minimum procedures to ensure that the replacement is successfully completed.

Table 7-1 Post-Repair Procedures

| Replaced Assembly or Part | Required Adjustments Correction Constants (CC) | Verification |
|----------------------------------|--|--|
| A1 Source Board | Perform the following required adjustments using “Source Board” in Spot Adjustment of the program. Synthesizer Gain Adjustment Local Output Power Adjustment Source Output Power Adjustment Receiver IF Range Adjustment Receiver Ports Characteristics Adj. | “To Execute the Diagnostic Test” on page 101 Frequency Accuracy Test RF Output Level Accuracy and Flatness Test RF Output Level Linearity Test Trace Noise Test Crosstalk & System Dynamic Range Test Dynamic Accuracy Test Uncorrected System Performance Test |
| A2 Receiver Board | Perform the following required adjustments using “Receiver Board” in Spot Adjustment of the program. Frequency Reference Adjustment Local Output Power Adjustment Source Output Power Adjustment Receiver IF Range Adjustment Receiver Ports Characteristics Adj. | “To Execute the Diagnostic Test” on page 101 Frequency Accuracy Test RF Output Level Accuracy and Flatness Test RF Output Level Linearity Test Trace Noise Test Crosstalk & System Dynamic Range Test Dynamic Accuracy Test Uncorrected System Performance Test |
| A10 Analog Motherboard | No adjustment needed | Inspect the Booting Process When the symptom of failure is out of specification, perform the performance test. |
| A20 Digital Motherboard | Set jumper and BIOS parameters on the A20. For details, see “To configure the A20 Digital Motherboard and BIOS” on page 120. | Inspect the Booting Process |
| A21 PCI DSP Card | Perform the following required adjustments using “Analog Interface” in Spot Adjustment of the program. Writing ID | Inspect the Booting Process “To Check the Front Panel” on page 109 “To Check the External Trigger Input” on page 112 |
| A22 Front Panel Keyboard | No adjustment needed | “To Check the Front Panel” on page 109 |
| A25 Handler I/O Board | No adjustment needed | “To Execute the Diagnostic Test” on page 101 |

Table 7-1 Post-Repair Procedures

| Replaced Assembly or Part | Required Adjustments Correction Constants (CC) | Verification |
|----------------------------------|--|---|
| A24 GPIB Card | No adjustment needed | “To Check the GPIB” on page 116 |
| A27 HDD | Perform “HDD” (Hard Disk Drive) in Spot Adjustment of the program. Calibration of the Touch Screen (for opt. 016) | Inspect the Booting Process |
| A28 FDD | No adjustment needed | “To Check the FDD” on page 111 |
| A50 Power Supply Assembly | No adjustment needed | Inspect the Booting Process |
| A51 LCD | Not adjustment needed | Inspect the Booting Process “To Check the LCD” on page 110 |
| Touch panel (for Opt. 016) | Calibration of the Touch Screen | Inspect the Booting Process “To Check the Touch Panel (Option 016 only)” on page 110 |
| A52 Inverter Board | No adjustment needed | Inspect the Booting Process |

Post-Repair Procedures
Post-Repair Procedures

A **Manual Changes**

This appendix contains the information required to adapt this manual to versions or configurations of the E5061A/E5062A manufactured earlier than the current printing date of this manual. The information in this manual applies directly to E5061A/E5062A units with the serial number that is printed on the title page of this manual.

Manual Changes

To adapt this manual to your E5061A/E5062A, refer to Table A-1 and Table A-2.

Table A-1 Manual Changes by Serial Number

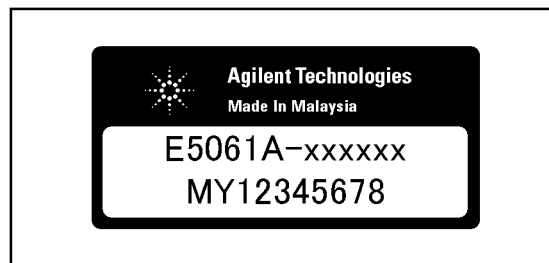
| Serial Prefix or Number | Make Manual Changes |
|-------------------------|---------------------|
| | |

Table A-2 Manual Changes by Firmware Version

| Version | Make Manual Changes |
|------------------|---------------------|
| A.02.00 or later | Change 1 |

Agilent Technologies uses a two-part, ten-character serial number that is stamped on the serial number plate (Figure A-1). The first five characters are the serial prefix and the last five digits are the suffix.

Figure A-1 Serial Number Plate Example



e5061auj2001

Change 1

The following functions are newly integrated into the firmware version A.02.00 onward. They are not supported by firmware version A.01.0x.

- User recovery function.*1

*1. This function is available when the volume label on the hard disk is AL200 or higher.

Manual Changes
Manual Changes

B **System Recovery**

This appendix describes how to recover the operating system (Windows 2000) when the operating system has been damaged.

System Recovery

By executing system recovery, you can return the system of the E5061A/E5062A (the Windows operating system and the firmware) to the factory state (at the time of purchase^{*1}).

Types of system recoveries

The following 2 types of system recoveries are available.

Factory recovery

Returns the contents of the C drive to the factory state.

User recovery^{*2}

Returns the contents of the C drive to a user-specified state. To use this function, you must prepare for recovery in advance. For information on the preparation, see “Procedure to create the user backup image” on page 208 for information on the execution, see “Procedure to execute the user recovery function” on page 211.

Notes on executing the factory recovery function

Executing the factory recovery function causes the following:

- In addition to the Windows operating system and the firmware, the following settings of the E5061A/E5062A are returned to the factory state or a user specified state.
 - Network setting
 - GPIB setting
 - Printer setting
- The driver for the supported printer installed after purchase is deleted.
- You need to execute initial registration again.

Files you created using the save function (files in the D drive) are not affected, but we recommend backing them up before executing system recovery for precautionary purposes. For more information on backup, refer to “Making Backup Files” as described in E5061A/E5062A User’s Guide.


*1. If the hard disk failed and has been replaced after purchase, the state when the replacement was performed is recovered.

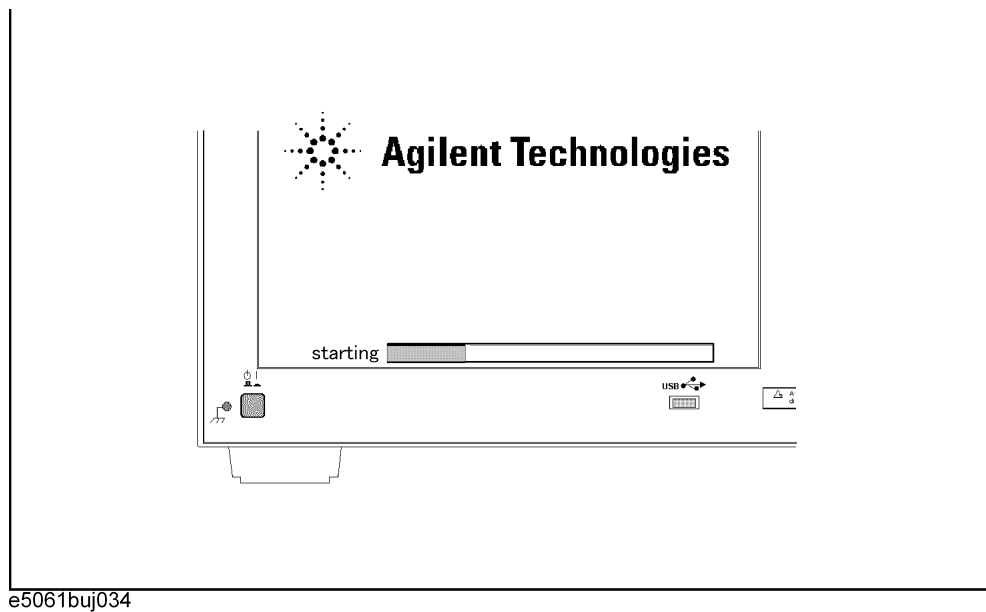
*2. This function is available when the volume label on the hard disk is AL200 or higher.

Procedure to execute the factory recovery function

This section describes how to return the contents of the C drive to the factory state.

NOTE You need the keyboard for this operation.

- Step 1.** Shut down the E5061A/E5062A.
- Step 2.** Connect the keyboard to the E5061A/E5062A.
- Step 3.** Insert the disk for the system recovery into the floppy disk drive of the E5061A/E5062A.
- Step 4.** Press the standby switch of the E5061A/E5062A to turn it on.
- Step 5.** When the screen as shown in the figure below appears, press and hold  of the keyboard until this screen disappears.



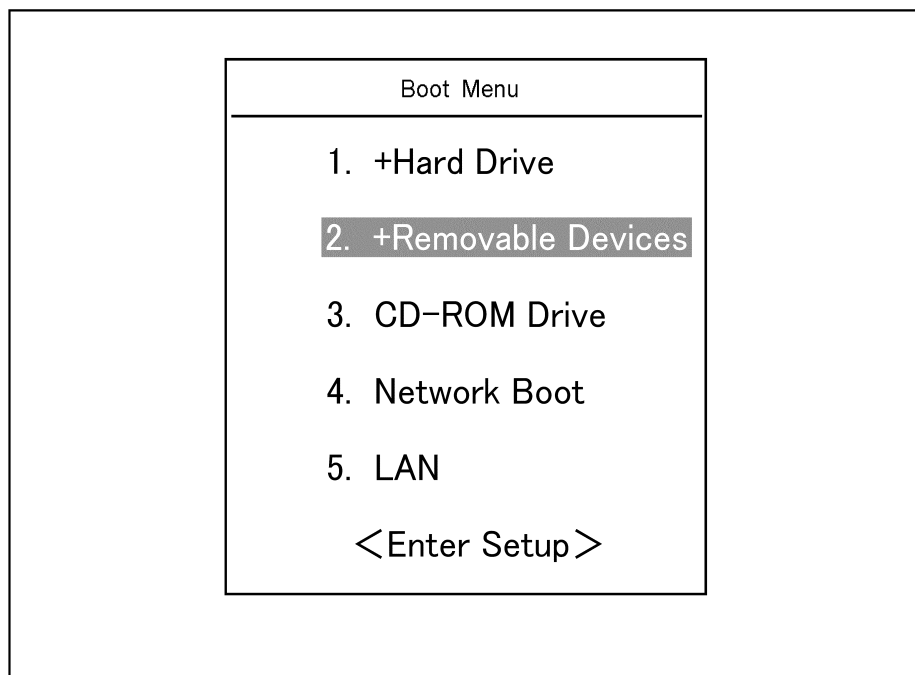
NOTE After several seconds, the next screen appears automatically even if you do not press any key, so do not miss it.

If the above message does not appear, the instrument is at fault; contact your local Agilent customer center listed at the end of this manual or distributor.

System Recovery

System Recovery

Step 6. The following screen appears. Check that “+Removable Devices” is selected (highlighted) (if “+Removable Devices” is not selected, select it with **↑** of the keyboard), and press **Enter** of the keyboard.



Step 7. The message as shown below appears. Press **1** of the keyboard. If you want to cancel the factory recovery, press **4** here.

```
Agilent Technologies System Utilities
Recovery & Backup Options for the E5061/62A
```

Choose One of the following:

-
1. Recover Factory Backup Image
 2. Create User Backup Image
 3. Recover User Backup Image
 4. Exit
-

Enter a Choice: _

NOTE

If the above message does not appear, the instrument or the disk for the system recovery is at fault; contact your local Agilent customer center listed at the end of this manual or distributor.

- Step 8.** The message as shown below appears. Press **C** of the keyboard. If you want to cancel the factory recovery, press **E** here.

You chose to Restore your system by installing the original factory installed OS and system software.

WARNING: Press C to Continue only if you are sure that you want to proceed. The C: Drive will be completely overwritten with no chance of recovering any data. Use Option 1 to recover the system from a serious malfunction caused by corrupted or inadvertently deleted files on the system's primary C: partition.

Press C to Continue or E to Exit: _

- Step 9.** The message as shown below appears. Press **C** of the keyboard to start the factory recovery. If you want to cancel the factory recovery, press **E** here.

CAUTION! Interrupting this process may leave the system in an unstable state. Allow the software to complete the backup and recovery process. This may take up to 20 minutes depending on the system configuration.

Press C to Continue or E to Exit: _

CAUTION

Never turn off the power during the factory recovery because doing so may cause serious damage to the E5061A/E5062A.

- Step 10.** The factory recovery will be complete in about 5 minutes. When the factory recovery is complete, the message as shown below appears. Press **Ctrl**, **Alt**, and **Del** of the keyboard at the same time to restart.

Remove the disk and Press CLT+ALT+DEL to restart your system.

NOTE

If the above message does not appear, the instrument is at fault; contact your local Agilent customer center listed at the end of this manual or distributor.


- Step 11.** After restart, the screen for initial registration appears. Execute initial registration. For information on the execution procedure, refer to “Initial Registration of E5061A/E5062A” on page 214.
- Step 12.** For the E5061A/E5062A equipped with the Option 016 touch screen, execute the calibration of the touch screen. For information on the execution procedure, refer to “Calibration of the Touch Screen” on page 217.

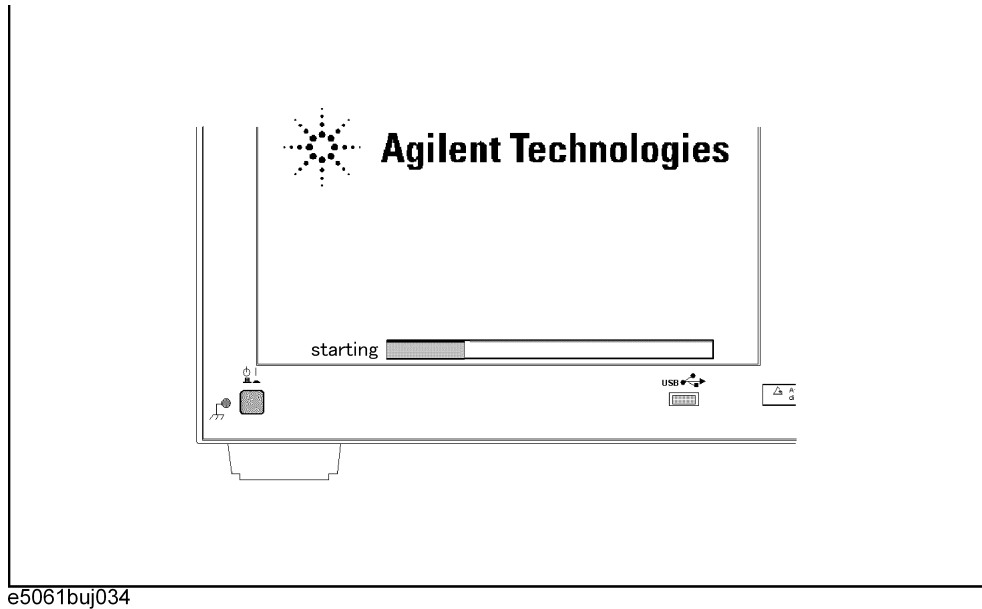
Procedure to create the user backup image

This section describes how to create the user backup image. The C drive contents saved in this creation are recalled when the user recovery function is executed.

NOTE This function is available when the volume label on the hard disk is AL200 or higher.

NOTE You need the keyboard for this operation.

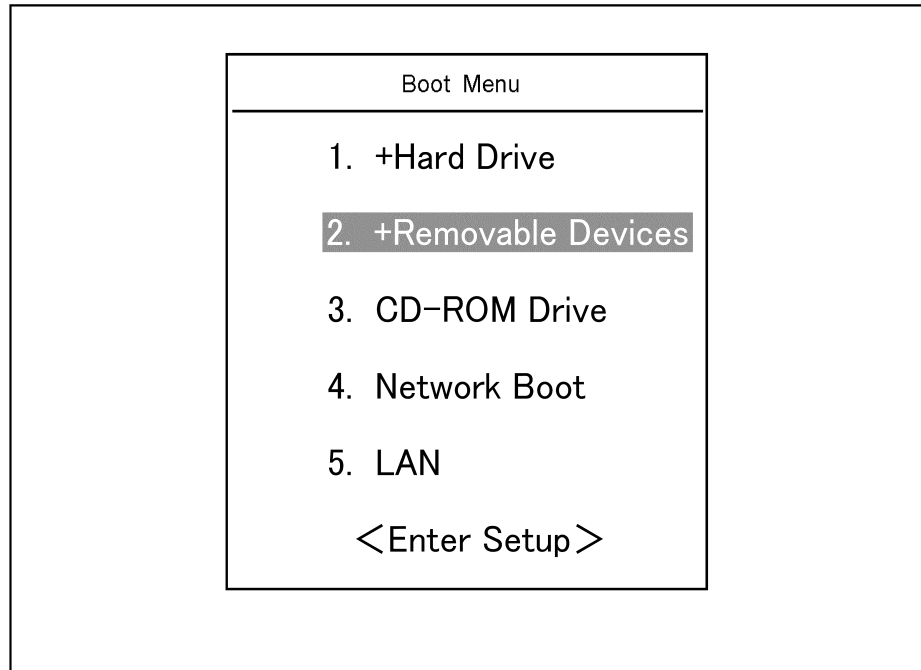
- Step 1.** Shut down the E5061A/E5062A.
- Step 2.** Connect the keyboard to the E5061A/E5062A.
- Step 3.** Insert the disk for the system recovery into the floppy disk drive of the E5061A/E5062A.
- Step 4.** Press the standby switch of the E5061A/E5062A to turn it on.
- Step 5.** When the screen as shown in the figure below appears, press and hold  of the keyboard until this screen disappears.



NOTE After several seconds, the next screen appears automatically even if you do not press any key, so do not miss it.

If the above message does not appear, the instrument is at fault; contact your local Agilent customer center listed at the end of this manual or distributor.

Step 6. The following screen appears. Check that Floppy is selected (highlighted) (if Floppy is not selected, select it with of the keyboard), and press of the keyboard.



Step 7. The message as shown below appears. Press of the keyboard. If you want to cancel the create user backup image, press here.

```

Agilent Technologies System Utilities
Recovery & Backup Options for the E5061/62A

```

Choose One of the following:

-
1. Recover Factory Backup Image
 2. Create User Backup Image
 3. Recover User Backup Image
 4. Exit
-

Enter a Choice: _

NOTE

If the above message does not appear, the instrument or the disk for the system recovery is at fault; contact your local Agilent customer center listed at the end of this manual or distributor.

System Recovery

System Recovery

Step 8. The message as shown below appears. Press **C** of the keyboard. If you want to cancel the create user backup image, press **E** here.

You chose to create a backup image file of your system.

The system will perform a quick integrity check of the file structure on the C: Drive. It will then copy the C: partition to an image file and store it on the System Recovery partition.

Press C to Continue or E to Exit: _

Step 9. The message as shown below appears. Press **C** of the keyboard to start the create user backup image. If you want to cancel the create user backup image, press **E** here.

CAUTION! Interrupting this process may leave the system in an unstable state. Allow the software to complete the backup and recovery process. This may take up to 20 minutes depending on the system configuration.

Press C to Continue or E to Exit: _

CAUTION

Never turn off the power during the create user backup image because doing so may cause serious damage to the E5061A/E5062A.

Step 10. The create user backup image will be complete in about 5 minutes. When the create user backup image is complete, the message as shown below appears. Press **Ctrl**, **Alt**, and **Delete** of the keyboard at the same time to restart.

Remove the disk and Press CLT+ALT+DEL to restart your system.

NOTE


If the above message does not appear, the instrument is at fault; contact your local Agilent customer center listed at the end of this manual or distributor.

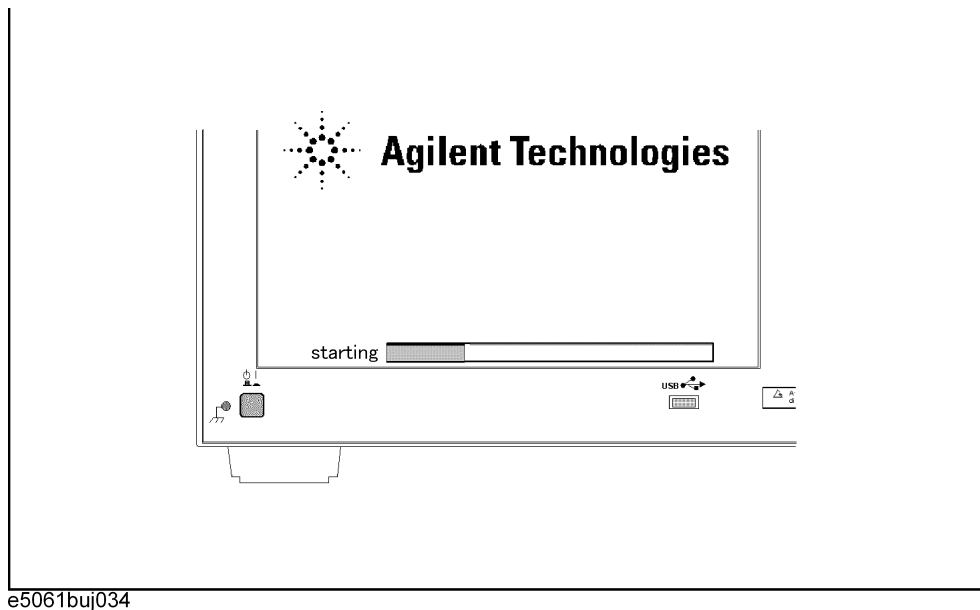
Procedure to execute the user recovery function

Returns the contents of the C drive to a user-specified state. To use this function, you must create the user backup image in advance. For more information, see the description “Procedure to create the user backup image” on page 208.

NOTE This function is available when the volume label on the hard disk is AL200 or higher.

NOTE You need the keyboard for this operation.

- Step 1.** Shut down the E5061A/E5062A.
- Step 2.** Connect the keyboard to the E5061A/E5062A.
- Step 3.** Insert the disk for the system recovery into the floppy disk drive of the E5061A/E5062A.
- Step 4.** Press the standby switch of the E5061A/E5062A to turn it on.
- Step 5.** When the screen as shown in the figure below appears, press and hold  of the keyboard until this screen disappears.



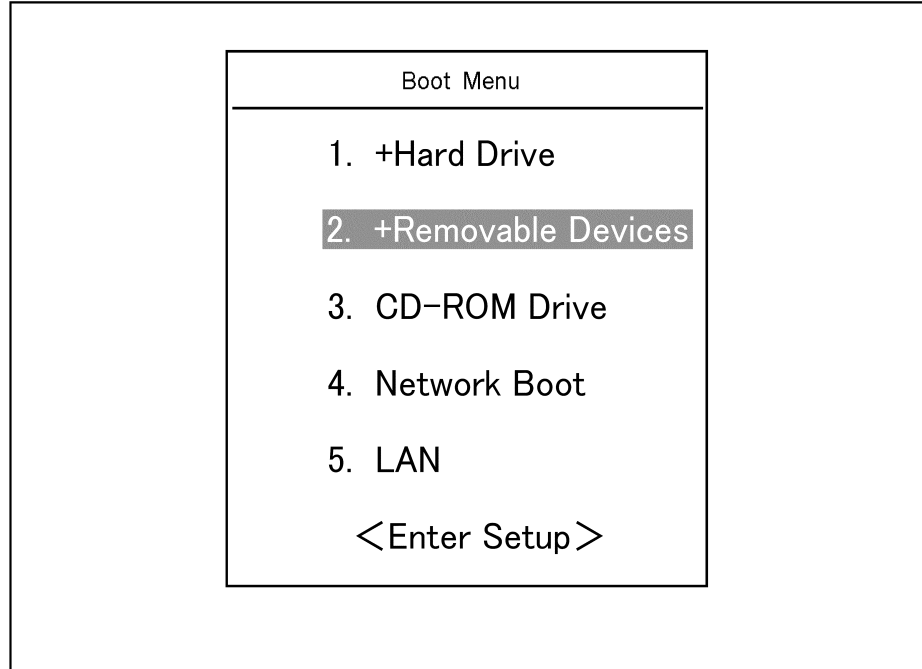
NOTE After several seconds, the next screen appears automatically even if you do not press any key, so do not miss it.

If the above message does not appear, the instrument is at fault; contact your local Agilent customer center listed at the end of this manual or distributor.

System Recovery

System Recovery

Step 6. The following screen appears. Check that Floppy is selected (highlighted) (if Floppy is not selected, select it with of the keyboard), and press of the keyboard.



Step 7. The message as shown below appears. Press of the keyboard. If you want to cancel the user recovery, press here.

```
Agilent Technologies System Utilities
Recovery & Backup Options for the E5061/62A
```

Choose One of the following:

-
1. Recover Factory Backup Image
 2. Create User Backup Image
 3. Recover User Backup Image
 4. Exit
-

Enter a Choice: _

NOTE

If the above message does not appear, the instrument or the disk for the system recovery is at fault; contact your local Agilent customer center listed at the end of this manual or distributor.

- Step 8.** The message as shown below appears. Press **C** of the keyboard. If you want to cancel the user recovery, press **E** here.

You chose to recover your own system backup image file.

WARNING: Press C to Continue only if you are sure that you want to proceed. The C: partition will be completely overwritten with no chance of recovering any data. Use Option 3 to recover the system from a serious malfunction caused by corrupted or inadvertently deleted files on the system's primary C: partition.

Press C to Continue or E to Exit: _

- Step 9.** The message as shown below appears. Press **C** of the keyboard to start the user recovery. If you want to cancel the user recovery, press **E** here.

CAUTION! Interrupting this process may leave the system in an unstable state. Allow the software to complete the backup and recovery process. This may take up to 20 minutes depending on the system configuration.

Press C to Continue or E to Exit: _

CAUTION

Never turn off the power during the system recovery because doing so may cause serious damage to the E5061A/E5062A.

- Step 10.** The user recovery will be complete in about 5 minutes. When the user recovery is complete, the message as shown below appears. Press **Ctrl**, **Alt**, and **Delete** of the keyboard at the same time to restart.

Remove the disk and Press CLT+ALT+DEL to restart your system.

NOTE

If the above message does not appear, the instrument is at fault; contact your local Agilent customer center listed at the end of this manual or distributor.

Initial Registration of E5061A/E5062A

When you start up the E5061A/E5062A for the first time or after executing system recovery, you need to perform the initial registration of the Windows 2000 operating system of the E5061A/E5062A.

NOTE You cannot use the front panel keys during the initial registration of the E5061A/E5062A therefore connect the mouse and the keyboard before turning on the power.

NOTE If you perform the following procedure incorrectly, a message asking you whether to return to the previous registration screen and perform the registration appears. In this case, follow the instruction to return to the previous registration screen.

Step 1. Turns on the E5061A/E5062A.

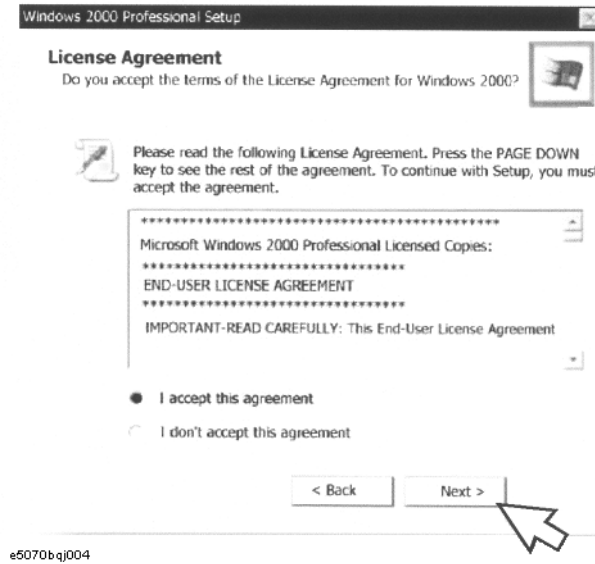
Step 2. The Windows 2000 Professional Setup wizard appears. Click the **Next >** button (Figure B-1).

Figure B-1 Windows 2000 Professional Setup wizard



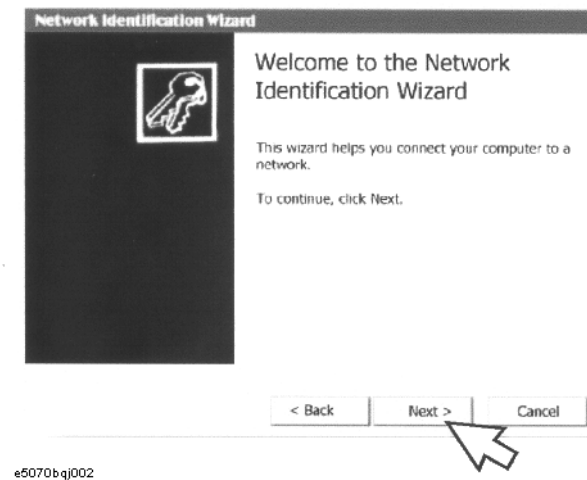
Step 3. In the Windows 2000 Professional Setup dialog box, select the **I accept this agreement** box and click the **Next >** button (Figure B-2). Then, the Windows 2000 operating system is restarted automatically.

Figure B-2 Windows 2000 Professional Setup dialog box



Step 4. The Network Identification wizard appears. Click the **Next >** button (Figure B-3).

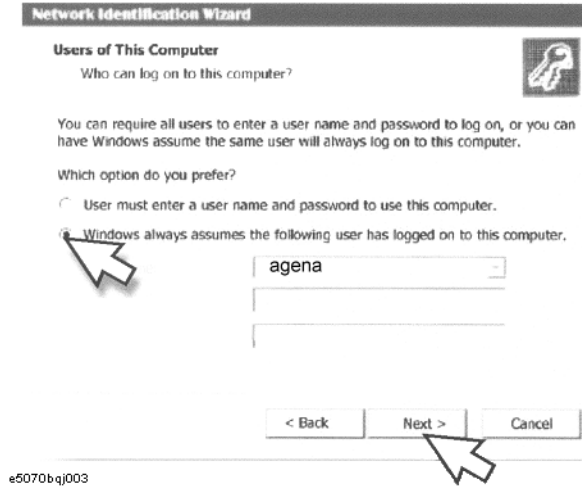
Figure B-3 Network Identification wizard



System Recovery
Initial Registration of E5061A/E5062A

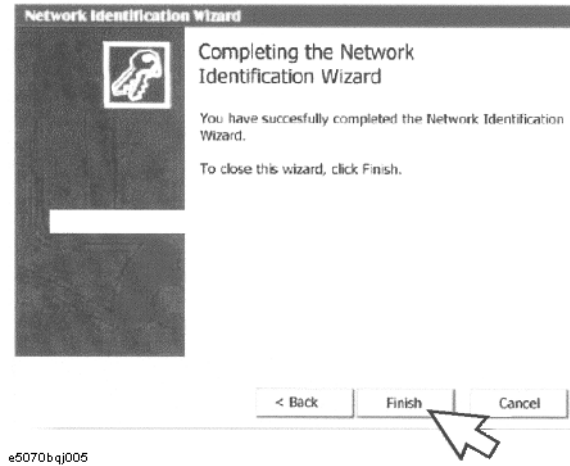
Step 5. In the Network Identification Wizard dialog box (1/2), select the **Windows always assumes the following user has logged on to this computer** box and check that **agena** is in the **User Name** box. If not, type in **agena**. Finally, click the **Next>** button (Figure B-4).

Figure B-4 Network Identification Wizard dialog box (1/2)



Step 6. In the Network Identification Wizard dialog box (2/2), click the **Finish** button to finish the initial registration of the E5061A/E5062A (Figure B-5). Then, the measurement display of the E5061A/E5062A appears.

Figure B-5 Network Identification Wizard dialog box (2/2)



Calibration of the Touch Screen

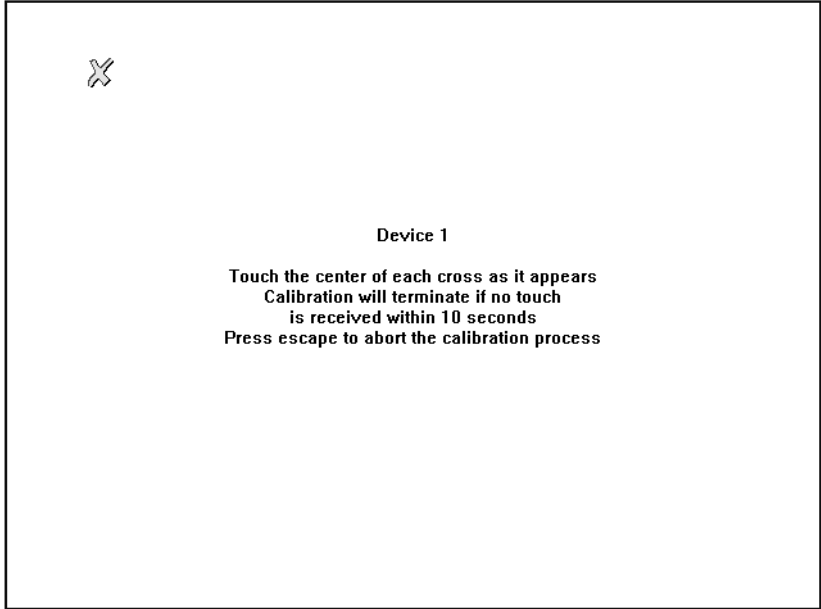
When you have executed system recovery on the E5061A/E5062A equipped with an Option 016 touch screen, you have to calibrate the touch screen. Follow the procedure described below to calibrate the touch screen.

- Step 1.** Press **System**.
- Step 2.** Press **Service Menu**.
- Step 3.** Press **Test Menu**.
- Step 4.** Press **Adjust Touch Screen**.

The touch screen calibration screen (Figure B-6) appears.

Figure B-6

Touch Panel Calibration Screen



- Step 5.** Touch the x mark on the upper left with your finger. The mark x appears also on the lower left, upper right, and lower right. Touch the x marks in that order with your finger.

Touching the four locations described above with your finger automatically concludes the touch screen calibration.

NOTE

With no operation on the touch screen calibration screen for a preset time, it automatically closes and the previous measurement screen reappears.

System Recovery
Calibration of the Touch Screen

C **Firmware Update**

This appendix describes how to update the E5061A/E5062A firmware. When you want to update the E5061A/E5062A firmware, refer to this appendix.

Firmware Update

Required Equipment

- E5061A or E5062A (with keyboard and mouse).
- Four blank floppy disks (DOS format).

How to make E5061A/E5062A Firmware Installation Disk

The following is the procedure to make the E5061A/E5062A Firmware Installation Disk.

Step 1. Copy the following files from Agilent Technologies web site to the four floppy disks using your computer's FDD.

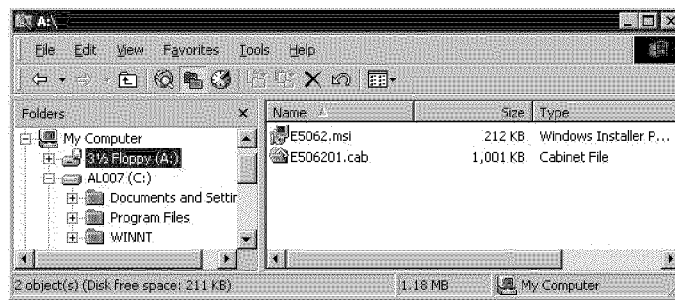
- disk1(1 of 4)-- e5062.msi, e506201.cab
- disk2(2 of 4)-- e506202.cab
- disk3(3 of 4)-- e506203.cab
- disk4(4 of 4)-- e506204.cab

Step 2. Assign the Label name as follows using the properties of your computer's Windows Explorer as shown in Figure C-1.

- DISK_1 (for disk1)
- DISK_2 (for disk2)
- DISK_3 (for disk3)
- DISK_4 (for disk4)

Figure C-1

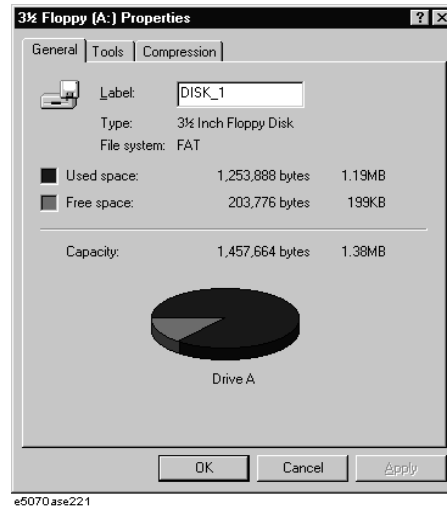
Windows Explorer (example)



1. Insert the disk1(1 of 4) into the FDD of your computer.
2. On the Windows Explorer, click **3 1/2 Floppy [A:]** and confirm the files.
3. Right click on **3 1/2 Floppy [A:]**, then click **Properties**. The Properties dialog box appears.
4. Enter the Label name in the Label box of properties dialog box (General) for the disk1

as shown in Figure C-2, and press the **OK** button.

Figure C-2 Properties Dialog Box (example)



5. Perform 1 through 4 for each disk.

NOTE

If the label name is not assigned, the firmware update for the E5061A/E5062A will not be done correctly.

How to update the E5061A/E5062A firmware

It is possible to update the E5061A/E5062A firmware, but not the following software by this procedure.

- OS (Operating System)
- VBA (Visual Basic for Application)
- Calibration Constant Data

The following is the procedure to update the E5061A/E5062A firmware.

- Step 1.** Prepare the E5061A/E5062A firmware installation disks (four disks).
- Step 2.** Connect the mouse and the keyboard to the E5061A/E5062A rear panel. Then turn the E5061A/E5062A on.
- Step 3.** Insert the E5061A/E5062A firmware installation disk1 (1 of 4) into the FDD of the E5061A/E5062A.
- Step 4.** Update the E5061A/E5062A firmware.
 1. Press **[System]** key.
 2. Press **Service Menu - Update Firmware** on the menu bar, and the Password dialog box will appear.

NOTE

If you do not see “Update Firmware” soft key, execute log-off, and re-login as “agena”.

Firmware Update

Firmware Update

3. Enter the password **e506xa** into the Password box.
4. Open dialog box apperas. Confirm that **E5062.msi** is displayed at the File name column. Press the **Open** button, and the Windows instoller will appear.
5. After the disk 1 installation is finished, insert the firmware installation disk 2 (2 of 4) into the FDD of the E5061A/E5062A, then click **OK**.
6. After the disk 2 installation is finished, insert the firmware installation disk 3 (3 of 4) into the FDD of the E5061A/E5062A, then click **OK**.
7. After the disk 3 installation is finished, insert the firmware installation disk 4 (4 of 4) into the FDD of the E5061A/E5062A, then click **OK**.

Step 5. After the disk 4 installatio is finished, the instrument will be restarted and the measurement view will appear.

Step 6. Press -**Firmware Revision**. Confirm the firmware revision you have just installed.

D **Computer Virus Check**

This appendix describes an example of how to check the system of E5061A/E5062A for computer viruses using computer viruses check software.

Computer Virus Check

The E5061A/E5062A should be protected against computer viruses. If you need to check the system of E5061A/E5062A for computer viruses, it's recommended that an external PC installed anti-virus software is used to access E5061A/E5062A's built-in drive (C and D) via LAN and perform virus scan.

The E5061A/E5062A has no virus function nor anti-virus software installed. The Windows operating system installed in this instrument is customized for more effective operation. Installing Windows-based software (including anti-virus software) for ordinary PCs into this instrument may affect the behavior of the instrument during measurement.

Required equipment

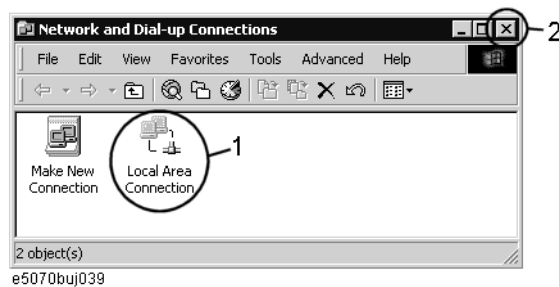
- E5061A or E5062A (with keyboard and mouse).
- An external PC installed anti-virus software such as "Norton AntiVirus®".
- A crossed LAN cable (It enables the peer-to-peer communication between the E5061A/E5062A and the PC.)

How to check the drive C and D of E5061A/E5062A

The following is an example procedure to check the drive C and D of E5061A/E5062A using the external PC.

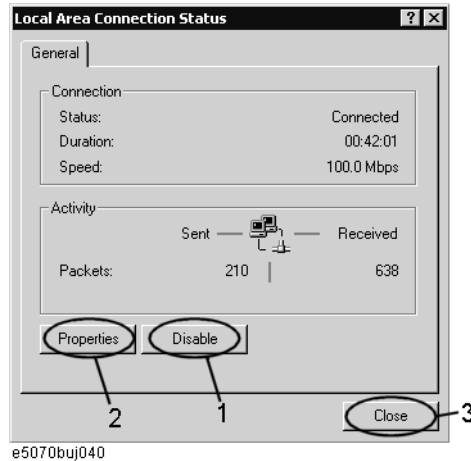
- Step 1.** Set up the E5061A/E5062A for file sharing.
1. Connect the E5061A/E5062A to the PC using the crossed LAN cable.
 2. Press **System** key.
 3. Press **Misc Setup - Network Setup - Network Configuration**. The Network and Dial-up Connections window will appear.

Figure D-1 Network and Dial-up Connections window



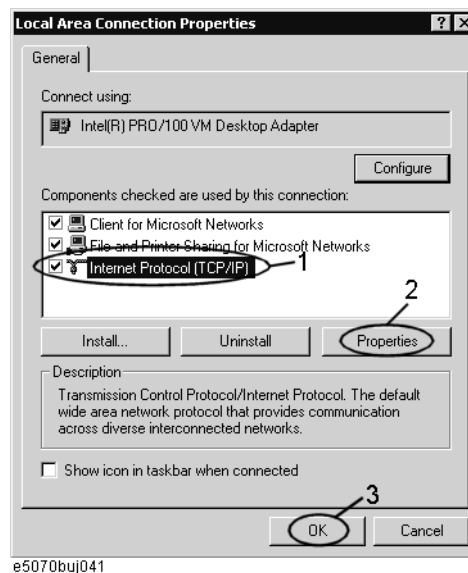
4. Double-click the Local Area Connection icon (1 in Figure D-1) in the Network and dial-up connections window to enable the network connection function. The Local Area Connection Status dialog box appears. Click the **Properties** button.

Figure D-2 Local Area Connection Status dialog box



5. The Local Area Connection Properties dialog box (Figure D-3) appears. Select (highlight) **Internet protocol (TCP/IP)** (1 in Figure D-3) and then click the **Properties** button (2 in Figure D-3).

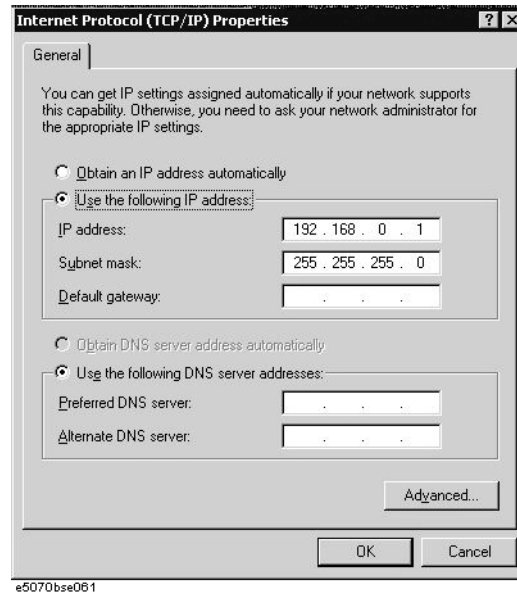
Figure D-3 Local Area Connection Properties dialog box



6. The Internet Protocol (TCP/IP) Properties dialog box (Figure D-4) appears. If **Obtain an IP address automatically** has been selected, you select **Use the following IP address** (1 in Figure D-4) and then enter the IP address 192.168.0.1 (2 in Figure D-4) and subnet mask 255.255.255.0 (3 in Figure D-4).

If a specific IP address and subnet mask have been assigned, press the **OK** button.

Figure D-4 Internet Protocol (TCP/IP) Properties dialog box

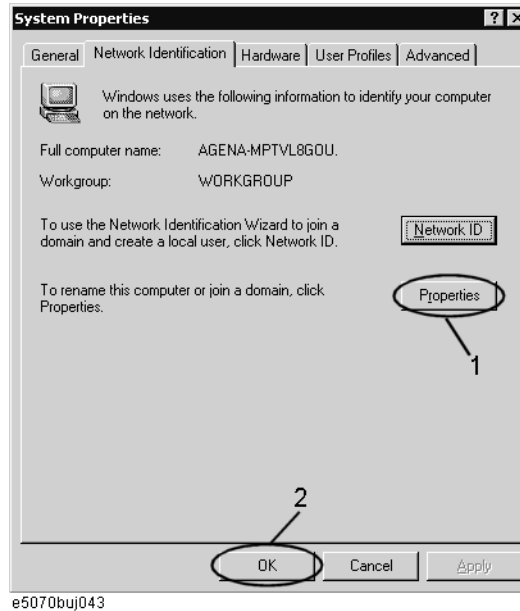


7. In the Internet Protocol (TCP/IP) Properties dialog vbox, click the **OK** button (6 in Figure D-4).
8. In the Local Area Connection Properties dialog box, click the **OK** button (3 in Figure D-3).
9. In the Local Area Connection Status dialog box, click the **Close** button (3 in Figure D-2).
10. Click the **x** button (2 in Figure D-1) in the upper right of the Network and Dial-up Connection window.

Step 2. Confirm the computer name of the E5061A/E5062A.

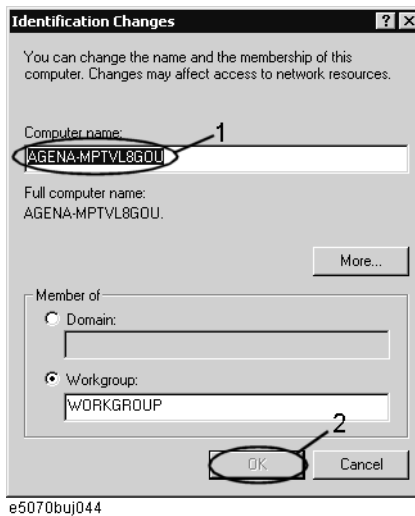
1. Press **System** key.
2. Press **Misc Setup - Network Setup - Network Identification**.
3. The System Properties dialog box as shown in Figure D-5 will appear. Click the **Properties** button (1 in Figure D-5).

Figure D-5 System Properties dialog box



4. The Identification Change dialog box (Figure D-6) appears. Confirm the computer name in the **Computer Name** box (1 in Figure D-6).

Figure D-6 Identification Change dialog box

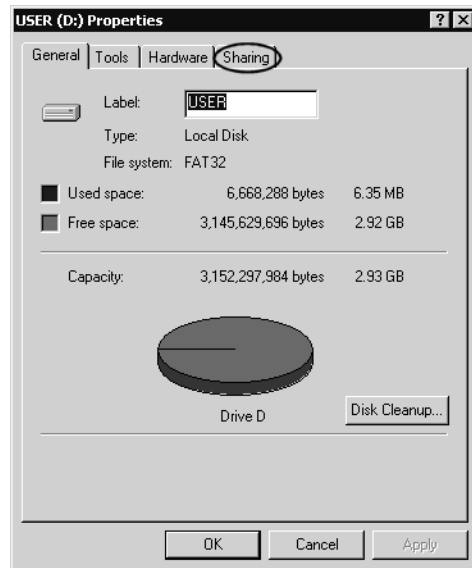


5. Turn the E5061A/E5062A power off and then turn it on.

Step 3. Set for sharing the hard disk (C or D drive) in the E5061A/E5062A.

1. Press **Save/Recall**, and then press **Explore ...**.
2. The Windows Explorer opens. Right click on **(C:)** or **USER (D:)** and then click **Properties** in the File menu.
3. The (C:) or USERS(D:) Properties dialog box (Figure D-7) appears. Select the **Sharing** tab.

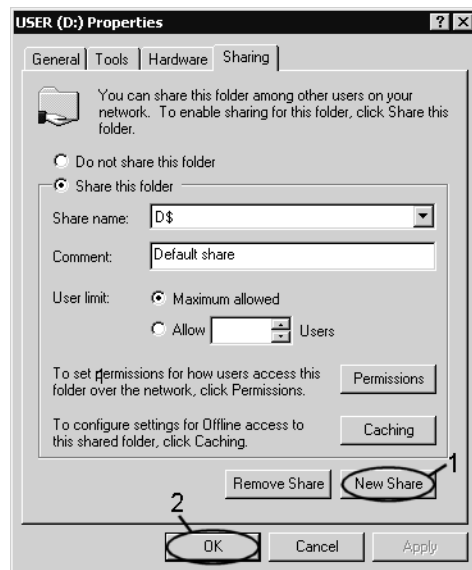
Figure D-7 USERS(D:) Properties dialog box (General tab)



e5070buj047

4. Select the **Share this folder** if (C:) is selected. Click the **New Share** button (1 in Figure D-8).

Figure D-8 USERS(D:) Properties dialog box (Sharing tab)



e5070buj048

5. The New Share dialog box (Figure D-9) appears. Enter the share name (name used when accessed from the external PC) in the **Share Name** box (1 in Figure D-9) and click the **OK** button (2 in Figure D-9).

Figure D-9 New Share dialog box

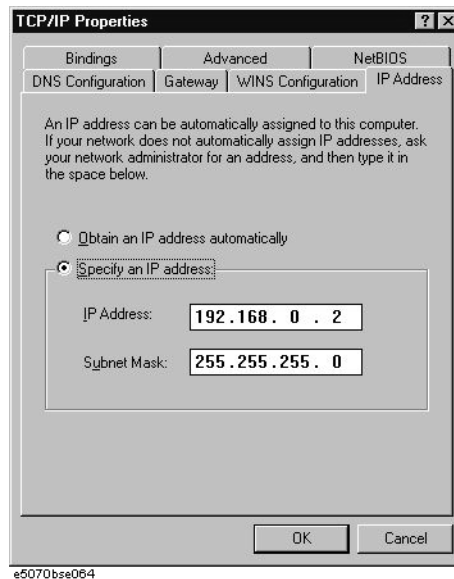


6. In the (C:) or USERS(D:) Properties dialog box, click the **OK** button (2 in Figure D-8).

Step 4. Set up the external PC's IP address and subnet mask.

1. Double-click **"My Computer"** icon on Windows desktop of the external PC. And double-click **Control Panel**. The Control Panel window will appear.
2. In the Control Panel window, double-click **Network**. The Network dialog box shown in fig will appear. In the **Configuration** tab, select **TCP/IP** (display it in revers video) and press the **Properties** button.
3. The dialog box appears. If **Specify an IP address** has been selected, record the IP address and sbnet mask.
4. If the **Obtain an IP address automatically** has been selected, select the **Specccify an IP address**. Enter the IP address xxx.xxx.xxx.y and subnet mask xxx.xxx.xxx.xxx as shown in Figure D-10. The letters x represent the IP address and subnet mask of the E5061A/E5062A. The letter y is different from the IP address of the E5061A/E5062A. Press the **OK** button.

Figure D-10 Network Dialog Box ("IP Address" Tab)



Step 5. Connect the drive of E5061A/E5062A to the PC, and check the drive using anti-virus software.

1. Click **Programs -Window Explorer** on the Start Menu to start up the PC's Explorer.

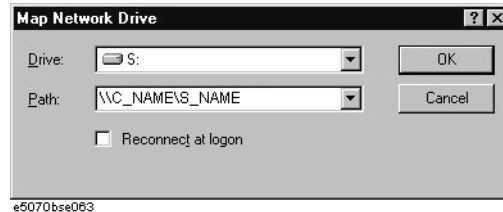
Computer Virus Check

Computer Virus Check

Click **Tools - Map Network Drive** on the menu of the Explorer.

2. Select a suitable drive name, enter the network path as shown in Figure D-11, and then press the **OK** button. For example, the network path is \\C_NAME\S_NAME.

Figure D-11 Map Network Drive Dialog Box



C_NAME in the network path is the computer name of the E5061A/E5062A you confirmed on 4 of Step 2.

S_NAME in the share name of the C or D drive of the E5061A/E5062A you entered on 5 of Step 3.

3. The dialog box to enter the user name and the password appears. Enter the user name **agena** and then click the **OK** button.
4. The network path will appear on the PC's Explorer. Confirm that the network path you enter is connected to the PC.
5. Execute the anti-virus software on the PC, and the menu for the anti-virus software will appear. Check the drive you entered on 2 of Step 5. For the operation of anti-virus software, refer to its manual.
6. Check if the drives C and D are infected.

Step 6. Disconnect the drives of E5061A/E5062A from the PC.

1. Click **Programs - Window Explorer** on the Start Menu to start up the PC's Explorer. Click **Tools - Disconnect Network Drive** on the menu of the Explorer. Disconnect Network dialog box will appear.
2. Select Network Drive you checked, and press the **OK** button. The drive will disappear from the Explorer.

NOTE

If no drive has been infected, proceed the next step.

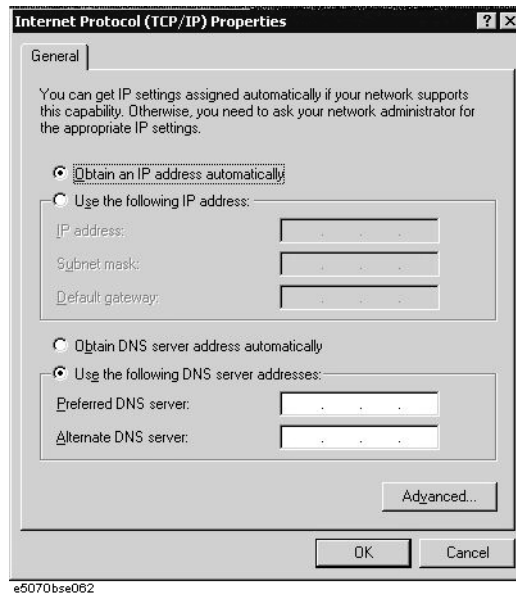
If the drive C or D has been infected, replace the A27 HDD of the E5061A/E5062A.

Step 7. Change the IP address and subnet mask of the E5061A/E5062A if you select **Use the following IP address** and entered the IP address and subnet mask on the 6 of Step 1.

1. Press **[System]** key.
2. Press **Misc Setup - Network Setup - Network Configuration**.
3. Double-click the Local Area Connection icon (1 in Figure D-1) in the Network and Dial-up Connections window. The Local Area Connection Status dialog box (Figure D-2) appears. Click the **Properties** button (2 in Figure D-2).
4. The dialog box (Figure D-12) appears. Select **Obtain an IP address automatically** and

press the **OK** button.

Figure D-12 Internet Protocol (TCP/IP) Properties dialog box



5. In the Internet Protocol (TCP/IP) Properties dialog vbox, click the **OK** button (6 in Figure D-4).
6. In the Local Area Connection Properties dialog box, click the **OK** button (3 in Figure D-3).
7. The Local Network dialog box will appear, press the **Yes** button to restart the instrument.

Step 8. Change the IP address and subnet mask of the external PC.

1. Double-click "**My Computer**" icon on Windows desktop of the external PC. And double-click **Control Panel**. The Control Panel window will appear.
2. In the Control Panel window, double-click **Network**. The Network dialog box appears. In the **Configuration** tab, select **TCP/IP** (display it in revers video) and press the **Properties** button.
3. The dialog box appears. If **Specify an IP address** has been selected on Step 4, enter the IP address and sbnet mask you recorded on 3 of Step 4.
4. If the **Obtain an IP address automatically** has been selected on Step 4, select the **Obtain an IP address automatically**.
5. Press the **OK** button.

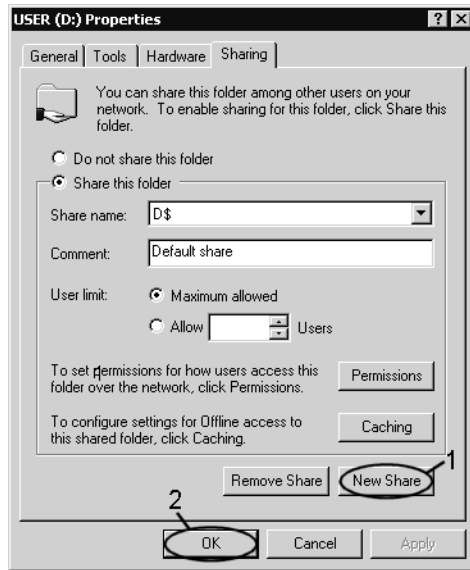
Step 9. Disable the C drive of the E5061A/E5062A when you checked the C drive.

1. Press **Save/Recall**., and then press **Explore**
2. The Windows Explorer opens. Select (highlight) **(C:)** and then click **Properties** in the File menu.
3. The (C:) Properties dialog box (Figure D-7) appears. Select the **Sharing** tab.

Computer Virus Check Computer Virus Check

4. Select the **Do not share this folder**, and then **OK** button.

Figure D-13 (C:) Properties dialog box (Sharing tab)



5. Turn the E5061A/E5062A power off.

E **Power Requirement**

Preparation for Power Supply

Before turning on power to the equipment, be sure to verify the following:

Power Requirements

The E5061A/E5062A requires the following power source:

| | Requirements |
|---------------------------|------------------------------------|
| Voltage | 90 to 132 VAC or 198 to 264 VAC *1 |
| Frequency | 47 to 63 Hz |
| Maximum power consumption | 350 VA |

*1. Switched automatically by the E5061A/E5062A in conformity to the voltage.

Power Cable

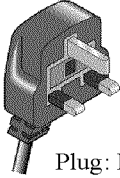
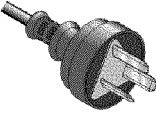
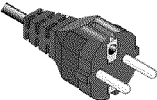
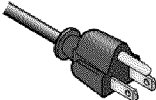

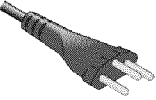
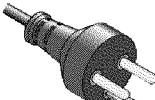
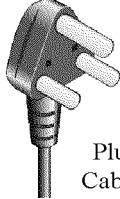
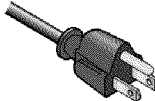

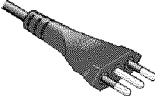

In accordance with international safety standards, this instrument is equipped with a three-wire power cable. When connected to an appropriate ac power outlet, this cable grounds the instrument frame. The type of power cable shipped with each instrument depends on country of destination. Refer to Figure E-1 for the part numbers of the power cables available.

WARNING

For protection from electrical shock, the power cable ground must not be defeated.

The power plug must be plugged into an outlet that provides a protective earth ground connection.

Figure E-1 Power cable options

| | |
|---|---|
| <p>OPTION 900</p>  <p>United Kingdom</p> <p>Plug: BS 1363/A, 250V, 10A Cable: 8120-1351, 8120-8705</p> | <p>OPTION 901</p>  <p>Australia/New Zealand</p> <p>Plug: AS 3112, 250V, 10A Cable: 8120-1369</p> |
| <p>OPTION 902</p>  <p>Continental Europe</p> <p>Plug: CEE 7 Standard Sheet VII, 250V, 10A Cable: 8120-1689</p> | <p>OPTION 903</p>  <p>U.S./Canada</p> <p>Plug: NEMA 5-15P, 125V, 10A Cable: 8120-1378</p> |
| <p>OPTION 904</p>  <p>U.S./Canada</p> <p>Plug: NEMA 6-15P, 250V, 6A Cable: 8120-0698</p> | <p>OPTION 906</p>  <p>Switzerland</p> <p>Plug: SEV Type 12, 250V, 10A Cable: 8120-2104</p> |
| <p>OPTION 912</p>  <p>Denmark</p> <p>Plug: SR 107-2-D, 250V, 10A Cable: 8120-2956</p> | <p>OPTION 917</p>  <p>India/Republic of S. Africa</p> <p>Plug: IEC 83-B1, 250V, 10A Cable: 8120-4211</p> |
| <p>OPTION 918</p>  <p>Japan</p> <p>Plug: JIS C 8303, 125V, 12A Cable: 8120-4753</p> | <p>OPTION 920</p>  <p>Argentina</p> <p>Plug: Argentine Resolution 63, Annex IV, 250V, 10A Cable: 8120-6870</p> |
| <p>OPTION 921</p>  <p>Chile</p> <p>Plug: CEI 23-16, 250V, 10A Cable: 8120-6978</p> | <p>OPTION 922</p>  <p>China</p> <p>Plug: GB 1002, 250V, 10A Cable: 8120-8376</p> |

NOTE: Each option number includes a 'family' of cords and connectors of various materials and plug body configurations (straight, 90° etc.).





power_e

E: Power Requirement




Turning the Power ON and OFF

Perform the following steps to turn the power ON or OFF.

Turning the power ON


- Step 1.** If the standby switch () in the lower-left part of the front panel is in the pressed down () position, press the switch to the popped up position ().
- Step 2.** Press the standby switch to the pressed down position ().
- This operation turns ON the power, and the E5061A/E5062A starts the self-test.
- Step 3.** Confirm that the self-test indicates normal operation.
- Normal operation is confirmed by the self-test if no error message appears.

Turning the power OFF

- Step 1.** Use either of the following methods to turn OFF the E5061A/E5062A.
- Press the standby switch () in the lower-left part of the front panel (now in the pressed down () position) to the popped up () position.
 - Send the shutdown command from an external controller.

These operations will start the E5061A/E5062A shutdown process (required software and hardware processes for turning the power off), and the power will turn OFF after a few seconds.

NOTE

Under normal circumstances, always press the standby switch (), or send the shutdown command from the external controller, to actuate the E5061A/E5062A shutdown process. **Never cut off the power supply directly by disconnecting the power cable plug from the rear panel of the unit.**

If the power supply is cut off directly by disconnecting the power cable plug or by disconnecting the power supply to the AC outlet, the shutdown process will not be carried out, and there is a risk of damage to the software or hardware of the E5061A/E5062A.

F Messages

The E5061A/5062A can display error messages as well as messages that indicate the internal operating status of the equipment. This appendix explains what these messages mean. They are listed in alphabetical order.

Messages showing the status of the E5061A/5062A are displayed in the lower-left area of the E5061A/5062A LCD screen. These messages include error messages that occur during

Messages

the execution of GPIB commands and others that indicate the internal status of the equipment.

Error messages are indicated following the character string “[Err]” and can be read out by a GPIB command. Other kinds of messages are indicated without the “[Err]” character string and cannot be read out by a GPIB command. This section explains the meaning of each message and how to resolve the problem it indicates.

Error Messages

An error message is displayed against a red background in the instrument message/warning area in the lower left part of the screen. Pushing a front panel key or executing :DISP:CCL command clears the error message. Errors caused by the operation of a front panel key simply appear on the display. They are not stored in the error queue with some exceptions.

An error with a positive error number is one uniquely defined for this instrument. On the other hand, an error with a negative error number is basically one defined for common GPIB devices in IEEE488.2

A

20 **Additional standard needed**

The GPIB command that turns ON the calibration function has been sent before all of the data measurements needed to calculate the calibration factor have been completed. For instance, the “SENS:CORR:COLL:SAVE” command is sent to calculate calibration coefficients and turn on error correction for 1-Port Calibration when open and short calibration are completed but load calibration is not completed. Be sure to measure all necessary calibration data before sending commands. This error is not generated by front key operations.

77 **Additional test set calibration needed**

Multiport test set calibration needs to be completed. This error occurs when Self Cal (SENS:CORR:MULT:SELF:ONCE) is performed without having test set calibration completed.

B

-168 **Block data not allowed**

An block-data element has been received at a position where this instrument does not accept one.

C

240 **Calibration data lost**

This error occurs when a file containing the system calibration data is not found or in a damaged state at time of the startup of this instrument, indicating a failure of this instrument. Contact an Agilent Technology sales office or the company from which you bought the instrument.

22 **Calibration method not selected**

This error occurs when the command for validating the calibration, SENS:CORR:COLL:SAVE, is executed before the command for selecting a calibration type, SENS:CORR:COLL:METH:xxxx, is executed. This error is not generated by front key operations.

-148 **Character data not allowed**

A character data element (not violating the standard) has been received at a position where

Messages
Command error

this instrument does not accept one. Double quotes (“”) are omitted where it is necessary to place a parameter in double quotes (“”), for example.

-100

Command error

A comprehensive syntax error has occurred showing that this instrument cannot detect a more detailed error. This code simply shows that a command error defined in 11.5.1.1.4, IEEE488.2 has occurred.

D

-222

Data out of range

A data element (not violating the standard) outside the range defined by this instrument has been received. This error occurs when an integer-based command for which the parameter can be rounded exceeds the range of -65536 to +65536 or when a real-number-based command for which the parameter can be rounded exceeds the range of -9.9e37 to +9.9e37, for example.

This error occurs also when a numeric value other than a specified one is entered into a command in which the “port number” and “CalKit number” are specified as parameters and hence the parameters are not rounded. Such commands are, for example, SENS:CORR:COLL:ACQ:OPEN, SENS:CORR:COLL:ECAL:SOLT1, SENS:CORR:COLL:CKIT:ORD:LOAD, etc.

-104

Data type error

The parser has recognized a data element that must not exist. Block data has been sent instead of numeric value data or character string data that had been expected, for example.

E

32

Ecal module not in appropriate RF path

This error occurs when an ECal command, SENS:CORR:COLL:ECAL:SOLTn, is executed with the port on the ECal module not connected correctly to the instrument.

-200

Execution error

An error associated with execution has been generated for which this instrument cannot specify the error message. This code shows that an error associated with execution defined in 11.5.1.1.5, IEEE488.2 has occurred. This error occurs also when a calibration measurement is aborted.

-123

Exponent too large

The absolute value of the exponent exceeds 32,000 (see 7.7.2.4.1, IEEE488.2).

-178

Expression data not allowed

An expression-data element has been received at a position where this instrument does not accept one.

-170

Expression error

When the expression data is put to syntactic analysis, an error not corresponding to one of Error Numbers -171 through -179 occurs.

F

- 31 **Failed to configure ECal module**
This error occurs when the control of the ECal module fails at time of executing an ECal command, SENS:CORR:COLL:ECAL:SOLTn. The failure results from the failure to connect the ECal module to the USB port, failure of the ECal module, etc.
- 76 **Failed to configure multiport test set**
This error occurs when multiport test set control is enabled (SENS:MULT ON) and the analyzer fails to control the test set. Make sure the analyzer and the test set are connected with the parallel cable, and the test set is powered on.
- 102 **Failed to copy file**
This error occurs when copying a file (MMEM:COPY command) fails.
- 104 **Failed to create directory**
This error occurs when creating a directory (MMEM:MDIR command) fails.
- 103 **Failed to delete file**
This error occurs when deleting a file (MMEM:DEL command) fails.
- 100 **Failed to read file**
This error occurs when a 2-port touchstone file (CALC:FSIM:SEND:PMC:PORT:USER:FIL command), the formatted data array (MMEM:LOAD:FDAT command) and limit table (MMEM:STOR:LIM command) for the active trace on the active channel, segment sweep table (MMEM:LOAD:SEGM command) for the active channel, a VBA project file (MMEM:LOAD:PROG command), etc. cannot be read normally.
- 101 **Failed to write file**
This error occurs when the formatted data array (MMEM:STOR:FDATcommand) and limit table (MMEM:STOR:LIM command) for the active trace on the active channel, segment sweep table (MMEM:STOR:SEGM command) for the active channel, display image (MMEM:STOR:IMAG command) for the LCD screen, a VBA project file (MMEM:STOR:PROG command), etc. cannot be written normally.
- 54 **Fault location not allowed**
This error occurs when the fault location function is enabled when the sweep type is not set to linear or the number of measurement points is two. The fault location function is available only when linear sweep with more than two measurement points.
- 257 **File name error**
A file name error. This message appears when an error exists in the file name and hence a command is not executed correctly. This error occurs when you try to copy to an unsuitable file name, for example.
- 256 **File name not found**
The file name specified is not found and hence the command is not executed correctly. This error occurs when you try to read a file that does not exist in a disk or a disk is not correctly inserted into the drive to read or write a file, for example.
- 107 **File transfer failed**
This error occurs when writing data into or reading data from a file (MMEM:TRAN

Messages
GET not allowed

command) fails.

G

-105 **GET not allowed**

A group execution trigger (GET) has been received in the program message (see 7.7, IEEE488.2).

H

-114 **Header suffix out of range**

The unit of the header is outside the range. The header is invalid in the unit for numeric parameters following a SCPI command.

I

-224 **Illegal parameter value**

The parameter value is not suitable. This error occurs when the CALC:PAR:DEF command is used to specify an S-parameter that does not exist in the model (S12 in the case of a T/R model), for example.

-282 **Illegal program name**

This error occurs when a nonexistent VBA program name is specified by the PROG:SEL:NAME command.

-213 **Init ignored**

Because another measurement is in progress, the request for initiating a measurement (“INIT” command) is ignored.

-161 **Invalid block data**

Block data has been expected, but the block data that appears is invalid for some reason (see 7.7.6.2, IEEE488.2). The END message is received before the length of block data has been filled, for example.

-101 **Invalid character**

An invalid character exists in the program message character string.

-141 **Invalid character data**

An invalid character is found in the character data element, or the parameter received is not valid.

-121 **Invalid character in number**

A character that is invalid for the data type subject to syntactic analysis has been received. For example, a letter is found in a decimal numeric value or a numeric character “9” in octal data.

-171 **Invalid expression**

The expression-data element is invalid (see 7.7.7.2, IEEE488.2). Parentheses are not paired, or illegal characters are used, for example.

-103 **Invalid separator**

The parser (a syntactic analysis program) had been expecting a delimiter, but a character that is not a delimiter has been sent.

-151 **Invalid string data**

Character string data has been expected, but the character string data that appears is invalid for some reason (see 7.7.5.2, IEEE488.2). The END message is received before the ending quotation mark character appears, for example.

-131 **Invalid suffix**

The suffix does not comply with the syntax defined in 7.7.3.2, IEEE488.2. Or it does not suit 4294A.

L

53 **Log sweep requires 2 octave minimum span**

The span of sweep range is not satisfied the requirement for logarithmic sweep. The sweep type is automatically changed to linear sweep when this error occurs.

For example, this error occurs when, with the start and stop frequency are set 1 MHz and 2 MHz respectively, the sweep type is changed to logarithmic sweep.

Set the stop frequency to more than four times as many as the start frequency. And then select logarithmic sweep.

M

-109 **Missing parameter**

The number of parameters is less than that required for the command, or the parameter has not been entered. For example, the command SENS{1-6}:SWE:POIN requires one more parameter.

Therefore, when a message “SENS1:SWE:POIN” is sent to a correct program message “SENS1:SWE:POIN 201” this instrument receives the former message as an invalid one because all parameters have not been entered. Enter command parameters correctly.

75 **Multiport test set not enabled**

This error occurs when multiport test set calibration is performed while test set control is not enabled.

N

56 **Not enough points for connector model**

This error occurs when the connector measurement function of the SRL measurement is performed with the number of measurement points less than 101. Use at least 101 points.

52 **No valid memory trace**

This error occurs when there is no valid memory trace data and :DISP: WIND:TRAC:MEM ON or DISP:WIND:TRAC:STAT ON is received or parameters other than “NORM” is set with CALC:MATH:FUNC.

-120 **Numeric data error**

Messages

Numeric data not allowed

An error resulting from the numeric value data (including numeric value data having no decimal point representation) has occurred. A numeric value error other than Errors -121 through -129 has occurred.

-128

Numeric data not allowed

An numeric-value-data element (not violating the standard) has been received at a position where this instrument does not accept one.

O

200

Option not installed

The command received has been ignored because of the mismatch between the contents of an option for this instrument and the command.

For example, this error occurs when the source attenuator (power range) is set at a value other than zero (SOUR:POW:ATT command) in a model not having the extended power output option.

This error is not generated by front key operations.

-225

Out of memory

Insufficient memory is available in this instrument to perform the required operation.

P

-220

Parameter error

When a parameter-related error other than Errors -221 through -229 occurs, that error is displayed.

-108

Parameter not allowed

The number of parameters exceeds that required for the command.

For instance, when a program message “:SENS1:SWE:TYPE LIN, SEGM” is sent instead of a correct program message with a command “:SENS1:SWE:TYPE LIN” which requires a parameter, the instrument receives the message as the number of parameters is invalid. See the command reference to confirm the required number of parameters.

41

Peak not found

This error occurs when, after specifying a peak and executing the CALC:MARK:FUNC:EXEC and CALC:FUNC:EXEC commands, the specified peak is not found in the marker search analysis.

220

Phase lock loop unlocked

This error occurs when the PLL circuit of this instrument becomes unlocked while the measurement is in progress. The measurement value is not correct. This error may occur when an external reference out of specification is connected to this instrument. Should an error occur with an external reference not connected, this instrument is faulty. Contact an Agilent Technology sales office or the company from which you bought the instrument.

221

Port 1 receiver overload

The input to Test Port 1 exceeds the maximum input level. The measurement value is not correct. When a DUT is an amplifier or the like, this error may occur, damaging the receiver in the worst case. Should this error occur with a passive part used as the DUT or

with nothing connected to the test port, this instrument is faulty. Contact an Agilent Technology sales office or the company from which you bought the instrument.

If this error occurs, the stimulus signal output is automatically turned to off.

222 **Port 2 receiver overload**

The input to Test Port 2 exceeds the maximum input level. The measurement value is not correct. When a DUT is an amplifier or the like, this error may occur, damaging the receiver in the worst case. Should this error occur with a passive part used as the DUT or with nothing connected to the test port, this instrument is faulty. Contact an Agilent Technology sales office or the company from which you bought the instrument.

If this error occurs, the stimulus signal output is automatically turned to off.

241 **Power on test failed**

This error occurs when the power-on test fails, indicating a failure of this instrument. Contact an Agilent Technology sales office or the company from which you bought the instrument.

61 **Power unlevelled**

The out power level exceeds available range.

For example, if the level after correction exceeds the power level that can be outputted when correcting the power level with the power calibration and power slope feature, this error occurs.

Check that the power level is set correctly, the power calibration has been performed correctly and the correction value of the power slope is set correctly.

120 **Printer error**

This error occurs when the previous printing is still in progress or the printer fails (offline, short of paper, etc.) at time of outputting the display image on the LCD screen to the printer (HCOP:IMM command).

121 **Print failed**

This error occurs when printing fails for reasons other than Error 120, Printer error.

-284 **Program currently running**

This error occurs when the PROG:SEL:STAT RUN command is executed with the VBA program in the Run state.

-112 **Program mnemonic too long**

The length of the header exceeds 12 characters (see 7.6.1.4.1, IEEE488.2).

-286 **Program runtime error**

An error occurring when VBA is executed.

Q

-430 **Query DEADLOCKED**

The state that generates a “DEADLOCKED” Query error (see 6.3.1.7, IEEE488.2). This error occurs when both input and output buffers have become full, preventing the instrument from continuing processing, for example.

-400 **Query error**

Messages

Query INTERRUPTED

A comprehensive query error has occurred showing that this instrument cannot detect a more detailed error. This code simply shows that a query error defined in 11.5.1.1.7 and 6.3, IEEE488.2 has occurred.

-410

Query INTERRUPTED

The state that generates a “INTERRUPTED” Query error (see 6.3.2.3, IEEE488.1). This error occurs when data bytes (DAB) or GET are received before the transmission of the response after a query has not been completed, for example.

-420

Query UNTERMINATED

The state that generates an “UNTERMINATED” Query error (see 6.3.2, IEEE488.2). This error occurs when this instrument is designated as the talker and an incomplete program message is received, for example.

-440

Query UNTERMINATED after indefinite response

After a query asking for an indefinite response has been run, another query is received in the same program message (See 6.5.7.5.7, IEEE488.2).

R

105

Recall failed

This error occurs when reading an instrument status file (State01.sta, etc.) (MMEM:LOAD:STAT command) fails.

S

106

Save failed

This error occurs when writing an instrument status file (State01.sta, etc.) (MMEM:STOR:STAT command) fails.

50

Specified channel hidden

This error occurs when an attempt is made to activate a channel not on display using the DISP:WIND:ACT command. This error is not generated by front key operations.

23

Specified error term dose not exist

21

Specified ports overlapped

This error occurs when a port number is duplicated in a command requiring two or more port numbers as parameters. Such commands are, for example, CALC:FSIM:BAL:TOP:SSB:PPOR 1,2,3,3. Specify port setup correctly to avoid duplication of ports. This error is not generated by front key operations.

51

Specified trace does not exist

-150

String data error

When a character-string-data element is put to syntactic analysis, an error not corresponding to one of Error Numbers -151 through -159 occurs.

-158

String data not allowed

- A character-string-data element has been received at a position where this instrument does not accept one.
- 138 **Suffix not allowed**
- A suffix is attached to a numeric value element to which a suffix is not allowed to be attached.
- 134 **Suffix too long**
- The unit is too long.
- The unit is expressed in 12 or more characters (see 7.7.3.4, IEEE488.2).
- 102 **Syntax error**
- A command or data type that is not recognized exists.
- 310 **System error**
- One of the errors designated as “system errors” in this instrument has occurred.
- T**
- 40 **Target value not found**
- This error occurs when the target is not found during the marker search analysis after specifying the target and executing the CALC:MARK:FUNC:EXEC and CALC:FUNC:EXEC commands. This error occurs also when the bandwidth is not found after executing the bandwidth marker command, CALC:MARK:BWID:DATA?
- 124 **Too many digits**
- The number of digits of the argument of the decimal numeric-value-data element exceeds 255 with the preceding 0 removed (see 7.7.2.4.1, IEEE488.2).
- 223 **Too much data**
- The block-, expression-, or character-string-type program data that has been received conforms with the standard. But it exceeds the amount that can be processed under the condition of the memory or conditions specific to memory-related devices. In this instrument, this error occurs when the number of characters exceeds 254 in a character-string parameter.
- 211 **Trigger ignored**
- This instrument receives and detects a trigger command (“TRIG”) or an external trigger signal. But it is ignored due to the timing condition (This instrument is not in the wait-for-trigger state, for example). Change the setup so that a trigger command or an external trigger signal can be sent after the instrument has entered the wait-for- trigger state.
- U**
- 113 **Undefined header**
- A command not defined in this instrument, though not illegal in the syntactic structure, has been received. For example, when a message “:DISP:WIND1:TABL:MEM ON” is sent to a correct program message “:DISP:WIND1:TRAC1:MEM ON,” the message sent is received as an undefined command by this instrument. See the command reference and use correct commands.

Messages

Undefined header

This error occurs also when a port not existing on this model is specified in a command specifying a port number as an index. Such commands are CALC:FSIM:SEND:DEEM:PORTn:xxxx, CALC:FSIM:SEND:PMC:PORTn:xxxx, CALC:FSIM:SEND:ZCON:PORTn:Z0:R, and SENS:CORR:EXT:PORTn:TIME; they include PORTn as a part.

Warning Message

A warning message is displayed in the instrument message/Warning area in the lower left part of the display against a gray background. Pushing a front panel key or executing :DISP:CCL command clears the message.

This message simply appears on the display, being not known to a remote environment such as a GPIB. This message is not displayed when another error (against a red background) has already been displayed in the instrument message/Warning area.

The warning messages for this instrument are as follows:

Cable Z out of range

This error occurs in SRL measurement function when measured average impedance is out of the tolerance (system impedance +/- 30%), and the SRL calculation is not valid.

Fault location not allowed

This warning message is displayed when the gating/transform function of time domain function is turned on, number of points is set 2 or sweep type is set logarithmic/segment sweep.

The gating function and transform function are automatically turned off when this warning message is displayed.

Log sweep requires 2 octave minimum span

If you change the sweep range that does not satisfy the necessary condition of the frequency span (the stop frequency is about 4 times or more of the start frequency) when the sweep type is set to the log sweep, this message is displayed.

If this message is displayed, the sweep type is automatically set to the linear sweep.

For example, if you attempt to change the log type to the log sweep when the start frequency is set to 1 MHz and the stop frequency to 2 MHz, this error occurs.

Set the stop frequency to a value of about 4 times or more the start frequency and then set the low sweep.

Peak not found

This warning message is displayed when, with the tracking turned on, the peak specified by the marker search has not been found by the time the sweep is finished (with the tracking executed).

Segment table changed

This warning message is displayed when the setting specified segment by segment in the segment table is automatically changed by a change in the other setting.

For example, this warning message is displayed when, with the power specified segment by segment in the segment table, the power setting for a segment is adjusted by a change in the power range setting.

Target value not found

This warning message is displayed when, with the tracking turned on, the target specified by the marker search has not been found by the time the sweep is finished (with the tracking executed).

This warning message is displayed also when, with the bandwidth marker displayed, the setting for the bandwidth marker is changed at the end of the sweep, or when, with the

Messages

User Preset File not found

active marker changed or moved, the bandwidth is not found.

User Preset File not found

This warning message is displayed if no user preset file (D:\UserPreset.sta) exists when executing the **:SYST:UPR** command.

If this message is displayed, a normal preset (**:SYST:PRES**) will be performed.

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