

# **HP E5250A/E5252A/E5255A Low Leakage Switch**

# **Service Manual**

## **SERIAL NUMBERS**

This manual applies to instruments with serial numbers JP10C-.



HP Part No. E5250-90600  
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■ GROUND THE INSTRUMENT

To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The power terminal and the power cable must meet International Electrotechnical Commission (IEC) safety standards.

■ DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

■ KEEP AWAY FROM LIVE CIRCUITS

Operation personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

■ DO NOT SERVICE OR ADJUST 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 INSTRUMENT

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to a Hewlett-Packard Sales and Service Office for services and repair to ensure that safety features are maintained.

■ DANGEROUS PROCEDURE WARNINGS

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

WARNING

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

Safety Symbols

The general definitions of safety symbols used on equipment or in manuals are listed below.



Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect against damage to the instrument.



Indicates dangerous voltage (terminals fed from the interior by voltage exceeding 1000 volts must be so marked).



Indicates earth (ground) terminal.



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



Alternating current (power line).



Direct current (power line).

WARNING

The 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

The caution sign denotes a hazard. It calls attention to an operating 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.

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## Preface

### Contents

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#### Warning



**The information in this manual is provided for use by service trained personnel only. To avoid electrical shock, do not perform any procedures in this manual, unless you are qualified to do so.**

---

This manual contains information relating to performance verification and repair of the HP E5250A Low Leakage Switch Mainframe, HP E5252A 10×12 Matrix Switch, and HP E5255A 24 (8×3) Channel Multiplexer. The manual consists of the following chapters:

- |                                         |                                                                                                          |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------|
| 1. Service Introduction                 | Contains information needed before the performance verification and repair.                              |
| 2. Service Operation and Test Functions | Contains information and instructions for initial inspection, diagnostics, and performance verification. |
| 3. Troubleshooting Procedure            | Contains troubleshooting instructions.                                                                   |
| 4. Hardware Information                 | Contains hardware information to aid in troubleshooting.                                                 |
| 5. Replaceable Parts                    | Contains information on replaceable parts and assembly location.                                         |

#### Other Manuals

See the following user's manual for information on user operation and programming.

*User's Guide* (HP part number E5250-90000)

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## Service Introduction

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This manual provides information and instructions for verifying and repairing the HP E5250A Low Leakage Switch Mainframe, HP E5252A 10×12 Matrix Switch, and HP E5255A 24 (8×3) Channel Multiplexer.

### Warning



**The information in this manual is provided for use by service trained personnel only. To avoid electrical shock, do not perform any procedures in this manual, unless you are qualified to do so.**

---

This chapter covers product general information, and performance verification and repair strategies.

For the HP E5250A/E5252A/E5255A specifications, see Appendix A, "Specifications" of the *HP E5250A User's Guide* (HP P/N E5250-90000).

For detailed hardware information, see Chapter 4.

---

## Product Description

### HP E5250A Low Leakage Switch Mainframe

The HP E5250A Low Leakage Switch Mainframe is a computer-controlled (via HP-IB) mainframe for the HP E5252A 10×12 Matrix Switch and the HP E5255A 24 (8×3) Channel Multiplexer. The HP E5250A, HP E5252A, and HP E5255A are designed for semiconductor dc characteristics measurements, which require low leakage current specifications.

The HP E5250A can be controlled only by an external computer (HP BASIC controller, instrument with built-in HP IBASIC, or personal computer) and is usually used with an instrument that has SMUs (Source and Monitor Units). It can also be used with a C-Meter. A typical configuration for using the HP E5250A is as follows:

|            |                                                                                                                                                     |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Controller | HP 4155A or HP 4156A (as an HP IBASIC controller); or personal computer with Microsoft® Windows® and HP Interactive Characterization Software (ICS) |
| SMU        | HP 4155A or HP 4156A                                                                                                                                |
| C-Meter    | HP 4284A                                                                                                                                            |

The HP E5250A has four slots for installing HP E5252As and HP E5255As. The HP E5250A can be configured with:

- HP E5252As
- HP E5255As
- Mix of HP E5252As and HP E5255As

The front panel of the HP E5250A has four status indicators (LEDs) and a **Local/Self-Test** key. All the input/output connections are made at the rear part.

### HP E5252A 10×12 Matrix Switch

The HP E5252A is equal to the HP E5250A option 001.

For using the HP E5252A 10×12 Matrix Switch, six SMU (triaxial) ports (two low leakage and four general), two HF (BNC) ports, and two CV (BNC) ports are available on the rear panel of the HP E5250A. Each HP E5252A has 12 output (triaxial) connectors, which allow six Kelvin connections.

### HP E5255A 24 (8×3) Channel Multiplexer

The HP E5255A is equal to the HP E5250A option 501.

For using the HP E5255A 24 (8×3) channel Multiplexer, six SMU (triaxial) ports are available on the rear panel for the HP E5250A. Each HP E5255A has three 8-channel (coaxial) multiplexers. The user can define the connections between the SMU ports and the 8-channel multiplexers by making internal cable connections. For example, the HP E5250A with four HP E5255As can have various input-output connections—six 16-channel multiplexers, three 32-channel multiplexers, one 96-channel multiplexer, and so on.

Three bias input (BNC) ports are also available on *each* HP E5255A.

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## Operational Verification and Performance Verification Methods

### Operational Verification

The Power-On Test, Relay Test, and Leak Test verify that the HP E5250A/E5252A/E5255A are functioning properly with 90% confidence.

These tests, easily performed by customers, also cover incoming inspection and verification after installing the HP E5252A or HP E5255A, which are customer installable.

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#### Note



If full performance verification is required after installing the HP E5252A or HP E5255A, use the Performance Verification program.

---

**Power-On Test** Performs the CPU Self-Test. This is automatically performed when the HP E5250A is turned on. The CPU Self-Test can also be performed from the Self-Test utility software (furnished with the HP E5250A), which runs on the HP 4155A/4156A.

|            |                                                                                                                                                                                                                                                                                                                                                                                              |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relay Test | Checks relays. A Relay Test Adapter (HP E5250A option 301, which is equal to HP P/N E5250-60002) and BNC shorting caps (HP P/N 1250-0929; furnished with the HP E5250A/E5255A) are required. The Relay Test can be performed from the front panel <b>Local/Self-Test</b> key, and also from the Self-Test utility software (furnished with the HP E5250A), which runs on the HP 4155A/4156A. |
| Leak Test  | Performs leakage current tests. The Leak Test can be performed only from the Self-Test utility software (furnished with the HP E5250A), which runs on the HP 4155A/4156A.                                                                                                                                                                                                                    |

For more information on the Power-On Test and Relay Test, see Chapter 2. For information on the Leak Test, see Chapter 3 of the *User's Guide* (HP P/N E5250-90000).

## Performance Verification

Performance Verification Tests are used to verify the HP E5250A/E5252A/E5255A specifications. All tests can be easily performed by using the Performance Verification software (MT5250, which is on a 3.5-inch flexible disk and must be ordered separately), which runs on the HP BASIC 5.0 or later. This software conforms to MIL-STD-45662A.

Perform the tests for periodic verification of performance and for inspection after troubleshooting. The recommended Performance Verification cycle is one year.

When you perform Performance Verification, the ambient temperature and humidity must be:

Temperature:  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$   
Humidity:  $< 60\% \text{ RH}$

For more information on the Performance Verification software, see Chapter 2.

---

## Repair Policy

The HP E5250A/E5252A/E5255A will be repaired and calibrated in a local HP Service Center.

Most HP E5250A repairs are handled on an assembly-level replacement basis. Mechanical parts and fuses are handled on a parts-level replacement basis.

The HP E5252A/E5255A repairs are handled on a parts-level replacement basis. The Performance Verification software is also used for isolating defective relays on the HP E5252A/E5255A.

---

### Note



Relays have life specifications. If near the end of their expected life, and many relays are wearing out, we recommend that the assemblies be replaced with new assemblies.

---

## Required Equipment

The following table lists the equipment required for performance tests and troubleshooting.

### Note



Equipment should be calibrated by an instrument traceable to the National Institute of Standards and Technology (NIST) or an equivalent standard; or calibrated directly by an authorized calibration organization such as NIST. The calibration cycle should be in accordance with the stability specifications of each component.

**Table 1-1. Required Equipment**

| Equipment                                                                           | Use <sup>1</sup> |
|-------------------------------------------------------------------------------------|------------------|
| Computer/HP BASIC 5.0 or later                                                      | P,T              |
| HP-IB Cables                                                                        | P,T              |
| HP 4339A/B High Resistance Meter <sup>2</sup>                                       | P                |
| HP 3458A Multimeter <sup>2</sup>                                                    | P                |
| HP E5250A Low Leakage Switch Mainframe <sup>3</sup>                                 | T                |
| Relay Test Adapter (E5250-60002 <sup>4</sup> )                                      | P,T              |
| BNC Shoring Cap (1250-0929), 3 ea                                                   | P,T              |
| Isolation Test Adapter (E5250-65002)                                                | P                |
| Banana-Triax Adapter (E5250-65003)                                                  | P                |
| Banana-BNC Adapter (E5250-65004)                                                    | P                |
| Banana-Dsub Adapter (E5250-65005)                                                   | P                |
| Triax-BNC Adapter (E5250-65006)                                                     | P                |
| PV/Diag (MT5250) Disk (E5250-65201)                                                 | P,T              |
| Triaxial Cable (1 m, 04142-61641; or 1.5m, 16058-61603 <sup>5</sup> ), 3 ea         | P                |
| BNC Cable (61 cm, 8120-1839; 122 cm, HP 10503A; or 1.5m, 04142-61636 <sup>6</sup> ) | P                |
| Banana-Banana Cable (HP 11058A), 2 ea                                               | P                |
| Torx TX15 Driver (for Top and Bottom Covers)                                        | T                |
| Torx TX25 Driver (for Side Cover)                                                   | T                |
| Torx Wrench for Plug-In Modules (8710-2151 <sup>7</sup> )                           | T                |
| Module Extractor (04155-60007 <sup>8</sup> )                                        | T                |
| Flat-Blade Screwdrivers                                                             | T                |
| Philips (Pozidriv No. 1, No. 2) Screwdrivers                                        | T                |

1 P = Performance Verification, T = Troubleshooting

2 Must have been calibrated within the recommended interval.

3 Allows returning defective E5252A/E5255A only (without E5250A).

4 Available as Mainframe option (HP E5250A #301).

5 Equals HP 16493C #001.

6 Equals HP 16493B #001.

7 Furnished with HP E5250A/E5252A/E5255A.

8 Furnished with HP E5250A/4155A/4156A and Product Support Package for HP 4155A/4156A (04155-65801).

---

## Service Kit

### Product Support Package

The Product Support Package for the HP E5250A/E5252A/E5255A (HP part number E5250-65801) contains items required for performance testing and troubleshooting the HP E5250A/E5252A/E5255A. The contents are shown below.

**Table 1-2. Contents of Product Support Package (E5250-65801)**

| Part Number | Quantity | Description                    |
|-------------|----------|--------------------------------|
| E5250-65002 | 1        | Isolation Test Adapter         |
| E5250-65003 | 1        | Banana - Triax Adapter         |
| E5250-65004 | 1        | Banana - BNC Adapter           |
| E5250-65005 | 1        | Banana - Dsub Adapter          |
| E5250-65006 | 1        | Triax - BNC Adapter            |
| E5250-65201 | 1        | MT5250 Program (3.5-Inch Disk) |

---

## Retrofit Products

When the HP E5250A option 001 and option 501 are specified, HP E5252A and E5255A are installed in the HP E5250A and their performance is verified at the factory. The HP E5252A and HP E5255A are usually ordered when additional channels are necessary (as retrofit products).

The HP E5252A/E5255A can be installed by customers. The Relay Test and Leak Test should be performed after the installation.

---

## Options and Accessories

See "Options and Accessories" in Chapter 1 of the *HP E5250A User's Guide*.



## Service Operation and Test Functions

---

This chapter explains the service operation for the HP E5250A/E5252A/E5255A, the built-in test functions, and the Performance Verification operating theory.

Service operations are of three types:

|                                |                                                                                                                                                                                                            |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function Tests                 | Firmware and software used to verify that the HP E5250A/E5252A/E5255A are operational. The function tests are mainly for users. See Chapter 3 of the <i>User's Guide</i> (HP P/N E5250-90000) for details. |
| Performance Verification Tests | Software to verify that the HP E5250A/E5252A/E5255A meet the published specifications.                                                                                                                     |
| Trouble Isolation              | Software to isolate defective FRUs (field replaceable units).                                                                                                                                              |

---

### Note



The HP BASIC program MT5250 is used for both Trouble Isolation and Performance Verification purposes.

---



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## Function Tests

### Power-On Test

#### Result Display of Power-On Test

When you power on the HP E5250A, the Power-On Test is automatically executed. The result of the Power-On Test is indicated by the front panel LEDs. The Power-On Test *does not* perform the Relay Test. To perform the Relay Test, see "Relay Test (via Front Panel)" or "Running Trouble Isolation".

---

### Note



The HP E5250A has eight DIP switches on the rear panel. Bits 1, 2, and 3 (the leftmost three bits) must be at the **0** position for normal Power-On Test operation. Bits 4 through 8 are for setting the HP-IB address.

---

When the HP E5250A is functioning properly, the following four front panel LEDs will light, and then they extinguish within five seconds after power-on. (The Power-On Test result is "PASS".)

**Remote**  
**Sys Fail**  
**Fail**  
**Local/Self Test**

In all the other cases (shown below), the Power-On Test result is "FAIL". See chapter 3.

- One or more LEDs (except **Line**) remain lit for more than five seconds after power-on. (In most cases, **Sys Fail** or **Fail**.)
- The four LEDs do not light at all.

### Power-On Test Sequence

The Power-On Test is executed in the following order.

1. (Turn on Mainframe.)
2. Turn on all LEDs.
3. Start up CPU.
4. Perform CPU board ROM check-sum test.
5. Perform CPU board RAM read/write test.
6. Turn off **Remote** and **Sys Fail** LEDs.
7. Perform CPU board timer test.
8. Perform slot communication test.
9. Turn off **Fail** LED.

### Relay Test (via Front Panel)

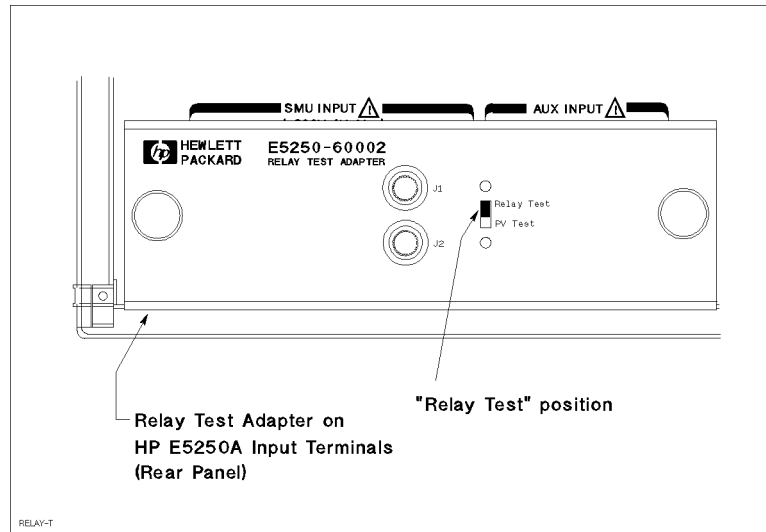
The Relay Test via the front panel tests all the modules together and indicates the "PASS" or "FAIL" result of the unit. This test does not indicate which module(s) are defective. An external controller is not required to perform this test.

### Required Equipment

- Relay Test Adapter (E5250-60002)
- (HP E5255A only) BNC Shorting Caps (1250-0929, 3 ea per HP E5255A)

### Relay Test Operation

1. Make sure all the output terminals of the HP E5250A are open.
2. Mount the Relay Test Adapter (HP P/N E5250-60002) on the input terminals (rear panel) of the HP E5250A, then tighten the two thumb screws.
3. Make sure the slide switch of the Relay Test Adapter is at the **Relay Test** position.



**Relay Test Adapter**

4. (Only if the HP E5255A module(s) are installed.) Attach three BNC shorting caps onto the three **BIAS INPUT** terminals of each HP E5255A module.
5. (If the **Remote** LED is lit.) Press the **Local/Self-Test** button on the front panel to set the HP E5250A to "local".
6. Press the **Local/Self-Test** button on the front panel.
7. Check the **Fail** LED. If the LED is lit, one or more of the relays are considered to be defective. Use the MT5250 program to isolate the defective relays. (See "Running Trouble Isolation".)

## Relay Test Theory

This section explains the relay test theory briefly. For the troubleshooting procedure (isolating defective relays), see "Running Trouble Isolation".

The CPU board of the HP E5250A has a relay test circuitry. The circuitry consists of two current sources (20 mA and 100  $\mu$ A), two voltage comparators (150 mV and 5 V), and four relays (used to test the relay test circuitry itself and to connect the circuitry to CV1 and CV2 ports).

The Relay Test performs Close Tests and Open Tests. It tests the relay test circuitry and its four relays first, then tests the relays on all the installed modules.

To perform a relay test, a test path (loop) must be set up. The Relay Test Adapter interconnects the input ports so that the input port relays are included with the test loop. The BNC shorting caps for the HP 5255A are for the same purpose. All the output ports must be open. (Output cables may be left connected if the other sides are *open*.)

### ■ Close Test

1. Close (make) relays to be tested (all the relays in a test path).
2. Force 20 mA.
3. Check the voltage by using the 150 mV comparator. The Close Test is PASS when the voltage is less than 150 mV. (The path resistance is less than 7.5  $\Omega$ .)

### ■ Open Test

1. Open (break) the relay to be tested (one of the relays in a test path).
2. Force 100  $\mu$ A.
3. Check the voltage by using the 5 V comparator. The Open Test is PASS when the voltage is greater than 5 V.

## Function Tests via IBASIC Controller (Overview Only)

Function Tests (Controller, Front Panel, and Relay Test) are performed via an HP IBASIC controller (typically, HP 4155A/4156A) by users to verify the operation of the HP E5250A/E5252A/E5255A. Note that all the Function Test items are also covered by the MT5250 program. (See "Running Trouble Isolation".) For more information about the Function Tests via IBASIC, see Chapter 3 of the *User's Guide* (HP P/N E5250-90000).

---

## Performance Verification Overview

### Required Equipment

The following is equipment required for the HP E5250A/E5252A/E5255A performance verification tests.

**Table 2-1. Required Equipment**

| Description                         | Quantity | Model / Part Number                                                                   |
|-------------------------------------|----------|---------------------------------------------------------------------------------------|
| Computer / HP BASIC 5.0 or later    | 1        |                                                                                       |
| HP-IB Cables                        |          |                                                                                       |
| High Resistance Meter               | 1        | HP 4339A/B                                                                            |
| Multimeter                          | 1        | HP 3458A                                                                              |
| Relay Test Adapter                  | 1        | E5250-60002                                                                           |
| BNC Shoring Cap                     | 3        | 1250-0929                                                                             |
| Isolation Test Adapter <sup>1</sup> | 1        | E5250-65002                                                                           |
| Banana-Triax Adapter <sup>1</sup>   | 1        | E5250-65003                                                                           |
| Banana-BNC Adapter <sup>1</sup>     | 1        | E5250-65004                                                                           |
| Banana-Dsub Adapter <sup>1</sup>    | 1        | E5250-65005                                                                           |
| Triax-BNC Adapter <sup>1</sup>      | 1        | E5250-65006                                                                           |
| PV/Diag Disk <sup>1</sup>           | 1        | E5250-65201                                                                           |
| Triaxial Cable                      | 3        | 04142-61641 (1 m)<br>or 16058-61603 (=HP 16493C #001) (1.5 m)                         |
| BNC Cable                           | 1        | 8120-1839 (61 cm),<br>HP 10503A (122 cm),<br>or 04142-61636 (=HP 16493B #001) (1.5 m) |
| Banana-Banana Cable                 | 2        | HP 11058A                                                                             |

<sup>1</sup> Included in Product Support Package (E5250-65801).

### Performance Test Record

Performance Test Results can be printed out to a printer by using the MT5250 Program. Examples of performance test records are at the end of this chapter.

### Performance Verification Cycle

The frequency of performance verification depends on the operating and environmental conditions under which the instrument is used. We recommend that the HP E5250A/E5252A/E5255A's performance be verified at least once a year.

## Performance Verification Environment

---

### Important



Perform all performance verification tests in the following conditions:

Temperature: 23 °C ± 5 °C

Humidity: < 60% RH

---

Allow the HP 4339A/B and HP 3458A to warm up and stabilize for their warmup time.

---

### Note



The HP 4339A/B and HP 3458A must be warmed up at least:

HP 4339A/B: 30 minutes

HP 3458A: four hours

Perform ACAL for the HP 3458A after the warmup time.

---

## Performance Verification Test Procedures

---

The following procedures explain how to execute the HP E5250A/E5252A/E5255A performance verification tests using the MT5250 program.

### Preparation

Before the tests, perform the following steps:

1. (HP E5255A only) Make sure the internal DIP switch setting is correct. See "HP E5255A DIP Switch Settings" in Chapter 4.
2. Connect the HP-IB cables.  
Interconnect the controller, HP E5250A, HP 3458A, HP 4339A/B, disk drive, and printer with interface cables. A printer is required only if you want to print the Test Records after the tests are complete.
3. Make sure the **Terminals** push-switch on the HP 3458A front panel is at the **Front** position.
4. Make sure the **Guard** push-switch on the HP 3458A front panel is at the **Open** position.
5. Check the HP-IB addresses of the HP 3458A and HP 4339A/B, and remember them.

### Starting the MT5250 Program

Use the following procedure to start the MT5250 program.

1. Turn the controller on and boot the HP BASIC/WS system.  
Insert BASIC 5.0 (or later) disk into the disk drive and turn your computer on. The language system loads automatically and **BASIC Ready** is displayed when BASIC is loaded. Remove the disk.
2. Load BASIC BIN files.  
Load the following binary (BIN) files from the BASIC Driver Disk and the BASIC Language Extensions Disk:

Driver BIN:                      HPIB  
Language Extension BIN:      CLOCK, ERR, IO, MAT

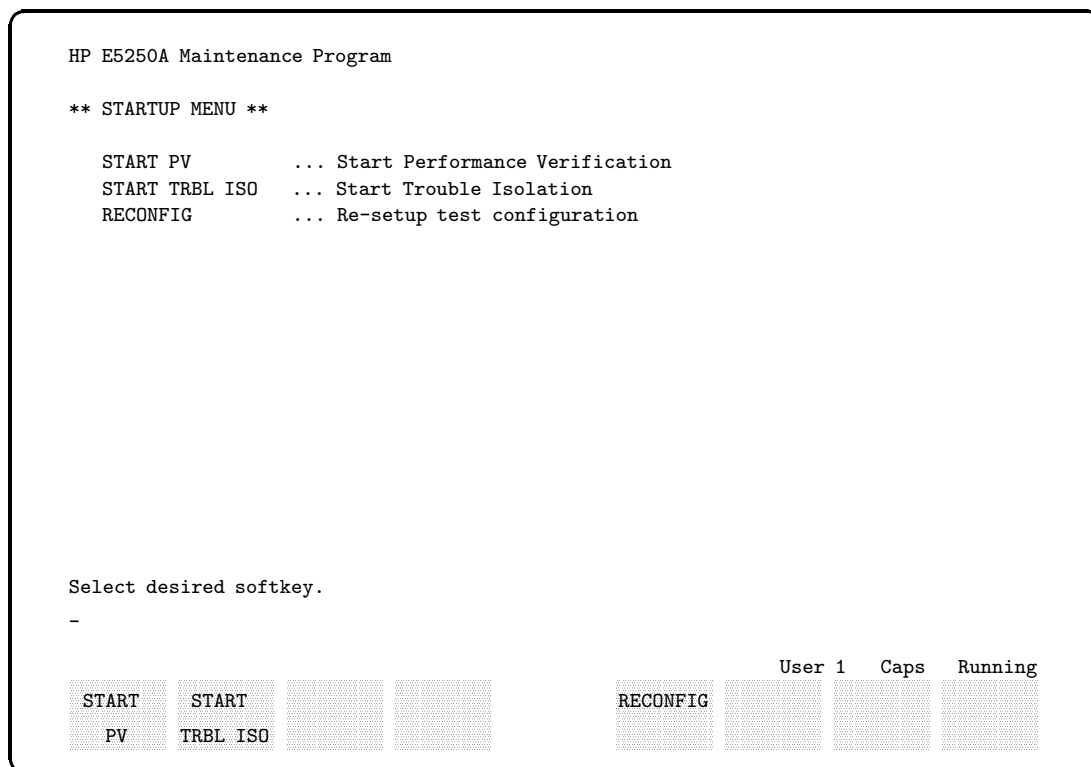
If you are using an external disk drive or other storage medium, you also need to load other BIN files (for example CS80 and DISC). Remove the disk.

3. Load and run the MT5250 program as follows:

```
LOAD "MT5250"   
RUN 
```

Change the working directory to the directory where MT5250 and related files are stored, or set MASS STORAGE IS (MSI) to the disk drive where MT5250 disk is inserted.

After the copyright message is displayed and the program initialization is completed, the STARTUP MENU is displayed.



## Setting Up Test Equipment Configurations

Before you begin the performance verification tests, you need to confirm/change the following items that are necessary information for the tests. Select the **RECONFIG** softkey in the STARTUP MENU. The RECONFIG MENU is displayed.

```
HP E5250A Maintenance Program

** RECONFIG MENU **

E5250A ADDR      ... change E5250A HP-IB address
3458A ADDR       ... change 3458A HP-IB address
4339A ADDR       ... change 4339A HP-IB address
PRINTER TYPE     ... change printer type
PRINTER ADDR     ... change printer's address, I/F
STARTUP MENU     ... return to STARTUP MENU

CURRENT SETTINGS
HP E5250A ADDR   = 722
HP 3458A ADDR    = 711
HP 4339A ADDR    = 718
PRINTER TYPE     = LOCAL
PRINTER ADDR     = 701          I/F = HP-IB

Select desired softkey.
-

E5250A  3458A  4339A  PRINTER  PRINTER  User 1  Caps  Running
ADDR    ADDR    ADDR    TYPE    ADDR
STARTUP
MENU
```

You can confirm/change the following items in this menu.

- HP E5250A HP-IB address
- HP 3458A HP-IB address
- HP 4339A/B HP-IB address
- Printer information (type, HP-IB address, and spooling directory)

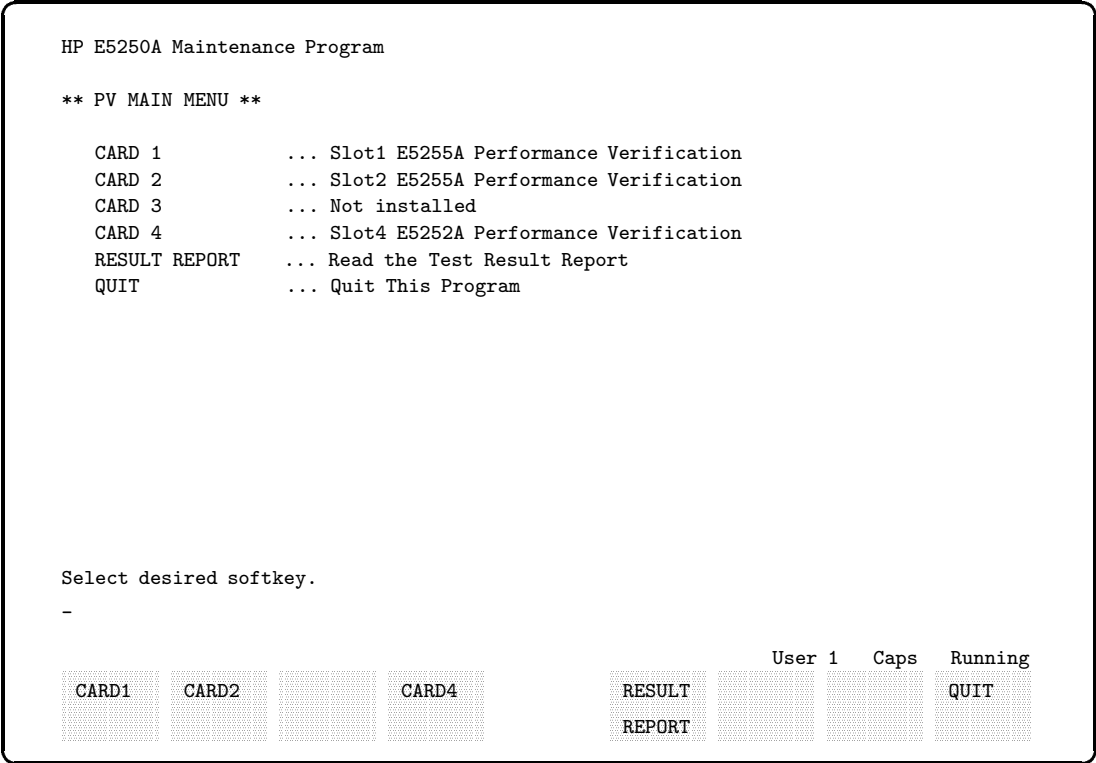
Select an appropriate softkey to confirm/change the item values. See "RECONFIG MENU Operation" for the details.

After you have set up the configurations, select the **STARTUP MENU** softkey to return to the STARTUP MENU.

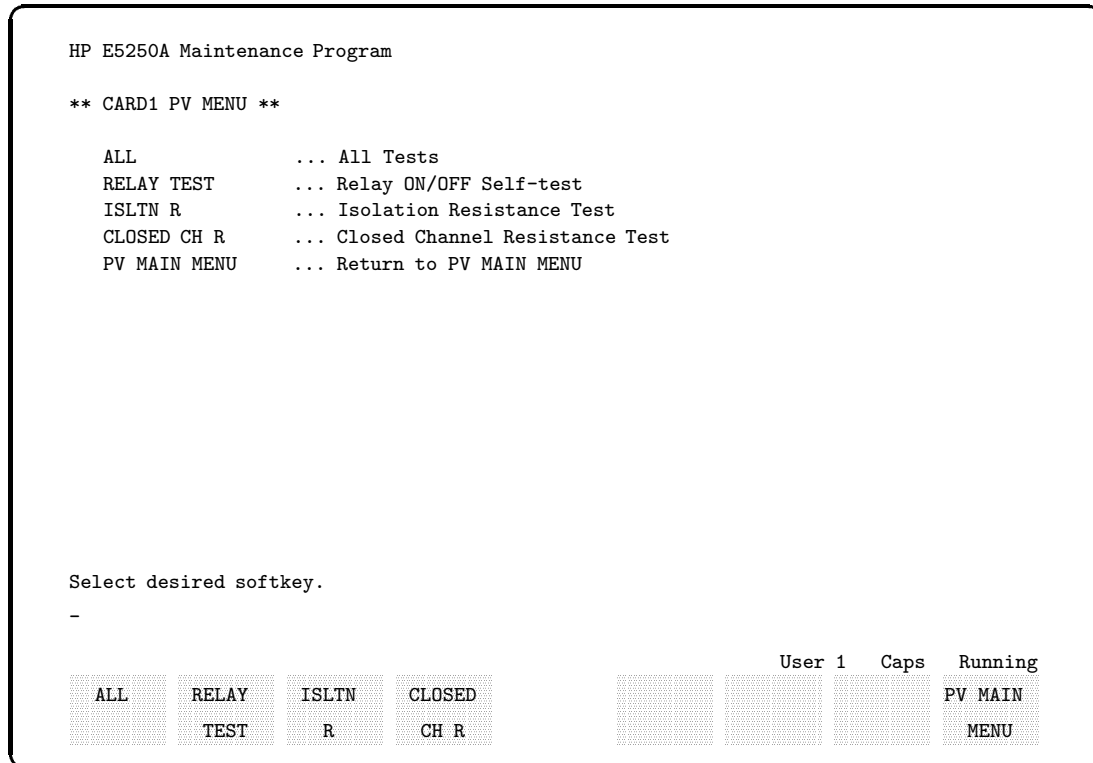
**Executing Performance Verification Tests**

To execute the performance verification tests, perform the following steps:

1. Display the PV MAIN MENU.  
To display the PV MAIN MENU, select the **START PV** softkey in the STARTUP MENU. Selecting the **START PV** softkey initializes the HP E5250A, HP 3458A, and HP 4339A/B. If the HP-IB addresses are not set correctly, an error message is displayed and the MT5250 program terminates.



2. Select the Slot (Card) number.  
Execute the Performance Verification for *each* module (card). Select the module to be tested by selecting from the card number softkeys.



3. Select the execution mode.

The MT5250 program has two test modes for the performance verification tests. One is the Sequential Test mode, which verifies all the test items for the selected module. The other is the Selective Test mode, which executes one test item specified by a softkey. Test results can be saved to a disk and printed out as the test record only in the Sequential Test mode. Select the **ALL** softkey in the PV MENU to start the Sequential Test.

4. Execute the tests.

To perform all tests sequentially, use the following steps:

- Select the **ALL** softkey. The message and softkeys are displayed:

Do you want to keep results in a file ? (Type CAT to get file catalog)

- Select the desired softkey (**YES** or **NO**). To be able to print out the test results as the test record, you must save the test results in a file (select the **YES** softkey).
- Insert a disk for saving the test results. Do not remove the disk until the PV MENU is displayed again after all tests are complete, because the MT5250 program creates temporary files on the disk during the tests and merges them into one file after all tests are complete.

---

**Note**

You can execute any BASIC statement directly whenever the MT5250 program is waiting for softkey input. For example, you can execute the **CAT** statement to display the catalog, or you can execute the **PURGE** statement to purge a file.

---

- d. Type the name of the file in which you want to save the test results, then press **(Return)**. A default filename is, for example, **PVS10396** (**PVS10396**: Performance Verification Slot 1, March (3) 1996). If you press **(Shift)-(Return)** without typing a filename and then **(Return)**, the MT5250 program returns you to step b again.
- 

**Note**

Do not use **TEMP001** through **TEMP999** as your test results filename because the MT5250 program creates temporary files with these names during the tests. After the tests are complete, these temporary files are automatically purged.

If you specify a file that has already been used to save the test results of a previous Performance Verification execution, you can selectively resave the results of desired test items. In this case, go to step g since you can not change the contents of step e. You can perform the desired test items by using the **CONTINUE** softkey and the **SKIP** softkey to skip over undesired test items.

---

- e. Type the serial numbers of the HP E5250A/E5252A/E5255A and press **(Return)**. Then enter Temperature, Humidity, Date, and operator's name as prompted. Press **(Return)** after each entry.
- f. After you have finished all the entries, MT5250 asks you if the entered data are correct or not:

Are you sure ?

If you have correctly entered all the data in step e, select the **YES** softkey. If you select the **NO** softkey, MT5250 returns you to step e again. Once you select the **YES** softkey, you can never change the data entered in step e.

- g. Perform test items in accordance with the messages that are displayed during test execution. See each test description for the details of the test method including cable connections.
- 

**Warning**

**During the Isolation Resistance Test, dangerous voltages may be present at the terminals of the HP E5250A, E5250-65002 test adapter, and cables.**

**Remove all the unused cables from the HP E5250A and E5250-65002, and do not touch other open terminals.**

---

The following shows the softkeys that are displayed during test item execution. First connect the cables in accordance with the displayed messages, then select the **CONTINUE** softkey to execute the test item. After the test result (**PASS** or **FAIL**) is displayed, select the **CONTINUE** softkey to perform the next test item. Basically, you can perform all test items by changing the cable connections, then selecting the **CONTINUE** softkey. After all tests are complete, MT5250 displays the PV MAIN MENU.

| Softkey  | Function                                                                                                                                                                                                                                                               |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CONTINUE | Goes to the next step in the test item.                                                                                                                                                                                                                                |
| SKIP     | Goes to the next test item.                                                                                                                                                                                                                                            |
| EXIT     | Returns to the PV MAIN MENU. Or if this softkey is selected after selecting the CRT softkey, exits from displaying the detailed test results.                                                                                                                          |
| RETRY    | Performs the test item again. If the test fails, make sure the cable connections are correct, then select this softkey if you want to perform the test item again. If the test results are being saved to a disk, the new test results overwrite the old test results. |
| DUMP     | Displays or prints the detailed test results.<br><br>If the PRINTER TYPE is set to FILE SPOOL, the created file name is MT5250_Dn( <i>n</i> is incremented from 1 to 99 repeatedly, such as 1, 2, ... , 99, 1) and the file type is ASCII (LIF ASCII).                 |
| CRT      | Displays the detailed test results.                                                                                                                                                                                                                                    |
| PRINTER  | Prints the detailed test results.                                                                                                                                                                                                                                      |
| MORE     | Displays one more screen of the detailed test results.                                                                                                                                                                                                                 |
| CANCEL   | Cancels printing.                                                                                                                                                                                                                                                      |

## Relay Test

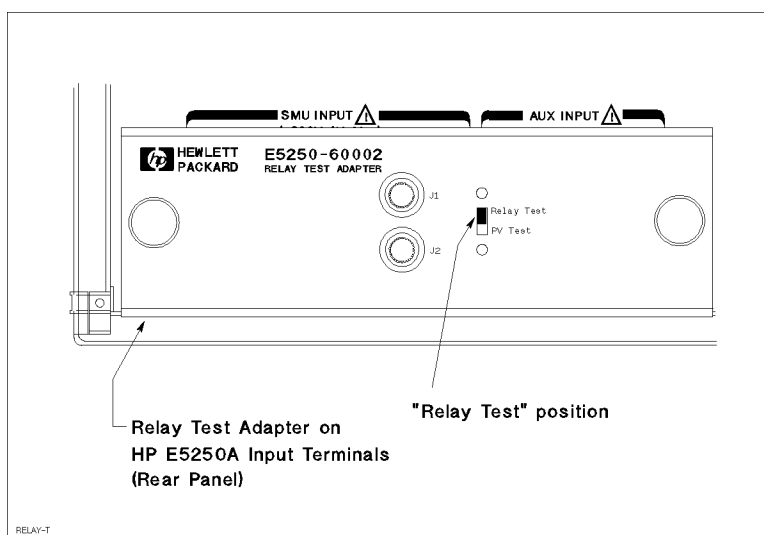
This test performs the built-in relay test of the HP E5250A. This test is executed when the **RELAY TEST** softkey is selected in CARD $n$  PV MENU.

### Test Equipment

- Relay Test Adapter (E5250-60002)
- (HP E5255A Only) BNC Shorting Caps (1250-0929; 3 ea)

### Test Method

1. Attach the Relay Test Adapter to the HP E5250A input terminals.
2. Set the switch of the Relay Test Adapter to the **Relay Test** position.
3. (HP E5255A only) Attach three BNC shorting caps on the three **BIAS INPUT** terminals of the HP E5255A.
4. Disconnect all the cables from the HP E5252A/E5255A.
5. MT5250 sends the relay test command to the HP E5250A and checks the result.



**Relay Test Adapter**

## Isolation Resistance Test

This test verifies the isolation resistance between channels. This test is executed when the **ISLTN R** softkey is selected in **CARD $n$  PV MENU**.

### Specifications

#### HP E5252A.

|                                       |                 |
|---------------------------------------|-----------------|
| Low Leak I-V Ports (SMU1 and SMU2)    | $10^{13}\Omega$ |
| General I-V Ports (SMU3 through SMU6) | $10^{12}\Omega$ |
| CV, HF Paths                          | $10^9\Omega$    |

#### HP E5255A.

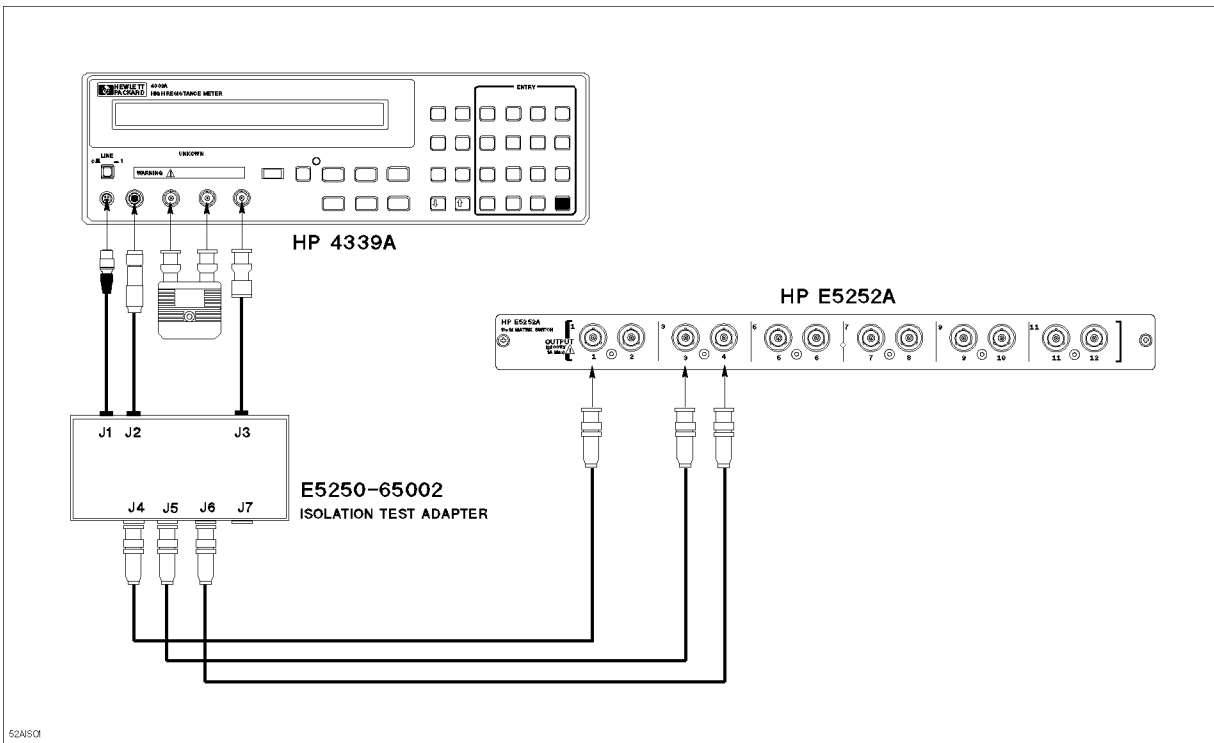
|            |                 |
|------------|-----------------|
| I-V Ports  | $10^{13}\Omega$ |
| Bias Ports | $10^9\Omega$    |

### Test Equipment

- HP 4339A/B High Resistance Meter
- Isolation Test Adapter (E5250-65002)
- Triaxial Cable; 3 ea:
  - 04142-61641 (1 m),
  - or 16058-61603 (=HP 16493C #001) (1.5 m)
- (HP E5255A Only) BNC Cable:
  - 8120-1839 (61 cm),
  - or HP 10503A (122 cm),
  - or 04142-61636 (=HP 16493B #001) (1.5 m)
- (HP E5255A Only) Triax-BNC Adapter (E5250-65006)

## Test Connections

### HP E5252A Test Connection.



#### HP E5252A Input - Input Isolation Resistance Test

### Important



Before beginning this test, remove the Relay Test Adapter from the HP E5250A input terminals. Otherwise, the test will FAIL.

#### \*\* INPUT - INPUT ISOLATION RESISTANCE TEST \*\*

Attach 04339-60003 on 4339A Ground/Guard. Press CONTINUE.

Connect E5250-65002 J1 to 4339A Interlock. Press CONTINUE.

Connect E5250-65002 J2 to 4339A Input. Press CONTINUE.

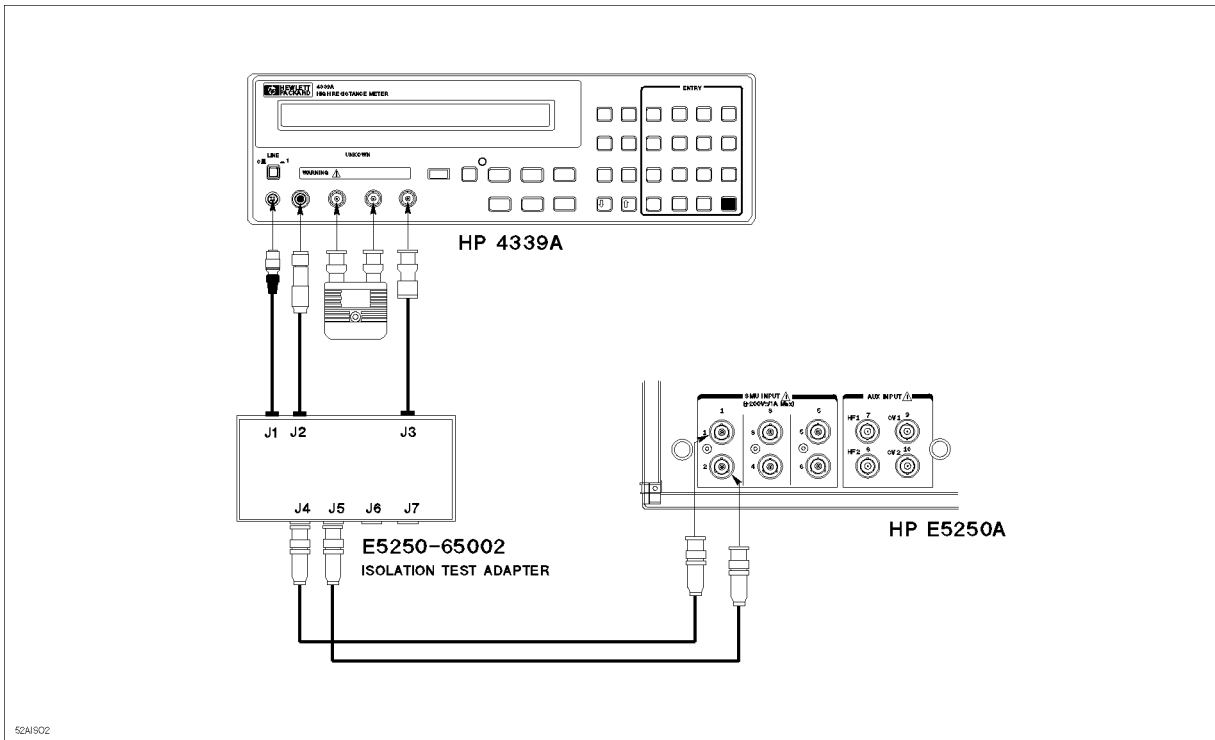
Connect E5250-65002 J3 to 4339A Output. Press CONTINUE.

Connect E5250-65002 J4 to E5252A(CARDn) OUTPUT 1. Press CONTINUE.

Connect E5250-65002 J5 to E5252A(CARDn) OUTPUT 3. Press CONTINUE.

Connect E5250-65002 J6 to E5252A(CARDn) OUTPUT 4. Press CONTINUE.

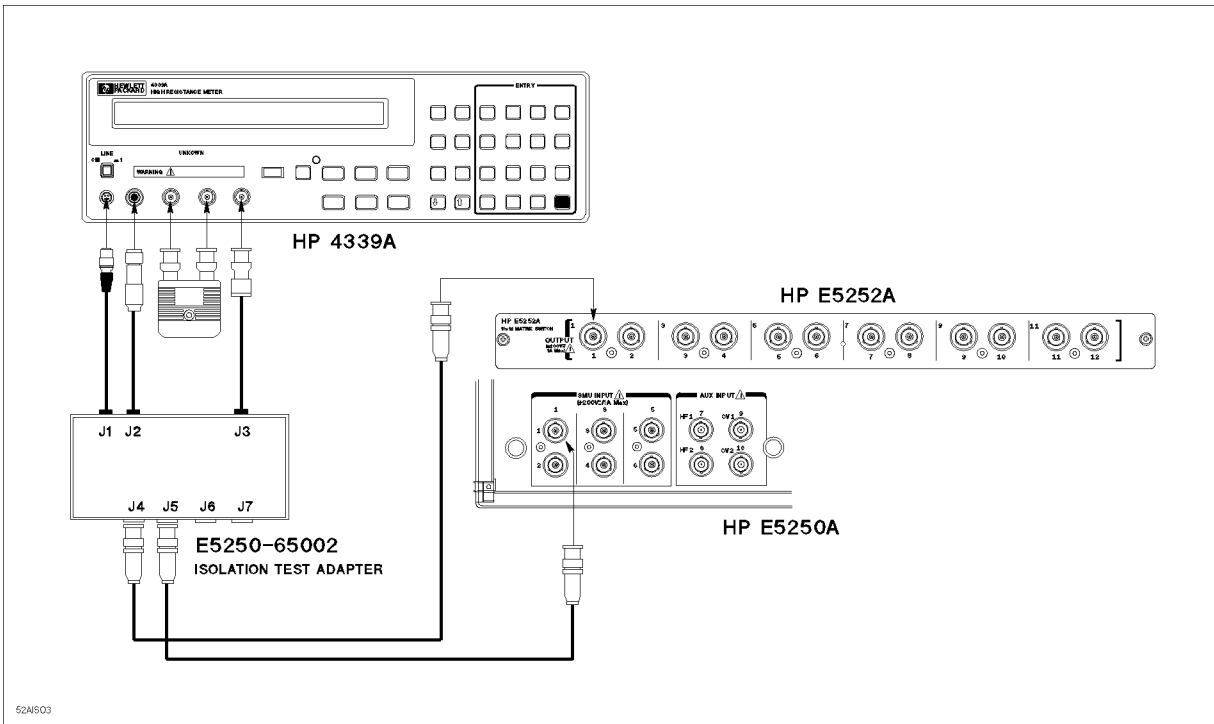
Disconnect cable from E5250-65002 J7. Press CONTINUE.



### HP E5252A Output- Output Isolation Resistance Test

#### \*\* OUTPUT - OUTPUT ISOLATION RESISTANCE TEST \*\*

Connect E5250-65002 J4 to E5250A SMU INPUT 1. Press CONTINUE.  
 Connect E5250-65002 J5 to E5250A SMU INPUT 2. Press CONTINUE.  
 Disconnect cable from E5250-65002 J6. Press CONTINUE.  
 Disconnect all cables from E5252A(CARDn). Press CONTINUE.



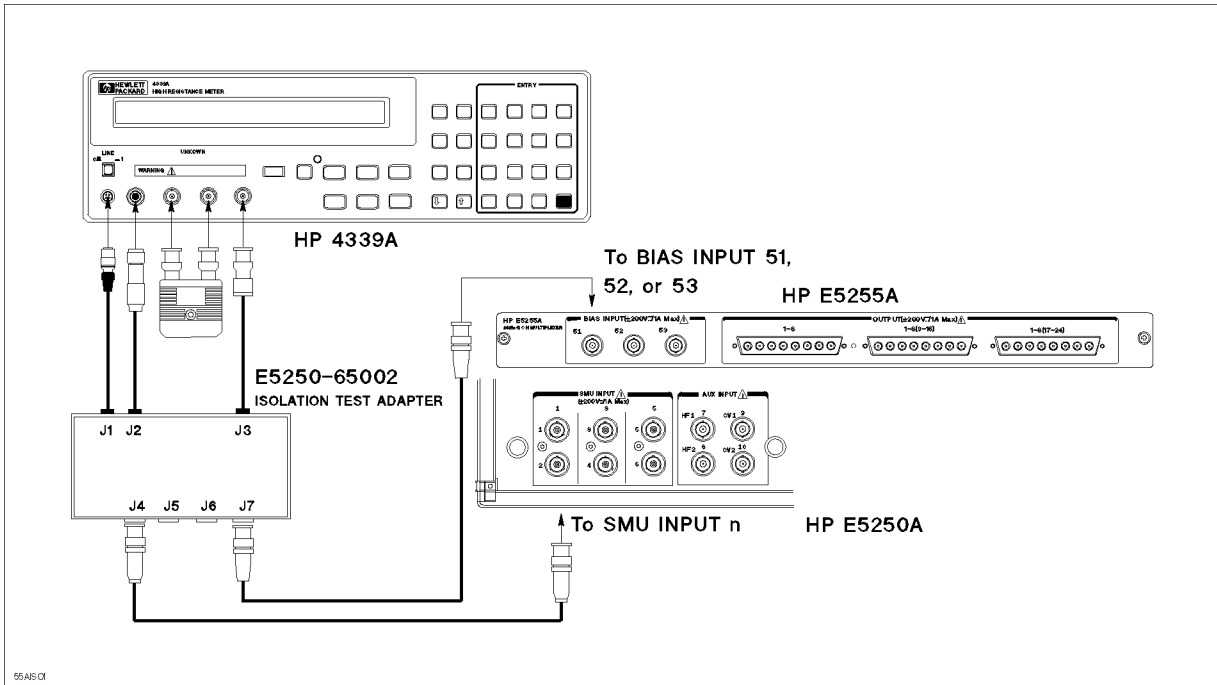
### HP E5252A Input - Output Isolation Resistance Test

**\*\* INPUT - OUTPUT ISOLATION RESISTANCE TEST \*\***

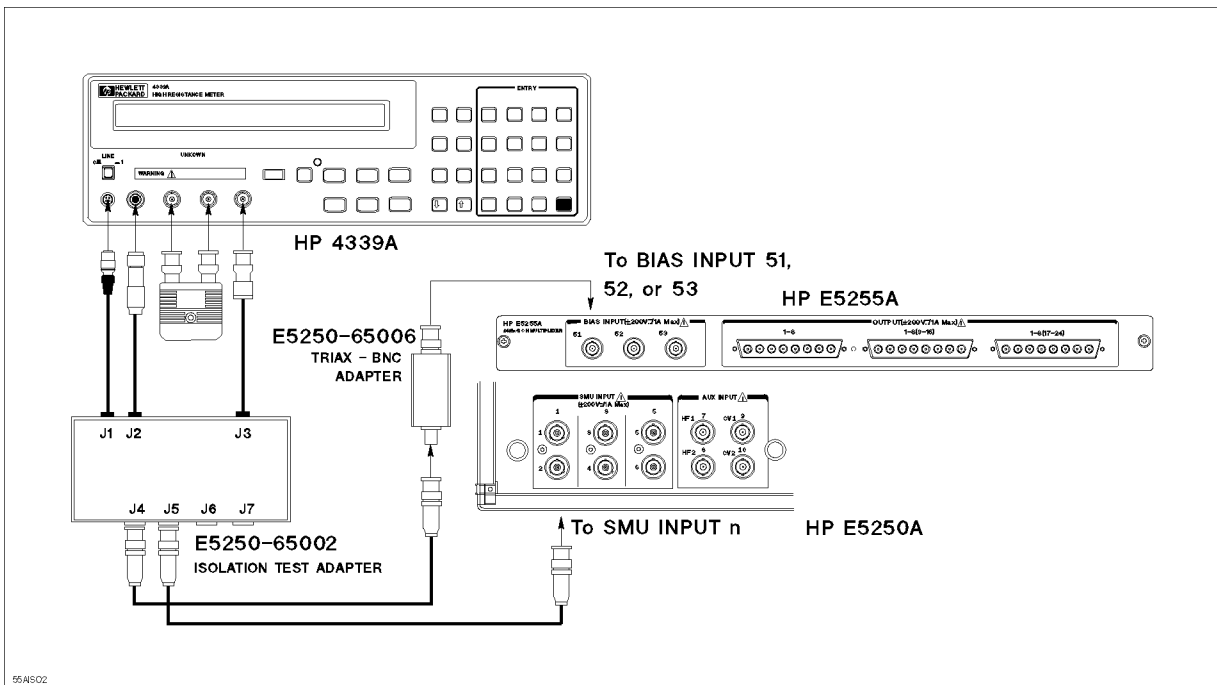
Connect E5250-65002 J4 to E5252A(CARDn) OUTPUT 1. Press CONTINUE.

Connect E5250-65002 J5 to E5250A SMU INPUT 1. Press CONTINUE.

## HP E5255A Test Connection.



**HP E5255A IV Port Isolation Resistance Test**



**HP E5255A BIAS Port Isolation Resistance Test**

```

** E5255A ISOLATION RESISTANCE TEST **
** BLOCK1 : IV PORT n ISOLATION RESISTANCE TEST **
Attach 04339-60003 on 4339A Ground/Guard. Press CONTINUE.
Connect E5250-65002 J1 to 4339A Interlock. Press CONTINUE.
Connect E5250-65002 J2 to 4339A Input. Press CONTINUE.
Connect E5250-65002 J3 to 4339A Output. Press CONTINUE.
Disconnect cable from E5250-65002 J6. Press CONTINUE.
Disconnect cable from E5250-65002 J5. Press CONTINUE.
Connect E5250-65002 J4 to E5250A SMU INPUT n. Press CONTINUE.
Connect E5250-65002 J7 to E5255A(CARDn) BIAS INPUT 51. Press CONTINUE.
** BLOCK1 : BIAS PORT 51 ISOLATION RESISTANCE TEST **
Disconnect cable from E5250-65002 J7. Press CONTINUE.
Attach E5250-65006 on E5255A(CARDn) BIAS INPUT 51. Press CONTINUE.
Connect E5250-65002 J4 to E5250-65006. Press CONTINUE.
Connect E5250-65002 J5 to E5250A SMU INPUT n. Press CONTINUE.

** BLOCK2 : IV PORT n ISOLATION RESISTANCE TEST **
Disconnect cable from E5250-65002 J5. Press CONTINUE.
Connect E5250-65002 J4 to E5250A SMU INPUT n. Press CONTINUE.
Connect E5250-65002 J7 to E5255A(CARDn) BIAS INPUT 52. Press CONTINUE.
** BLOCK2 : BIAS PORT 52 ISOLATION RESISTANCE TEST **
Disconnect cable from E5250-65002 J7. Press CONTINUE.
Attach E5250-65006 on E5255A(CARDn) BIAS INPUT 52. Press CONTINUE.
Connect E5250-65002 J4 to E5250-65006. Press CONTINUE.
Connect E5250-65002 J5 to E5250A SMU INPUT n. Press CONTINUE.

** BLOCK3 : IV PORT n ISOLATION RESISTANCE TEST **
Disconnect cable from E5250-65002 J5. Press CONTINUE.
Connect E5250-65002 J4 to E5250A SMU INPUT n. Press CONTINUE.
Connect E5250-65002 J7 to E5255A(CARDn) BIAS INPUT 53. Press CONTINUE.
** BLOCK3 : BIAS PORT 53 ISOLATION RESISTANCE TEST **
Disconnect cable from E5250-65002 J7. Press CONTINUE.
Attach E5250-65006 on E5255A(CARDn) BIAS INPUT 53. Press CONTINUE.
Connect E5250-65002 J4 to E5250-65006. Press CONTINUE.
Connect E5250-65002 J5 to E5250A SMU INPUT n. Press CONTINUE.

```

## Closed Channel Resistance Test

This test verifies the closed channel resistance. This test is executed when the **CLOSED CH R** softkey is selected in **CARD $n$  PV MENU**.

### Specifications

#### HP E5252A.

|                                       |              |
|---------------------------------------|--------------|
| Low Leak I-V Ports (SMU1 and SMU2)    | 0.6 $\Omega$ |
| General I-V Ports (SMU3 through SMU6) | 1.0 $\Omega$ |
| CV, HF Paths                          | 1.0 $\Omega$ |

#### HP E5255A.

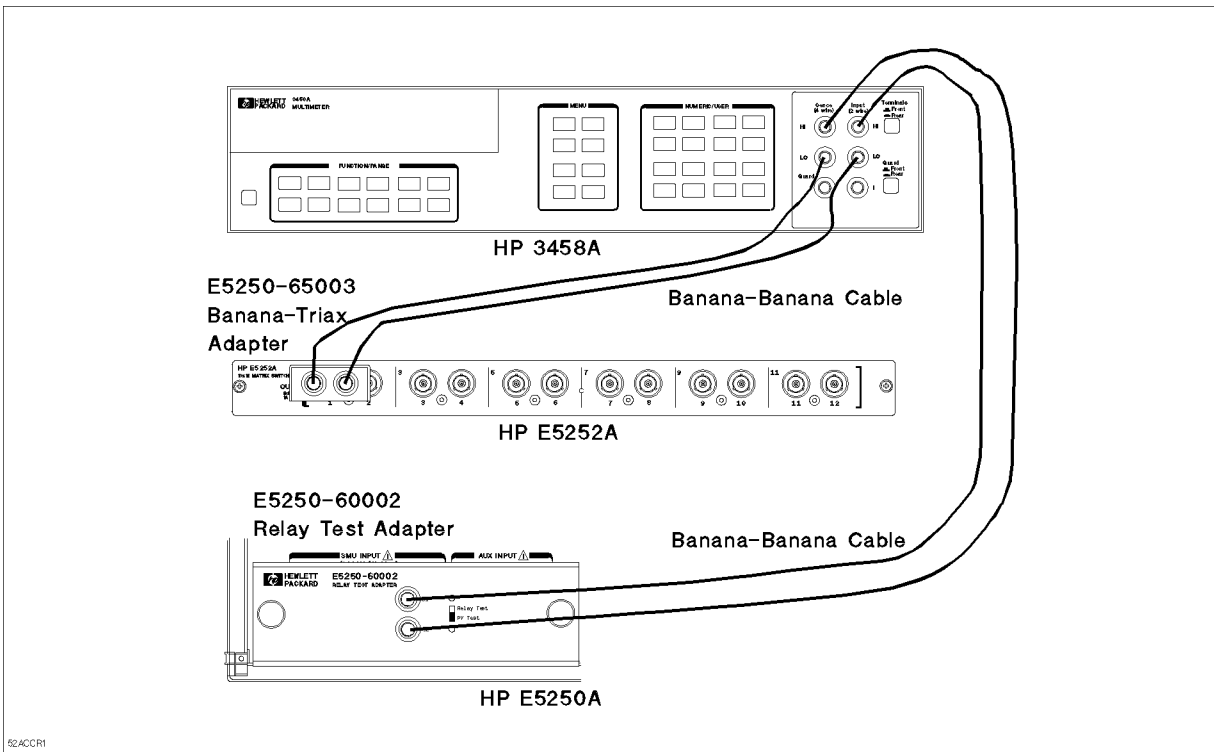
|            |              |
|------------|--------------|
| I-V Ports  | 0.6 $\Omega$ |
| Bias Ports | 1.0 $\Omega$ |

### Test Equipment

- HP 3458A Mutimeter
- Relay Test Adapter (E5250-60002)
- (HP E5252A Only) Banana-Triax Adapter (E5250-65003)
- (HP E5255A Only) Banana-BNC Adapter (E5250-65004)
- (HP E5255A Only) Banana-Dsub Adapter (E5250-65005)
- Banana-Banana Cable (HP 11058A), 2 ea.

## Test Connections

### HP E5252A Test Connection.



### HP E5252A Closed Channel Resistance Test

#### \*\* E5252A CLOSED CHANNEL RESISTANCE TEST \*\*

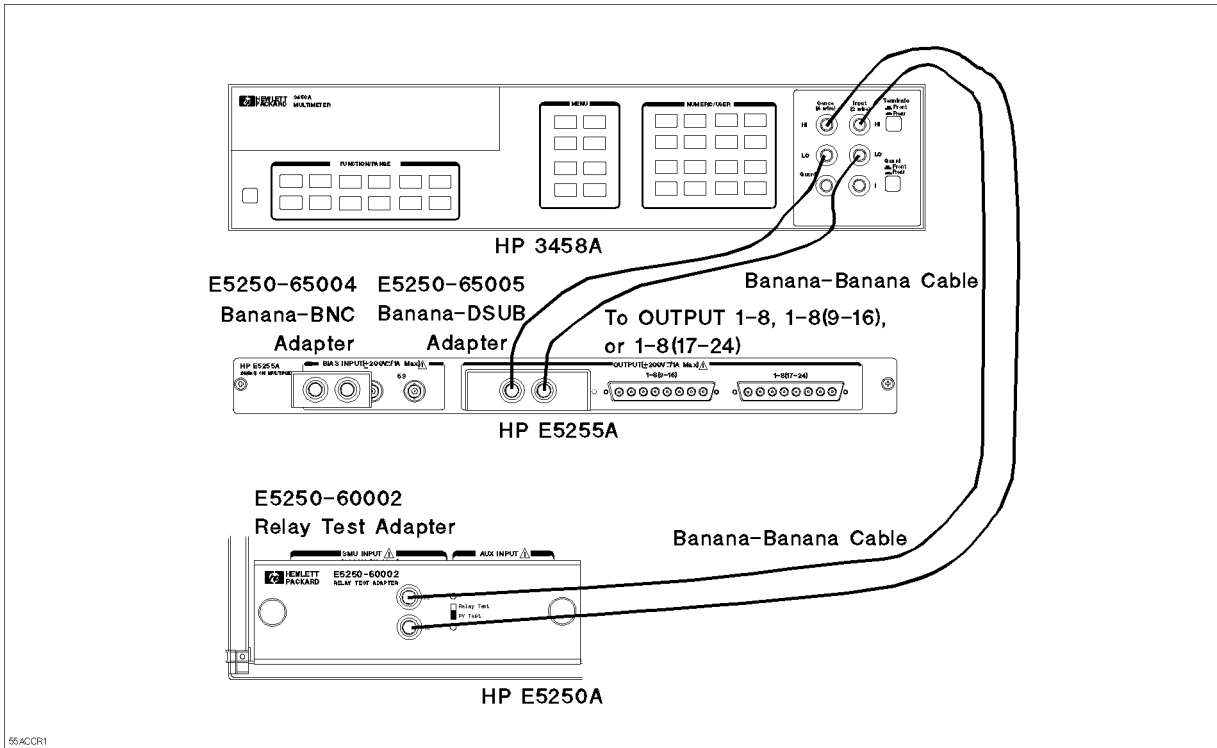
Attach E5250-60002 on E5250A input terminal. Press CONTINUE.  
Set E5250-60002 switch at PV Test position. Press CONTINUE.  
Connect 3458A Input/Sense HI to E5250-60002. Press CONTINUE.  
Attach E5250-65003 on E5252A(CARDn) OUTPUT 1. Press CONTINUE.  
Connect 3458A Input/Sense LO to E5250-65003. Press CONTINUE.

Attach E5250-65003 on E5252A(CARDn) OUTPUT 2. Press CONTINUE.  
Connect 3458A Input/Sense LO to E5250-65003. Press CONTINUE.

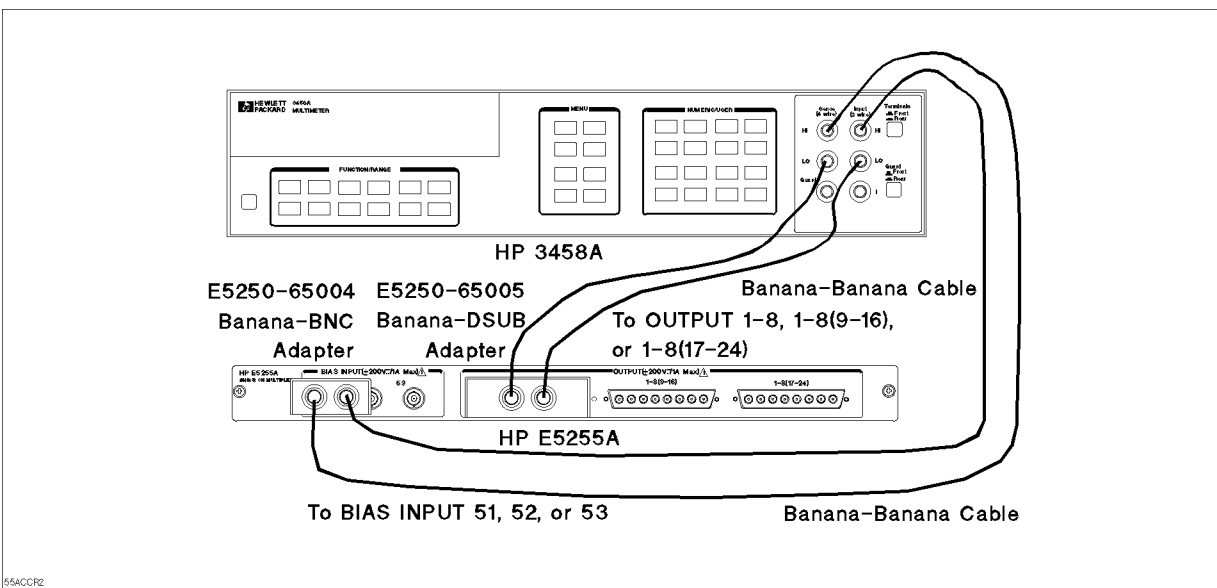
:

Attach E5250-65003 on E5252A(CARDn) OUTPUT 12. Press CONTINUE.  
Connect 3458A Input/Sense LO to E5250-65003. Press CONTINUE.

## HP E5255A Test Connection.



**HP E5255A IV Port Closed Channel Resistance Test**



**HP E5255A Bias Port Closed Channel Resistance Test**

```

** E5255A CLOSED CHANNEL RESISTANCE TEST **
** BLOCK1 IV PORT CLOSED CHANNEL RESISTANCE TEST **
Attach E5250-60002 on E5250A input terminal. Press CONTINUE.
Set E5250-60002 switch at PV Test position. Press CONTINUE.
Connect 3458A Input/Sense HI to E5250-60002. Press CONTINUE.
Attach E5250-65004 on E5255A(CARDn) BIAS INPUT 51. Press CONTINUE.
Attach E5250-65005 on E5255A(CARDn) OUTPUT 1-8. Press CONTINUE.
Connect 3458A Input/Sense LO to E5250-65005. Press CONTINUE.
** BLOCK1 BIAS PORT CLOSED CHANNEL RESISTANCE TEST **
Connect 3458A Input/Sense HI to E5250-65004. Press CONTINUE.

** BLOCK2 IV PORT CLOSED CHANNEL RESISTANCE TEST **
Connect 3458A Input/Sense HI to E5250-60002. Press CONTINUE.
Attach E5250-65004 on E5255A(CARDn) BIAS INPUT 52. Press CONTINUE.
Attach E5250-65005 on E5255A(CARDn) OUTPUT 1-8(9-16). Press CONTINUE.
Connect 3458A Input/Sense LO to E5250-65005. Press CONTINUE.
** BLOCK2 BIAS PORT CLOSED CHANNEL RESISTANCE TEST **
Connect 3458A Input/Sense HI to E5250-65004. Press CONTINUE.

** BLOCK3 IV PORT CLOSED CHANNEL RESISTANCE TEST **
Connect 3458A Input/Sense HI to E5250-60002. Press CONTINUE.
Attach E5250-65004 on E5255A(CARDn) BIAS INPUT 53. Press CONTINUE.
Attach E5250-65005 on E5255A(CARDn) OUTPUT 1-8(17-24). Press CONTINUE.
Connect 3458A Input/Sense LO to E5250-65005. Press CONTINUE.
** BLOCK3 BIAS PORT CLOSED CHANNEL RESISTANCE TEST **
Connect 3458A Input/Sense HI to E5250-65004. Press CONTINUE.

```

## RECONFIG MENU Operation

This section describes how to set up test equipment configurations in RECONFIG MENU before you begin the performance verification tests.

## HP-IB Address Entry

Select the **E5250A ADDR**, **3458A ADDR**, or **4339A ADDR** softkey in RECONFIG MENU and type the new HP-IB address for the HP E5250A, HP 3458A, or HP 4339A/B. Press **(Return)**. The range allowed is 700 to 3130. The lower two digits must be 30 or less. The new HP-IB address is displayed.

If you press **Return** without entering numeric data, the present value is retained.

After pressing **Return**, RECONFIG MENU is displayed again.

[illegible]

## Printer Control Setting Entry

To change your printer control settings, use the following procedure.

1. Select the **PRINTER TYPE** softkey in RECONFIG MENU, then select the **LOCAL** softkey. If you use the SRM, select the **FILE SPOOL** softkey instead of **LOCAL**.

2. If you select the **LOCAL** softkey:

Select the **PRINTER ADDR** softkey. The message **Type new address.** is displayed. If you use an HP-IB interface printer, enter the new printer address in the range of 700 to 3130. Then select the **HP-IB** softkey.

If you use an RS-232C interface printer, enter the new printer address in the range of 8 to 31, then select the **RS-232C** softkey, then enter the baud rate of the RS-232C interface. The following values are allowed:

50, 75, 110, 134, 150, 200, 300, 600, 1800, 2400, 3200, 4800, 9600, 19200

3. If you select the **FILE SPOOL** softkey:

Select the **SPOOL DIR.** softkey. The message **Enter new spooling directory in double quotations.** is displayed. Enter the new spooling directory. For example, type:

"/spool:REMOTE" 

If you do not enter a volume specifier, the volume specifier of the current mass storage unit is used.

After you have entered all the items, RECONFIG MENU is displayed again.

The test results can be printed out by the printer or displayed on the CRT. The instruments are not required to report the test results. To report the test results, use the following procedure:

- Insert 'REPORT' into the current mass storage device. Then press CONTINUE.

- ```
HP E5250A Maintenance Program

** REPORT RESULT MENU **

READ FILE      ... Enter file name to be reported
MAIN MENU      ... Return to MAIN MENU
```

—

READ  
FILE

MAIN

MENU

Type file name. Press RETURN to cancel.

6. Type the name of the file that you want to report. Then press **Return**. If you press **Return** without typing the file name, the REPORT RESULT MENU is displayed again.

If you want to report the file from the mass storage unit that is not specified as the current mass storage unit, type the mass storage unit specifier after the file name; such as, PVS10396: ,700,1.

---

**Note**

When you perform step 7, the MT5250/REPORT executes the following BASIC statement to use memory volume ":MEMORY,0,15".

INITIALIZE ":MEMORY,0,15"

If you already use that memory volume, move your data to another memory volume or it will be lost when you perform step 7.

---

7. Select the desired softkey (**CRT** or **PRINTER**).

■ **CRT** softkey is selected

The first screen of test results is displayed on the CRT. Select the **MORE** softkey to report the next screen. If all the test results have been displayed, the REPORT RESULT MENU is displayed again.

■ **PRINTER** softkey is selected

- a. **Type report number.** is displayed. If you want to print a report number on the test record, type the report number with maximum 14 characters, then press **Return**. If not, press **Return** without typing any characters.
- b. Select the **RECONFIG** softkey. Change the printer control settings to your desired settings. After you finish changing the settings, select the **RETURN** softkey. See "Printer Setting for REPORT RESULT" for the details.
- c. Select the **PRINT** softkey. The test results are printed as the Test Record. During printing, the **CANCEL** softkey is displayed. If you select this key, printing is canceled. When printing is complete, the REPORT RESULT MENU is displayed again.

---

**Note**

If a test fails, the following characters are printed or displayed on the Fail column of the test record.

- If the test result is over the maximum value: >>>
  - If the test result is under the minimum value: <<<
-

## Printer Setting for REPORT RESULT

This section describes how to change the configuration of the printer to print test results using the REPORT RESULT function.

The following is the REPORT RESULT printer configuration page.

```
***** CONFIGURATION *****

PRINTER TYPE  = LOCAL
PRINTER ADDR  = 701
PRINTER I/F   = HP-IB
PAGE LENGTH   = 66
MARGIN        : TOP = 2   BOTTOM = 2   LEFT = 0
PAGE NUMBERING = ON

PRINTER TYPE  ... change printer type
PRINTER ADDR  ... change Printer's address. I/F
PAGE LENGTH   ... change number of printing lines per page
MARGIN        ... change top. bottom. and left margin
PAGE NUMBER   ... change page numbering ON/OFF
SAVE DATA    ... store configuration data into "VIEW_DATA"

Select desired softkey.
-

PRINTER  PAGE      MARGIN  PAGE      User 1  Caps  Running
ADDR     LENGTH    NUMBER  TYPE      SAVE    RETURN
          PAGE      NUMBER  TYPE      DATA
          LENGTH    NUMBER  TYPE      DATA
```

### Softkey

### Function

**PRINTER ADDR**

(Displayed when PRINTER TYPE is set to LOCAL.) This softkey is for changing the address of the printer (select code and HP-IB address).

**SPOOL DIR.**

(Displayed when PRINTER TYPE is set to FILE SPOOL.) This softkey is for changing the spool directory of the SRM system.

After selecting this softkey, the following message appears, and the current spooling command is displayed at the keyboard input line.

Enter new spooling directory in double quotations.

Enter the new spooling directory. For example,

"/spool:REMOTE".

**PAGE LENGTH**

For changing the page length (lines/page) of the printer. The allowable range is 17 for disabled **PAGE NUMBER** (19 for enabled **PAGE NUMBER**) through 32767.

## MARGIN

For changing the top, bottom, and left margins.

After selecting this softkey, the message **Type new margin (top, bottom, left)**. is displayed. Enter the three values, separated by commas. For example, enter: 4,4,2

The top margin, bottom margin, and page length settings must satisfy the following conditions:

top margin  $\geq 0$ , bottom margin  $\geq 0$

if **PAGE NUMBER** is enabled, then:

top margin + bottom margin < page length - 6

if **PAGE NUMBER** is disabled, then:

top margin + bottom margin < page length - 8

## PAGE NUMBER

For enabling and disabling page number and test result file name to be printed on the bottom of each page.

## PRINTER TYPE

For changing the printer type. If you select this softkey, the **LOCAL** and **FILE SPOOL** softkeys are displayed for selecting or changing the presently set printer.

## SAVE DATA

For saving or resaving the setting data of REPORT RESULT RECONFIG MENU into the file **VIEW\_DATA**.

When you select the **REPORT RESULT** softkey in the MAIN MENU, if the **VIEW\_DATA** file is stored in the current mass storage unit, all settings of REPORT RESULT RECONFIG MENU are read from this file. If the **VIEW\_DATA** file does not exist, the settings are as follows:

PAGE LENGTH: 66 lines/page

MARGIN: Top: 2 line, Bottom: 2 line, Left: 0 space

PAGE NUMBERING: ON

Other settings: the settings of RECONFIG MENU directly under the START UP MENU.

## RETURN

For returning to the previous menu.

---

## Running Trouble Isolation

The MT5250 program also has the function of running relay tests, controller test, front panel test, and isolating defective field replaceable units (FRUs). The test functions available from the TROUBLE ISOLATION MAIN MENU are almost the same as the functions of the SELF TEST MENU, which is displayed by running the SELFTEST program in the HP E5250A's program disk for user. However, the SELF TEST MENU is for function tests only and doesn't have the trouble isolation function.

To start the trouble isolation, use the following procedure:

1. Display the START UP MENU.
2. Select the **START TRBL ISO** softkey. The TROUBLE ISOLATION MAIN MENU is displayed.

```
HP E5250A Maintenance Program

** TROUBLE ISOLATION MAIN MENU **

CARD 1 RELAY    ... Start Slot1 E5255A Relay Test    [F]
CARD 2 RELAY    ... Start Slot2 E5255A Relay Test    [P]
CARD 3 RELAY    ... Not installed
CARD 4 RELAY    ... Start Slot4 E5252A Relay Test    [N]
CONTROL         ... Start E5250A Controller Test     [P]
FRONT PANEL     ... Start E5250A Front Panel UIF Test [N]
START TRBL ISO  ... Start Trouble Isolation Program

[P] indicates test was passed.
[F] indicates test was failed.
[N] indicates test is not executed.

Prepare the relay test adapters before you select "CARDn RELAY" key.
Execute all test before you select "TROUBLE ISO." key.

Select desired softkey.
-

User 1  Caps  Running
CARD1   CARD2   CARD4   CONTRO-  FRONT  START  QUIT
RELAY   RELAY   RELAY   LLER    PANEL  TRBL ISO
```

## Executing the Controller Test

To execute the controller test, press the **CONTROLLER** softkey.

## Executing the Front Panel Interface Test

To execute the front panel interface test, do the following:

1. Press the **FRONT PANEL** softkey.
2. Confirm that the following four LEDs on the HP E5250A front panel are blinking. Then, press the **Local/Self Test** key on the HP E5250A front panel within 10 seconds.

**Remote**

**System Fail**

**Fail**

**Local/Self Test**

## Executing the Relay Test

To execute the Relay Test, press the **CARD $n$  RELAY** softkey ( $n = 1$  to 4). Use the same procedure as for the Relay Test from the Performance Verification.

## Executing Trouble Isolation

To execute Trouble Isolation, press the **Start TRBL ISO** softkey.

---

## Performance Verification Operating Theory

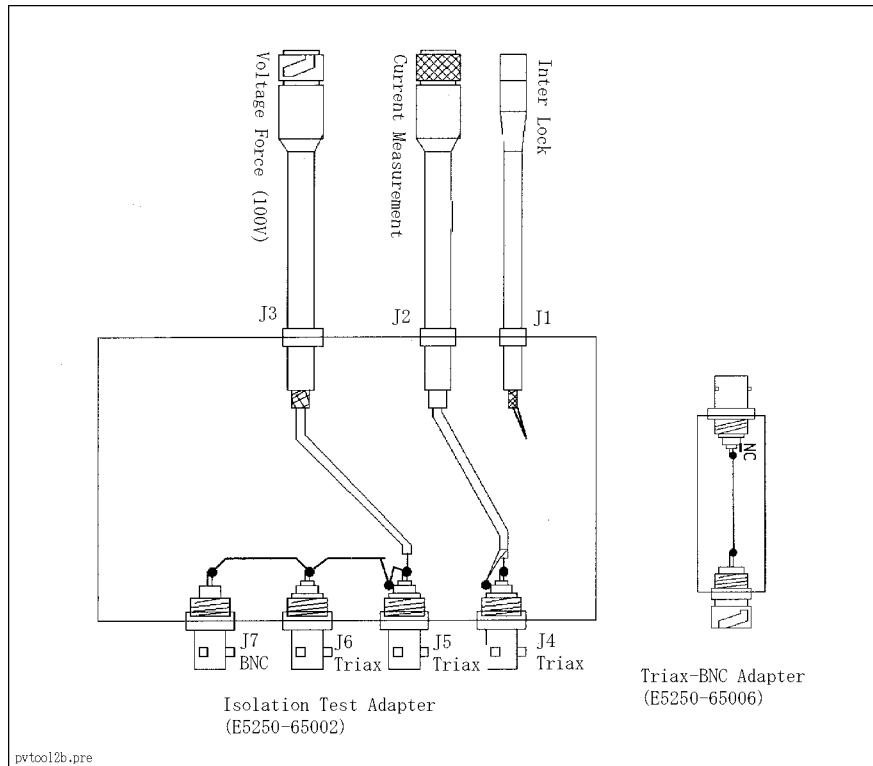
### General Information

- For performance verification, the Performance Verification (PV) program must be executed *after* the HP E5250A has passed the Relay Function Test.
- For trouble isolation, the "Closed Channel Resistance" test of the PV program may be used when the Relay Function Test fails.
- There are two PV test items, corresponding to the HP E5250A specifications.
  - Isolation Resistance
  - Closed Channel Resistance
- The HP 4339A/B is used for Isolation Resistance measurements.
- The HP 3458A is used for Closed Channel Resistance measurements.
- The PV program is executed for each plug-in module (HP E5252A or HP E5255A). (PV data is taken for each module.)

## Tools and Instruments Required

### ■ Isolation Resistance Measurement

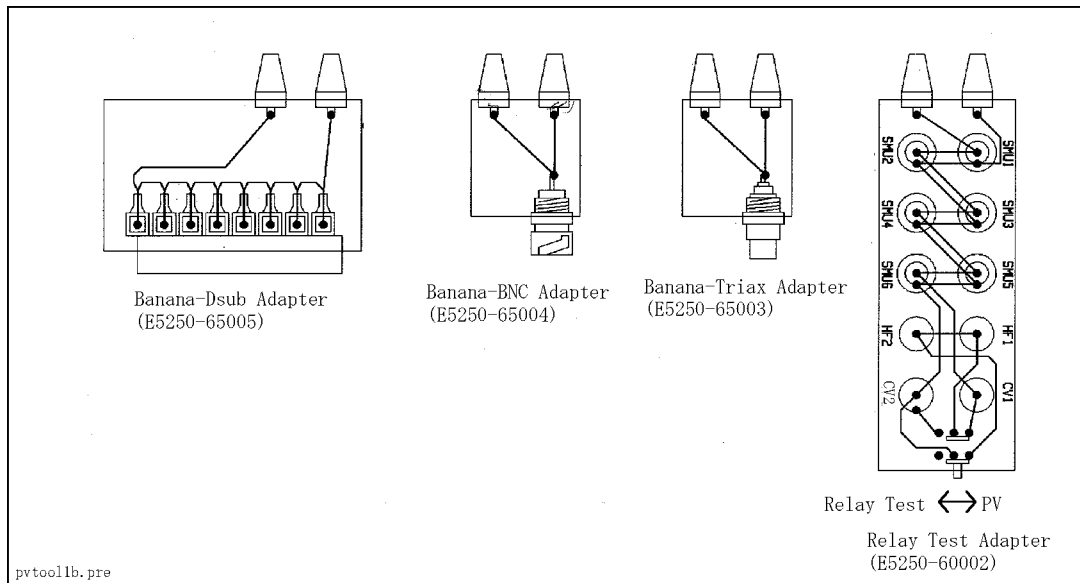
HP 4339A/B (Voltage Force/ Current Measurement)  
Isolation Test Adapter (E5250-65002) (= Adapter 2)  
Triaxial-BNC Adapter (E5250-65006) (= T/B Adapter)  
Triaxial Cable 1.5m (3 ea) (16058-61603 or equivalent)  
BNC Cable 1.5m (04142-61636 or equivalent)



**Figure 2-1. Isolation Resistance Test Tools**

## ■ Closed Channel Resistance

HP 3458A (for 4-wire resistance measurement)  
 Relay Function Test Adapter (E5250-60002) (= Adapter 1)  
 Banana-Triax Adapter (E5250-65003) (= Adapter 3)  
 Banana-BNC Adapter (E5250-65004) (= Adapter 4)  
 Banana-Dsub 8W8 Adapter (E5250-65005) (= Adapter 5)  
 Banana Cable (2 set) (HP 11058A)



**Figure 2-2. Closed Channel Resistance Test Tools**

## Traceability and Measurement Uncertainty

### ■ Traceability

Both Isolation R and Closed Ch R are traced via HP 4339A/B and HP 3458A.

The maximum uncertainty is 3.43% of the specification.

### ■ Isolation R Uncertainty

HP 4339A/B Conditions:

Calibrated within one year  
 $23 \pm 5 \text{ }^{\circ}\text{C}$   
 Meas Time: Long  
 Contact Check Off  
 Offset Error ON  
 After Auto Cal  
 Open Correction

HP 4339A/B VF Uncertainty:

0.16% + 100 mV  
(0.26% @100 V)

HP 4339A/B IM Uncertainty:

100 pA Range: 2.57% of reading + 0.060 pA (HP E5252A: IV 1–2; HP E5255A: IV path)  
→ 3.17% (@ 10 pA = 100 V/10<sup>13</sup>Ω)  
1 nA Range: 0.91% of reading + 0.003 nA (HP E5252A: IV path3–6)  
→ 1.21% (@ 1 nA = 100 V/10<sup>11</sup>Ω)  
100 nA Range: 0.5% of reading + 0.025 nA (HP E5252A: CV/HF path) (HP E5255A: Bias path)  
→ 0.525% (@ 100 nA = 100 V/10<sup>9</sup>Ω)

Total Isolation R Uncertainty:

---

**Note**



The uncertainties of the HP E5252A IV path 3–6/CV/HF, and HP E5255A Bias path include offset measurement errors.

---

**Specifications**

**Uncertainty**

|                                       |                 |
|---------------------------------------|-----------------|
| HP E5252A IV1–2: > 10 <sup>13</sup> Ω | 3.43%/0.343 TΩ  |
| HP E5252A IV3–6: > 10 <sup>11</sup> Ω | 2.68%/2.68 GΩ   |
| HP E5252A CV/HF: > 10 <sup>9</sup> Ω  | 1.31%/0.0131 GΩ |
| HP E5255A IV: > 10 <sup>13</sup> Ω    | 3.43%/0.343 TΩ  |
| HP E5255A Bias: > 10 <sup>9</sup> Ω   | 1.31%/0.0131 GΩ |

■ Closed Ch R Uncertainty

HP 3458A Conditions:

Calibrated within one year  
23 ± 5 °C,  
± 1 °C of ACAL  
± 5 °C of Tcal  
NPLC = 1  
Offset COMP = ON

HP 3458A 4-Wire Resistance Measurement Uncertainty:

10 ohm: 15 ppm of Reading  
+ 3ppm of reading (HP factory traceability)  
+ 1ppm of reading (Gain error @NPLC=1)  
+ 5ppm of range  
+ 5ppm of range (Noise error @NPLC=1)  
→ 0.0019% + 100 μΩ

Contact Resistances:

Triax: 3 mΩ  
BNC: 8 mΩ  
D-SUB Coax: 7.33 mΩ

Total Closed Ch R Uncertainty:

| Specifications                     | Uncertainty                                         |
|------------------------------------|-----------------------------------------------------|
| HP E5252A IV1–2: $\leq 0.6 \Omega$ | 0.0019% + 6.1 m $\Omega$ (1.01%/6.1 m $\Omega$ )    |
| HP E5252A IV3–6: $\leq 1.0 \Omega$ | 0.0019% + 6.1 m $\Omega$ (0.61%/6.1 m $\Omega$ )    |
| HP E5252A CV/HF: $\leq 1.0 \Omega$ | 0.0019% + 11.1 m $\Omega$ (1.11%/11.1 m $\Omega$ )  |
| HP E5255A IV: $\leq 0.6 \Omega$    | 0.0019% + 10.43 m $\Omega$ (1.73%/10.4 m $\Omega$ ) |
| HP E5255A Bias: $\leq 1.0 \Omega$  | 0.0019% + 15.43 m $\Omega$ (1.54%/15.4 m $\Omega$ ) |

**PV Execution Time (Including Time for Manual Operation)**

HP E5252A: 30 min/slot

(Isolation R = 22 min/slot)  
(Closed Ch R = 3 min/slot)  
(Preparation, etc. = 5 min/slot)  
(Prep, etc. should be added once per PV)

HP E5255A: 26 min/slot

(Isolation R = 18 min/slot)  
(Closed Ch R = 3 min/slot)  
(Preparation, etc. = 5 min/slot)  
(Prep, etc. should be added once per PV)

## HP E5252A Isolation Resistance

### Overview

The following isolation resistances are measured in this test.

- Isolation between Input Channels
- Isolation between Output Channels
- Input/Output Matrix Isolation

The output channel isolation measurement between slots is not performed. This is substituted (or covered) by testing the isolation between output channels.

The isolation between two terminals is measured by connecting one terminal to the VF (voltage force) port of the HP 4339A/B and one terminal to the IM (current measure) port.

In the following measurement sequence, the input ports of the HP E5250A are named Input 1 through Input 10. (HF1 = Input 7, HF2 = Input 8, ... )

### Overall Measurement Sequence

#### 1. HP 4339A/B Setup

VF, IM (100 V/1 mA output)

Make connections between Adapter 2 and the HP 4339A/B. (Display instructions).

#### 2. HP E5250A/E5252A Connection

Connect J4 through J6 of Adapter 2. (Display instructions).

#### 3. Connection Check

Check that connections J4 through J6 are correct by using the HP 4339A/B.

#### 4. Offset Current Measurement

Measure offset current for each new "IM" path except SMU1 and SMU2 of the HP E5252A.

#### 5. Measurement

Set the IM range of the HP 4339A/B. (Use fixed range; in case of overflow, use auto-ranging.)

Set up the measurement path in the HP E5252A.

Force 100 V. (In case of overload, record the status.)

Wait for five seconds.

Measure current. (In case of overflow, use auto-ranging.)

Force 0 V.

Go to next measurement.

#### 6. Result Report

Calculate resistance from VF, IM, and offset values. ( $I_m \leq 0$  is acceptable considering offset currents.)

Calculate measurement uncertainty.

## Connection Details (Input Channels)

### 1. Connect Adapter 2

IM (Adapter 2 J4)  $\leftarrow$  Triaxial Cable  $\rightarrow$  Output 1  
VF (Adapter 2 J5)  $\leftarrow$  Triaxial Cable  $\rightarrow$  Output 3  
VF (Adapter 2 J6)  $\leftarrow$  Triaxial Cable  $\rightarrow$  Output 4  
VF (Adapter 2 J7) NC

### 2. Measurement 1

Set up the HP E5252A to check all the following connections. (Check offset current every time N changes.)

Input N  $\leftrightarrow$  Output 1 (IM)     [N = 1, ... ,5]  
Input M  $\leftrightarrow$  Output 3 (VF)     [M = N+1, ... ,6 @N=1,3, ... ,5 ]  
                                         [M = 1, N+1, ... ,6 @N=2]

### 3. Measurement 2

Set up the HP E5252A to check all the following connections. (Check offset current every time N changes.)

Input N  $\leftrightarrow$  Output 1 (IM)     [N = 1, ... ,9]  
Input M  $\leftrightarrow$  Output 4 (VF)     [M = K, ... ,10] (K: 7 or N+1 (greater))

The following connections are not measured:

N = 5 / M = 7, 9  
N = 6 / M = 8, 10  
N = 7 / M = 9  
N = 8 / M = 10

- Input 7 through 10 are coaxial terminals and guard voltages cannot be applied.
- Each of input 5–6, 7–8, and 9–10 uses a single (common) bus in the module.

### 4. The above measures resistances between input channels and resistances between input channels and output 1.

## Connection Details (Output Channels)

### 1. Connect Adapter 2.

IM (Adapter 2 J4)  $\leftarrow$  Triaxial Cable  $\rightarrow$  Input 1  
VF (Adapter 2 J5)  $\leftarrow$  Triaxial Cable  $\rightarrow$  Input 2  
VF (Adapter 2 J6) NC  
VF (Adapter 2 J7) NC

### 2. Measurement

Set up the HP E5252A to check all the following connections.

Input 1  $\leftrightarrow$  Output N (IM)     [N = 1, ... ,11]  
Input 2  $\leftrightarrow$  Output M (VF)     [M = N+1, ... ,12]

### 3. The above measures resistances between output channels and resistances between input 1 and output 2 through 10. ("Input 1 $\leftrightarrow$ Output 1" has been measured already, in the step "Connection Details (Input Channels)".)

### Connection Details (Input/Output)

At "Connection Details (Input Channels)" and "Connection Details (Output Channels)", "Input 1  $\leftrightarrow$  each output" and "each input  $\leftrightarrow$  Output 1" have been measured already. The remaining connections are checked.

#### 1. Connect Adapter 2.

IM (Adapter 2 J4)  $\leftarrow$  Triaxial Cable  $\rightarrow$  Output 1  
VF (Adapter 2 J5)  $\leftarrow$  Triaxial Cable  $\rightarrow$  Input 1  
VF (Adapter 2 J6) NC  
VF (Adapter 2 J7) NC

#### 2. Measurement

Set up the HP E5252A to check all the following connections. (Check offset current every time N changes.)

Input N  $\leftrightarrow$  Output 1 (IM)      [N = 2,  $\dots$ , 10]  
Input 1  $\leftrightarrow$  Output M (VF)      [M = 2,  $\dots$ , 12]

## HP E5252A Closed Channel Resistance

### Overview

This test performs 4-wire measurements by using the HP 3458A. Adapter 1 and 3 are used for making Kelvin connections. Adapter 1 is also used for making Kelvin connections to the input ports. (The DIP switch must be at the "PV" position.) The closed channel resistance of each input/output connection is measured.

### Overall Measurement Sequence

#### 1. HP 3458A and HP E5250A Setup

4-Wire Ohm Measurement

10 $\Omega$  Range

Attach Adapter 1 to the HP E5250A and set the DIP switch to the "PV" position.

(Display instructions.)

Connect the HP 3458A terminals to Adapter 1 and Adapter 3 by using banana cables.

(Display instructions.)

(Input Hi, ohm sense Hi to Adapter 1)

(Input Lo, ohm sense Lo to Adapter 2)

#### 2. Connection

Connect Adapter 3 to the HP E5252A OUTPUT channel. (Display instructions.)

#### 3. Measurement

Measure resistance. (Use fixed range; in case of overflow, use auto-ranging.)

Measurement conditions

10 $\Omega$  Range

NPLC: 1

Range: 10 $\Omega$

Offset Compensation: ON

AUTO Ranging

NPLC: 1

Range: AUTO

Offset Compensation: OFF

#### 4. Result Report

Calculate resistance.

Calculate measurement uncertainty.

### Connection Details

1. Connect Adapter 3 to Output N ( $N = 1, \dots, 12$ ).

2. Set up the HP E5252A to check each of the following connections.

Input M  $\leftrightarrow$  Output N ( $M = 1, \dots, 10$ )

3. Measure resistance.

## HP E5255A Isolation Resistance

### Overview

This performs measurement for each block.

The isolation resistances between slots are not measured since they are guarded by the case.

The isolation between two terminals is measured by connecting one terminal to the VF (voltage force) port of the HP 4339A/B and one terminal to the IM (current measure) port.

### Overall Measurement Sequence

#### 1. HP 4339A/B Setup

VF, IM (100 V / 1 mA output)

Make connections between Adapter 2 and the HP 4339A/B. (Display instructions.)

#### 2. HP E5250A/E5255A Connection

##### ■ I-V Port

Connect the Adapter 2 terminals to the HP E5250A/E5255A.

IM(J4): I-V Input Channel used (connected, and indicated by DIP switch).  
(Use Triaxial Cable.)

VF(J5): NC

VF(J6): NC

VF(J7): Bias Input Channel used (connected, and indicated by DIP switch).  
(Use BNC Cable.)

(Display instructions.)

##### ■ Bias Port

Connect Adapter 2 terminals to HP E5250A/E5255A.

IM(J4): Bias Input Channel used (connected, and indicated by DIP switch).  
(Use Triaxial Cable, T/B Adapter, and BNC Cable.)

VF(J5): I-V Input Channel used (connected, and indicated by DIP switch).  
(Use Triaxial Cable.)

VF(J6): NC

VF(J7): NC

(Display instructions.)

#### 3. Connection Check

Check that connections J4 through J7 are correct by using the HP 4339A/B.

#### 4. Offset Current Measurement

Measure offset current for each new "IM" path except the following connection type (offset current values are negligible):

IM path is connected to IV Input Channel.

#### 5. Measurement

Set the IM range of the HP 4339A/B. (Use fixed range; in case of overflow, use auto-ranging.)

Set up the measurement path in the HP E5252A.

Force 100 V. (In case of overload, record the status.)

## 2-40 Service Operation and Test Functions

Wait for five seconds.

Measure current. (In case of overflow, use auto-ranging.)

Force 0 V.

Go to next measurement.

6. Result Report

7. Calculate resistance from VF, IM, and offset values. ( $I_m \leq 0$  is acceptable considering offset currents.)

8. Calculate measurement uncertainty.

### Connection Details

#### ■ I-V Port

Set up the HP E5255A to check all the following connections. (Check offset current every time N changes.)

|                                           |                                  |
|-------------------------------------------|----------------------------------|
| I-V Input $\leftrightarrow$ Output N (IM) | [N = 1, ... ,8]                  |
| Bias Input $\leftrightarrow$ Output M     | [M = N+1, ... ,8 @N = 1, ... ,7] |
| (VF)                                      | [M = 1 @N = 8 ]                  |

#### ■ Bias Port

Set up the HP E5255A to check all the following connections. (Check offset current every time N changes.)

|                                            |                                  |
|--------------------------------------------|----------------------------------|
| Bias Input $\leftrightarrow$ Output N (IM) | [N = 1, ... ,8]                  |
| I-V Input $\leftrightarrow$ Output M (VF)  | [M = N+1, ... ,8 @N = 1, ... ,7] |
|                                            | [M = 1 @N = 8 ]                  |

## HP E5255A Closed Channel Resistance

### Overview

This test performs 4-wire measurements by using the HP 3458A. Adapters 1, 3, 4, and 5 are used for making Kelvin connections. (The DIP switch of Adapter 1 must be at the "PV" position.) Adapter 5 makes Kelvin connections of all the output terminals. The closed channel resistance of each input/output connection is measured.

### Overall Measurement Sequence

#### 1. HP 3458A and HP E5250A Setup

4-Wire Ohm Measurement

10 $\Omega$  Range

Attach Adapter 1 to the HP E5250A and set the DIP switch to the "PV" position.  
(Display instructions.)

#### 2. Connection

- a. Connect Adapter 4 to the HP E5255A Bias Input of the measured block.
- b. Connect Adapter 5 to the HP E5255A Output of the measured block.
- c. (I-V) Connect the HP 3458A terminals to Adapters 1 and 5 with banana cables.  
(Bias) Connect the HP 3458A terminals to Adapters 4 and 5 with banana cables.  
(Display instructions.)

#### 3. Measurement

Measure resistance. (Use fixed range; in case of overflow, use auto-ranging.)

Measurement conditions

- a. 10 $\Omega$  Range  
NPLC: 1  
Range: 10 $\Omega$   
Offset Compensation: ON
- b. AUTO Ranging  
NPLC: 1  
Range: AUTO  
Offset Compensation: OFF

#### 4. Result Report

Calculate resistance.

Calculate measurement uncertainty.

PASS/FAIL judgment exception:

If resistors (other than 0 ohm) are on bias paths of a block, test results are always PASS.

### Connection Details

#### ■ I-V Port

1. Connect the HP 3458A terminals to Adapters 1 and 5 by using banana cables. (Display instructions.)
2. (Input Hi, ohm sense Hi to Adapter 1)

3. (Input Lo, ohm sense Lo to Adapter 5)
4. Set up the HP E5255A to check each of the following connections.

I-V Input  $\leftrightarrow$  Output N (N = 1, ... ,8)

5. Measure resistance.

■ Bias Port

1. Connect the HP 3458A terminals to Adapters 4 and 5 by using banana cables. (Display instructions.)
2. (Input Hi, ohm sense Hi to Adapter 4)
3. (Input Lo, ohm sense Lo to Adapter 5)
4. Set up the HP E5255A to check each of the following connections.

Bias Input  $\leftrightarrow$  Output N (N = 1, ... ,8)

5. Measure resistance.

```
=====
P E R F O R M A N C E   T E S T   R E P O R T
=====
```

Test Facility:

Hewlett-Packard

Report No. \_\_\_\_\_E5252A-001

-----

Date \_\_\_\_\_23 Jan 1996

-----

Customer \_\_\_\_\_

-----

Tested by \_\_\_\_\_M0

Temperature \_\_\_\_\_25 degree C

Humidity \_\_\_\_\_50 %

Line Frequency \_\_\_\_\_Hz(nominal)

CARD 1 HP E5252A 10x12 Matrix Switch

Serial Number: \_\_\_\_\_

HP E5250A Low Leakage Switch Mainframe

Serial Number: \_\_\_\_JP10C00106

Special Notes:

-----  
 -----  
 -----  
 -----

\*E5252A\_N1\*

--- 1/ ---

HP E5252A Test Record Example (1/15)

Model: HP E5252

Report No.: E5252A-001

Date: 23 Jan 1996

Test Equipment Used:

|     | Description | Model No. | Trace No. | Cal Due Date |
|-----|-------------|-----------|-----------|--------------|
| 1.  | -----       | -----     | -----     | -----        |
| 2.  | -----       | -----     | -----     | -----        |
| 3.  | -----       | -----     | -----     | -----        |
| 4.  | -----       | -----     | -----     | -----        |
| 5.  | -----       | -----     | -----     | -----        |
| 6.  | -----       | -----     | -----     | -----        |
| 7.  | -----       | -----     | -----     | -----        |
| 8.  | -----       | -----     | -----     | -----        |
| 9.  | -----       | -----     | -----     | -----        |
| 10. | -----       | -----     | -----     | -----        |
| 11. | -----       | -----     | -----     | -----        |
| 12. | -----       | -----     | -----     | -----        |
| 13. | -----       | -----     | -----     | -----        |
| 14. | -----       | -----     | -----     | -----        |

\*E5252A\_N1\*

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HP E5252A Test Record Example (2/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| TEST DESCRIPTION | Minimum | Results | Maximum | Uncertainty | Fail |
|------------------|---------|---------|---------|-------------|------|
|------------------|---------|---------|---------|-------------|------|

Relay Open/Close Self-test

CARD 1

PASS

Isolation Resistance Test

Input Channel Isolation Resistance Test

| Input Terminal |    |            |             |  |        |  |
|----------------|----|------------|-------------|--|--------|--|
| 1              | 2  | +10.00Tohm | +707.41Tohm |  | 3.43 % |  |
|                | 3  | +10.00Tohm | +622.42Tohm |  | 3.43 % |  |
|                | 4  | +10.00Tohm | +780.24Tohm |  | 3.43 % |  |
|                | 5  | +10.00Tohm | +989.74Tohm |  | 3.43 % |  |
|                | 6  | +10.00Tohm | +1.15Pohm   |  | 3.43 % |  |
|                | 7  | +10.00Tohm | +792.76Tohm |  | 3.43 % |  |
|                | 8  | +10.00Tohm | +855.84Tohm |  | 3.43 % |  |
|                | 9  | +10.00Tohm | +1.05Pohm   |  | 3.43 % |  |
|                | 10 | +10.00Tohm | +1.11Pohm   |  | 3.43 % |  |
| 2              | 1  | +10.00Tohm | +280.98Tohm |  | 3.43 % |  |
|                | 3  | +10.00Tohm | +386.53Tohm |  | 3.43 % |  |
|                | 4  | +10.00Tohm | +461.94Tohm |  | 3.43 % |  |
|                | 5  | +10.00Tohm | +602.09Tohm |  | 3.43 % |  |
|                | 6  | +10.00Tohm | +769.58Tohm |  | 3.43 % |  |
|                | 7  | +10.00Tohm | +684.28Tohm |  | 3.43 % |  |
|                | 8  | +10.00Tohm | +879.39Tohm |  | 3.43 % |  |
|                | 9  | +10.00Tohm | +981.62Tohm |  | 3.43 % |  |
|                | 10 | +10.00Tohm | +1.10Pohm   |  | 3.43 % |  |
| 3              | 4  | +1.00Tohm  | +15.69Tohm  |  | 1.47 % |  |
|                | 5  | +1.00Tohm  | +22.80Tohm  |  | 1.47 % |  |
|                | 6  | +1.00Tohm  | +29.50Tohm  |  | 1.47 % |  |

\*E5252A\_N1\*

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## HP E5252A Test Record Example (3/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| =====                                    |    |            |             |         |             |      |
|------------------------------------------|----|------------|-------------|---------|-------------|------|
| TEST DESCRIPTION                         |    | Minimum    | Results     | Maximum | Uncertainty | Fail |
| =====                                    |    |            |             |         |             |      |
|                                          | 7  | +1.00Tohm  | +15.88Tohm  |         | 1.47 %      |      |
|                                          | 8  | +1.00Tohm  | +35.80Tohm  |         | 1.47 %      |      |
|                                          | 9  | +1.00Tohm  | +33.54Tohm  |         | 1.47 %      |      |
|                                          | 10 | +1.00Tohm  | +55.44Tohm  |         | 1.47 %      |      |
| 4                                        | 5  | +1.00Tohm  | +14.20Tohm  |         | 1.47 %      |      |
|                                          | 6  | +1.00Tohm  | +31.91Tohm  |         | 1.47 %      |      |
|                                          | 7  | +1.00Tohm  | +16.73Tohm  |         | 1.47 %      |      |
|                                          | 8  | +1.00Tohm  | +46.37Tohm  |         | 1.47 %      |      |
|                                          | 9  | +1.00Tohm  | +29.12Tohm  |         | 1.47 %      |      |
|                                          | 10 | +1.00Tohm  | +78.03Tohm  |         | 1.47 %      |      |
| 5                                        | 6  | +1.00Tohm  | +19.41Tohm  |         | 1.47 %      |      |
|                                          | 8  | +1.00Tohm  | +17.92Tohm  |         | 1.47 %      |      |
|                                          | 10 | +1.00Tohm  | +18.73Tohm  |         | 1.47 %      |      |
| 6                                        | 7  | +1.00Tohm  | +10.00*ohm  |         | 1.47 %      |      |
|                                          | 9  | +1.00Tohm  | +9.85Tohm   |         | 1.47 %      |      |
| 7                                        | 8  | +1.00Gohm  | +10.00*ohm  |         | 0.785%      |      |
|                                          | 10 | +1.00Gohm  | +9.85Tohm   |         | 0.785%      |      |
| 8                                        | 9  | +1.00Gohm  | +10.00*ohm  |         | 0.785%      |      |
| 9                                        | 10 | +1.00Gohm  | +10.00*ohm  |         | 0.785%      |      |
| -----                                    |    |            |             |         |             |      |
| Output Channel Isolation Resistance Test |    |            |             |         |             |      |
| -----                                    |    |            |             |         |             |      |
| Output Terminal                          |    |            |             |         |             |      |
| 1                                        | 2  | +10.00Tohm | +1.15Pohm   |         | 3.43 %      |      |
|                                          | 3  | +10.00Tohm | +921.48Tohm |         | 3.43 %      |      |
|                                          | 4  | +10.00Tohm | +908.98Tohm |         | 3.43 %      |      |
|                                          | 5  | +10.00Tohm | +916.76Tohm |         | 3.43 %      |      |
|                                          | 6  | +10.00Tohm | +907.06Tohm |         | 3.43 %      |      |
| -----                                    |    |            |             |         |             |      |

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## HP E5252A Test Record Example (4/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| =====            |    |            |             |         |             |      |
|------------------|----|------------|-------------|---------|-------------|------|
| TEST DESCRIPTION |    | Minimum    | Results     | Maximum | Uncertainty | Fail |
| =====            |    |            |             |         |             |      |
|                  | 7  | +10.00Tohm | +967.45Tohm |         | 3.43 %      |      |
|                  | 8  | +10.00Tohm | +1.00Pohm   |         | 3.43 %      |      |
|                  | 9  | +10.00Tohm | +1.01Pohm   |         | 3.43 %      |      |
|                  | 10 | +10.00Tohm | +1.01Pohm   |         | 3.43 %      |      |
|                  | 11 | +10.00Tohm | +1.01Pohm   |         | 3.43 %      |      |
|                  | 12 | +10.00Tohm | +1.06Pohm   |         | 3.43 %      |      |
| 2                | 3  | +10.00Tohm | +868.00Tohm |         | 3.43 %      |      |
|                  | 4  | +10.00Tohm | +938.05Tohm |         | 3.43 %      |      |
|                  | 5  | +10.00Tohm | +931.85Tohm |         | 3.43 %      |      |
|                  | 6  | +10.00Tohm | +978.98Tohm |         | 3.43 %      |      |
|                  | 7  | +10.00Tohm | +987.92Tohm |         | 3.43 %      |      |
|                  | 8  | +10.00Tohm | +1.08Pohm   |         | 3.43 %      |      |
|                  | 9  | +10.00Tohm | +1.07Pohm   |         | 3.43 %      |      |
|                  | 10 | +10.00Tohm | +1.05Pohm   |         | 3.43 %      |      |
|                  | 11 | +10.00Tohm | +1.06Pohm   |         | 3.43 %      |      |
|                  | 12 | +10.00Tohm | +1.14Pohm   |         | 3.43 %      |      |
| 3                | 4  | +10.00Tohm | +859.41Tohm |         | 3.43 %      |      |
|                  | 5  | +10.00Tohm | +843.66Tohm |         | 3.43 %      |      |
|                  | 6  | +10.00Tohm | +877.99Tohm |         | 3.43 %      |      |
|                  | 7  | +10.00Tohm | +908.83Tohm |         | 3.43 %      |      |
|                  | 8  | +10.00Tohm | +975.91Tohm |         | 3.43 %      |      |
|                  | 9  | +10.00Tohm | +977.60Tohm |         | 3.43 %      |      |
|                  | 10 | +10.00Tohm | +985.69Tohm |         | 3.43 %      |      |
|                  | 11 | +10.00Tohm | +1.04Pohm   |         | 3.43 %      |      |
|                  | 12 | +10.00Tohm | +1.07Pohm   |         | 3.43 %      |      |
| 4                | 5  | +10.00Tohm | +782.52Tohm |         | 3.43 %      |      |
| -----            |    |            |             |         |             |      |

\*E5252A\_N1\*

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## HP E5252A Test Record Example (5/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| =====            |    |            |             |         |             |      |
|------------------|----|------------|-------------|---------|-------------|------|
| TEST DESCRIPTION |    | Minimum    | Results     | Maximum | Uncertainty | Fail |
| =====            |    |            |             |         |             |      |
|                  | 6  | +10.00Tohm | +748.50Tohm |         | 3.43 %      |      |
|                  | 7  | +10.00Tohm | +828.15Tohm |         | 3.43 %      |      |
|                  | 8  | +10.00Tohm | +857.21Tohm |         | 3.43 %      |      |
|                  | 9  | +10.00Tohm | +864.61Tohm |         | 3.43 %      |      |
|                  | 10 | +10.00Tohm | +872.06Tohm |         | 3.43 %      |      |
|                  | 11 | +10.00Tohm | +889.05Tohm |         | 3.43 %      |      |
|                  | 12 | +10.00Tohm | +956.71Tohm |         | 3.43 %      |      |
| 5                | 6  | +10.00Tohm | +1.20Pohm   |         | 3.43 %      |      |
|                  | 7  | +10.00Tohm | +1.36Pohm   |         | 3.43 %      |      |
|                  | 8  | +10.00Tohm | +1.52Pohm   |         | 3.43 %      |      |
|                  | 9  | +10.00Tohm | +1.58Pohm   |         | 3.43 %      |      |
|                  | 10 | +10.00Tohm | +1.61Pohm   |         | 3.43 %      |      |
|                  | 11 | +10.00Tohm | +1.70Pohm   |         | 3.43 %      |      |
|                  | 12 | +10.00Tohm | +1.99Pohm   |         | 3.43 %      |      |
| 6                | 7  | +10.00Tohm | +947.83Tohm |         | 3.43 %      |      |
|                  | 8  | +10.00Tohm | +1.05Pohm   |         | 3.43 %      |      |
|                  | 9  | +10.00Tohm | +970.05Tohm |         | 3.43 %      |      |
|                  | 10 | +10.00Tohm | +966.63Tohm |         | 3.43 %      |      |
|                  | 11 | +10.00Tohm | +1.02Pohm   |         | 3.43 %      |      |
|                  | 12 | +10.00Tohm | +1.07Pohm   |         | 3.43 %      |      |
| 7                | 8  | +10.00Tohm | +1.03Pohm   |         | 3.43 %      |      |
|                  | 9  | +10.00Tohm | +1.11Pohm   |         | 3.43 %      |      |
|                  | 10 | +10.00Tohm | +1.06Pohm   |         | 3.43 %      |      |
|                  | 11 | +10.00Tohm | +1.24Pohm   |         | 3.43 %      |      |
|                  | 12 | +10.00Tohm | +1.19Pohm   |         | 3.43 %      |      |
| 8                | 9  | +10.00Tohm | +984.47Tohm |         | 3.43 %      |      |
| -----            |    |            |             |         |             |      |

\*E5252A\_N1\*

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## HP E5252A Test Record Example (6/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| =====                                          |        |            |             |         |             |      |
|------------------------------------------------|--------|------------|-------------|---------|-------------|------|
| TEST DESCRIPTION                               |        | Minimum    | Results     | Maximum | Uncertainty | Fail |
| =====                                          |        |            |             |         |             |      |
|                                                | 10     | +10.00Tohm | +961.17Tohm |         | 3.43 %      |      |
|                                                | 11     | +10.00Tohm | +971.45Tohm |         | 3.43 %      |      |
|                                                | 12     | +10.00Tohm | +1.05Pohm   |         | 3.43 %      |      |
| 9                                              | 10     | +10.00Tohm | +1.13Pohm   |         | 3.43 %      |      |
|                                                | 11     | +10.00Tohm | +1.04Pohm   |         | 3.43 %      |      |
|                                                | 12     | +10.00Tohm | +1.02Pohm   |         | 3.43 %      |      |
| 10                                             | 11     | +10.00Tohm | +1.52Pohm   |         | 3.43 %      |      |
|                                                | 12     | +10.00Tohm | +1.70Pohm   |         | 3.43 %      |      |
| 11                                             | 12     | +10.00Tohm | +1.38Pohm   |         | 3.43 %      |      |
| -----                                          |        |            |             |         |             |      |
| Input/Output Channel Isolation Resistance Test |        |            |             |         |             |      |
| -----                                          |        |            |             |         |             |      |
| Input                                          | Output |            |             |         |             |      |
| 2                                              | 2      | +10.00Tohm | +949.93Tohm |         | 3.43 %      |      |
|                                                | 3      | +10.00Tohm | +1.07Pohm   |         | 3.43 %      |      |
|                                                | 4      | +10.00Tohm | +1.20Pohm   |         | 3.43 %      |      |
|                                                | 5      | +10.00Tohm | +1.08Pohm   |         | 3.43 %      |      |
|                                                | 6      | +10.00Tohm | +1.17Pohm   |         | 3.43 %      |      |
|                                                | 7      | +10.00Tohm | +1.27Pohm   |         | 3.43 %      |      |
|                                                | 8      | +10.00Tohm | +1.28Pohm   |         | 3.43 %      |      |
|                                                | 9      | +10.00Tohm | +1.28Pohm   |         | 3.43 %      |      |
|                                                | 10     | +10.00Tohm | +1.32Pohm   |         | 3.43 %      |      |
|                                                | 11     | +10.00Tohm | +1.30Pohm   |         | 3.43 %      |      |
|                                                | 12     | +10.00Tohm | +1.37Pohm   |         | 3.43 %      |      |
| 3                                              | 2      | +1.00Tohm  | +68.08Tohm  |         | 1.47 %      |      |
|                                                | 3      | +1.00Tohm  | +326.59Tohm |         | 1.47 %      |      |
|                                                | 4      | +1.00Tohm  | +15.38Pohm  |         | 1.47 %      |      |
|                                                | 5      | +1.00Tohm  | +10.00*ohm  |         | 1.47 %      |      |
| -----                                          |        |            |             |         |             |      |

\*E5252A\_N1\*

--- 7/ ---

## HP E5252A Test Record Example (7/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| =====            |    |           |             |         |             |      |
|------------------|----|-----------|-------------|---------|-------------|------|
| TEST DESCRIPTION |    | Minimum   | Results     | Maximum | Uncertainty | Fail |
| =====            |    |           |             |         |             |      |
|                  | 6  | +1.00Tohm | +16.09Pohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 7  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 8  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 9  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 10 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 11 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 12 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
| 4                | 2  | +1.00Tohm | +147.47Tohm |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 3  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 4  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 5  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 6  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 7  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 8  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 9  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 10 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 11 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 12 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
| 5                | 2  | +1.00Tohm | +168.38Tohm |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 3  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 4  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 5  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 6  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 7  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 8  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |
|                  | 9  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| -----            |    |           |             |         |             |      |

\*E5252A\_N1\*

--- 8/ ---

## HP E5252A Test Record Example (8/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| =====            |    |           |             |         |             |      |
|------------------|----|-----------|-------------|---------|-------------|------|
| TEST DESCRIPTION |    | Minimum   | Results     | Maximum | Uncertainty | Fail |
| =====            |    |           |             |         |             |      |
|                  | 10 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 11 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 12 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| 6                | 2  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 3  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 4  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 5  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 6  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 7  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 8  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 9  | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 10 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 11 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
|                  | 12 | +1.00Tohm | +10.00*ohm  |         | 1.47 %      |      |
| 7                | 2  | +1.00Gohm | +61.39Tohm  |         | 0.785%      |      |
|                  | 3  | +1.00Gohm | +227.34Tohm |         | 0.785%      |      |
|                  | 4  | +1.00Gohm | +137.43Tohm |         | 0.785%      |      |
|                  | 5  | +1.00Gohm | +154.38Tohm |         | 0.785%      |      |
|                  | 6  | +1.00Gohm | +1.74Pohm   |         | 0.785%      |      |
|                  | 7  | +1.00Gohm | +594.76Tohm |         | 0.785%      |      |
|                  | 8  | +1.00Gohm | +288.47Tohm |         | 0.785%      |      |
|                  | 9  | +1.00Gohm | +248.01Tohm |         | 0.785%      |      |
|                  | 10 | +1.00Gohm | +317.11Tohm |         | 0.785%      |      |
|                  | 11 | +1.00Gohm | +1.07Pohm   |         | 0.785%      |      |
|                  | 12 | +1.00Gohm | +281.73Tohm |         | 0.785%      |      |
| 8                | 2  | +1.00Gohm | +68.38Tohm  |         | 0.785%      |      |

\*E5252A\_N1\*

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## HP E5252A Test Record Example (9/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| =====            |    |           |             |         |             |      |
|------------------|----|-----------|-------------|---------|-------------|------|
| TEST DESCRIPTION |    | Minimum   | Results     | Maximum | Uncertainty | Fail |
| =====            |    |           |             |         |             |      |
|                  | 3  | +1.00Gohm | +150.52Tohm |         | 0.785%      |      |
|                  | 4  | +1.00Gohm | +123.67Tohm |         | 0.785%      |      |
|                  | 5  | +1.00Gohm | +345.98Tohm |         | 0.785%      |      |
|                  | 6  | +1.00Gohm | +79.41Tohm  |         | 0.785%      |      |
|                  | 7  | +1.00Gohm | +221.01Tohm |         | 0.785%      |      |
|                  | 8  | +1.00Gohm | +252.45Tohm |         | 0.785%      |      |
|                  | 9  | +1.00Gohm | +308.55Tohm |         | 0.785%      |      |
|                  | 10 | +1.00Gohm | +210.00Tohm |         | 0.785%      |      |
|                  | 11 | +1.00Gohm | +217.21Tohm |         | 0.785%      |      |
|                  | 12 | +1.00Gohm | +330.85Tohm |         | 0.785%      |      |
| 9                | 2  | +1.00Gohm | +58.68Tohm  |         | 0.785%      |      |
|                  | 3  | +1.00Gohm | +182.87Tohm |         | 0.785%      |      |
|                  | 4  | +1.00Gohm | +119.50Tohm |         | 0.785%      |      |
|                  | 5  | +1.00Gohm | +135.17Tohm |         | 0.785%      |      |
|                  | 6  | +1.00Gohm | +534.67Tohm |         | 0.785%      |      |
|                  | 7  | +1.00Gohm | +371.09Tohm |         | 0.785%      |      |
|                  | 8  | +1.00Gohm | +216.66Tohm |         | 0.785%      |      |
|                  | 9  | +1.00Gohm | +188.44Tohm |         | 0.785%      |      |
|                  | 10 | +1.00Gohm | +226.35Tohm |         | 0.785%      |      |
|                  | 11 | +1.00Gohm | +566.44Tohm |         | 0.785%      |      |
|                  | 12 | +1.00Gohm | +215.35Tohm |         | 0.785%      |      |
| 10               | 2  | +1.00Gohm | +68.93Tohm  |         | 0.785%      |      |
|                  | 3  | +1.00Gohm | +211.62Tohm |         | 0.785%      |      |
|                  | 4  | +1.00Gohm | +181.27Tohm |         | 0.785%      |      |
|                  | 5  | +1.00Gohm | +3.85Pohm   |         | 0.785%      |      |
|                  | 6  | +1.00Gohm | +115.64Tohm |         | 0.785%      |      |
| -----            |    |           |             |         |             |      |

\*E5252A\_N1\*

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## HP E5252A Test Record Example (10/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| TEST DESCRIPTION | Minimum   | Results     | Maximum | Uncertainty | Fail |
|------------------|-----------|-------------|---------|-------------|------|
| 7                | +1.00Gohm | +773.21Tohm |         | 0.785%      |      |
| 8                | +1.00Gohm | +1.69Pohm   |         | 0.785%      |      |
| 9                | +1.00Gohm | +10.00*ohm  |         | 0.785%      |      |
| 10               | +1.00Gohm | +753.99Tohm |         | 0.785%      |      |
| 11               | +1.00Gohm | +1.23Pohm   |         | 0.785%      |      |
| 12               | +1.00Gohm | +10.00*ohm  |         | 0.785%      |      |

## Closed Channel Resistance Test

| Output | Input |                                 |
|--------|-------|---------------------------------|
| 1      | 1     | +207.73mohm +600.00mohm  0.76 % |
|        | 2     | +213.92mohm +600.00mohm  0.76 % |
|        | 3     | +247.29mohm  +1.00 ohm  0.76 %  |
|        | 4     | +263.08mohm  +1.00 ohm  0.76 %  |
|        | 5     | +256.32mohm  +1.00 ohm  0.76 %  |
|        | 6     | +274.95mohm  +1.00 ohm  0.76 %  |
|        | 7     | +371.19mohm  +1.00 ohm  0.76 %  |
|        | 8     | +365.50mohm  +1.00 ohm  0.76 %  |
|        | 9     | +371.03mohm  +1.00 ohm  0.76 %  |
|        | 10    | +361.11mohm  +1.00 ohm  0.76 %  |
| 2      | 1     | +200.59mohm +600.00mohm  0.76 % |
|        | 2     | +207.67mohm +600.00mohm  0.76 % |
|        | 3     | +260.72mohm  +1.00 ohm  0.76 %  |
|        | 4     | +266.38mohm  +1.00 ohm  0.76 %  |
|        | 5     | +268.02mohm  +1.00 ohm  0.76 %  |
|        | 6     | +273.20mohm  +1.00 ohm  0.76 %  |
|        | 7     | +383.21mohm  +1.00 ohm  0.76 %  |
|        | 8     | +364.40mohm  +1.00 ohm  0.76 %  |

\*E5252A\_N1\*

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## HP E5252A Test Record Example (11/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| =====            |    |         |             |             |             |      |
|------------------|----|---------|-------------|-------------|-------------|------|
| TEST DESCRIPTION |    | Minimum | Results     | Maximum     | Uncertainty | Fail |
| =====            |    |         |             |             |             |      |
|                  | 9  |         | +383.37mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 10 |         | +359.49mohm | +1.00 ohm   | 0.76 %      |      |
| 3                | 1  |         | +210.09mohm | +600.00mohm | 0.76 %      |      |
|                  | 2  |         | +214.47mohm | +600.00mohm | 0.76 %      |      |
|                  | 3  |         | +251.81mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 4  |         | +272.45mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 5  |         | +264.98mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 6  |         | +261.85mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 7  |         | +380.34mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 8  |         | +352.52mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 9  |         | +380.49mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 10 |         | +348.16mohm | +1.00 ohm   | 0.76 %      |      |
| 4                | 1  |         | +217.66mohm | +600.00mohm | 0.76 %      |      |
|                  | 2  |         | +209.44mohm | +600.00mohm | 0.76 %      |      |
|                  | 3  |         | +253.02mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 4  |         | +274.63mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 5  |         | +273.12mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 6  |         | +253.81mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 7  |         | +388.56mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 8  |         | +344.42mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 9  |         | +388.75mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 10 |         | +339.98mohm | +1.00 ohm   | 0.76 %      |      |
| 5                | 1  |         | +217.31mohm | +600.00mohm | 0.76 %      |      |
|                  | 2  |         | +218.40mohm | +600.00mohm | 0.76 %      |      |
|                  | 3  |         | +265.76mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 4  |         | +279.33mohm | +1.00 ohm   | 0.76 %      |      |

\*E5252A\_N1\*

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## HP E5252A Test Record Example (12/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| =====            |    |         |             |             |             |      |
|------------------|----|---------|-------------|-------------|-------------|------|
| TEST DESCRIPTION |    | Minimum | Results     | Maximum     | Uncertainty | Fail |
| =====            |    |         |             |             |             |      |
|                  | 5  |         | +275.95mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 6  |         | +268.88mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 7  |         | +391.54mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 8  |         | +359.64mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 9  |         | +391.63mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 10 |         | +355.01mohm | +1.00 ohm   | 0.76 %      |      |
| 6                | 1  |         | +211.49mohm | +600.00mohm | 0.76 %      |      |
|                  | 2  |         | +212.27mohm | +600.00mohm | 0.76 %      |      |
|                  | 3  |         | +281.63mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 4  |         | +288.81mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 5  |         | +286.23mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 6  |         | +272.02mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 7  |         | +401.75mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 8  |         | +353.38mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 9  |         | +402.09mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 10 |         | +348.77mohm | +1.00 ohm   | 0.76 %      |      |
| 7                | 1  |         | +218.15mohm | +600.00mohm | 0.76 %      |      |
|                  | 2  |         | +220.35mohm | +600.00mohm | 0.76 %      |      |
|                  | 3  |         | +273.03mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 4  |         | +294.78mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 5  |         | +295.07mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 6  |         | +269.07mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 7  |         | +410.79mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 8  |         | +340.16mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 9  |         | +411.15mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 10 |         | +335.92mohm | +1.00 ohm   | 0.76 %      |      |
| -----            |    |         |             |             |             |      |

\*E5252A\_N1\*

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## HP E5252A Test Record Example (13/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| =====            |         |             |             |             |      |  |
|------------------|---------|-------------|-------------|-------------|------|--|
| TEST DESCRIPTION | Minimum | Results     | Maximum     | Uncertainty | Fail |  |
| =====            |         |             |             |             |      |  |
| 8                | 1       | +218.97mohm | +600.00mohm | 0.76 %      |      |  |
|                  | 2       | +222.94mohm | +600.00mohm | 0.76 %      |      |  |
|                  | 3       | +283.96mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 4       | +292.95mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 5       | +294.50mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 6       | +268.90mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 7       | +410.17mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 8       | +339.03mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 9       | +410.56mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 10      | +334.74mohm | +1.00 ohm   | 0.76 %      |      |  |
| 9                | 1       | +227.19mohm | +600.00mohm | 0.76 %      |      |  |
|                  | 2       | +226.97mohm | +600.00mohm | 0.76 %      |      |  |
|                  | 3       | +287.91mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 4       | +361.36mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 5       | +300.89mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 6       | +275.00mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 7       | +416.86mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 8       | +345.05mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 9       | +417.06mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 10      | +340.64mohm | +1.00 ohm   | 0.76 %      |      |  |
| 10               | 1       | +222.41mohm | +600.00mohm | 0.76 %      |      |  |
|                  | 2       | +230.12mohm | +600.00mohm | 0.76 %      |      |  |
|                  | 3       | +290.90mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 4       | +313.82mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 5       | +308.75mohm | +1.00 ohm   | 0.76 %      |      |  |
|                  | 6       | +282.80mohm | +1.00 ohm   | 0.76 %      |      |  |
| -----            |         |             |             |             |      |  |

\*E5252A\_N1\*

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## HP E5252A Test Record Example (14/15)

Model: HP E5252A

Report No.: E5252A-001

Date: 23 Jan 1996

| =====            |    |         |             |             |             |      |
|------------------|----|---------|-------------|-------------|-------------|------|
| TEST DESCRIPTION |    | Minimum | Results     | Maximum     | Uncertainty | Fail |
| =====            |    |         |             |             |             |      |
|                  | 7  |         | +424.44mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 8  |         | +352.94mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 9  |         | +424.79mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 10 |         | +348.56mohm | +1.00 ohm   | 0.76 %      |      |
| 11               | 1  |         | +226.99mohm | +600.00mohm | 0.76 %      |      |
|                  | 2  |         | +225.90mohm | +600.00mohm | 0.76 %      |      |
|                  | 3  |         | +306.23mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 4  |         | +305.28mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 5  |         | +304.61mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 6  |         | +286.84mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 7  |         | +420.44mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 8  |         | +357.53mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 9  |         | +420.78mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 10 |         | +353.17mohm | +1.00 ohm   | 0.76 %      |      |
| 12               | 1  |         | +240.07mohm | +600.00mohm | 0.76 %      |      |
|                  | 2  |         | +231.60mohm | +600.00mohm | 0.76 %      |      |
|                  | 3  |         | +310.11mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 4  |         | +325.82mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 5  |         | +322.28mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 6  |         | +292.45mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 7  |         | +438.04mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 8  |         | +362.81mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 9  |         | +438.52mohm | +1.00 ohm   | 0.76 %      |      |
|                  | 10 |         | +358.21mohm | +1.00 ohm   | 0.76 %      |      |
| =====            |    |         |             |             |             |      |

[END OF REPORT]

\*E5252A\_N1\*

--- 15/ ---

## HP E5252A Test Record Example (15/15)

```
=====
P E R F O R M A N C E   T E S T   R E P O R T
=====
```

Test Facility:

|                 |                                 |
|-----------------|---------------------------------|
| Hewlett-Packard | Report No. _____E5255A-003      |
| _____           | Date _____23 Jan 1996           |
| _____           | Customer _____                  |
| _____           | Tested by _____M0               |
|                 | Temperature _____25 degree C    |
|                 | Humidity _____50 %              |
|                 | Line Frequency _____Hz(nominal) |

CARD 3 HP E5255A 24 (8x3) Channel Multiplexer

Serial Number: \_\_\_\_\_JP10C00106

HP E5250A Low Leakage Switch Mainframe

Serial Number: \_\_\_\_\_

Special Notes:

```
-----
-----
-----
-----
```

\*E5255A\_N3\*

--- 1/ ---

Model: HP E5255

Report No.: E5255A-003

Date: 23 Jan 1996

Test Equipment Used:

|     | Description | Model No. | Trace No. | Cal Due Date |
|-----|-------------|-----------|-----------|--------------|
| 1.  | -----       | -----     | -----     | -----        |
| 2.  | -----       | -----     | -----     | -----        |
| 3.  | -----       | -----     | -----     | -----        |
| 4.  | -----       | -----     | -----     | -----        |
| 5.  | -----       | -----     | -----     | -----        |
| 6.  | -----       | -----     | -----     | -----        |
| 7.  | -----       | -----     | -----     | -----        |
| 8.  | -----       | -----     | -----     | -----        |
| 9.  | -----       | -----     | -----     | -----        |
| 10. | -----       | -----     | -----     | -----        |
| 11. | -----       | -----     | -----     | -----        |
| 12. | -----       | -----     | -----     | -----        |
| 13. | -----       | -----     | -----     | -----        |
| 14. | -----       | -----     | -----     | -----        |

\*E5255A\_N3\*

--- 2/ ---

HP E5255A Test Record Example (2/11)

Model: HP E5255A

Report No.: E5255A-003

Date: 23 Jan 1996

| TEST DESCRIPTION | Minimum | Results | Maximum | Uncertainty | Fail |
|------------------|---------|---------|---------|-------------|------|
|------------------|---------|---------|---------|-------------|------|

Relay Open/Close Self-test

CARD 3

PASS

Isolation Resistance Test

Input/Bias Channel Isolation Resistance Test

|Block|Output |Output |

|   |   |   |            |             |        |
|---|---|---|------------|-------------|--------|
| 1 | 1 | 2 | +10.00Tohm | +10.00*ohm  | 3.43 % |
|   |   | 3 | +10.00Tohm | +984.53Tohm | 3.43 % |
|   |   | 4 | +10.00Tohm | +815.93Tohm | 3.43 % |
|   |   | 5 | +10.00Tohm | +795.35Tohm | 3.43 % |
|   |   | 6 | +10.00Tohm | +771.31Tohm | 3.43 % |
|   |   | 7 | +10.00Tohm | +818.42Tohm | 3.43 % |
|   |   | 8 | +10.00Tohm | +902.52Tohm | 3.43 % |
|   | 2 | 3 | +10.00Tohm | +673.46Tohm | 3.43 % |
|   |   | 4 | +10.00Tohm | +691.26Tohm | 3.43 % |
|   |   | 5 | +10.00Tohm | +786.05Tohm | 3.43 % |
|   |   | 6 | +10.00Tohm | +673.46Tohm | 3.43 % |
|   |   | 7 | +10.00Tohm | +757.71Tohm | 3.43 % |
|   |   | 8 | +10.00Tohm | +827.81Tohm | 3.43 % |
|   | 3 | 4 | +10.00Tohm | +753.87Tohm | 3.43 % |
|   |   | 5 | +10.00Tohm | +704.34Tohm | 3.43 % |
|   |   | 6 | +10.00Tohm | +624.71Tohm | 3.43 % |
|   |   | 7 | +10.00Tohm | +641.54Tohm | 3.43 % |
|   |   | 8 | +10.00Tohm | +707.13Tohm | 3.43 % |
|   | 4 | 5 | +10.00Tohm | +651.34Tohm | 3.43 % |
|   |   | 6 | +10.00Tohm | +584.88Tohm | 3.43 % |
|   |   | 7 | +10.00Tohm | +649.76Tohm | 3.43 % |

\*E5255A\_N3\*

--- 3/ ---

## HP E5255A Test Record Example (3/11)

Model: HP E5255A

Report No.: E5255A-003

Date: 23 Jan 1996

| =====            |   |   |            |             |         |                   |
|------------------|---|---|------------|-------------|---------|-------------------|
| TEST DESCRIPTION |   |   | Minimum    | Results     | Maximum | Uncertainty  Fail |
| =====            |   |   |            |             |         |                   |
|                  |   | 8 | +10.00Tohm | +705.34Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  | 5 | 6 | +10.00Tohm | +827.27Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 7 | +10.00Tohm | +808.54Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 8 | +10.00Tohm | +921.17Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  | 6 | 7 | +10.00Tohm | +922.76Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 8 | +10.00Tohm | +1.01Pohm   |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  | 7 | 8 | +10.00Tohm | +1.51Pohm   |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  | 8 | 1 | +10.00Tohm | +1.17Pohm   |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
| 2                | 1 | 2 | +10.00Tohm | +10.00*ohm  |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 3 | +10.00Tohm | +10.00*ohm  |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 4 | +10.00Tohm | +1.16Pohm   |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 5 | +10.00Tohm | +1.20Pohm   |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 6 | +10.00Tohm | +985.31Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 7 | +10.00Tohm | +1.04Pohm   |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 8 | +10.00Tohm | +909.06Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  | 2 | 3 | +10.00Tohm | +902.93Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 4 | +10.00Tohm | +788.67Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 5 | +10.00Tohm | +815.06Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 6 | +10.00Tohm | +679.24Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 7 | +10.00Tohm | +814.44Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 8 | +10.00Tohm | +750.76Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  | 3 | 4 | +10.00Tohm | +752.34Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 5 | +10.00Tohm | +706.71Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 6 | +10.00Tohm | +660.14Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 7 | +10.00Tohm | +732.79Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |
|                  |   | 8 | +10.00Tohm | +668.37Tohm |         | 3.43 %            |
| -----            |   |   |            |             |         |                   |

\*E5255A\_N3\*

--- 4/ ---

## HP E5255A Test Record Example (4/11)

Model: HP E5255A

Report No.: E5255A-003

Date: 23 Jan 1996

| =====            |   |   |   |            |                        |         |             |      |  |
|------------------|---|---|---|------------|------------------------|---------|-------------|------|--|
| TEST DESCRIPTION |   |   |   | Minimum    | Results                | Maximum | Uncertainty | Fail |  |
| =====            |   |   |   |            |                        |         |             |      |  |
|                  |   | 4 | 5 | +10.00Tohm | +706.50Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 6 | +10.00Tohm | +628.24Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 7 | +10.00Tohm | +672.38Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 8 | +10.00Tohm | +628.98Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   | 5 | 6 | +10.00Tohm | +764.44Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 7 | +10.00Tohm | +772.70Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 8 | +10.00Tohm | +739.72Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   | 6 | 7 | +10.00Tohm | +885.08Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 8 | +10.00Tohm | +739.21Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   | 7 | 8 | +10.00Tohm | +1.11Po <sub>hm</sub>  |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   | 8 | 1 | +10.00Tohm | +981.52Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
| 3                | 1 | 2 |   | +10.00Tohm | +10.00*o <sub>hm</sub> |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 3 | +10.00Tohm | +906.95Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 4 | +10.00Tohm | +725.80Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 5 | +10.00Tohm | +764.63Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 6 | +10.00Tohm | +685.86Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 7 | +10.00Tohm | +668.75Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 8 | +10.00Tohm | +619.10Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   | 2 | 3 | +10.00Tohm | +635.62Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 4 | +10.00Tohm | +606.49Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 5 | +10.00Tohm | +644.41Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 6 | +10.00Tohm | +613.43Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 7 | +10.00Tohm | +632.25Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 8 | +10.00Tohm | +609.25Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   | 3 | 4 | +10.00Tohm | +569.14Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |
|                  |   |   | 5 | +10.00Tohm | +574.94Tohm            |         | 3.43 %      |      |  |
| -----            |   |   |   |            |                        |         |             |      |  |

\*E5255A\_N3\*

--- 5/ ---

## HP E5255A Test Record Example (5/11)

Model: HP E5255A

Report No.: E5255A-003

Date: 23 Jan 1996

| =====                                        |   |        |            |             |         |             |      |  |  |
|----------------------------------------------|---|--------|------------|-------------|---------|-------------|------|--|--|
| TEST DESCRIPTION                             |   |        | Minimum    | Results     | Maximum | Uncertainty | Fail |  |  |
|                                              |   |        |            |             |         |             |      |  |  |
| =====                                        |   |        |            |             |         |             |      |  |  |
|                                              |   | 6      | +10.00Tohm | +588.51Tohm |         | 3.43 %      |      |  |  |
|                                              |   | 7      | +10.00Tohm | +584.34Tohm |         | 3.43 %      |      |  |  |
|                                              |   | 8      | +10.00Tohm | +509.37Tohm |         | 3.43 %      |      |  |  |
|                                              | 4 | 5      | +10.00Tohm | +686.70Tohm |         | 3.43 %      |      |  |  |
|                                              |   | 6      | +10.00Tohm | +713.20Tohm |         | 3.43 %      |      |  |  |
|                                              |   | 7      | +10.00Tohm | +664.56Tohm |         | 3.43 %      |      |  |  |
|                                              |   | 8      | +10.00Tohm | +593.87Tohm |         | 3.43 %      |      |  |  |
|                                              | 5 | 6      | +10.00Tohm | +589.95Tohm |         | 3.43 %      |      |  |  |
|                                              |   | 7      | +10.00Tohm | +623.22Tohm |         | 3.43 %      |      |  |  |
|                                              |   | 8      | +10.00Tohm | +557.20Tohm |         | 3.43 %      |      |  |  |
|                                              | 6 | 7      | +10.00Tohm | +751.29Tohm |         | 3.43 %      |      |  |  |
|                                              |   | 8      | +10.00Tohm | +653.70Tohm |         | 3.43 %      |      |  |  |
|                                              | 7 | 8      | +10.00Tohm | +1.06Pohm   |         | 3.43 %      |      |  |  |
|                                              | 8 | 1      | +10.00Tohm | +783.12Tohm |         | 3.43 %      |      |  |  |
| -----                                        |   |        |            |             |         |             |      |  |  |
| Bias/Input Channel Isolation Resistance Test |   |        |            |             |         |             |      |  |  |
| -----                                        |   |        |            |             |         |             |      |  |  |
| Block                                        |   | Output |            | Output      |         |             |      |  |  |
| -----                                        |   |        |            |             |         |             |      |  |  |
| 1                                            | 1 | 2      | +1.00Gohm  | +7.89Tohm   |         | 0.785%      |      |  |  |
|                                              |   | 3      | +1.00Gohm  | +15.42Tohm  |         | 0.785%      |      |  |  |
|                                              |   | 4      | +1.00Gohm  | +17.11Tohm  |         | 0.785%      |      |  |  |
|                                              |   | 5      | +1.00Gohm  | +21.62Tohm  |         | 0.785%      |      |  |  |
|                                              |   | 6      | +1.00Gohm  | +26.54Tohm  |         | 0.785%      |      |  |  |
|                                              |   | 7      | +1.00Gohm  | +23.34Tohm  |         | 0.785%      |      |  |  |
|                                              |   | 8      | +1.00Gohm  | +22.04Tohm  |         | 0.785%      |      |  |  |
|                                              | 2 | 3      | +1.00Gohm  | +7.02Tohm   |         | 0.785%      |      |  |  |
|                                              |   | 4      | +1.00Gohm  | +8.67Tohm   |         | 0.785%      |      |  |  |
|                                              |   | 5      | +1.00Gohm  | +13.39Tohm  |         | 0.785%      |      |  |  |
| -----                                        |   |        |            |             |         |             |      |  |  |

\*E5255A\_N3\*

--- 6/ ---

## HP E5255A Test Record Example (6/11)

Model: HP E5255A

Report No.: E5255A-003

Date: 23 Jan 1996

| =====            |   |   |           |             |         |                   |
|------------------|---|---|-----------|-------------|---------|-------------------|
| TEST DESCRIPTION |   |   | Minimum   | Results     | Maximum | Uncertainty  Fail |
| =====            |   |   |           |             |         |                   |
|                  |   | 6 | +1.00Gohm | +18.77Tohm  |         | 0.785%            |
|                  |   | 7 | +1.00Gohm | +22.46Tohm  |         | 0.785%            |
|                  |   | 8 | +1.00Gohm | +37.31Tohm  |         | 0.785%            |
|                  | 3 | 4 | +1.00Gohm | +5.97Tohm   |         | 0.785%            |
|                  |   | 5 | +1.00Gohm | +12.23Tohm  |         | 0.785%            |
|                  |   | 6 | +1.00Gohm | +19.70Tohm  |         | 0.785%            |
|                  |   | 7 | +1.00Gohm | +18.55Tohm  |         | 0.785%            |
|                  |   | 8 | +1.00Gohm | +51.22Tohm  |         | 0.785%            |
|                  | 4 | 5 | +1.00Gohm | +6.52Tohm   |         | 0.785%            |
|                  |   | 6 | +1.00Gohm | +10.54Tohm  |         | 0.785%            |
|                  |   | 7 | +1.00Gohm | +14.16Tohm  |         | 0.785%            |
|                  |   | 8 | +1.00Gohm | +24.06Tohm  |         | 0.785%            |
|                  | 5 | 6 | +1.00Gohm | +8.36Tohm   |         | 0.785%            |
|                  |   | 7 | +1.00Gohm | +39.57Tohm  |         | 0.785%            |
|                  |   | 8 | +1.00Gohm | +10.00*ohm  |         | 0.785%            |
|                  | 6 | 7 | +1.00Gohm | +6.77Tohm   |         | 0.785%            |
|                  |   | 8 | +1.00Gohm | +33.50Tohm  |         | 0.785%            |
|                  | 7 | 8 | +1.00Gohm | +7.93Tohm   |         | 0.785%            |
|                  | 8 | 1 | +1.00Gohm | +10.00*ohm  |         | 0.785%            |
| 2                | 1 | 2 | +1.00Gohm | +9.77Tohm   |         | 0.785%            |
|                  |   | 3 | +1.00Gohm | +545.85Tohm |         | 0.785%            |
|                  |   | 4 | +1.00Gohm | +34.10Tohm  |         | 0.785%            |
|                  |   | 5 | +1.00Gohm | +10.00*ohm  |         | 0.785%            |
|                  |   | 6 | +1.00Gohm | +10.00*ohm  |         | 0.785%            |
|                  |   | 7 | +1.00Gohm | +10.00*ohm  |         | 0.785%            |
|                  |   | 8 | +1.00Gohm | +10.00*ohm  |         | 0.785%            |
| -----            |   |   |           |             |         |                   |

\*E5255A\_N3\*

--- 7/ ---

## HP E5255A Test Record Example (7/11)

Model: HP E5255A

Report No.: E5255A-003

Date: 23 Jan 1996

| =====            |   |   |   |           |             |         |             |      |  |
|------------------|---|---|---|-----------|-------------|---------|-------------|------|--|
| TEST DESCRIPTION |   |   |   | Minimum   | Results     | Maximum | Uncertainty | Fail |  |
| =====            |   |   |   |           |             |         |             |      |  |
|                  |   | 2 | 3 | +1.00Gohm | +17.43Tohm  |         | 0.785%      |      |  |
|                  |   |   | 4 | +1.00Gohm | +18.53Tohm  |         | 0.785%      |      |  |
|                  |   |   | 5 | +1.00Gohm | +56.97Tohm  |         | 0.785%      |      |  |
|                  |   |   | 6 | +1.00Gohm | +31.74Tohm  |         | 0.785%      |      |  |
|                  |   |   | 7 | +1.00Gohm | +55.17Tohm  |         | 0.785%      |      |  |
|                  |   |   | 8 | +1.00Gohm | +391.70Tohm |         | 0.785%      |      |  |
|                  |   | 3 | 4 | +1.00Gohm | +11.54Tohm  |         | 0.785%      |      |  |
|                  |   |   | 5 | +1.00Gohm | +125.44Tohm |         | 0.785%      |      |  |
|                  |   |   | 6 | +1.00Gohm | +115.89Tohm |         | 0.785%      |      |  |
|                  |   |   | 7 | +1.00Gohm | +10.00*ohm  |         | 0.785%      |      |  |
|                  |   |   | 8 | +1.00Gohm | +10.00*ohm  |         | 0.785%      |      |  |
|                  |   | 4 | 5 | +1.00Gohm | +14.47Tohm  |         | 0.785%      |      |  |
|                  |   |   | 6 | +1.00Gohm | +26.77Tohm  |         | 0.785%      |      |  |
|                  |   |   | 7 | +1.00Gohm | +30.26Tohm  |         | 0.785%      |      |  |
|                  |   |   | 8 | +1.00Gohm | +87.10Tohm  |         | 0.785%      |      |  |
|                  |   | 5 | 6 | +1.00Gohm | +8.01Tohm   |         | 0.785%      |      |  |
|                  |   |   | 7 | +1.00Gohm | +19.28Tohm  |         | 0.785%      |      |  |
|                  |   |   | 8 | +1.00Gohm | +38.04Tohm  |         | 0.785%      |      |  |
|                  |   | 6 | 7 | +1.00Gohm | +49.64Tohm  |         | 0.785%      |      |  |
|                  |   |   | 8 | +1.00Gohm | +10.00*ohm  |         | 0.785%      |      |  |
|                  |   | 7 | 8 | +1.00Gohm | +13.16Tohm  |         | 0.785%      |      |  |
|                  |   | 8 | 1 | +1.00Gohm | +10.00*ohm  |         | 0.785%      |      |  |
|                  | 3 | 1 | 2 | +1.00Gohm | +5.51Tohm   |         | 0.785%      |      |  |
|                  |   |   | 3 | +1.00Gohm | +7.83Tohm   |         | 0.785%      |      |  |
|                  |   |   | 4 | +1.00Gohm | +9.08Tohm   |         | 0.785%      |      |  |
|                  |   |   | 5 | +1.00Gohm | +15.57Tohm  |         | 0.785%      |      |  |
| =====            |   |   |   |           |             |         |             |      |  |

\*E5255A\_N3\*

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## HP E5255A Test Record Example (8/11)

Model: HP E5255A

Report No.: E5255A-003

Date: 23 Jan 1996

| =====                                       |   |   |           |            |         |                   |
|---------------------------------------------|---|---|-----------|------------|---------|-------------------|
| TEST DESCRIPTION                            |   |   | Minimum   | Results    | Maximum | Uncertainty  Fail |
| =====                                       |   |   |           |            |         |                   |
|                                             |   | 6 | +1.00Gohm | +14.78Tohm |         | 0.785%            |
|                                             |   | 7 | +1.00Gohm | +16.79Tohm |         | 0.785%            |
|                                             |   | 8 | +1.00Gohm | +17.70Tohm |         | 0.785%            |
|                                             | 2 | 3 | +1.00Gohm | +4.58Tohm  |         | 0.785%            |
|                                             |   | 4 | +1.00Gohm | +5.72Tohm  |         | 0.785%            |
|                                             |   | 5 | +1.00Gohm | +8.91Tohm  |         | 0.785%            |
|                                             |   | 6 | +1.00Gohm | +9.58Tohm  |         | 0.785%            |
|                                             |   | 7 | +1.00Gohm | +12.43Tohm |         | 0.785%            |
|                                             |   | 8 | +1.00Gohm | +14.37Tohm |         | 0.785%            |
|                                             | 3 | 4 | +1.00Gohm | +5.26Tohm  |         | 0.785%            |
|                                             |   | 5 | +1.00Gohm | +10.51Tohm |         | 0.785%            |
|                                             |   | 6 | +1.00Gohm | +16.89Tohm |         | 0.785%            |
|                                             |   | 7 | +1.00Gohm | +42.56Tohm |         | 0.785%            |
|                                             |   | 8 | +1.00Gohm | +34.57Tohm |         | 0.785%            |
|                                             | 4 | 5 | +1.00Gohm | +6.04Tohm  |         | 0.785%            |
|                                             |   | 6 | +1.00Gohm | +11.79Tohm |         | 0.785%            |
|                                             |   | 7 | +1.00Gohm | +24.43Tohm |         | 0.785%            |
|                                             |   | 8 | +1.00Gohm | +42.05Tohm |         | 0.785%            |
|                                             | 5 | 6 | +1.00Gohm | +5.13Tohm  |         | 0.785%            |
|                                             |   | 7 | +1.00Gohm | +9.67Tohm  |         | 0.785%            |
|                                             |   | 8 | +1.00Gohm | +13.42Tohm |         | 0.785%            |
|                                             | 6 | 7 | +1.00Gohm | +6.14Tohm  |         | 0.785%            |
|                                             |   | 8 | +1.00Gohm | +12.77Tohm |         | 0.785%            |
|                                             | 7 | 8 | +1.00Gohm | +6.59Tohm  |         | 0.785%            |
|                                             | 8 | 1 | +1.00Gohm | +10.00*ohm |         | 0.785%            |
| =====                                       |   |   |           |            |         |                   |
| Closed Input/Output Channel Resistance Test |   |   |           |            |         |                   |
| =====                                       |   |   |           |            |         |                   |

\*E5255A\_N3\*

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## HP E5255A Test Record Example (9/11)

Model: HP E5255A

Report No.: E5255A-003

Date: 23 Jan 1996

| =====                                      |         |             |             |             |      |  |
|--------------------------------------------|---------|-------------|-------------|-------------|------|--|
| TEST DESCRIPTION                           | Minimum | Results     | Maximum     | Uncertainty | Fail |  |
| =====                                      |         |             |             |             |      |  |
| Block                                      | Output  |             |             |             |      |  |
| 1                                          | 1       | +215.79mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 2       | +211.00mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 3       | +217.18mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 4       | +220.23mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 5       | +222.34mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 6       | +216.51mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 7       | +214.54mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 8       | +216.28mohm | +600.00mohm | 1.30 %      |      |  |
| 2                                          | 1       | +237.07mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 2       | +223.54mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 3       | +229.58mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 4       | +231.31mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 5       | +233.03mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 6       | +231.28mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 7       | +236.77mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 8       | +232.56mohm | +600.00mohm | 1.30 %      |      |  |
| 3                                          | 1       | +246.76mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 2       | +243.31mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 3       | +242.66mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 4       | +242.56mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 5       | +249.99mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 6       | +240.69mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 7       | +251.42mohm | +600.00mohm | 1.30 %      |      |  |
|                                            | 8       | +256.94mohm | +600.00mohm | 1.30 %      |      |  |
| Closed Bias/Output Channel Resistance Test |         |             |             |             |      |  |
| -----                                      |         |             |             |             |      |  |

\*E5255A\_N3\*

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## HP E5255A Test Record Example (10/11)

Model: HP E5255A

Report No.: E5255A-003

Date: 23 Jan 1996

| =====            |        |         |  |             |  |           |             |      |
|------------------|--------|---------|--|-------------|--|-----------|-------------|------|
| TEST DESCRIPTION |        | Minimum |  | Results     |  | Maximum   | Uncertainty | Fail |
| =====            |        |         |  |             |  |           |             |      |
| Block            | Output |         |  |             |  |           |             |      |
| 1                | 1      |         |  | +183.16mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 2      |         |  | +188.19mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 3      |         |  | +186.37mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 4      |         |  | +195.73mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 5      |         |  | +205.48mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 6      |         |  | +207.91mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 7      |         |  | +222.49mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 8      |         |  | +232.87mohm |  | +1.00 ohm | 1.30 %      |      |
| 2                | 1      |         |  | +191.97mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 2      |         |  | +209.63mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 3      |         |  | +220.38mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 4      |         |  | +221.33mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 5      |         |  | +232.00mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 6      |         |  | +242.84mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 7      |         |  | +268.89mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 8      |         |  | +268.33mohm |  | +1.00 ohm | 1.30 %      |      |
| 3                | 1      |         |  | +217.41mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 2      |         |  | +222.68mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 3      |         |  | +232.80mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 4      |         |  | +236.60mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 5      |         |  | +259.49mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 6      |         |  | +267.19mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 7      |         |  | +272.60mohm |  | +1.00 ohm | 1.30 %      |      |
|                  | 8      |         |  | +277.62mohm |  | +1.00 ohm | 1.30 %      |      |
| =====            |        |         |  |             |  |           |             |      |

[END OF REPORT]

\*E5255A\_N3\*

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## HP E5255A Test Record Example (11/11)



## Troubleshooting Procedure

---

This troubleshooting procedure is for service personnel and assumes that the unit has passed the manufacturing test before.

### Caution



Do not wash or clean the printed circuit boards unless you suspect the contamination on the boards is the cause of the PV failure (isolation resistance/leakage).

For cleaning with an air gun, use a filter. Unfiltered air may contain oil.

### Important



Before starting the procedure:

1. Check that the DIP switch settings on the Mainframe rear panel are correct. See "HP E5250A DIP Switch/HP-IB Address Settings" in Chapter 4.
2. (HP E5255A only) Check that the DIP switch setting on the HP E5255A Multiplexer modules are correct. See "HP E5255A DIP Switch Settings" in Chapter 4.

---

## Overview

### Failure Modes

In this procedure, the failure modes are categorized as below. (Perform in the order 1. → 2. → 3. → 4.)

1. Power-On Fail
  - 1-1. **Line** LED does not light.
  - 1-2. **System Fail** LED is lit.
  - 1-3. **Fail** LED is lit.
  - 1-4. Other LEDs are lit (unexpectedly).
2. Unable to control
  - 2-1. Self-Test cannot be executed from Front Panel.
  - 2-2. Unable to control unit via HP-IB.
3. Self-Test Fail
  - 3-1. Self-Test (Relay Test) Fail
4. PV Test Fail (HP E5252A Matrix)

- 4-1. ON R Test Fail (Closed Channel Resistance)
- 4-2. Off R Test Fail (Isolation Resistance/ Leakage)
- 5. PV Test Fail (HP E5255A Multiplexer)
  - 5-1. ON R Test Fail (Closed Channel Resistance)
  - 5-2. Off R Test Fail (Isolation Resistance/ Leakage)

## Field Replaceable Units (FRUs)

The troubleshooting procedure assumes that the following parts and assemblies are FRUs.

### ■ PC-Board Assemblies

- E5250-66501: CPU Bd (CPU Board)
- E5250-66502: M-Bd (Mother Board)
- E5250-66503: F-Bd (Front LED Board)
- E5250-66504: HP-IB Bd (HP-IB Board)
- E5250-61001: PS (Power Supply)
- E5252-66501: Matrix Bd (HP E5252A Matrix Module)
- E5255-66501: Multiplexer Bd (HP E5255A Multiplexer Module)

### ■ Others

- E5250-61631: AUX Path Coaxial Cable (The *IV* Path cables are soldered with the mother board.)
- E5250-61626: 14-Pin Cable Assy
- 0490-2326 Low I Path Relay (Matrix and Multiplexer)  
(2A):
- 0490-1790 IV Path Pre-selector (Matrix: I-V 1–4 ch Path)
- (1A1B): IV Path Pre-selector (Multiplexer: I-V Path)
- 0490-1793 General Path Relay (Matrix)
- (2A): IV 5/6 Path Pre-selector (Matrix)
- Bias Path Relay (Multiplexer)

### Note



Pre-selectors are the relays that are located at the matrix/multiplexer input points.

---

# Troubleshooting Flow

## 1. Power-On Fail

---

### Note



Normal LED On/Off pattern at Power-On is as follows:

1. Power switch ON.  
(0.5 sec)
  2. All LEDs are lit.  
(0.5 sec)
  3. **Remote** and **System Fail** LEDs turn off.  
(1 sec)
  4. **Fail** and **Local/Self-Test** LEDs turn off.
- 

Perform in the order 1-1 → 1-2 → 1-3 → 1-4.

### 1-1: "Line" LED does not light

The LED never lights or goes off immediately?

|

+Y-> Remove all modules, then retry. Fixed?

|

| +Y-> Install one module at a time, then check the result

| | -> [Replace failed module]

|

| +-N-> [Replace PS] (If not fixed replace CPU Bd)

|

+N-> [Replace Front LED Bd] (If not fixed replace in the order of  
CPU Bd -> M-Bd)

### 1-2: "System Fail" LED is lit

[Replace CPU Bd] (If not fixed replace PS)

(Ignore the statuses of other LEDs)

### 1-3: "Fail" LED is lit

Remove all modules, then retry. Fixed?

|

+Y-> Install one module at a time, then check the result

|

| +-> [Replace failed module] (If not fixed replace M-Bd)

|

+N-> [Replace CPU bd] (If not fixed replace M-Bd)

#### 1-4: Other LEDs are lit (unexpectedly)

```
"Remote" or "Local/Self-Test" LED is lit?  
|  
+-Y-> [Replace CPU Bd] (If not fixed replace F-Bd)  
|  
+-N-> At least one LED lights?  
|  
+-Y-> [Replace CPU Bd]  
|  
+-N-> [Replace F-Bd] (If not fixed replace M-Bd)
```

## 2. Unable to Control

#### 2-1: Self-Test cannot be executed from Front Panel

```
Unable to control unit via HP-IB?  
|  
+-Y-> [Replace CPU Bd]  
|  
+-N-> [Replace F-Bd] (If not fixed replace M-Bd)
```

#### 2-2: Unable to control unit via HP-IB

```
[Replace CPU Bd] (If not fixed replace HP-IB Bd)
```

## 3. Self-Test Fail

#### 3-1: Self-Test (Relay Test) Fail

```
Use Trouble Isolation Program--see the explanation below  
(If this does not work replace M-Bd or AUX Path Coax Cable)
```

The Trouble Isolation Program may report multiple relays as failed relays. The following example shows that the relays K705(F), K116(G), K205(F), K216(F), K316(F), K416(F), K516(F), K514(F) failed the OPEN TEST. (One of the relays is considered stuck.)

```
F705,G116,F205,F216,F316,F416,F516,F514 OPEN FAIL
```

If multiple relays are reported, use the following procedures to isolate the defective relay.

|           |                                                                                                                                                                    |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Open Test | One of the reported relays is considered stuck. (The relays are normally open.) Measure the resistances between the terminals of the reported relays (one by one). |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|            |                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Close Test | One of the reported relays is considered open (will not make). Run the Closed Channel Resistance Test of the Performance Verification. If an input-output path of the test includes the Open relay, the PV should fail at this measurement. Confirm the relays used in the failed measurement (on the block diagrams) and check for the relay(s) that are in the relay list displayed by the Trouble Isolation Program. |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 3-4 Troubleshooting Procedure

## 4. PV Test Fail (HP E5252A Matrix)

### 4-1: ON R Test Fail (Closed Channel Resistance)

Note: Marginal = [Spec R] > [On R] > [Spec R × 0.7]

|

One Output ch Fail?

|

+-Y-> [Exchange Failed Path Relay]

|

+-N-> Multiple Output Ch Fail (or Marginal) at single Input ch?

|

+-Y-> Multiple Modules Fail?

|

| +-Y-> [Replace Mother Bd or AUX Path Coax Cable]

|

| +-N-> [Replace Path Pre-selector Relay of failed Input ch]  
(If not fixed replace Mother Bd or AUX Path Coax Cable,  
then Failed Path Relay)

|

+-N-> [Replace Failed Path Relay] (If not fixed replace  
Path Pre-selector Relay)

#### 4-2: Off R Test Fail (Isolation Resistance/ Leakage)

Note: If multiple modules fail, perform PV & troubleshooting one by one.

|

Note: If one-by-one test passes and multiple test fails, then  
replace [Pre Selector Relay -> Mother Bd or AUX Path Coax Cable]

|

One Output ch Fail?

|

+Y-> [Replace Failed Path Relay] (If not fixed, contamination suspected)  
-> Replace module or clean module

|

+N-> Multiple Output Ch Fail at single Input ch?

|

+Y-> Only One Output Ch Pass?

|

+Y-> [Replace Passed Path Relay]  
(If not fixed replace Failed Path Pre-Selector Relay)

|

+N-> All Output Ch Fail?

|

+Y-> [Replace Failed Input Ch Pre-Selector Relay]  
(If not fixed replace Mother Bd or AUX Path Coax  
Cable -> Failed Path Relay)

|

+N-> [Replace Path Relay passed with best measurement data]  
(If not fixed replace Failed Output Ch Path Relay  
-> Failed Input Ch Pre-Selector relay)

|

+N-> [Replace Failed Output Ch Path Relay]  
(If not fixed replace Path Pre-Selector Relay)

## 5. PV Test Fail (HP E5255A Multiplexer)

### 5-1: ON R Test Fail (Closed Channel Resistance)

Note: Marginal = [Spec R] > [On R] > [Spec R × 0.7]

|

Note: If resistors are used in Bias path, take resistor values into account. In this case PV program does not perform Pass/Fail judgment (performs measurements only).

If measured values seem unusual, check individual resistances; or short terminals temporarily, then perform PV.

|

One Output ch Fail?

|

+-Y-> [Replace Failed Path Relay]

|

+-N-> Multiple Output Ch Fail (or Marginal) at single Input ch?

|

+-Y-> Is Fail on Bias Path?

|

| +-Y-> [Replace Module]

|

| +-N-> Multiple Module or Blocks Fail?

|

| +-Y-> [Replace M-Bd]

|

| +-N-> [Replace Failed Input Ch Path Pre-Selector Relay]  
(If not fixed replace M-Bd or AUX Path Coax Cable  
-> Failed Path Relay)

|

+-N-> [Replace Failed Path Relay]

(If not fixed replace Path Pre-Selector Relay)

## 5-2: Off R Test Fail (Isolation Resistance/ Leakage)

Note: If multiple modules fail, perform PV & troubleshooting one by one.

|

Note: If multiple blocks are connected to single Input ch and PV fails, connect each block to single input, then perform PV & troubleshooting. If single input -- single block connections are OK and single input -- multiple block connections fail, then replace [Pre Selector Relay -> Mother Bd]

|

One Output ch Fail?

|

+--Y-> [Replace Failed Path Relay] (If not fixed, contamination suspected)  
-> Replace module or clean module

|

+--N-> Multiple Output Ch Fail at single Input ch?

|

+--Y-> Only One Output Ch Pass?

|

+--Y-> [Replace Passed Path Relay]  
(If not fixed replace Failed Path Pre-Selector Relay)

|

+--N-> All Output Ch Fail?

|

+--Y-> [Replace Failed Input Ch Pre-Selector Relay]  
(If not fixed replace Mother Bd or AUX Path Coax  
Cable -> Failed Path Relay)

|

+--N-> [Replace Path Relay passed with best measurement data]  
(If not fixed replace Failed Output Ch Path Relay  
-> Failed Input Ch Pre-Selector relay)

|

+--N-> [Replace Failed Output Ch Path Relay]  
(If not fixed replace Path Pre-Selector Relay)

## Hardware Information

---

### HP E5252A 10×12 Matrix Switch

The HP E5252A 10×12 Matrix Switch is a 10-input to 12-output switching matrix card for the HP E5250A.

A maximum of four HP E5252As can be installed in the HP E5250A. All the input terminals of the HP E5252As are connected together inside the HP E5250A (on the mother board backplane bus). The following are possible matrix configurations:

One HP E5252A: 10×12 matrix

Two HP E5252As: 10×24 matrix

Three HP E5252As: 10×36 matrix

Four HP E5252As: 10×48 matrix

The HP E5252A has 10 input ports connected to the HP E5250A rear panel.

Note the following points:

- SMU1 and SMU2 are for low current measurement and have better isolation resistance specification than other channels.
- SMU5, HF1, and CV1 ports share the same input path. (One port can be used at time.)
- SMU6, HF2, and CV2 ports share the same input path. (One port can be used at a time.)
- No DIP switch settings or inside cable connections are required.
- Each input port of the HP E5252A has a relay called **pre-selector relay**.

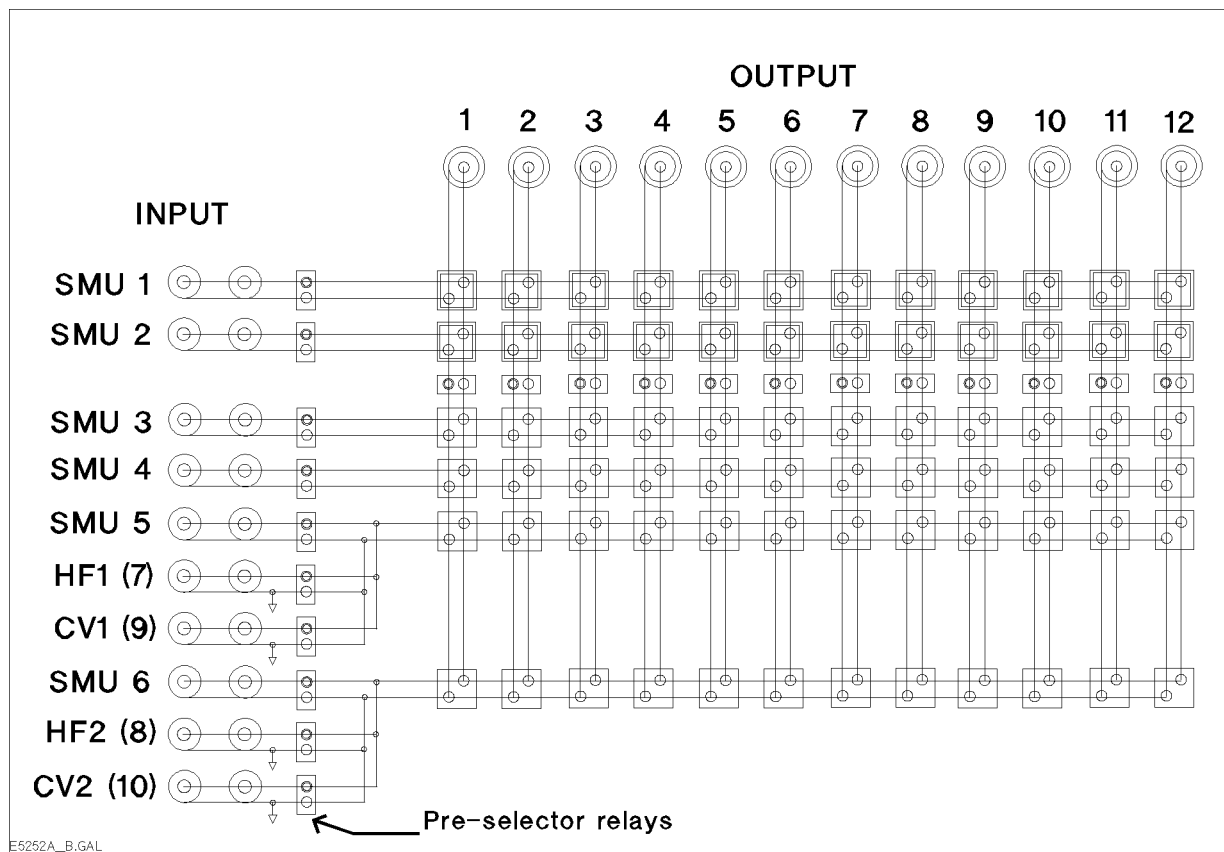


Figure 4-1. HP E5252A Block Diagram

## HP E5255A 24 (8×3) Channel Multiplexer

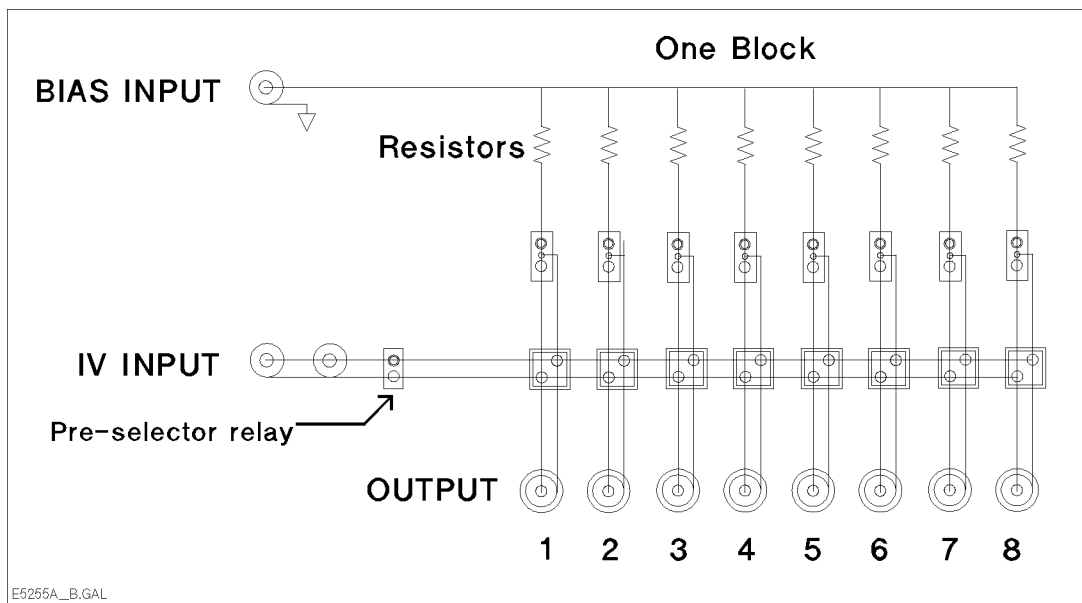
The HP E5255A 24 (8×3) Channel Multiplexer is a 2-input (IV and BIAS) to 24-output multiplexer card for the HP E5250A. The HP E5255A consists of three blocks (three 2×8 multiplexers). One HP E5255A can be configured as a 2×8 multiplexer, 2×16 multiplexer, or 2×24 multiplexer.

A maximum of four HP E5255As can be installed in the HP E5250A, which can use the multiplexers in many configurations. The following are examples:

Twelve 8-output multiplexers: Three 8-output multiplexers → Four HP E5255As

Four 24-output multiplexers: 24-output multiplexer → Four HP E5255As (Four SMU inputs are used.)

One 96-output multiplexer: 24-output multiplexer → Four HP E5255As (One SMU input is used.)



**Figure 4-2. HP E5255A (One Block) Block Diagram**

The HP E5255A has three (one for each block) BIAS input ports on the HP E5255A rear panel and SMU1–SMU6 terminals, which are connected to the SMU INPUT ports on the HP E5250A rear panel.

Note the following points:

- The BIAS input ports are used to apply ac or dc bias to DUT. BIAS ports are BNC connectors. Each BIAS input port is assigned to a 2×8 multiplexer block. The user can make internal connections to connect a BIAS input port to multiple blocks.
- IV input is used for measuring/forcing dc current/voltage. The IV input can be connected internally to the desired HP E5250A SMU INPUT connector (SMU1–SMU6). HP E5250A AUX INPUT connectors are not used with the HP E5255A.
- Each 8-channel output connector is assigned to a 2×8 multiplexer.
- Resistors connected between BIAS path and IV path are for protecting DUT from electrical damage. When shipped from the factory, 0Ω resistance is used in the HP E5255A. The user can easily replace this with desired resistors. Three resistor sets (0Ω, 1.2kΩ, and 22kΩ) are furnished with the HP E5255A.
- Each IV input port of the HP E5255A has a relay called **pre-selector relay**.

### Important



Internal DIP switch setting is required. If the setting is correct, the Performance Verification program will fail.

- Specify the SMU INPUT connector used for the IV input. (Select from SMU1–SMU6.)
- Specify if resistors other than 0Ω are used (0Ω or other).

## HP E5255A DIP Switch Settings

Each HP E5255A block has a DIP switch. The DIP switches must be set properly according to the internal connection. Each DIP switch has four bit switches. For detailed information about the HP E5255A setting, see "To Set up the Internal Connections of HP E5255A" in Chapter 2 of the *HP E5250A User's Guide* (HP P/N E5250-90000).

Bits 1 to 3 are used to specify which SMU input connector is connected to the IV input port of the block.

Bit 4 is related to the resistors in the resistor holders. If  $0\Omega$  resistors are installed in the resistor holder for a block, set bit 4 to 0. If other resistors are installed, set bit 4 to 1.

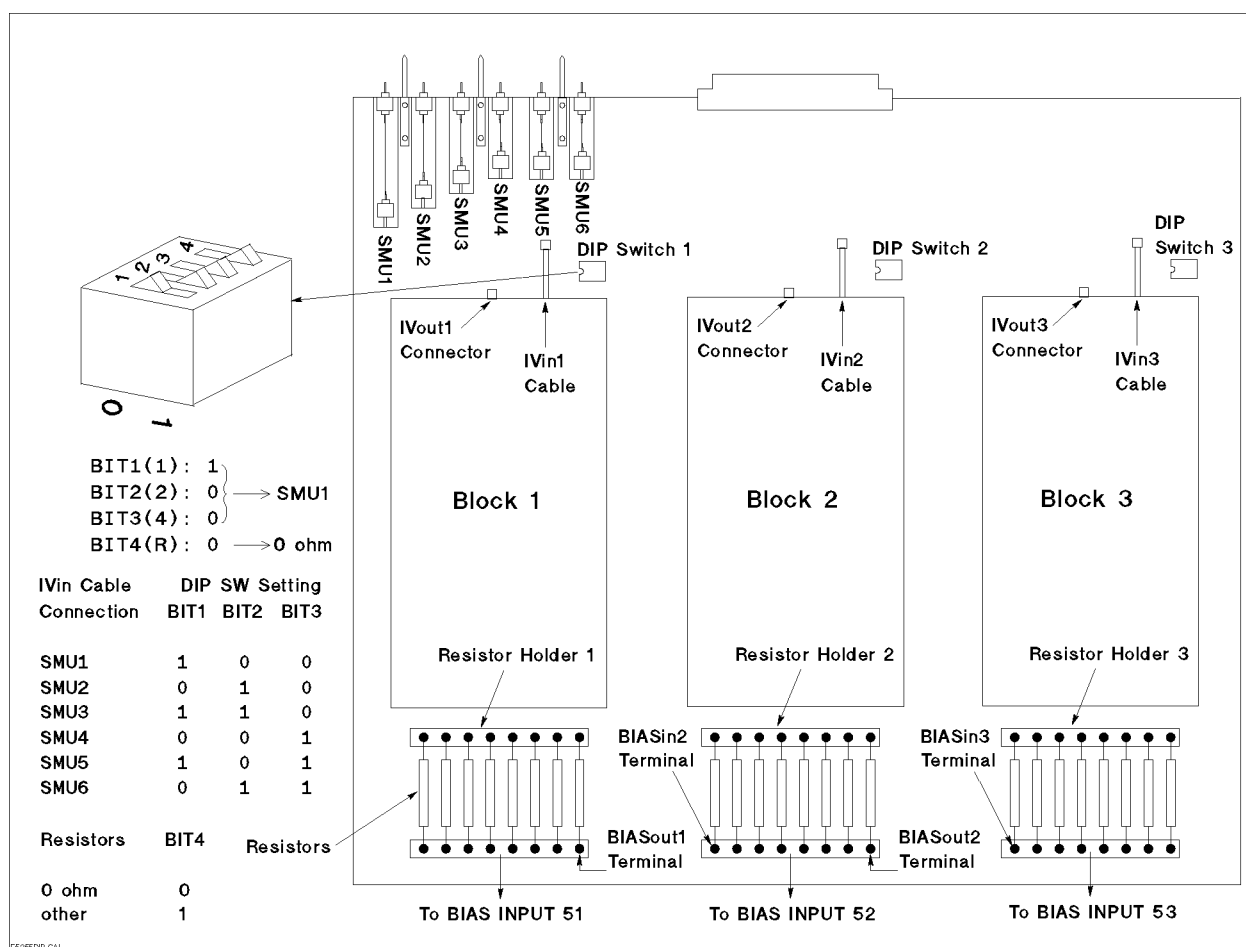


Figure 4-3. HP E5255A DIP Switch Settings

The following is an example for making 2-input  $\times$  24-output multiplexer using one HP E5255A:

1. Connect the "IVin1" cable of "Block1" to the desired SMU input connector. This will be the IV input for the 24 channel multiplexer.
2. Connect the "IVin2" cable of "Block2" to the "IVout1" connector of "Block1".
3. Connect the "IVin3" cable of "Block3" to the "IVout2" connector of "Block2".

### 4-4 Hardware Information

4. Connect the "BIASout1" terminal to the "BIASin2" terminal by using the wire included in the BIAS Input Modification Kit furnished with the HP E5255A.
5. Connect the "BIAS out2" terminal to the "BIASin3" terminal by using the wire.
6. Set "DIP SW1", "DIP SW2", and "DIP SW3". See Figure 4-3. Settings for bits 1 to 3 of these three DIP switches must be the same.
7. Connect BNC open caps included in the BIAS Input Modification Kit furnished with the HP E5255A to the BIAS INPUT 52 and 53 connectors. Hence, in this case, the BIAS INPUT 51 connector will be the bias input port of the 24 channel multiplexer.

## HP E5250A DIP Switch/HP-IB Address Settings

The HP E5250A has a DIP switch on the rear panel, which is mainly used for setting the HP-IB address.

| Rear Panel DIP Switch (Factory Setting) |  |   |   |   |   |   |   |                |
|-----------------------------------------|--|---|---|---|---|---|---|----------------|
| +-----+                                 |  |   |   |   |   |   |   |                |
| 1                                       |  |   |   | 0 | 0 | 0 |   |                |
| 0                                       |  | 0 | 0 | 0 | 0 |   | 0 |                |
| +-----+                                 |  |   |   |   |   |   |   |                |
|                                         |  | 1 | 2 | 3 | 4 | 5 | 6 | 7 8 ( Bit No ) |

**Figure 4-4. Rear Panel DIP Switch Settings**

**Table 4-1. Rear Panel DIP Switch Settings**

| Bit No | Name               | Meaning                                                                            |
|--------|--------------------|------------------------------------------------------------------------------------|
| 1      | Prod Test Mode     | 0: Normal Mode <sup>1</sup><br>1: Production Test Mode                             |
| 2      | ROM CheckSum Skip  | 0: Execute ROM CheckSum <sup>1</sup><br>1: Skip ROM CheckSum                       |
| 3      | SYS_FAIL Disp Mode | 0: Only SYS_FAIL LED on SYS_FAIL <sup>1</sup><br>1: ERROR Code (4-bit) on SYS_FAIL |
| 4-8    | HP-IB Address      | 0 - 31: HP-IB Address<br>( Bit 8 is LSB )<br>Factory Setting = 22                  |

<sup>1</sup> Factory setting—do not change

The above factory (normal) setting means:

- Execute ROM CheckSum
- Only SYS\_FAIL LED on SYS\_FAIL
- HP-IB Address = 22

Bits 1 through 3 are for factory use only—they must be 0 for normal use at the customer site.

---

## Power-On Self-Test

The following indicate the required HP E5250A rear panel DIP switch (bit) setting for each Power-On Test item (for bits 1 through 3):

1. LED Display Test: Bit1 = 1
2. ROM CheckSum Test: Bit2 = 0
3. RAM Read/Write Test: (Always executed)
4. DIP Switch Test: Bit1 = 1 (Infinite loop)
5. Timer Test: Bit1 = 0
6. Module IO Test: Bit1 = 0

The following are brief explanations of Power-On Test items:

1. LED Display Test

Front Panel LED ON/OFF Test

1. Turn on all LEDs (1 second).
2. Turn off all LEDs (0.5 second).
3. Turn on one LED at 0.3 second interval.  
(Order: REMOTE → SYS\_FAIL → FAIL → TEST)
4. Turn off all LEDs.

2. ROM CheckSum Test

3. RAM Read/Write Test

Perform read/write test of all RAMs.

1. 00H Write & Read Test
2. FFH Write & Read Test
3. A5H Write & Read Test (if Bit1 = 1)
4. 5AH Write & Read Test (if Bit1 = 1)
5. Addressability test (if Bit1 = 1)

4. DIP Switch Test

Indicate present DIP switch setting by using LEDs.

- (Repeat 1 through 3 infinitely.)
1. Turn on all LEDs (1 second).
  2. Bits 5 through 8 (1 second).
  3. Bits 1 through 4 (1 second).

5. Timer Test

1. TIMER2 Test (1 msec)
2. TIMER5 Test (1 sec)

6. Module IO Test

1. Card1 ID Check
2. Card1 ID Check
3. Card1 ID Check
4. Card1 ID Check

**LED Patterns (Error Codes) on SYS\_FAIL** (SYS\_FAIL Disp Mode—Bit3 = 1)

**LED Patterns (Error Codes)**

| Error Code | TEST | FAIL | SYS_FAIL | REMOTE |
|------------|------|------|----------|--------|
| 1          | off  | off  | off      | ON     |
| 2          | off  | off  | ON       | off    |
| 3          | off  | off  | ON       | ON     |
| 4          | off  | ON   | off      | off    |
| 5          | off  | ON   | off      | ON     |
| 6          | off  | ON   | ON       | off    |
| 7          | off  | ON   | ON       | ON     |
| 8          | ON   | off  | off      | off    |
| 9          | ON   | off  | off      | ON     |
| 10         | ON   | off  | ON       | off    |
| 11         | ON   | off  | ON       | ON     |
| 12         | ON   | ON   | off      | off    |
| 13         | ON   | ON   | off      | ON     |
| 14         | ON   | ON   | ON       | off    |
| 15         | ON   | ON   | ON       | ON     |

■ SysFail on Boot Test

- ROM CheckSum Test Fail      Error Code 1 (0.2 sec interval)  
RAM Read/Write Test Fail      Error Code 2 (0.2 sec interval)

■ SysFail on Boot Initialize

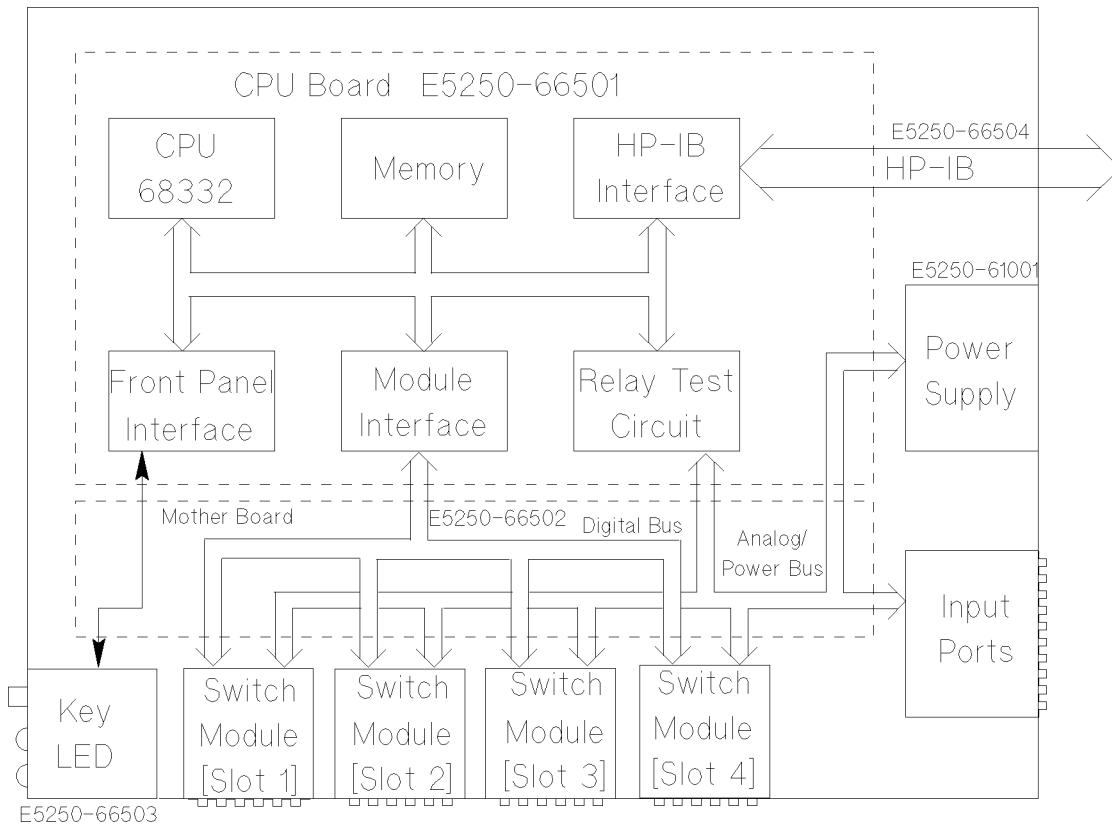
|                      |                                 |
|----------------------|---------------------------------|
| PON_TEST Fail        | Error Code 1 (0.5 sec interval) |
| IS_OPEN Fail         | Error Code 2 (0.5 sec interval) |
| IS_REGISTER Fail     | Error Code 3 (0.5 sec interval) |
| RLOCK_OPEN Fail      | Error Code 4 (0.5 sec interval) |
| MCAT_OPEN Fail       | Error Code 5 (0.5 sec interval) |
| SCPI_SPAWN Fail      | Error Code 6 (0.5 sec interval) |
| SCPI_ACTIVATE Fail   | Error Code 6 (0.5 sec interval) |
| KEYP_SPAWN Fail      | Error Code 7 (0.5 sec interval) |
| KEYP_ACTIVATE Fail   | Error Code 7 (0.5 sec interval) |
| SE_OPEN Fail         | Error Code 8 (0.5 sec interval) |
| SCUM_OPEN Fail       | Error Code 9 (0.5 sec interval) |
| HRSCPI_OPEN Fail     | Error Code10 (0.5 sec interval) |
| SCPI_OPEN Fail       | Error Code11 (0.5 sec interval) |
| SCPILANG_OPEN Fail   | Error Code12 (0.5 sec interval) |
| SCPISTREAM_OPEN Fail | Error Code13 (0.5 sec interval) |
| OTHER Fail           | Error Code15 (0.5 sec interval) |

■ SysFail after Boot (Exception Error)

|                 |                                 |
|-----------------|---------------------------------|
| BUS Error       | Error Code 1 (1.2 sec interval) |
| ADDRESS Error   | Error Code 2 (1.2 sec interval) |
| ILLEGALOP Error | Error Code 3 (1.2 sec interval) |
| DIVZERO Error   | Error Code 4 (1.2 sec interval) |
| PRIVVIOL Error  | Error Code 5 (1.2 sec interval) |
| FMT Error       | Error Code 6 (1.2 sec interval) |
| UNINIT Error    | Error Code 7 (1.2 sec interval) |
| SPURIOUS Error  | Error Code 8 (1.2 sec interval) |
| OTHER Error     | Error Code15 (1.2 sec interval) |

---

## Control and Power Supply Diagram



**Figure 4-5. CPU and Control Diagram**

### CPU Board

68332 16 MHz  
512 KB UVROM  
128 KB SRAM  
Self-Test Circuitry

### Module Interface Bus

Data: 8-bit  
Address: 5-bit  
Control: 4 lines (Reset, Board Select, Read, Write)

### Power Supply

Input:  
100 – 240 VAC  $\pm 10\%$  (Auto selection)  
47 Hz – 63 Hz  
100 VA Maximum  
Output:  
+12 V 3 A  $\pm 7\%$  (For relays)  
+5 V 2 A  $\pm 3\%$  (For digital)

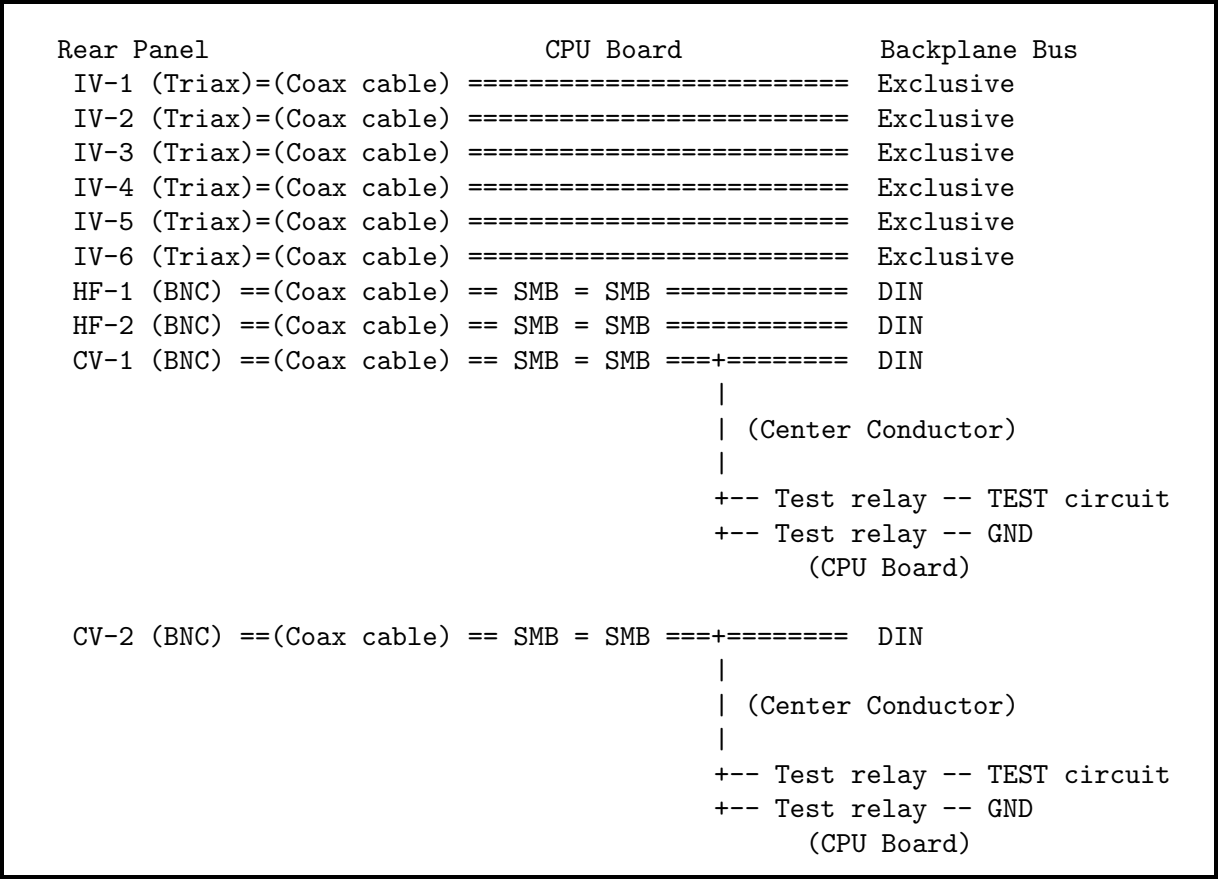


Figure 4-6. Mother Board (Backplane) Configuration

Circuit Diagrams

Insert artwork here.

**Figure 4-7. HP E5252A Circuit Diagram (1/4)**

Insert artwork here.

**Figure 4-8. HP E5252A Circuit Diagram (2/4)**

Insert artwork here.

**Figure 4-9. HP E5252A Circuit Diagram (3/4)**

Insert artwork here.

**Figure 4-10. HP E5252A Circuit Diagram (4/4)**

Insert artwork here.

**Figure 4-11. HP E5255A Circuit Diagram (1/3)**

Insert artwork here.

**Figure 4-12. HP E5255A Circuit Diagram (2/3)**

Insert artwork here.

**Figure 4-13. HP E5255A Circuit Diagram (3/3)**



## Replaceable Parts

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This chapter provides replaceable parts information.

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**Warning**

**Dangerous voltages are present in this instrument. Use extreme caution when handling, testing, and adjusting.**

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**Warning**

**When replacing the power supply module, do NOT touch the components on the module|they become very hot.**

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**Caution**

**When handling the printed circuit boards and components on the HP E5252A and HP E5255A, use clean gloves. Stains, lint, oil, etc. cause leakage currents.**

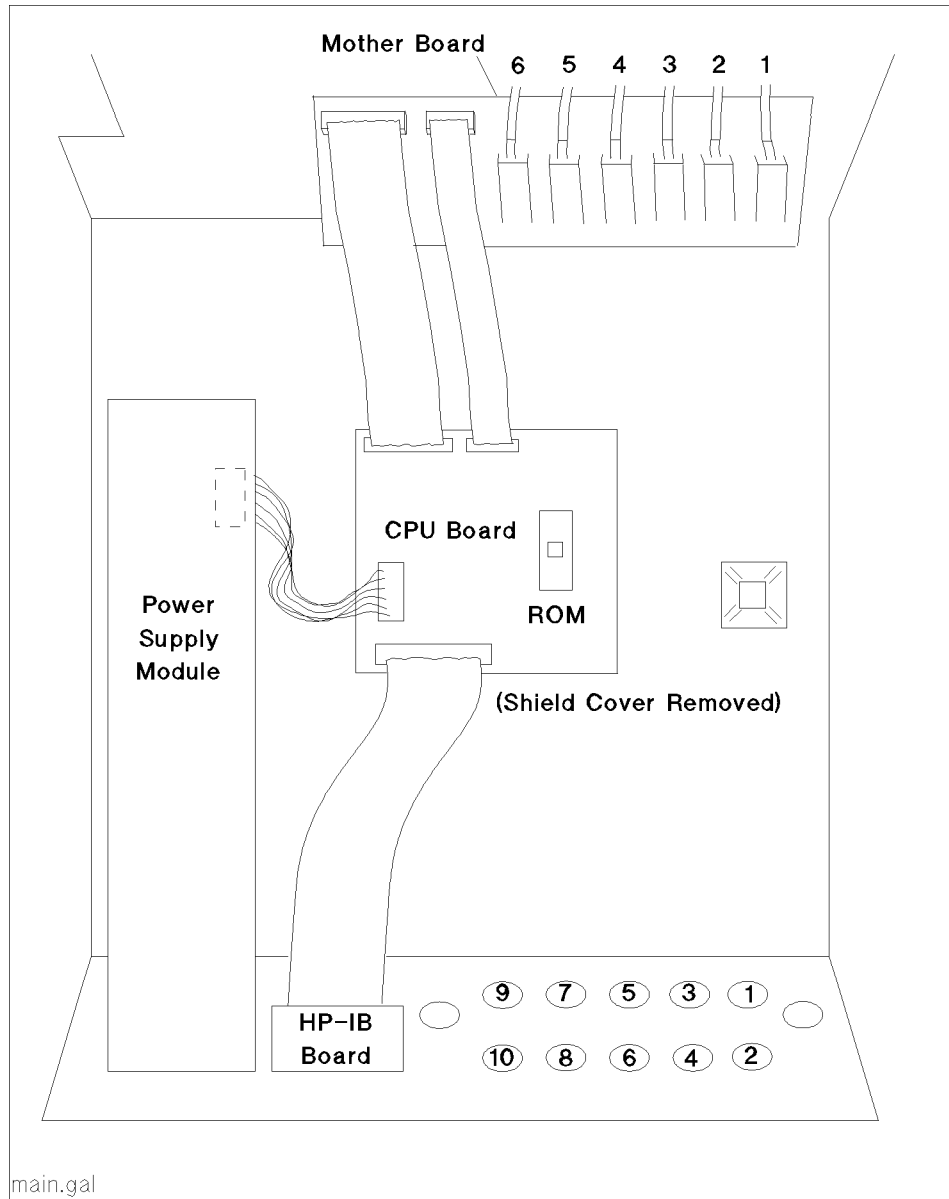
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## Replaceable Parts Lists

### HP E5250A Mainframe Assemblies

The electrical part of the HP E5250A Mainframe consists of the assemblies shown in the following figure:



**Figure 5-1. HP E5250A Assembly Location**

**Table 5-1. HP E5250A Major Assemblies**

| Assembly Name     | New Assembly Part Number |
|-------------------|--------------------------|
| Power Supply Unit | E5250-61001              |
| CPU               | E5250-66501              |
| Mother Board      | E5250-66502              |
| Front LED Board   | E5250-66503              |
| HP-IB Board       | E5250-66504              |

For the Front LED Board location, see Figure 5-6.

### HP E5252A/E5255A Parts

The HP E5252A Matrix and HP E5255A Multiplexer are component-level repair products. Assembly replacement is acceptable when the assembly is worn out or component-level repair is not possible.

---

**Note**

Relays have life specifications. If near the end of their expected life, and many relays are wearing out, we recommend that the assemblies be replaced with new assemblies.

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**Table 5-2. HP E5252A/E5255A Major Replaceable Parts**

| Assembly/Part Name            | New Assembly Part Number |
|-------------------------------|--------------------------|
| 10×12 Matrix (HP E5252A)      | E5252-66501              |
| 24-Ch Multiplexer (HP E5255A) | E5255-66501              |
| Relay, Reed 1C 12V            | 0490-1790                |
| Relay, Reed 2A 12V            | 0490-1793                |
| Relay, Reed 2M 12V            | 0490-2326                |
| Spring Contact Pin            | 0960-0931                |
| FUSE-SMT 5A 125V              | 2110-0935                |

**Table 5-3. HP E5252A Parts**

| Reference<br>Designation | Part Number | Description          | Quantity |
|--------------------------|-------------|----------------------|----------|
| C1                       | 0180-3597   | CAP 47 $\mu$ F 35 V  | 1        |
| C2                       | 0180-3597   | CAP 47 $\mu$ F 35 V  | 1        |
| C3                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C4                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C5                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C6                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C7                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C8                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C9                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C10                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C11                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C12                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C13                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C14                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C15                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C16                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C17                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C18                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C19                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C20                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C21                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C22                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C23                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| F1                       | 2110-0935   | FUSE-SMT 5A 125V     | 1        |
| F2                       | 2110-0935   | FUSE-SMT 5A 125V     | 1        |
| I1                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I3                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I4                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I5                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I6                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I7                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I8                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I10                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I11                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I12                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I13                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I15                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I16                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I17                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I18                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I20                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I21                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I23                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I24                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I25                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I26                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I28                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I29                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I30                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I31                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I33                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I34                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I35                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I36                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I38                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I39                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I40                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I41                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I42                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I43                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I45                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I46                      | 0360-1641   | TERM-FKD-TUR         | 1        |

**Table 5-3. HP E5252A Parts (continued)**

| Reference<br>Designation | Part Number | Description      | Quantity |
|--------------------------|-------------|------------------|----------|
| I47                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I48                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I50                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I51                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I52                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I53                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I55                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I56                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I57                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I58                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I60                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I61                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| I62                      | 0360-1641   | TERM-FKD-TUR     | 1        |
| J1                       | 0960-1238   | PROBE COAX       | 1        |
| J2                       | 0960-1238   | PROBE COAX       | 1        |
| J3                       | 0960-1238   | PROBE COAX       | 1        |
| J4                       | 0960-1238   | PROBE COAX       | 1        |
| J5                       | 0960-1238   | PROBE COAX       | 1        |
| J6                       | 0960-1238   | PROBE COAX       | 1        |
| J7                       | 1251-7799   | CONN-POST-TP-PST | 1        |
| K101                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K102                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K103                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K104                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K105                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K106                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K107                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K108                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K109                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K110                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K111                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K112                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K116                     | 0490-1790   | RLY-REED 1T 2.5A | 1        |
| K201                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K202                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K203                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K204                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K205                     | 0490-2326   | RLY-REED 2M 1    | 1        |
| K206                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K207                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K208                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K209                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K210                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K211                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K212                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K216                     | 0490-1790   | RLY-REED 1T 2.5A | 1        |
| K301                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K302                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K303                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K304                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K305                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K306                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K307                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K308                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K309                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K310                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K311                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K312                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K316                     | 0490-1790   | RLY-REED 1T 2.5A | 1        |
| K401                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K402                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K403                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K404                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K405                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K406                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K407                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K408                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K409                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K410                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K411                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K412                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K416                     | 0490-1790   | RLY-REED 1T 2.5A | 1        |
| K501                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K502                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K503                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |

**Table 5-3. HP E5252A Parts (continued)**

| Reference Designation | Part Number | Description           | Quantity |
|-----------------------|-------------|-----------------------|----------|
| K504                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K505                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K506                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K507                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K508                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K509                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K510                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K511                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K512                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K514                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K515                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K516                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K601                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K602                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K603                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K604                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K605                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K606                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K607                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K608                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K609                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K610                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K611                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K612                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K614                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K615                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K616                  | 0490-1793   | RLY-REED 2M 2.5A      | 1        |
| K701                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K702                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K703                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K704                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K705                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K706                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K707                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K708                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K709                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K710                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K711                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K712                  | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| L1                    | 9140-1976   | L 10 $\mu$ H +10%–10% | 1        |
| L2                    | 9140-1976   | L 10 $\mu$ H +10%–10% | 1        |
| TP1                   | 1252-3721   | CONN-SGL CONT         | 1        |
| TP2                   | 1252-3721   | CONN-SGL CONT         | 1        |
| U1                    | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U2                    | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U3                    | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U4                    | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U5                    | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U6                    | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U7                    | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U8                    | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U9                    | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U10                   | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U11                   | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U12                   | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U13                   | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U14                   | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U15                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U16                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U17                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U18                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U19                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U20                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U21                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U22                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U23                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U24                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U25                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U26                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U27                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U28                   | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U31                   | 1820-6156   | IC-74ACT244SC         | 1        |
| U32                   | 1820-4257   | IC-SN74ALS138D        | 1        |
| U33                   | 1820-4257   | IC-SN74ALS138D        | 1        |
| U34                   | 1820-4245   | IC-SN74ALS02AD        | 1        |

**Table 5-3. HP E5252A Parts (continued)**

| Reference<br>Designation | Part Number | Description                  | Quantity |
|--------------------------|-------------|------------------------------|----------|
| U35                      | 1820-4249   | IC-SN74ALS04BD               | 1        |
| U36                      | 1820-4252   | IC-SN74ALS10AD               | 1        |
| U37                      | 1820-4933   | IC-SN74ALS541DW              | 1        |
|                          | 0361-1053   | RVT-BLINDPL-THRU             | 2        |
|                          | 0515-0664   | SCR-MACHINE (TORX)           | 2        |
|                          | 0515-0914   | SCR-MACH M3X0.5 <sup>1</sup> | 7        |
|                          | 0515-1550   | SCR-MACHINE (FOR PC BRD)     | 16       |
|                          | 0515-1551   | SCR-MACHINE (FOR GUIDE)      | 6        |
|                          | 0590-1095   | THD INSR-NUT                 | 7        |
|                          | 0590-1793   | THD INSR-STDF                | 13       |
|                          | 0960-0931   | SPRING CONTACT PIN           | 6        |
|                          | 1250-1906   | TRIAxIAL CONNECTOR           | 12       |
|                          | 1400-0249   | CABLE TIE                    | 2        |
|                          | 3050-1284   | WASHER CAPTIVE (FOR TORX)    | 2        |
|                          | 5080-3211   | LABEL                        | 1        |
|                          | 8150-3491   | WIRE                         | 3        |
|                          | E5252-00101 | CHASSIS                      | 1        |
|                          | E5252-00201 | REAR PANEL                   | 1        |
|                          | E5252-00601 | TOP COVER                    | 1        |
|                          | E5252-01201 | L-ANGLE (LONG)               | 1        |
|                          | E5252-01202 | L-ANGLE (SHORT)              | 1        |
|                          | E5252-24003 | STANDOFF                     | 4        |
|                          | E5252-24004 | GUIDE (FOR CONTACT PIN)      | 3        |
|                          | E5252-26501 | PC-BD BLANK                  | 1        |
|                          | E5252-61620 | IV CONN CABLE(SMU1/2)        | 2        |
|                          | E5252-61621 | IV ROW CABLE (WHT/RED)       | 12       |

1 (FOR TOP COVER (3)/ PC BOARD (4))

**Table 5-4.**  
**HP E5255A Parts**

| Reference<br>Designation | Part Number | Description          | Quantity |
|--------------------------|-------------|----------------------|----------|
| C1                       | 0180-3597   | CAP 47 $\mu$ F 35 V  | 1        |
| C2                       | 0180-3597   | CAP 47 $\mu$ F 35 V  | 1        |
| C3                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C4                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C5                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C6                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C7                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C8                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C9                       | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C10                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C11                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C12                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C13                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C14                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C15                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C16                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| C17                      | 0160-7563   | CAP 0.1 $\mu$ F 25 V | 1        |
| F1                       | 2110-0935   | FUSE-SMT 5A 125V     | 1        |
| F2                       | 2110-0935   | FUSE-SMT 5A 125V     | 1        |
| I1                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I2                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I3                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I4                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I5                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I6                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I7                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I8                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I9                       | 0360-1641   | TERM-FKD-TUR         | 1        |
| I10                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I11                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I12                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I13                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I14                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I15                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I16                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I17                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I18                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I19                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I20                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I21                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I22                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I23                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I24                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I25                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I26                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I27                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I28                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I29                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I30                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I31                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I32                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I33                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I34                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I35                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I36                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I37                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I38                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I39                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I40                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I41                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I42                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I43                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I44                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I45                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I46                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I47                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I48                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I49                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I50                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I51                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I52                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I53                      | 0360-1641   | TERM-FKD-TUR         | 1        |
| I54                      | 0360-1641   | TERM-FKD-TUR         | 1        |

**Table 5-4.**  
**HP E5255A Parts**  
**(continued)**

| Reference<br>Designation | Part Number | Description      | Quantity |
|--------------------------|-------------|------------------|----------|
| J1                       | 1251-7845   | CONN-POST-TP-PST | 1        |
| J2                       | 0960-1238   | PROBE COAX       | 1        |
| J3                       | 0960-1238   | PROBE COAX       | 1        |
| J4                       | 1251-7799   | CONN-POST-TP-PST | 1        |
| J5                       | 0360-2601   | BARRIER BLOCK    | 1        |
| J6                       | 0360-2601   | BARRIER BLOCK    | 1        |
| J7                       | 0360-2601   | BARRIER BLOCK    | 1        |
| J8                       | 0960-1238   | PROBE COAX       | 1        |
| J9                       | 1250-2558   | TERMN-COAX-CA    | 1        |
| J10                      | 1250-2558   | TERMN-COAX-CA    | 1        |
| J11                      | 1250-2558   | TERMN-COAX-CA    | 1        |
| J12                      | 0360-2601   | BARRIER BLOCK    | 1        |
| J13                      | 0360-2601   | BARRIER BLOCK    | 1        |
| J14                      | 0360-2601   | BARRIER BLOCK    | 1        |
| J15                      | 0960-1238   | PROBE COAX       | 1        |
| J16                      | 0960-1238   | PROBE COAX       | 1        |
| J17                      | 1250-2558   | TERMN-COAX-CA    | 1        |
| J18                      | 0960-1238   | PROBE COAX       | 1        |
| J19                      | 1250-2558   | TERMN-COAX-CA    | 1        |
| J21                      | 1250-2558   | TERMN-COAX-CA    | 1        |
| J23                      | 1250-2558   | TERMN-COAX-CA    | 1        |
| J25                      | 1250-2558   | TERMN-COAX-CA    | 1        |
| K101                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K102                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K103                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K104                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K105                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K106                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K107                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K108                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K109                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K110                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K111                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K112                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K113                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K114                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K115                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K116                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K201                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K202                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K203                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K204                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K205                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K206                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K207                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K208                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K209                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K210                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K211                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K212                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K213                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K214                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K215                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K216                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K301                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K302                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K303                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K304                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K305                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K306                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K307                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K308                     | 0490-2326   | RLY-REED 2M 1A   | 1        |
| K309                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K310                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K311                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K312                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K313                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K314                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K315                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |
| K316                     | 0490-1793   | RLY-REED 2M 2.5A | 1        |

**Table 5-4.**  
**HP E5255A Parts**  
**(continued)**

| Reference<br>Designation | Part Number | Description           | Quantity |
|--------------------------|-------------|-----------------------|----------|
| K401                     | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K402                     | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| K403                     | 0490-1790   | RLY-REED 1T 2.5A      | 1        |
| L1                       | 9140-1976   | L 10 $\mu$ H +10%–10% | 1        |
| L2                       | 9140-1976   | L 10 $\mu$ H +10%–10% | 1        |
| R1                       | 1810-1128   | NETWORK-RES SMD       | 1        |
| SW1                      | 3101-2063   | SW-DIP 4-1A RKR       | 1        |
| SW2                      | 3101-2063   | SW-DIP 4-1A RKR       | 1        |
| SW3                      | 3101-2063   | SW-DIP 4-1A RKR       | 1        |
| TP1                      | 1252-3721   | CONN-SGL CONT         | 1        |
| U1                       | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U2                       | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U3                       | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U4                       | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U5                       | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U6                       | 1820-4257   | IC-SN74ALS138D        | 1        |
| U7                       | 1820-4245   | IC-SN74ALS02AD        | 1        |
| U8                       | 1820-4933   | IC-SN74ALS541DW       | 1        |
| U9                       | 1820-6156   | IC-74ACT244SC         | 1        |
| U10                      | 1820-4257   | IC-SN74ALS138D        | 1        |
| U11                      | 1820-6156   | IC-74ACT244SC         | 1        |
| U12                      | 1820-6156   | IC-74ACT244SC         | 1        |
| U19                      | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U28                      | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U29                      | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U30                      | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U31                      | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U32                      | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U33                      | 1820-8486   | IC-MC74ACT273DW       | 1        |
| U34                      | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U35                      | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| U36                      | 1820-6412   | XSTR ARY 16P-SMD      | 1        |
| W1                       | 8159-0005   | RES 0 CWM             | 1        |
| W2                       | 8159-0005   | RES 0 CWM             | 1        |
| W3                       | 8159-0005   | RES 0 CWM             | 1        |
| W4                       | 8159-0005   | RES 0 CWM             | 1        |
| W5                       | 8159-0005   | RES 0 CWM             | 1        |
| W6                       | 8159-0005   | RES 0 CWM             | 1        |
| W7                       | 8159-0005   | RES 0 CWM             | 1        |
| W8                       | 8159-0005   | RES 0 CWM             | 1        |
| W9                       | 8159-0005   | RES 0 CWM             | 1        |
| W10                      | 8159-0005   | RES 0 CWM             | 1        |
| W11                      | 8159-0005   | RES 0 CWM             | 1        |
| W12                      | 8159-0005   | RES 0 CWM             | 1        |
| W13                      | 8159-0005   | RES 0 CWM             | 1        |
| W14                      | 8159-0005   | RES 0 CWM             | 1        |
| W15                      | 8159-0005   | RES 0 CWM             | 1        |
| W16                      | 8159-0005   | RES 0 CWM             | 1        |
| W17                      | 8159-0005   | RES 0 CWM             | 1        |
| W18                      | 8159-0005   | RES 0 CWM             | 1        |
| W19                      | 8159-0005   | RES 0 CWM             | 1        |
| W20                      | 8159-0005   | RES 0 CWM             | 1        |
| W21                      | 8159-0005   | RES 0 CWM             | 1        |
| W22                      | 8159-0005   | RES 0 CWM             | 1        |
| W23                      | 8159-0005   | RES 0 CWM             | 1        |
| W24                      | 8159-0005   | RES 0 CWM             | 1        |

**Table 5-4.**  
**HP E5255A Parts**  
**(continued)**

| Reference<br>Designation | Part Number | Description                    | Quantity |
|--------------------------|-------------|--------------------------------|----------|
|                          | 0361-1053   | RVT-BLINDPL-THRU               | 2        |
|                          | 0380-1782   | STDF                           | 12       |
|                          | 0380-3070   | STDF-HEX .25-IN                | 6        |
|                          | 0515-0664   | SCR-MACHINE (TORX)             | 2        |
|                          | 0515-0914   | SCR-MACH M3X0.5 (FOR COVER(3)) | 12       |
|                          | 0515-1550   | SCR-MACHINE (FOR PC BRD)       | 9        |
|                          | 0515-1551   | SCR-MACHINE (FOR GUIDE)        | 6        |
|                          | 0590-1095   | THD INSR-NUT                   | 3        |
|                          | 0590-1793   | THD INSR-STDF                  | 11       |
|                          | 0960-0931   | SPRING CONTACT PIN             | 6        |
|                          | 1250-0083   | BNC CONNECTOR                  | 3        |
|                          | 1400-0249   | CABLE TIE                      | 13       |
|                          | 2190-0016   | WSHR-LK INTL T(FOR BNC)        | 3        |
|                          | 2190-0913   | WSHR-LK HLCL (FOR DSUB)        | 6        |
|                          | 2260-0002   | NUT-HEX-DBL-CHAM (FOR DSUB)    | 6        |
|                          | 2950-0001   | NUT-HEX-DBL-CHAM (FOR BNC)     | 3        |
|                          | 3050-1284   | WASHER CAPTIVE (FOR TORX)      | 2        |
|                          | 5080-3211   | LABEL                          | 1        |
|                          | 8150-3491   | WIRE                           | 2        |
|                          | E5252-24004 | GUIDE (FOR CONTACT PIN)        | 3        |
|                          | E5255-00101 | CHASSIS                        | 1        |
|                          | E5255-04001 | COVER                          | 3        |
|                          | E5255-26501 | PC-BD BLANK                    | 1        |
|                          | E5255-61620 | D-SUB CABLE ASSY               | 3        |
|                          | E5255-61621 | SMB CABLE 1 (SHORT)            | 1        |
|                          | E5255-61622 | SMB CABLE 2 (MEDIUM)           | 1        |
|                          | E5255-61623 | SMB CABLE 3 (LONG)             | 1        |
|                          | E5255-61624 | BNC CONN WIRE (3-WIRE)         | 1        |

## Tools and Consumables

The following are tools and consumables for the HP E5250A/E5252A/E5255A.

**Table 5-5. Tools and Consumables**

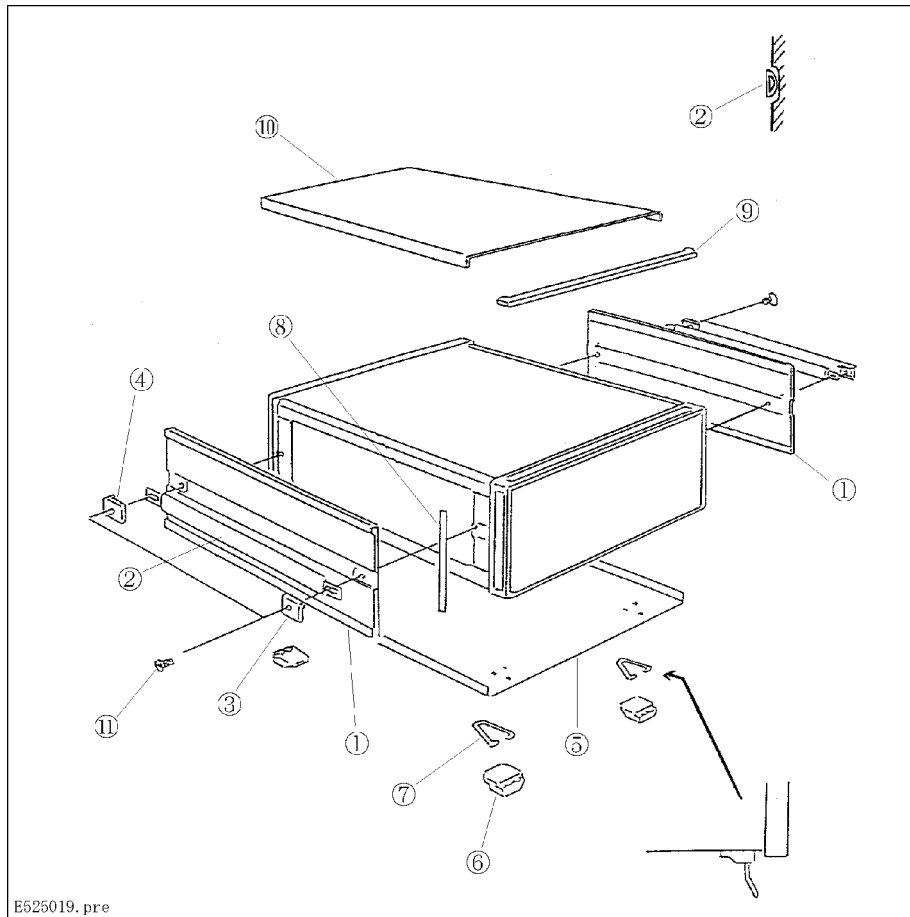
| Assembly/Part Name            | New Assembly/Part Number |
|-------------------------------|--------------------------|
| Relay Test Adapter            | E5250-60002              |
| <b>PV Tools:</b>              |                          |
| PV Tool Set <sup>1</sup>      | E5250-65801              |
| Isolation Test Adapter        | E5250-65002              |
| Banana-Triax Adapter          | E5250-65003              |
| Banana-BNC Adapter            | E5250-65004              |
| Banana-Dsub Adapter           | E5250-65005              |
| Triax-BNC Adapter             | E5250-65006              |
| MT5250 PV/Diag 3.5-In         | E5250-65201              |
| <b>Consumables:</b>           |                          |
| Jumper Cable Set              | E5255-65000              |
| RESISTOR SET 0Ω               | E5255-65001              |
| RESISTOR SET 1.2k             | E5255-65002              |
| RESISTOR SET 22k              | E5255-65003              |
| CBL with Contact Pin          | E5255-61626              |
| Triax-DualTriax Adapter       | E5250-60004              |
| SMPL/UTIL Disk                | E5250-87001              |
| Module Extractor              | 04155-60007              |
| Torx Wrench <sup>2</sup>      | 8710-2151                |
| Module Protector <sup>3</sup> | E5250-89001              |

1 Includes five PV adapters and PV/Diag diskette; does not include Relay Test Adapter.

2 Used for removing/installing the HP E5252A/E5255A.

3 Used for protecting the HP E5252A/E5255A, such as during transit.

## HP E5250A Mainframe Chassis

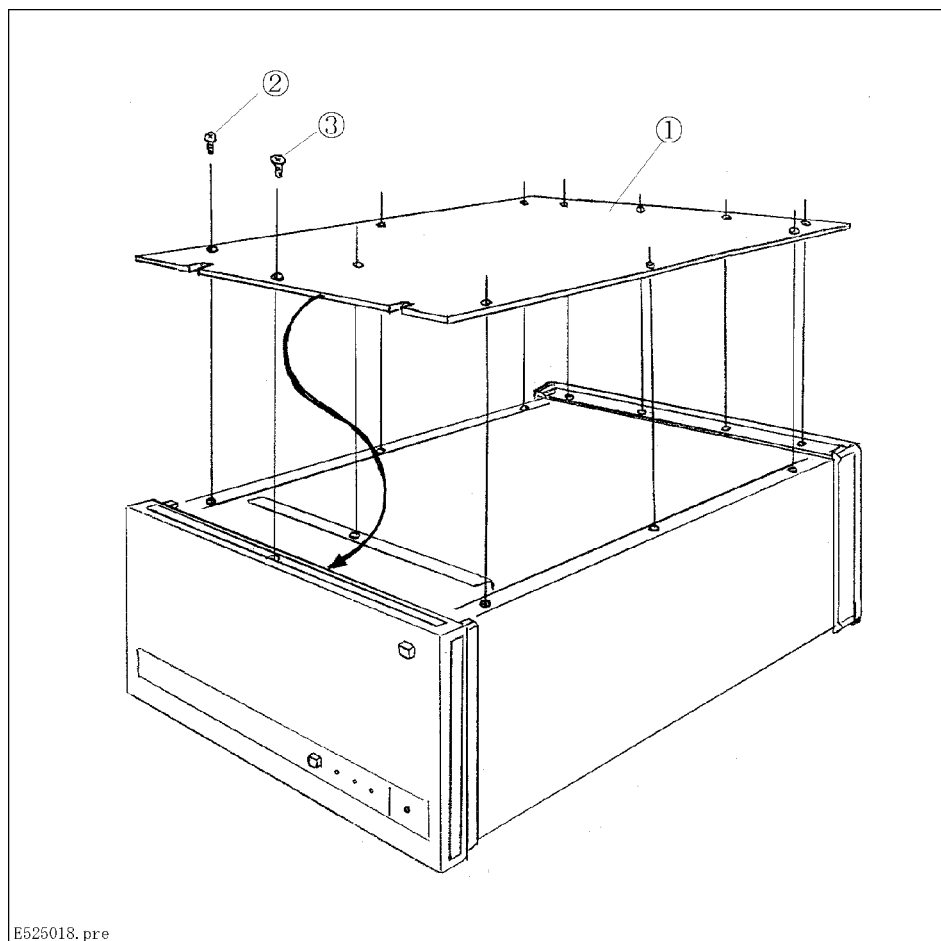


**Figure 5-2. Mainframe (1 of 2)**

**Table 5-6. Mainframe (1 of 2)**

| Reference Designation | Part Number (Original Color) | Part Number (New Color) <sup>1</sup> | Quantity | Description  |
|-----------------------|------------------------------|--------------------------------------|----------|--------------|
| 1                     | 5062-3848                    | 5062-3999                            | 2        | Side Cover   |
| 2                     | 5062-3705                    | 5063-9211                            | 2        | Strap Handle |
| 3                     | 5041-8819                    | 5041-9186                            | 2        | Front Cap    |
| 4                     | 5041-8820                    | 5041-9187                            | 2        | Rear Cap     |
| 5                     | 5062-3748                    | 5002-1089                            | 1        | Bottom Cover |
| 6                     | 5041-8801                    | 5041-9167                            | 4        | Foot         |
| 7                     | 1460-1345                    | ⇐                                    | 2        | Tilt Stand   |
| 8                     | 5001-0541                    | 5041-9173                            | 2        | Trim Side    |
| 9                     | 5041-8802                    | 5041-9176                            | 1        | Trip Top     |
| 10                    | 5062-3736                    | 5002-1048                            | 1        | Top Cover    |
| 11                    | 0515-1384                    | ⇐                                    | 4        | Screw M5     |

<sup>1</sup> For JP10C00351 and above.

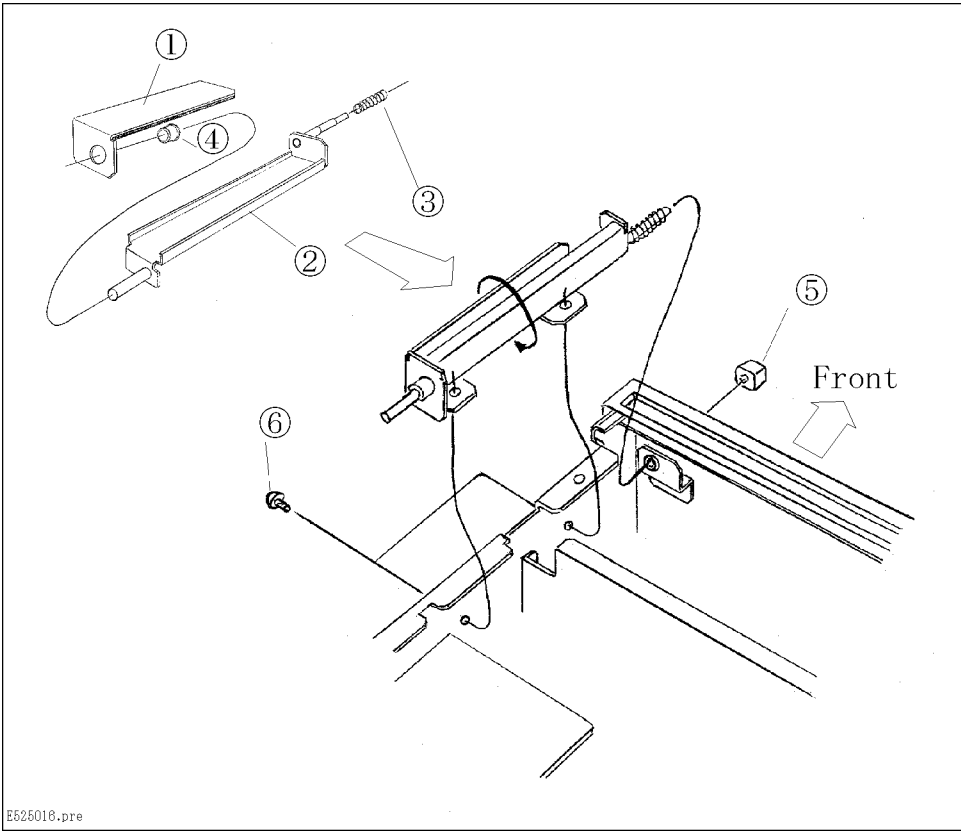


**Figure 5-3. Mainframe (2 of 2)**

**Table 5-7. Mainframe (2 of 2)**

| Reference Designation | Part Number | Quantity | Description |
|-----------------------|-------------|----------|-------------|
| 1                     | E5250-04003 | 1        | Cover       |
| 2                     | 0515-1719   | 11       | Screw M4    |
| 3                     | 0515-1012   | 1        | Screw M4    |

**HP E5250A Power Switch**



**Figure 5-4. Power Switch**

**Table 5-8. Power Switch**

| Reference Designation | Part Number | Quantity | Description |
|-----------------------|-------------|----------|-------------|
| 1                     | E5250-01206 | 1        | Angle       |
| 2                     | E5250-01204 | 1        | Angle       |
| 3                     | 1460-2360   | 1        | Spring      |
| 4                     | 0400-0064   | 1        | Bush        |
| 5                     | 5041-0564   | 1        | Key Cap     |
| 6                     | 0515-2079   | 2        | Screw M4    |

## HP E5250A Front Panel

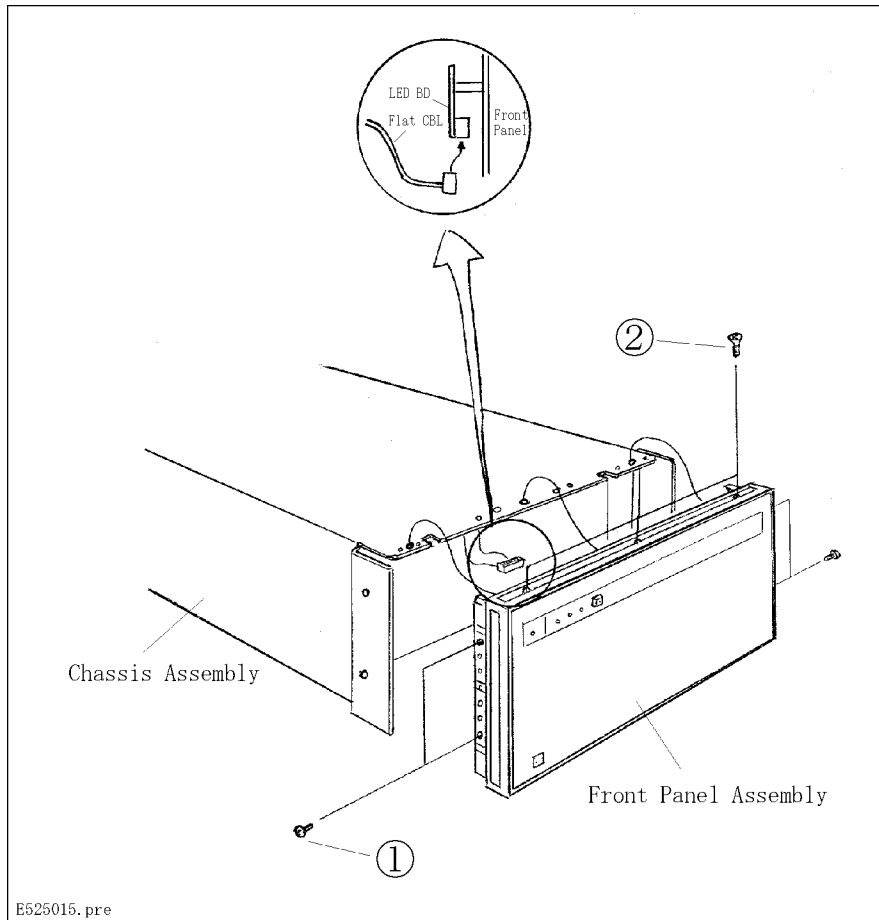
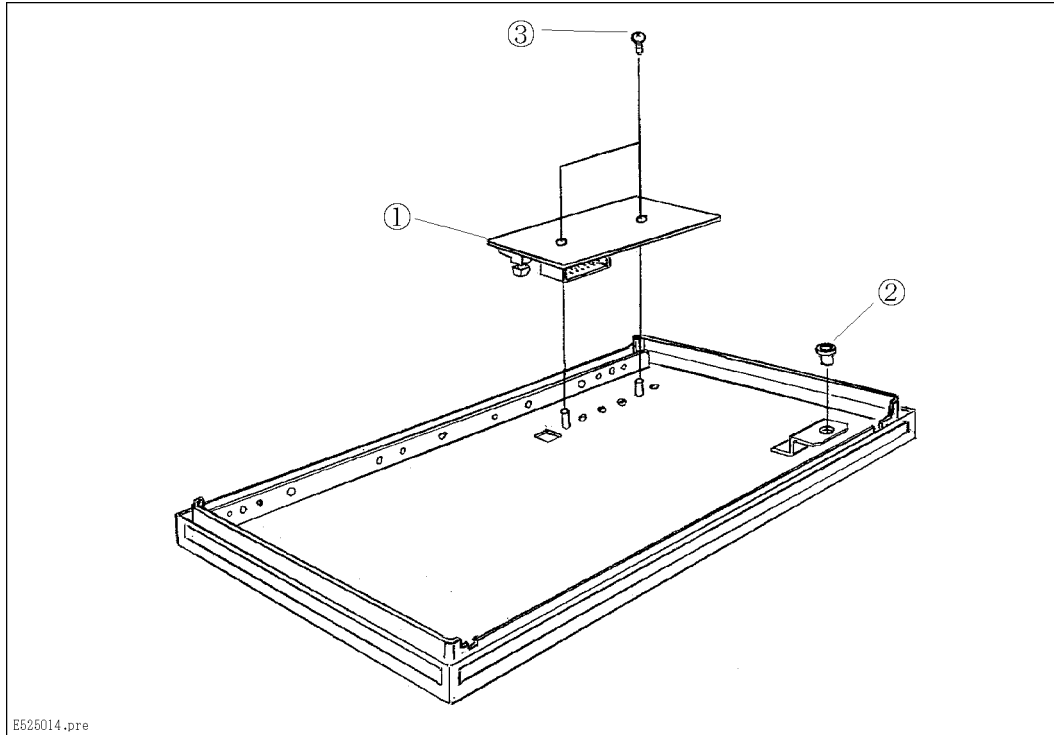


Figure 5-5. Front Panel (1 of 4)

Table 5-9. Front Panel (1 of 4)

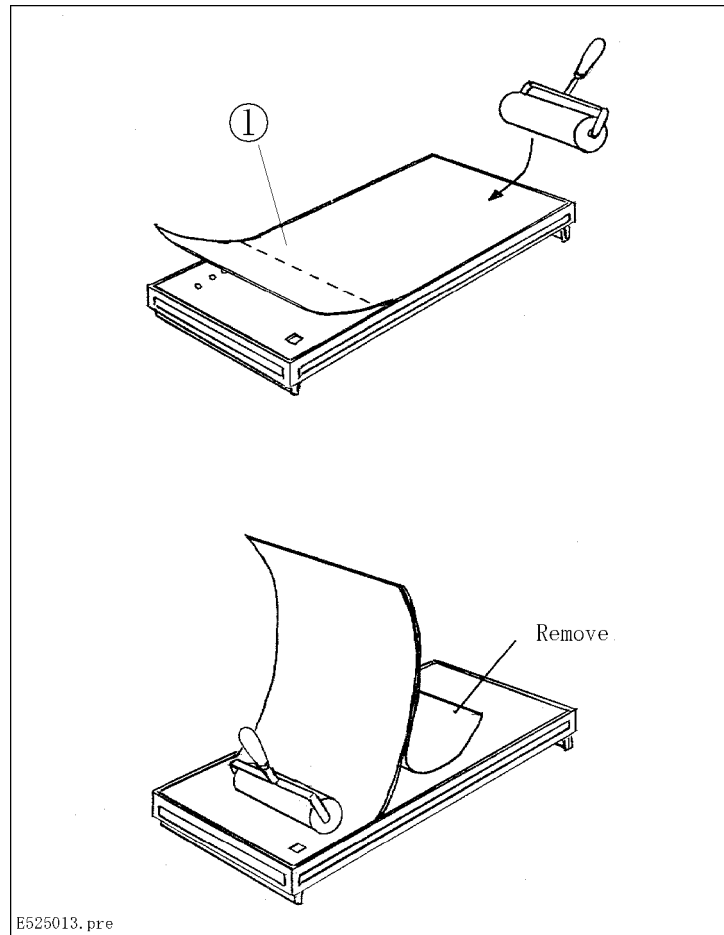
| Reference Designation | Part Number | Quantity | Description |
|-----------------------|-------------|----------|-------------|
| 1                     | 0515-2079   | 4        | Screw M4    |
| 2                     | 0515-1012   | 3        | Screw M4    |



**Figure 5-6. Front Panel (2 of 4)**

**Table 5-10. Front Panel (2 of 4)**

| Reference Designation | Part Number | Quantity | Description |
|-----------------------|-------------|----------|-------------|
| 1                     | E5250-66503 | 1        | LED Board   |
| 2                     | 0400-0157   | 1        | Bush        |
| 3                     | 0515-1550   | 2        | Screw M3    |

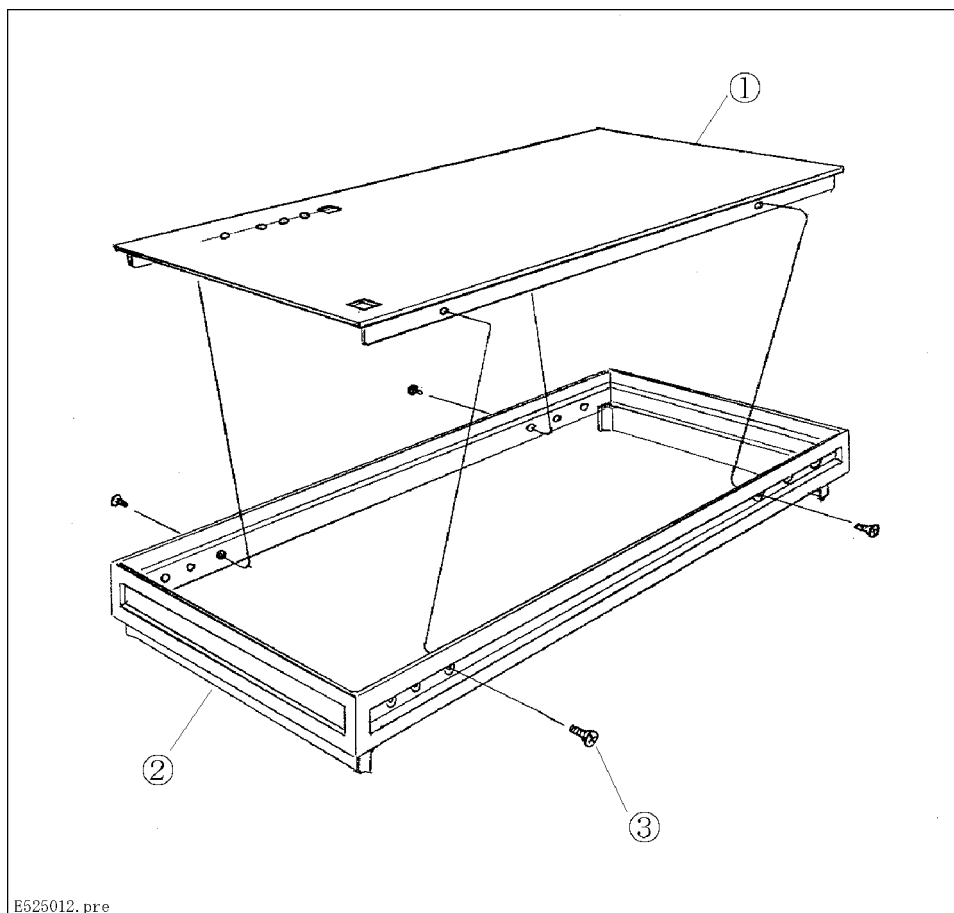


**Figure 5-7. Front Panel (3 of 4)**

**Table 5-11. Front Panel (3 of 4)**

| Reference Designation | Part Number (Original Color) | Part Number (New Color) <sup>1</sup> | Quantity | Description |
|-----------------------|------------------------------|--------------------------------------|----------|-------------|
| 1                     | E5250-87101                  | E5250-87141                          | 1        | Label       |

<sup>1</sup> For JP10C00351 and above.



E525012.pre

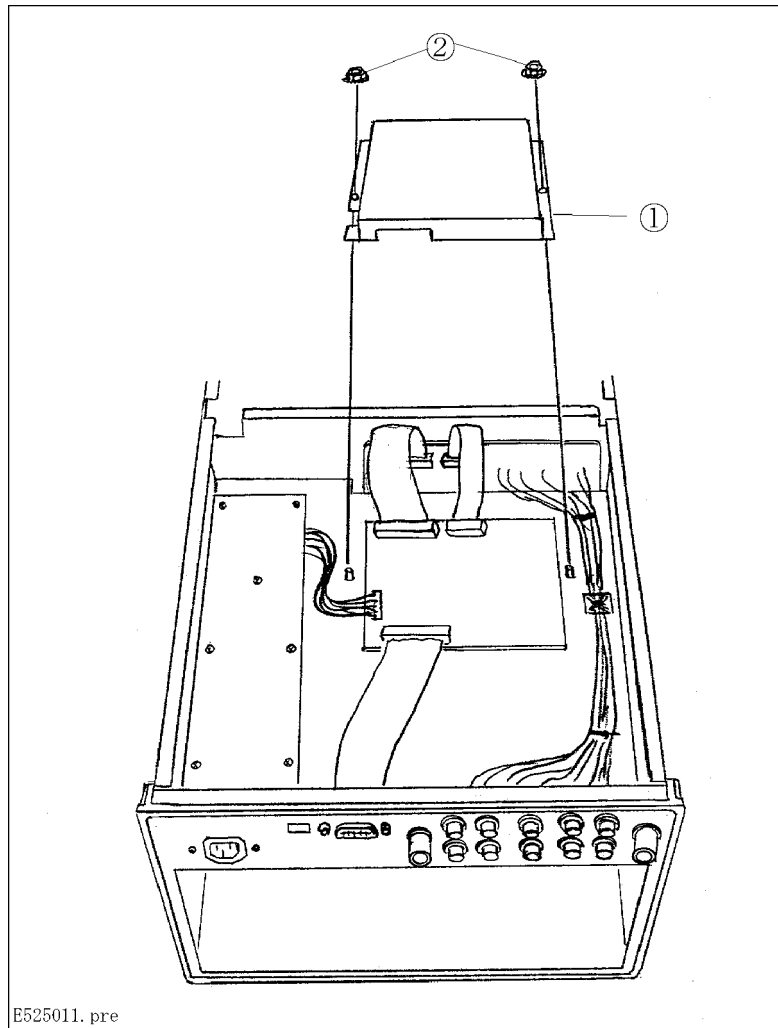
**Figure 5-8. Front Panel (4 of 4)**

**Table 5-12. Front Panel (4 of 4)**

| Reference Designation | Part Number (Original Color) | Part Number (New Color) <sup>1</sup> | Quantity | Description     |
|-----------------------|------------------------------|--------------------------------------|----------|-----------------|
| 1                     | E5250-00201                  | ⇐                                    | 1        | Front Sub Panel |
| 2                     | 5021-8407                    | 5022-1190                            | 1        | Front Frame     |
| 3                     | 0515-1012                    | ⇐                                    | 4        | Screw M4        |

<sup>1</sup> For JP10C00351 and above.

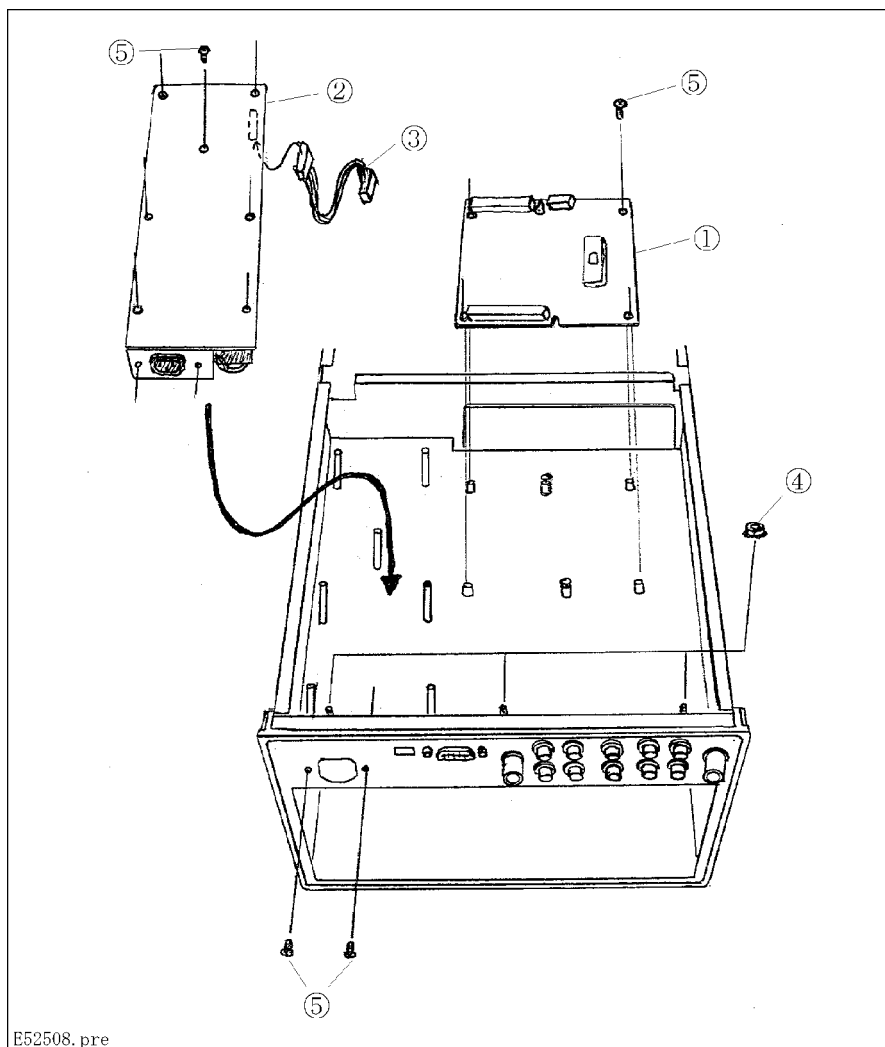
## HP E5250A CPU and Power Supply



**Figure 5-9. CPU and Power Supply (1 of 2)**

**Table 5-13. CPU and Power Supply (1 of 2)**

| Reference Designation | Part Number | Quantity | Description  |
|-----------------------|-------------|----------|--------------|
| 1                     | E5250-04006 | 1        | Shield Cover |
| 2                     | 05335-0043  | 2        | Nut M4       |



**Figure 5-10. CPU and Power Supply (2 of 2)**

**Table 5-14. CPU and Power Supply (2 of 2)**

| Reference Designation | Part Number | Quantity | Description    |
|-----------------------|-------------|----------|----------------|
| 1                     | E5250-66501 | 1        | CPU Board      |
| 2                     | E5250-61001 | 1        | Power Supply   |
| 3                     | E5250-61626 | 1        | Cable Assembly |
| 4                     | 0535-0043   | 3        | Nut M4         |
| 5                     | 0515-1550   | 13       | Screw M3       |

## HP E5250A Mother Board

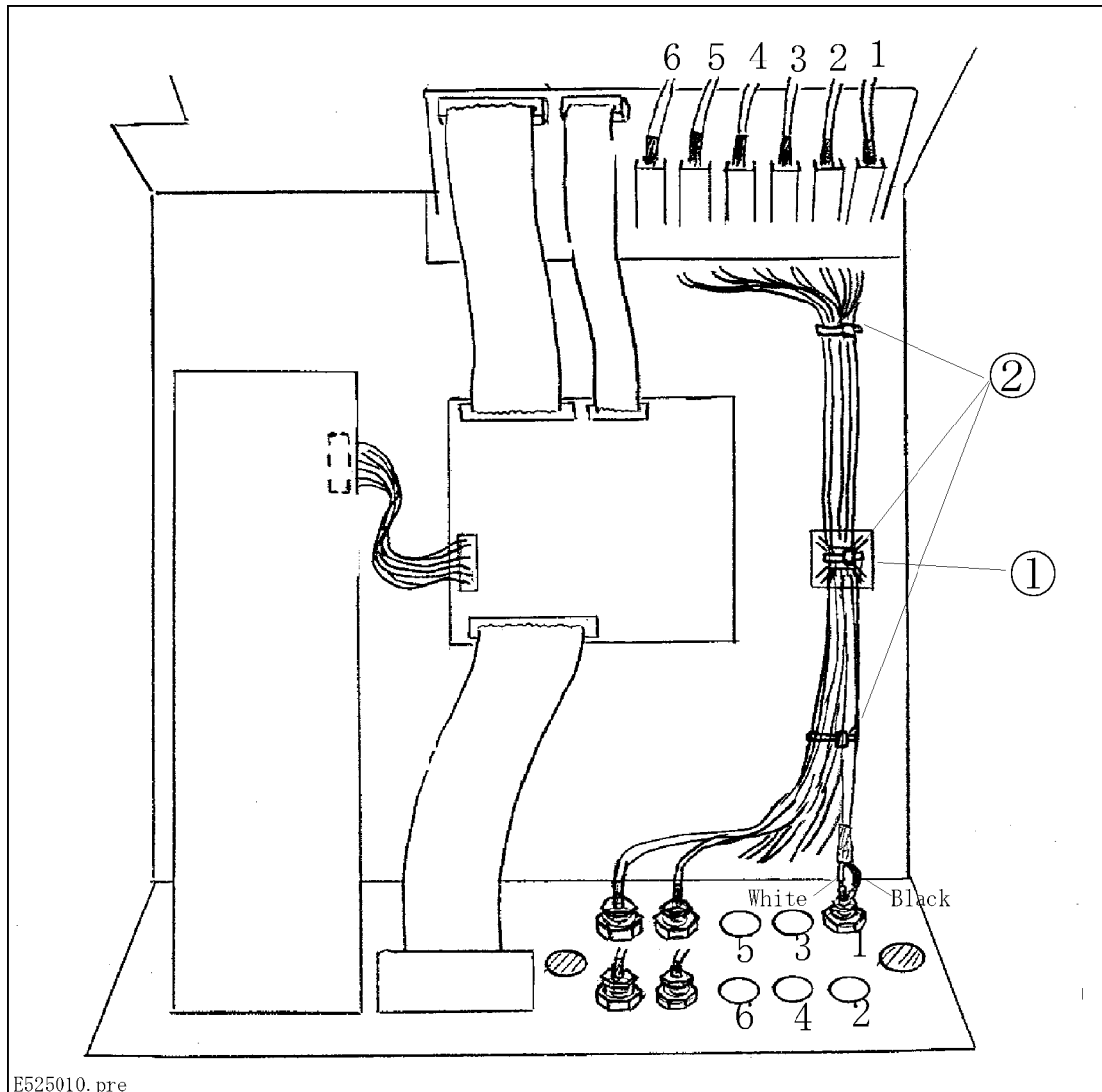
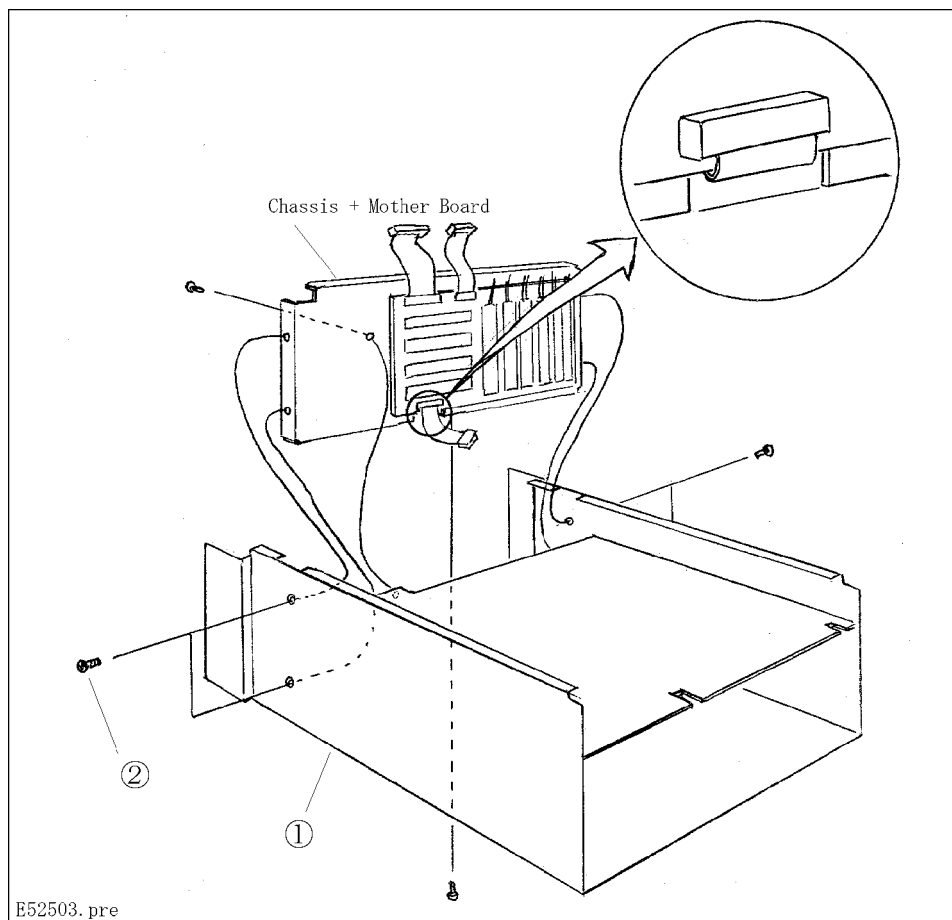


Figure 5-11. Mother Board (1 of 3 )

Table 5-15. Mother Board (1 of 3 )

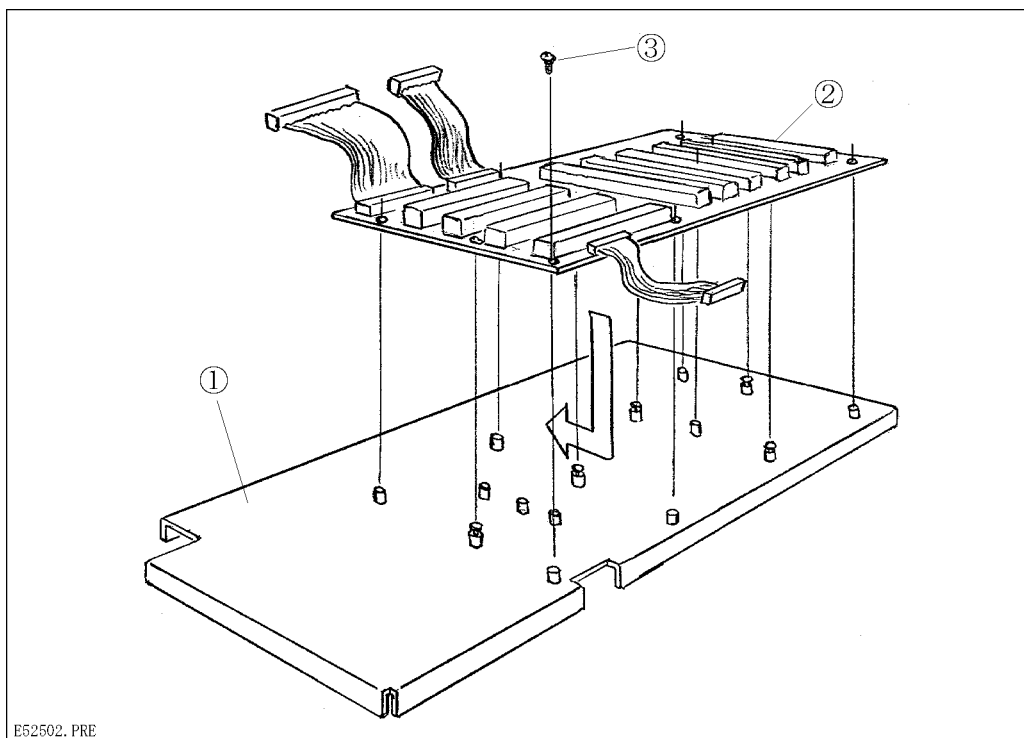
| Reference Designation | Part Number | Quantity | Description |
|-----------------------|-------------|----------|-------------|
| 1                     | 1400-1438   | 1        | Cable Mount |
| 2                     | 1400-0493   | 3        | Tie-wrap    |



**Figure 5-12. Mother Board (2 of 3)**

**Table 5-16. Mother Board (2 of 3)**

| Reference Designation | Part Number | Quantity | Description |
|-----------------------|-------------|----------|-------------|
| 1                     | E5250-00101 | 1        | Chassis     |
| 2                     | 0515-2079   | 6        | Screw M4    |



**Figure 5-13. Mother Board (3 of 3)**

**Table 5-17. Mother Board (3 of 3)**

| Reference Designation | Part Number | Quantity | Description    |
|-----------------------|-------------|----------|----------------|
| 1                     | E5250-00103 | 1        | Mother Chassis |
| 2                     | E5250-66502 | 1        | Mother Board   |
| 3                     | 0515-1550   | 7        | Screw M3       |

HP E5250A Rear Frame

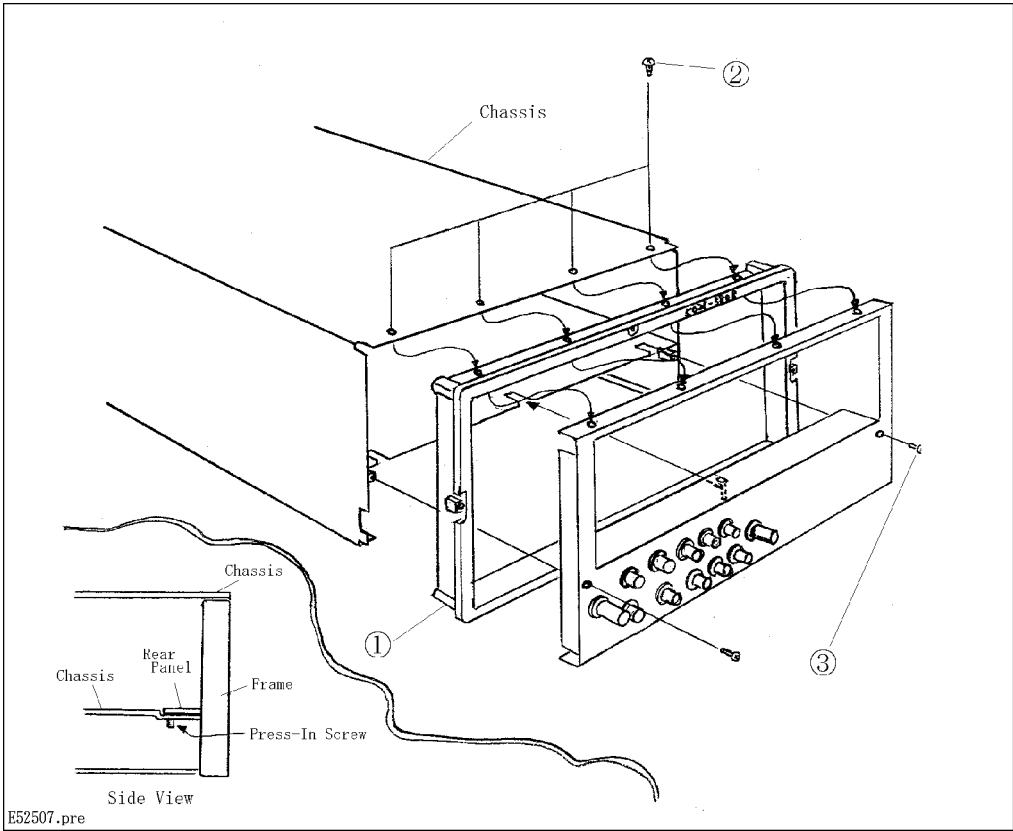
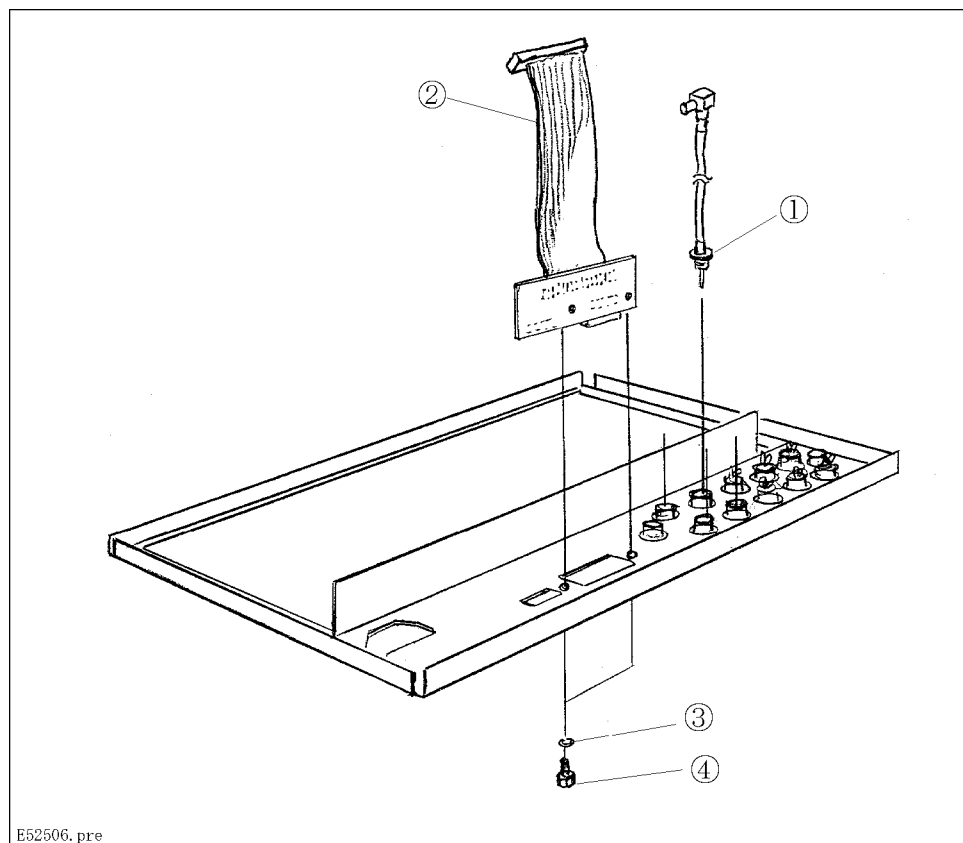


Figure 5-14. Rear Frame (1 of 3)

Table 5-18. Rear Frame (1 of 3)

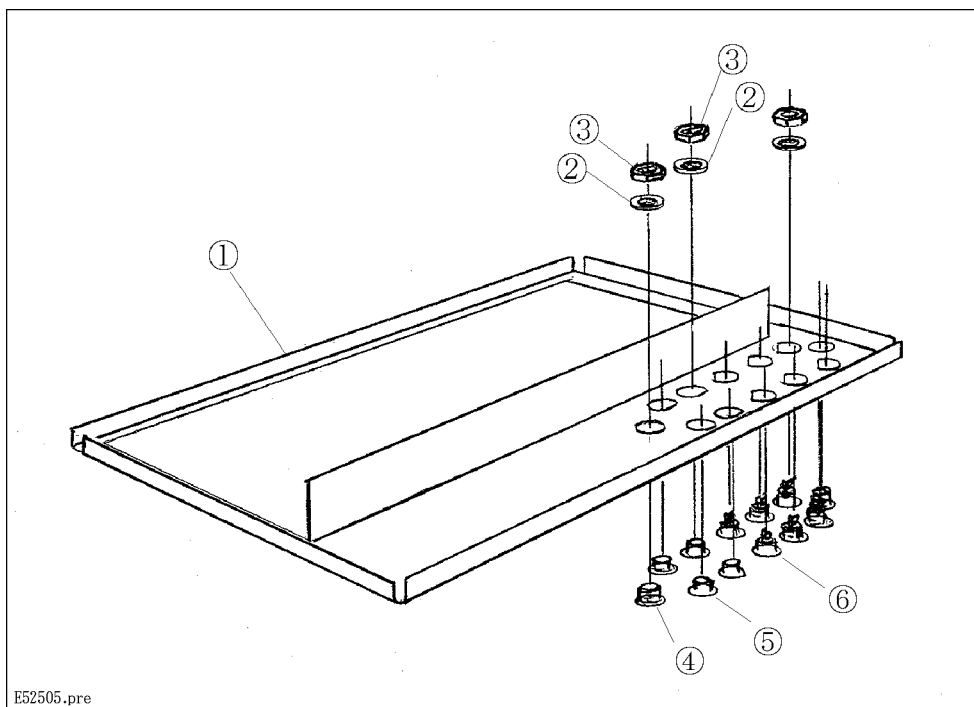
| Reference Designation | Part Number | Quantity | Description |
|-----------------------|-------------|----------|-------------|
| 1                     | 5021-5808   | 1        | Rear Frame  |
| 2                     | 0515-1719   | 4        | Screw M4    |
| 3                     | 0515-1550   | 2        | Screw M3    |



**Figure 5-15. Rear Frame (2 of 3)**

**Table 5-19. Rear Frame (2 of 3)**

| Reference Designation | Part Number | Quantity | Description            |
|-----------------------|-------------|----------|------------------------|
| 1                     | E5250-61631 | 4        | Coaxial Cable Assembly |
| 2                     | E5250-66504 | 1        | HP-IB Board            |
| 3                     | 2190-0577   | 2        | Spring Washer          |
| 4                     | 0380-0643   | 2        | Screw Hex              |



**Figure 5-16. Rear Frame (3 of 3)**

**Table 5-20. Rear Frame (3 of 3)**

| Reference Designation | Part Number | Quantity | Description        |
|-----------------------|-------------|----------|--------------------|
| 1                     | E5250-04002 | 1        | Rear Panel         |
| 2                     | 2190-0054   | 6        | Washer             |
| 3                     | 2950-0054   | 6        | Nut                |
| 4                     | E5250-24003 | 2        | Guide              |
| 5                     | 1250-0102   | 4        | BNC Connector      |
| 6                     | 1250-1906   | 6        | Triaxial Connector |

## HP 16495A/F Connector Plate

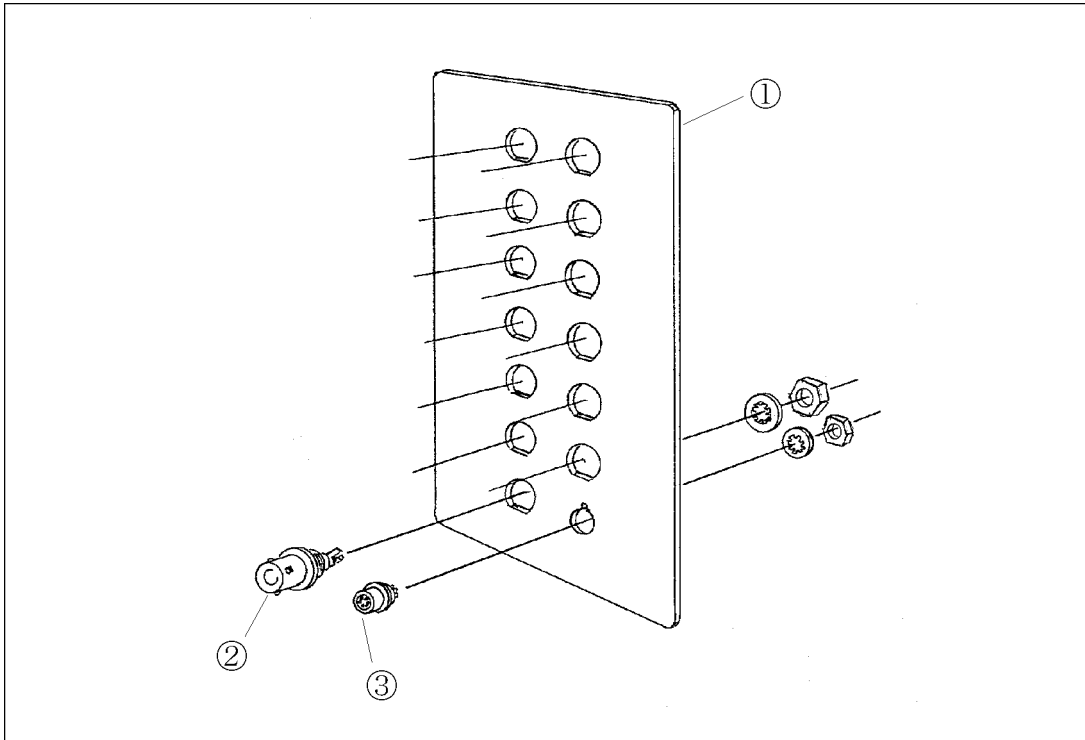
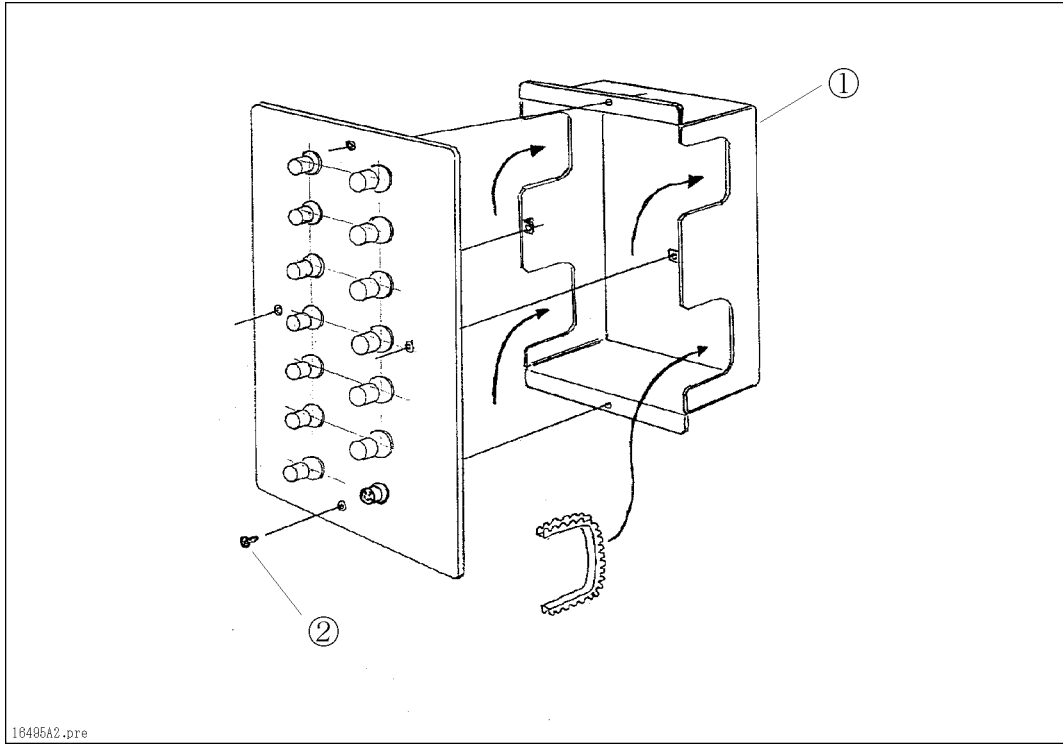


Figure 5-17. HP 16495A/F (1 of 2)

Table 5-21. HP 16495A/F (1 of 2)

| Reference Designation | Part Number | Quantity | Description                                |
|-----------------------|-------------|----------|--------------------------------------------|
| 1                     | 16495-00201 | 1        | (HP 16495A) Panel                          |
|                       | 16495-00211 | 1        | (HP 16495F #001) Panel                     |
|                       | 16495-00206 | 1        | (HP 16495F #002) Panel                     |
| 2                     | 1250-2618   | 13       | (HP 16495F #001) Triaxial Connector        |
|                       | 1250-1906   | 13       | (HP 16495A/16495F #002) Triaxial Connector |
| 3                     | 1252-1419   | 1        | Connector 6-Pin                            |



**Figure 5-18. HP 16495A/F (2 of 2)**

**Table 5-22. HP 16495A/F (2 of 2)**

| Reference Designation | Part Number | Quantity | Description |
|-----------------------|-------------|----------|-------------|
| 1                     | 16495-04001 | 1        | Cover       |
| 2                     | 0515-0914   | 4        | Screw M3    |

## HP 16495B/G Connector Plate

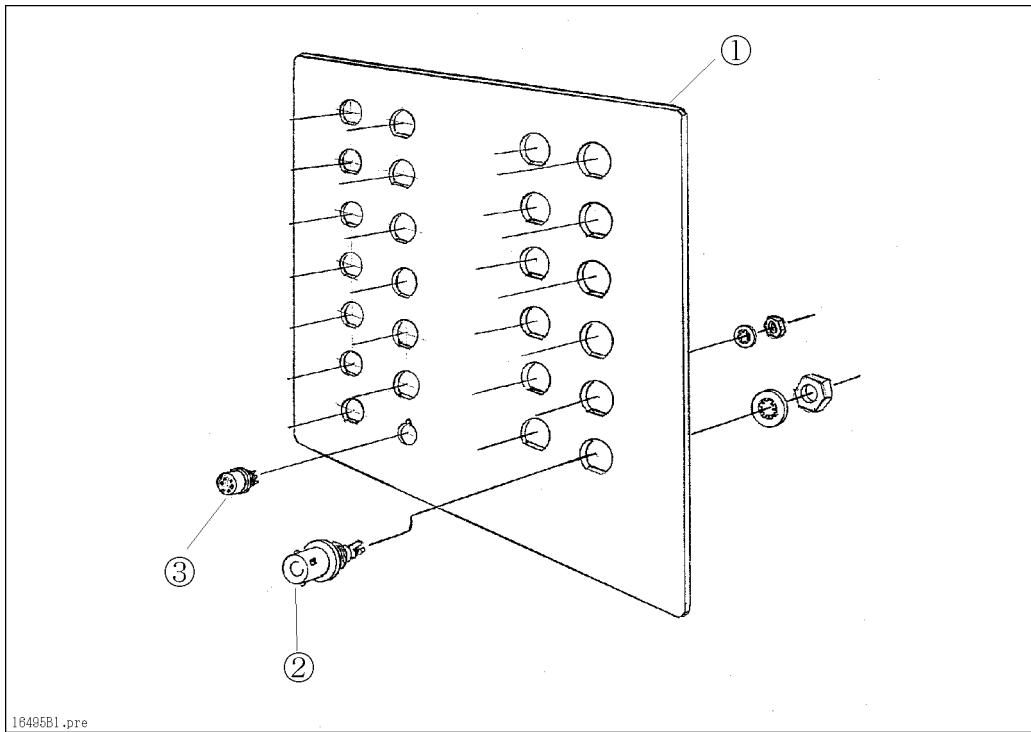
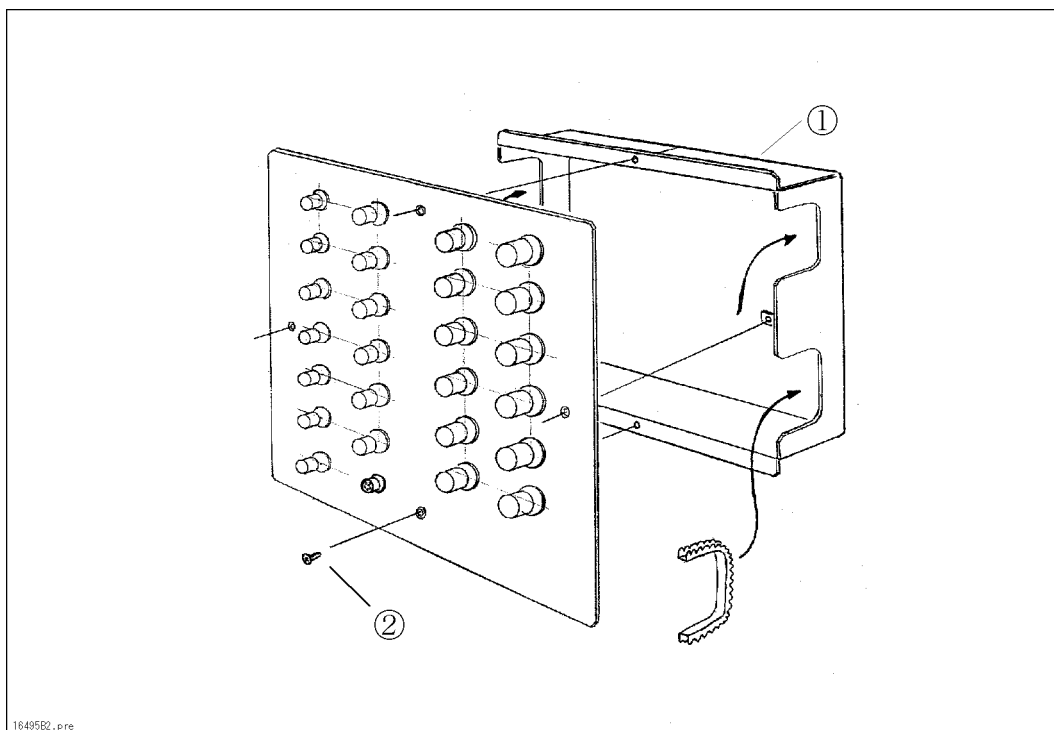


Figure 5-19. HP 16495B/G (1 of 2)

Table 5-23. HP 16495B/G (1 of 2)

| Reference Designation | Part Number | Quantity | Description                                   |
|-----------------------|-------------|----------|-----------------------------------------------|
| 1                     | 16495-00202 | 1        | (HP 16495B) Panel                             |
|                       | 16495-00212 | 1        | (HP 16495G #001) Panel                        |
|                       | 16495-00207 | 1        | (HP 16495G #002) Panel                        |
| 2                     | 1250-2618   | 25       | (HP 16495G #001) Triaxial Connector           |
|                       | 1250-1906   | 25       | (HP 16495B/HP 16495G #002) Triaxial Connector |
| 3                     | 1252-1419   | 1        | Connector 6-Pin                               |



**Figure 5-20. HP 16495B/G (2 of 2)**

**Table 5-24. HP 16495B/G (2 of 2)**

| Reference Designation | Part Number | Quantity | Description |
|-----------------------|-------------|----------|-------------|
| 1                     | 16495-04002 | 1        | Cover       |
| 2                     | 0515-0914   | 4        | Screw M3    |

## HP 16495C Connector Plate

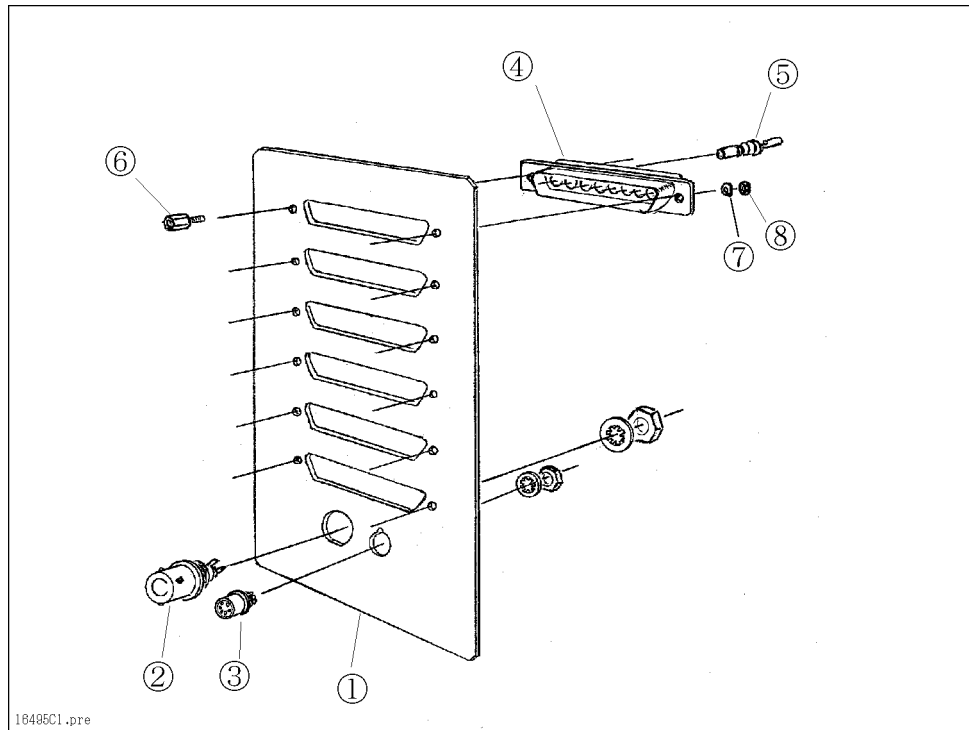
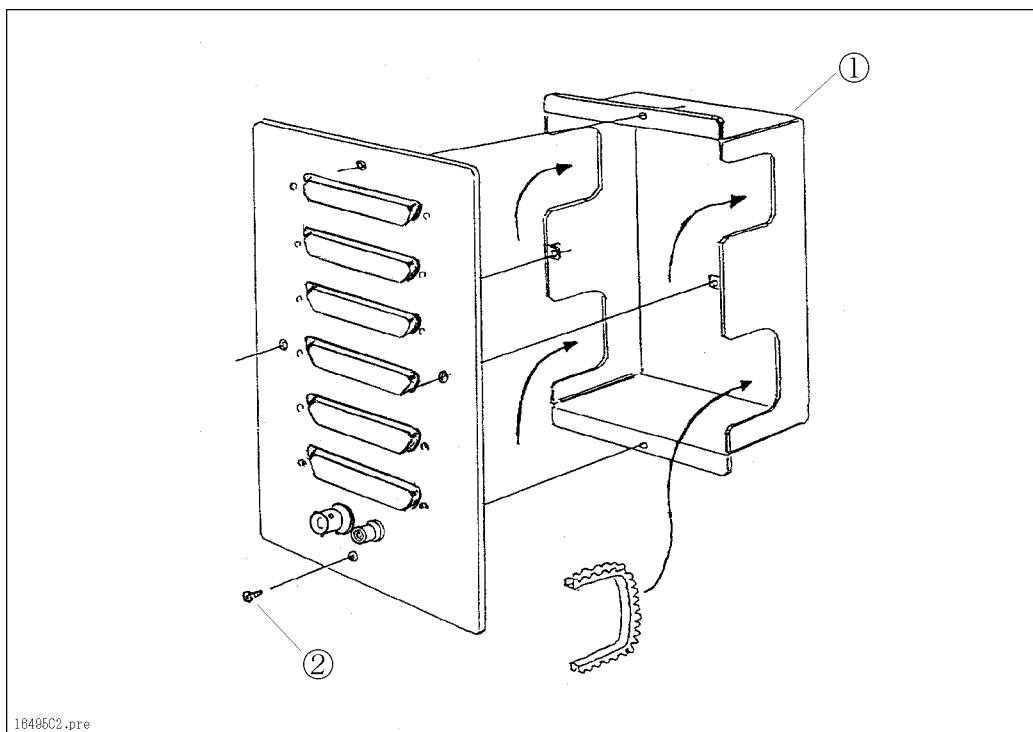


Figure 5-21. HP 16495C (1 of 2)

Table 5-25. HP 16495C (1 of 2)

| Reference Designation | Part Number | Quantity | Description        |
|-----------------------|-------------|----------|--------------------|
| 1                     | 16495-00203 | 1        | Panel              |
| 2                     | 1250-1906   | 1        | Triaxial Connector |
| 3                     | 1252-1419   | 1        | Connector 6-Pin    |
| 4                     | 1251-2367   | 6        | Connector 8-Pin    |
| 5                     | 1251-0179   | 48       | Contact Pin        |
| 6                     | 0380-3070   | 12       | Screw              |
| 7                     | 2190-0913   | 12       | Spring Washer      |
| 8                     | 2260-0002   | 12       | Nut                |



**Figure 5-22. HP 16495C (2 of 2)**

**Table 5-26. HP 16495C (2 of 2)**

| Reference Designation | Part Number | Quantity | Description |
|-----------------------|-------------|----------|-------------|
| 1                     | 16495-04001 | 1        | Cover       |
| 2                     | 0515-0914   | 4        | Screw M3    |

## HP 16495D Connector Plate

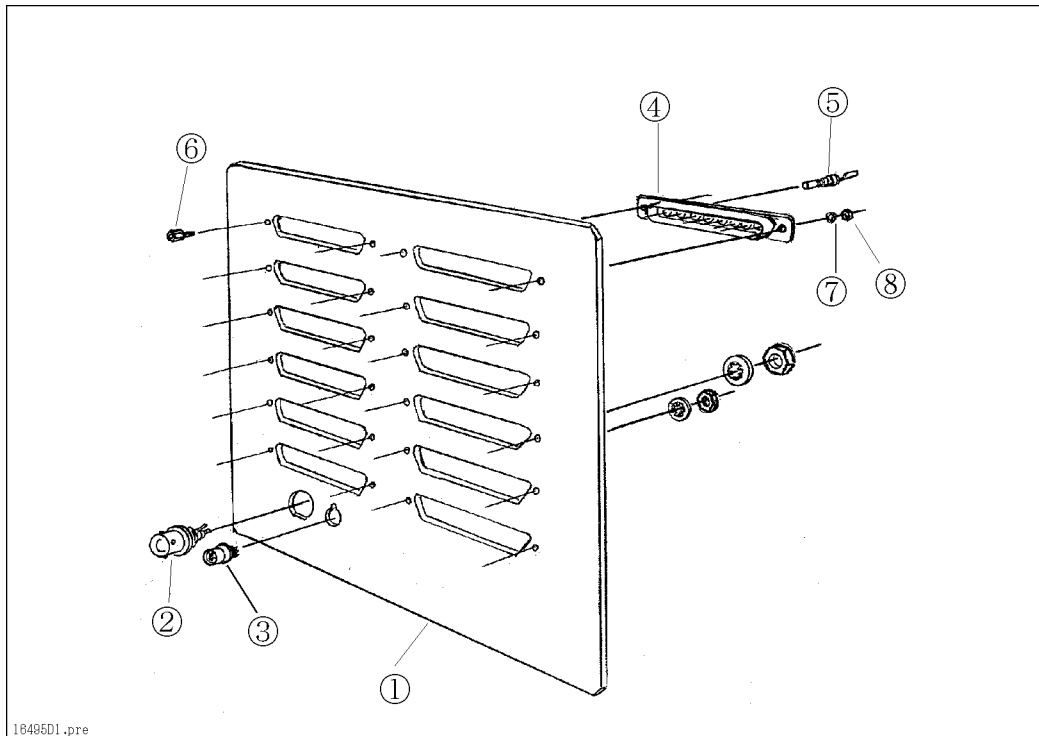
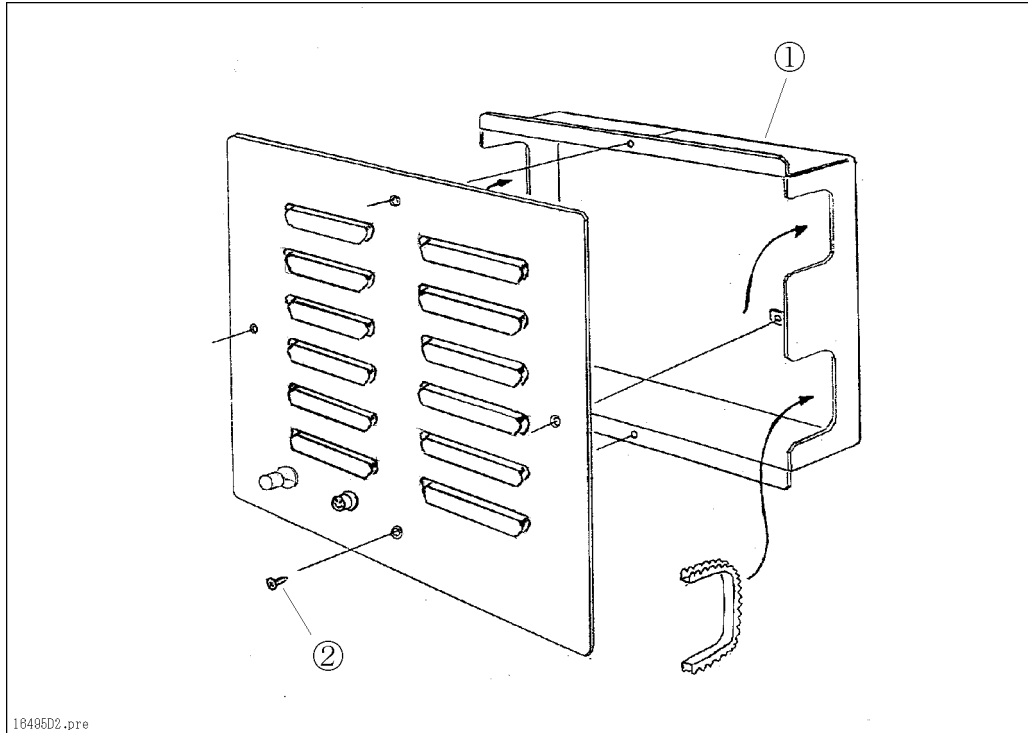


Figure 5-23. HP 16495D (1 of 2)

Table 5-27. HP 16495D (1 of 2)

| Reference Designation | Part Number | Quantity | Description        |
|-----------------------|-------------|----------|--------------------|
| 1                     | 16495-00204 | 1        | Panel              |
| 2                     | 1250-1906   | 1        | Triaxial Connector |
| 3                     | 1252-1419   | 1        | Connector 6-Pin    |
| 4                     | 1251-2367   | 12       | Connector 8-Pin    |
| 5                     | 1251-0179   | 96       | Contact Pin        |
| 6                     | 0380-3070   | 24       | Screw              |
| 7                     | 2190-0913   | 24       | Spring Washer      |
| 8                     | 2260-0002   | 24       | Nut                |



**Figure 5-24. HP 16495D (2 of 2)**

**Table 5-28. HP 16495D (2 of 2)**

| Reference Designation | Part Number | Quantity | Description |
|-----------------------|-------------|----------|-------------|
| 1                     | 16495-04002 | 1        | Cover       |
| 2                     | 0515-0914   | 4        | Screw M3    |



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