

Agilent 4339B High Resistance Meter

Service Manual

SERIAL NUMBERS

This manual applies directly to instruments with serial number prefix JP1KD.
For additional important information about serial numbers, read
“Instruments Covered by This Manual” in Chapter 1 of this manual.



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Notice

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Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific **WARNINGS** elsewhere in this manual may impair the protection provided by the equipment. In addition it violates safety standards of design, manufacture, and intended use of the instrument.

The Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

Note



4339B is designed for use in INSTALLATION CATEGORY II according to IEC 61010-1 and POLLUTION DEGREE 1 according to IEC 61010-1 and IEC 60664-1. 4339B is an INDOOR USE product.

Note



LEDs in 4339B are Class 1 in accordance with IEC60825-1.
CLASS 1 LED PRODUCT

Ground The Instrument

To avoid electric shock hazard, the instrument chassis and cabinet must be connected to a safety earth ground by the supplied power cable with earth blade.

DO NOT Operate In An Explosive Atmosphere

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

Keep Away From Live Circuits

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous 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 unauthorized modifications to the instrument. Return the instrument to a Agilent Technologies Sales and Service Office for service and repair to ensure that safety features are maintained.

Dangerous Procedure Warnings

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

Warning



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

Certification

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

Warranty

This Agilent Technologies instrument product is warranted against defects in material and workmanship for a period of one year from the date of shipment, except that in the case of certain components listed in *General Information* of this manual, the warranty shall be for the specified period. During the warranty period, Agilent Technologies will, at its option, either repair or replace products that prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by Agilent Technologies. Buyer shall prepay shipping charges to Agilent Technologies and Agilent Technologies shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to Agilent Technologies from another country.

Agilent Technologies warrants that its software and firmware designated by Agilent Technologies for use with an instrument will execute its programming instruction when properly installed on that instrument. Agilent Technologies does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error free.

Limitation Of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside the environmental specifications for the product, or improper site preparation or maintenance.

No other warranty is expressed or implied. Agilent Technologies specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

Exclusive Remedies

The remedies provided herein are buyer's sole and exclusive remedies. Agilent Technologies shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.

Assistance

Product maintenance agreements and other customer assistance agreements are available for Agilent Technologies products.

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

Safety Symbols

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



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



Alternating current.



Direct current.



On (Supply).



Off (Supply).

Warning



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

Caution



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

Note



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



Affixed to product containing static sensitive devices use anti-static handling procedures to prevent electrostatic discharge damage to component.



Caution, risk of electric shock : Terminals which may be supplied from the interior of the equipment at a voltage exceeding 1 kV, or allow connection to a voltage exceeding 1 kV are marked with this symbol.

Documentation Map

Operation Manual

Operation Manual (Agilent Part Number: 04339-90050 for English edition, 04339-97050 for Japanese edition) explains specifications, basic measurement explanations, and how to verify conformance to published specifications.

Service Manual

Service Manual (Agilent Part Number: 04339-90043) explains how to adjust, troubleshoot, and repair the 4339B.

How To Use This Manual

This is the Service Manual for the 4339B High Resistance Meter. This manual contains adjustments and repair information, and consists of the following four chapters.

Chapter 1 General Information

Chapter 1 gives general information for servicing the 4339B. This chapter lists the recommended equipment for adjustments and troubleshooting.

Chapter 2 Adjustments

Chapter 2 describes the adjustments, required to ensure that the 4339B is within its published specifications after it has been repaired, or it fails the performance tests.

Chapter 3 Assembly Replacement

Chapter 3 provides the information on replacing the 4339B assemblies. The information includes replaceable assembly lists, and removal and installation procedures.

Chapter 4 Troubleshooting

Chapter 4 provides the information on troubleshooting the 4339B. The information includes theory of operation and information on faulty assembly isolation.

Appendix A Manual Changes

Appendix A contains manual changes and provides information for using this manual with 4339Bs manufactured before the printing date of the manual.

Appendix B Default Jumper and Switch Settings

Appendix B describes the settings of the jumpers and switches on the 4339B A2 CPU Board Assembly. The information is required when the A2 assembly is replaced.

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General Information

Introduction

This chapter provides information on instruments covered by this manual and required equipment for the adjustment and troubleshooting.

Instruments Covered by This Manual

Agilent Technologies uses a two-section, nine character serial number which is printed on the serial number label (Figure 1-1) attached to the instrument's rear panel. The first four digits and a letter are the serial number prefix, and the last five digits are the suffix.



Figure 1-1. Serial Number Label

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

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

Required Equipment

Table 1-1 lists the required equipment for adjusting and troubleshooting the 4339B. Table 1-2 lists the required language extensions to be used with the adjustment program.

Table 1-1. Required Equipment

Equipment	Requirements	Recommended Model	Qty.	Use
Multimeter	No Substitute	3458A	1	A ¹ , T ²
RC Box	No Substitute	16340A	1	A
Computer	No Substitute	HP 9000 series 200 or 300 ³ RAM ≥4M bytes	1	A
Operating System	BASIC 5.1 or higher	98616A	1	A
Adjustment Program	No substitute	Agilent PN 04339-65008	1	A
Cable	Banana-Banana Jumper Dual Banana-BNC(m) Cable	11058A Agilent PN 11001-60001	1	A
RC Box Adapter	No Substitute	Agilent PN 04339-65005	1	A
V Measurement Adapter	No Substitute	Agilent PN 04339-65006	1	A
Shunt Connector	No Substitute	Agilent PN 04339-60003	1	A

1 Adjustment

2 Troubleshooting

3 Excluding the 9826A

Note



Because the 3458A is the only multimeter available which satisfies the requirements, 1.2 kV allowable dc voltage as well as accuracy, no substitute is available.

Table 1-2. Required Language Extensions

Name	Ver.	Name	Ver.	Name	Ver.	Name	Ver.
CLOCK	5.0	EDIT	5.1	GRAPHX	5.2	MAT	5.1
CRTA	5.1	ERR	5.1	GPIB	5.0	MS	5.1
CRTX	5.1	FHPIB	5.0	IO	5.1	PDEV	5.0
CS80	5.0	GRAPH	5.2	KBD	5.1		

Adjustments

Introduction

This chapter describes the adjustments required to ensure the 4339B is within its published specifications after it has been repaired, or when it fails the performance tests. The adjustments should be performed along with periodic maintenance to keep the 4339B in optimum operating condition. If proper performance cannot be achieved after adjustments, proceed to Chapter 4.

Note

To ensure proper results and correct instrument operation, a 60 minute warm-up (stabilization) is required before performing the adjustments.

Safety Consideration

This chapter contains *NOTES*, *CAUTIONS*, and *WARNINGS* which must be followed to ensure operator safety and to maintain the instrument in a safe and serviceable condition. The adjustments covered in this chapter should be performed only by a qualified person who is aware of the hazards.

Warning

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

Required Equipment

Table 1-1 lists the equipment required to perform the adjustments. Use only calibrated equipment when adjusting the 4339B.

Adjustment Tools

No hand tools are required for the adjustments.

Adjustable Components

There are no adjustable components, such as variable capacitors or variable resistors, in the 4339B. All adjustments are performed by updating the adjustment data stored in the internal EEPROM.

Factory-Selected Components

No factory-selected components are used in the 4339B.

EEPROM Write Protect Switch

There are no EEPROM write protect switches in the 4339B.

Related Adjustments

There are two adjustments for the 4339B. Table 2-1 lists the adjustments that must be performed if an assembly has been replaced.

Table 2-1. Related Adjustments

Assembly Replaced	Required Adjustment
A1 Main Board Assembly	All adjustments
A2 CPU Board Assy without ROM	None ¹
A3 Ammeter Board Assembly	Ammeter Adjustment
A5 AC Inlet Board Assembly	None
LCD Assembly	None
DC-DC Converter Unit	None
Keyboard Assembly	None

¹ If the EEPROM, A2U1, is replaced, all adjustments are required.

Adjustment Program

The adjustment program listed in Table 1-1 is required for the adjustments. Using the program, the computer controls the 4339B and the other pieces of equipment to obtain the adjustment data, and stores the data in the 4339B's internal EEPROM, A2U1.

The adjustment program runs on the computer listed in Table 1-1. The program should be installed into your computer according to the procedure described in "Program Installation". To start the program after it has been installed, refer to "Program Execution".

Figure 2-1 shows the adjustment program flow. The following lists the brief explanation for each menu item. At the end of each adjustment, the program writes the obtained adjustment data both to the 4339B internal EEPROM and to the unit-serial-number dependent file on the disk.

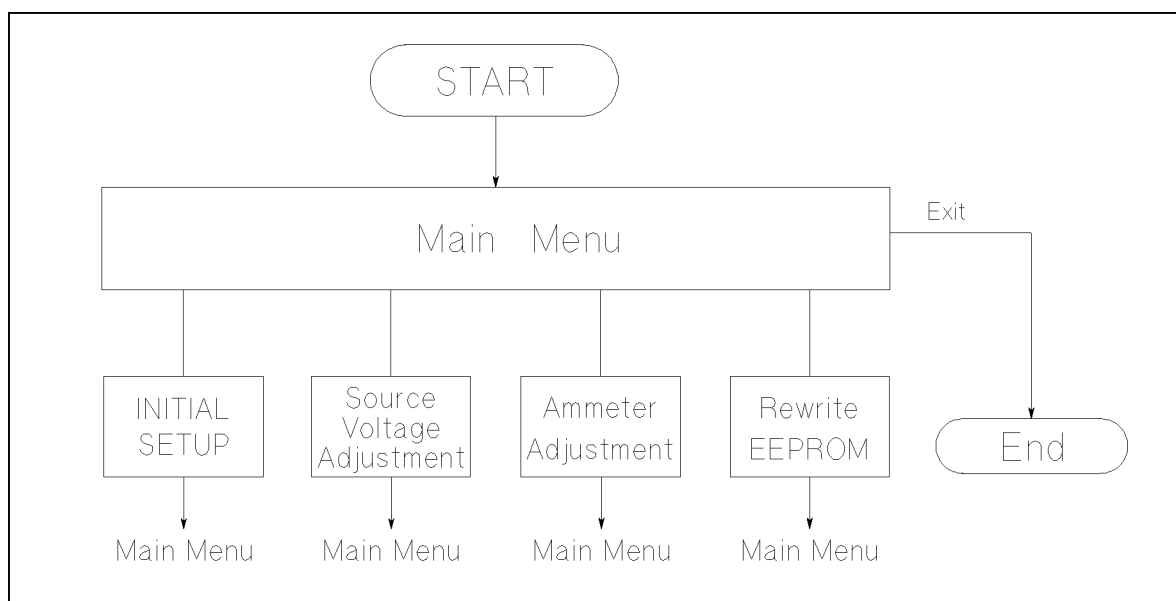


Figure 2-1. Adjustment Program Flow

INITIAL SETUP	defines the standards' calibration values. Update the calibration values as necessary.
Source Voltage Adjustment	obtains the data to adjust the actual source output voltage equal to the set value. This adjustment should be performed if the performance test, Source Voltage Accuracy Test, fails.
Ammeter Adjustment	obtains two kinds of the ammeter related factor, the input resistance and scaling, and a voltage source related factor, the output resistance. This adjustment should be performed if any performance test fails.
Rewrite EEPROM	writes the adjustment data, which is stored in a unit-serial-number dependent file, to the EEPROM. Only the adjustment data of previously adjusted item(s) will be written.

Note



Make sure that the correct line frequency (50 or 60Hz) has been selected in the "UUT: 4339B" window preceding the Main Menu. This selection will improve the adjustment data accuracy.

Program Installation

The adjustment program must be installed in the computer using the following procedures. The installation can be divided into two stages, “Making a Working Copy” and “Defining the Configuration”.

Making a Working Copy

Copy the contents of the adjustment program disk to a working disk or to the harddisk to prevent accidental deletion or destruction of the program files. Use the working disk or the harddisk and store the original disk in a safe place.

Defining the Configuration

Define the configuration of the adjustment equipment. The configuration includes the GPIB address of the Multimeter. The GPIB address will be used as a default in the program. Because the program depends on equipment configuration, it must be redefined if the equipment configuration has changed.

Refer to the following procedure to define the configuration.

1. Turn on the computer and bring up the BASIC system.
2. Set the Mass Storage Unit Specifier to the drive/directory where the adjustment program exists using the MSI command.
3. Load the “TE_A4339B” file from the adjustment program disk by pressing
LOAD “TE_A4339B” **(Return)** (or **(Enter)**).
4. Run the loaded program by pressing RUN.
5. As the program instructs, enter the default GPIB address of the Multimeter.

Note



Once the default GPIB address of the Multimeter is set, it cannot be changed unless the configuration is redefined.

Program Execution

Perform the following steps to start the adjustment program.

Note



Install the program prior to execution. Refer to “Program Installation”.

1. Turn on the computer and bring up the BASIC system. Refer to the Table 1-2 for the required language extensions.
2. Set the Mass Storage Unit Specifier to the drive/directory where the adjustment program exists using the MSI command.
3. Load the program, “ADJ4339B” by pressing LOAD “ADJ4339B” **(Return)** (or **(Enter)**).
4. Execute the loaded program by pressing RUN.

Note

In the program, the 4339B is referred as “UUT”.



Note

If the adjustments being performed follow right after EEPROM replacement, change switch A2SW1-1 to “CLOSE”, so that the 4339B will ignore the self test errors at power-on. (Return the switch to the “OPEN” position when the adjustments have been completed.) Refer to Figure B-1 for the switch location.



Adjustments Procedure References

This section provides supplemental information for the adjustments which are performed by the program. Connection instructions and some additional explanations are provided. Use this chapter as a reference when you perform the adjustments.

Source Voltage Adjustment

This adjustment updates the voltage source adjustment data stored in the EEPROM.

Equipment

Multimeter	3458A
Banana-Banana Jumper	11058A
V Measurement Adapter	Agilent PN 04339-65006
Shunt Connector	Agilent PN 04339-60003

Warning



To avoid the electrical shock hazard by eventual touch, use only the 11058A for connection. Each of the jumper's banana plug conductor is equipped with an retractive protective sleeve.

Setup

This setup obtains the data to adjust the actual source output voltage equal to the set value.

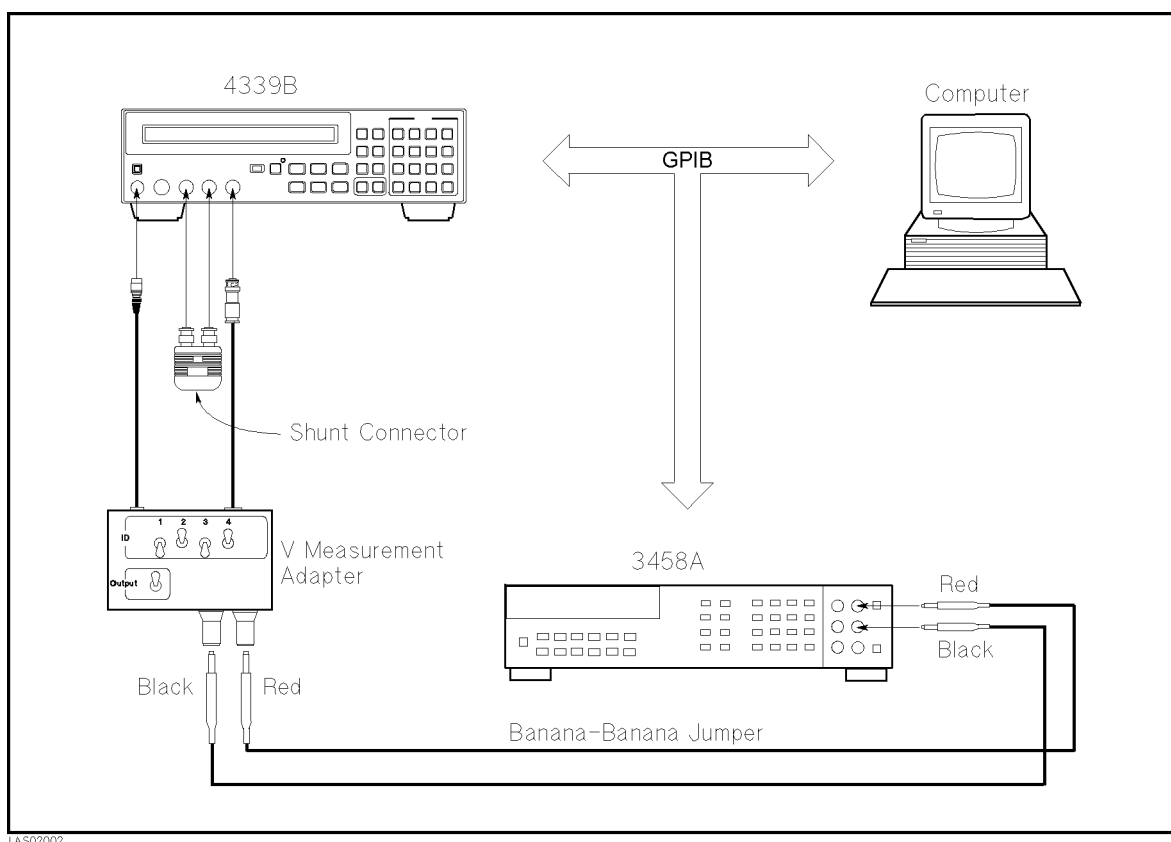


Figure 2-2. Source Voltage Adjustment Setup

Perform the following steps as the program instructs.

1. Connect the 3458A “INPUT HI” post to the V Measurement Adapter “+” post using the red lead of the Banana-Banana Jumper.
2. Connect the 3458A “INPUT LO” post to the V Measurement Adapter “Ground” post using the black lead of the Banana-Banana Jumper.
3. Set the V Measurement Adapter’s switches as follows:

Table 2-2. V Measurement Adapter Switch Settings

ID				Output
1	2	3	4	
0	1	0	1	Disable

4. Connect the Shunt Connector directly to the 4339B’s “Ground” and “Guard” connectors.
5. Connect the V Measurement Adapter’s “Output” cable to the 4339B “Output” connector.
6. Connect the V Measurement Adapter’s “Interlock” cable to the 4339B “Interlock” connector.
7. Set the V Measurement Adapter’s Interlock Switch “Output” to “Enable”.

Ammeter Adjustment

This adjustment updates the ammeter related and voltage source related adjustment data stored in the EEPROM. This adjustment consists of two setups.

Equipment

Multimeter	3458A
RC Box	16340A
Dual Banana-BNC(m) Cable	Agilent PN 11001-60001
RC Box Adapter	Agilent PN 04339-65005

Setup 1/2

This setup obtains the voltage source output resistance, and the ammeter scaling factors.

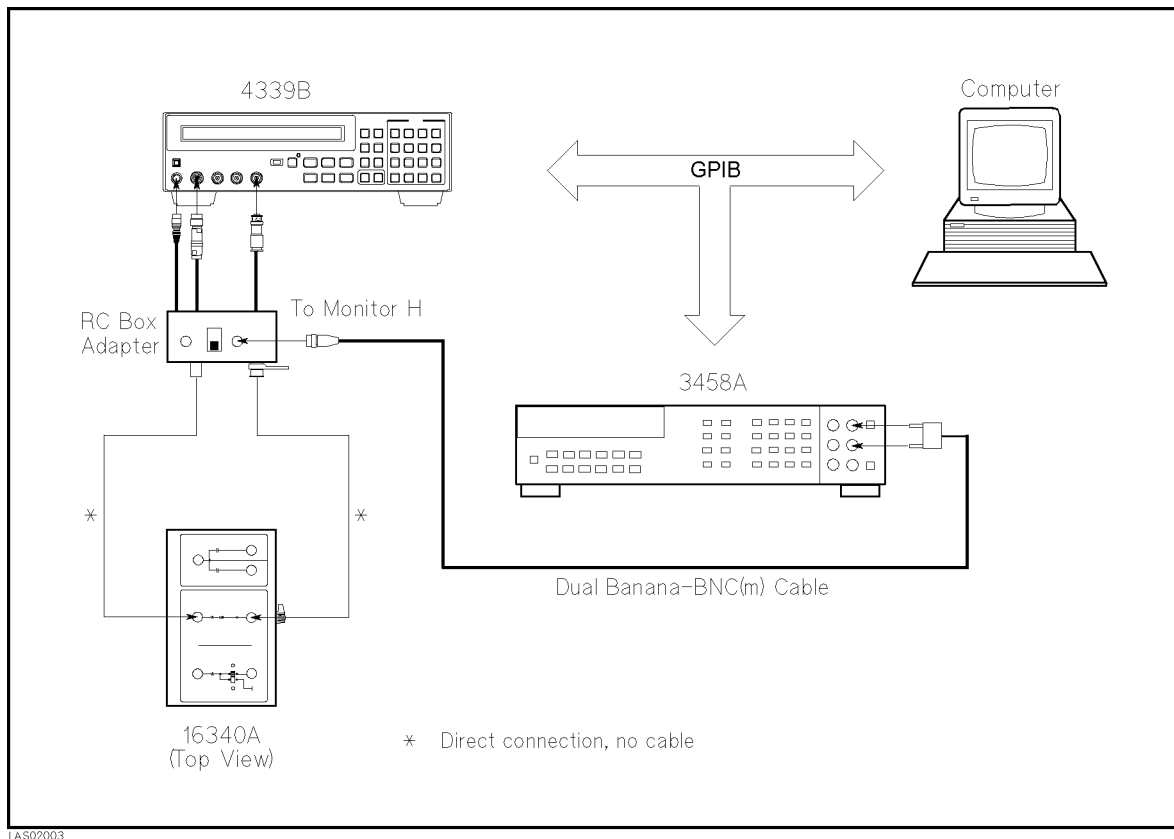


Figure 2-3. Ammeter Adjustment Setup 1/2

Perform the following steps as the program instructs.

1. Connect the RC Box Adapter's "Input" cable to the 4339B "Input" connector.
2. Connect the RC Box Adapter's "Output" cable to the 4339B "Output" connector.
3. Connect the RC Box Adapter's "Interlock" cable to the 4339B "Interlock" connector.
4. Set the RC Box Adapter switch to "F".

Upon the program instruction, perform the following steps.

1. Connect the RC Box Adapter directly to the 16340A's "10¹⁰ – 10²" connectors.
2. Connect the Dual Banana-BNC(m) cable to the RC Box Adapter's "Monitor H" connector.
3. Connect the other end of the Dual Banana-BNC(m) cable to the 3458A "INPUT".

Caution



To prevent electrostatic noise which may cause error in the adjustment data, do not move the RC Box Adapter cables while the 4339B is in measurement.

Setup 2/2

This setup obtains the ammeter input resistance.

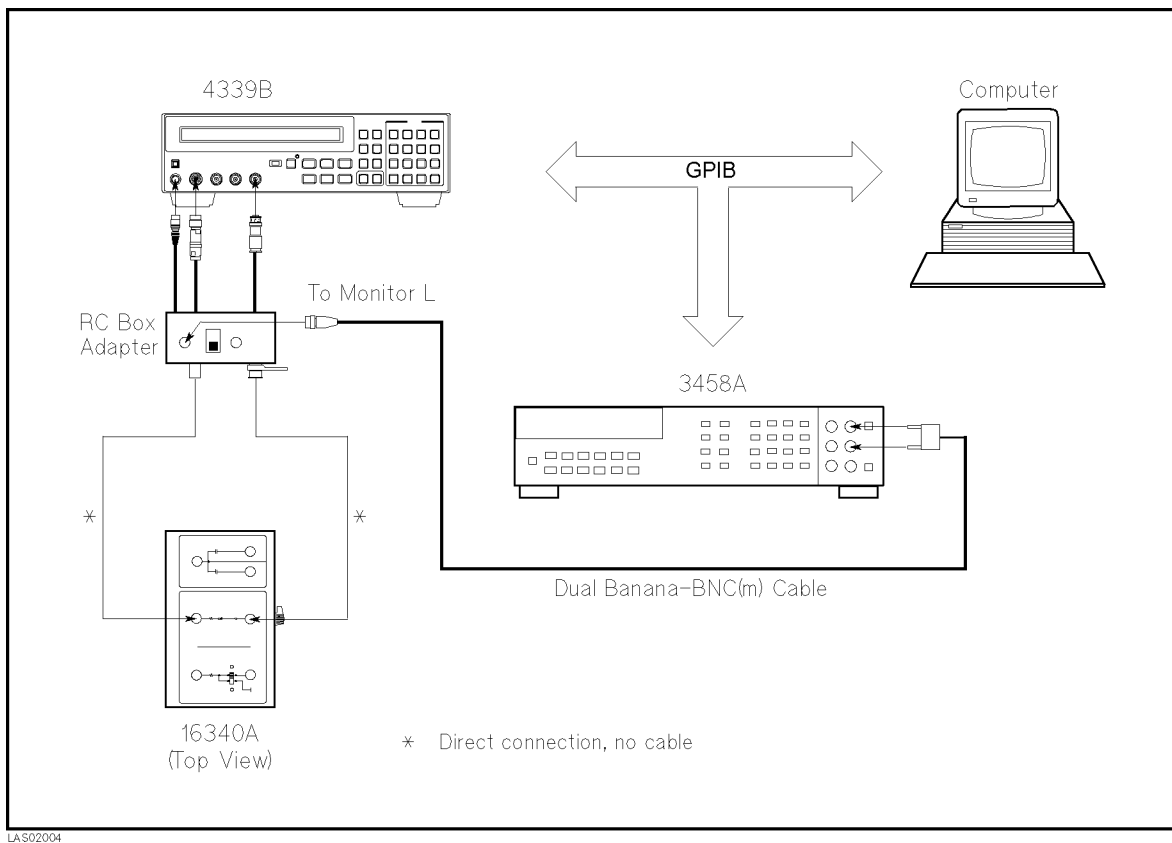


Figure 2-4. Ammeter Adjustment Setup 2/2

Perform the following steps as the program instructs.

1. Disconnect the Dual Banana-BNC(m) cable from the RC Box Adapter's "Monitor H" connector.
2. Connect the Dual Banana-BNC(m) cable to the RC Box Adapter's "Monitor L" connector.

Assembly Replacement

Introduction

This chapter provides the 4339B replaceable parts lists, and the step by step disassembly procedures for the major assemblies. Table 3-1 to Table 3-9 describe all the 4339B replaceable parts. The figure sections of Table 3-7 and Table 3-8 also shows the connections.

Ordering Information

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

To order a part that is not listed in the replaceable parts list, include the instrument model number, complete instrument serial number, the description and function of the part, and the quantity of parts required. Address the order to the nearest Agilent Technologies office.

Restored Exchange Assemblies

Some replacement assemblies are available as either new or restored assemblies. The restored assembly is more economical than a new assembly and, as with new assemblies, a 90-day warranty applies through the instrument's support life. The defective assembly must be returned for credit. For this reason, new assemblies must be ordered for spare parts. The part numbers for both new and restored assemblies are given in the replaceable parts lists.

Note



The Exchange Program may not apply in your country. Contact the nearest Agilent Technologies office for further details.

Replacing the A2 CPU Board Assembly

The A2 CPU Board Assembly has a ROM for the firmware and an EEPROM for the adjustment data and user data. Both ROM and EEPROM are mounted in sockets for easy replacement. If the A2 assembly is replaced, the ROM and EEPROM may be transferred from the defective assembly to the new assembly as long as the ROM and EEPROM are not defective. The ROM transfer reduces parts cost for the repair, and the EEPROM transfer saves time from readjusting the 4339B. For this purpose, the A2 assembly can only be ordered without the ROM.

When the A2 assembly is replaced, make sure that the jumpers and switches on the A2 assembly are in the default position as shown in Appendix B.

Replaceable Assembly List

The replaceable electrical assemblies are listed in Table 3-1 and Table 3-3.

Table 3-1. Replaceable Major Assembly List

LA003101			
Reference Designation	Agilent Part Number	Qty.	Description
1	04339-60002	1	Transformer
2	04339-66505	1	A5 AC Inlet Board Assembly
3	04263-80901	1	DC-DC Converter Unit
4	04339-66501	1	A1 Main Board Assembly
	04339-69501		A1 Main Board Assembly (Exchange Assembly)
5	04263-66532	1	A2 CPU Board Assembly w/o ROM
	04263-00604	1	Case Shield ¹
	0515-1550	4	Screw M3
	04339-00612	1	Insulator
	0460-0616	70 mm	Adhesive Tape (for Insulator)
6	04339-66504	1	A4 Keyboard Assembly
	04339-25151	1	Rubber Key
	0515-1550	1	Screw M3
7	04263-61010	1	LCD
	04263-25003	1	Filter Transparent
	0515-1550	2	Screw M3
8	04339-66503	1	A3 Ammeter Board Assembly
	04339-69503		A3 Ammeter Board Assembly (Exchange Assembly)
9 ²	04263-80901	1	DC-DC Converter Unit

¹ Included in 04263-66532

² Included in A3 Ammeter Board Assembly, 8

Table 3-2. A2 CPU Board Assembly, Replaceable Assembly List

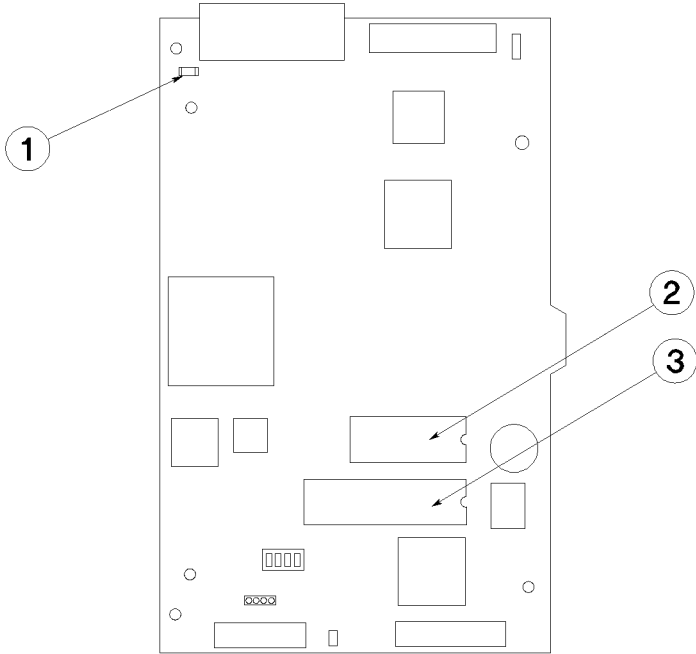
			
Reference Designation	Agilent Part Number	Qty.	Description
1	2110-1123	1	A2F1, Fuse SMT 2 A
2	1818-5146	1	A2U1, EEPROM
3	04339-85071	1	A2U11, ROM Rev. 1.04

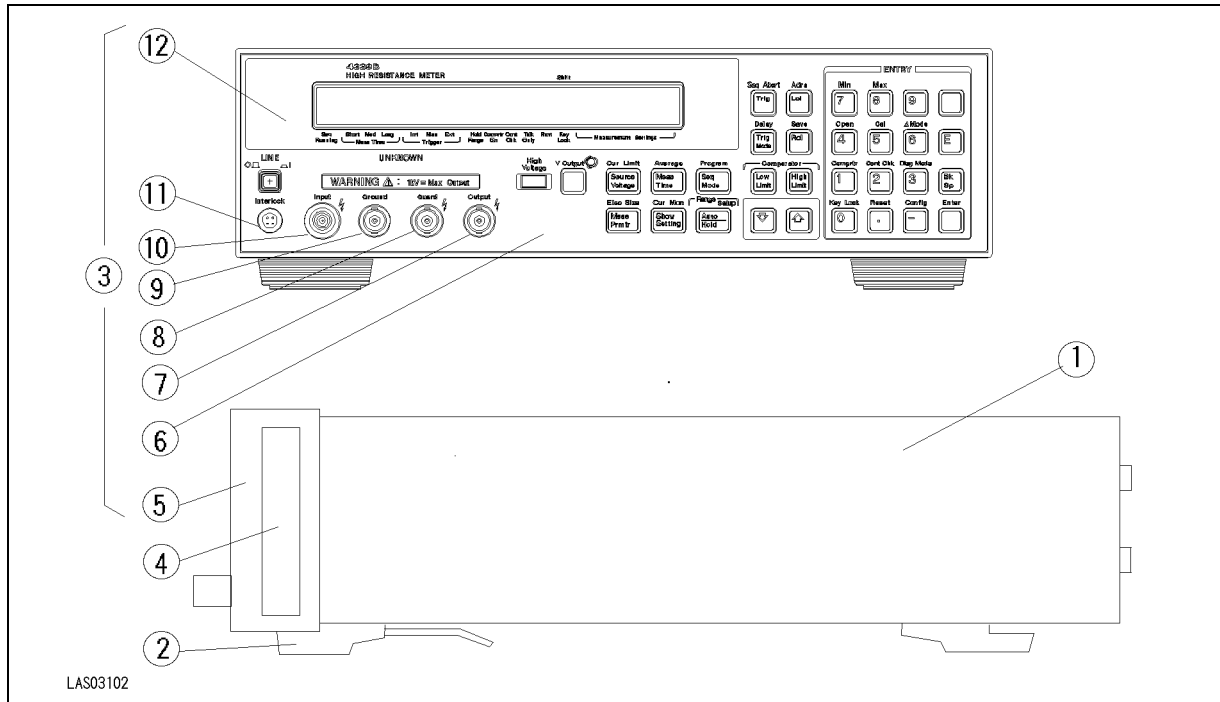
Table 3-3. Replaceable Assembly List

Reference Designation	Agilent Part Number	Qty.	Description
A1C500	0180-4334	1	Capacitor, 22000 μ F (for power supply)
A1C501	0180-4334	1	Capacitor, 22000 μ F (for power supply)
A3C500	0180-4334	1	Capacitor, 22000 μ F
A5SW1	3101-3173	1	Line Switch
A5SW2	3101-3156	1	Voltage Selection Switch
A5VR1	0837-0237	1	Varistor
A5VR2	0837-0237	1	Varistor

Replaceable Mechanical Parts List

The replaceable mechanical parts are listed in Table 3-4 to Table 3-7.

Table 3-4. Replaceable Mechanical Parts List 1



Reference Designation	Agilent Part Number	Qty.	Description
1	04339-04004	1	Cover
	0363-0125	30 mm × 2	Gasket
2	5041-9167	4	Foot
	1460-1345	2	Tilt Stand
3	04339-65020	1	Front Panel Assembly ¹
4	5041-9170	2	Trim Side
	0515-0914	4	Screw M3 (Hidden)
5	04263-40001	1	Front Bezel ²
6	04339-00605	1	Sub Panel (Hidden) ²
	0515-0914	4	Screw M3 (Hidden) ²
7	1250-2317	1	HV BNC Connector ²³
	0360-1190	1	Lug Terminal (Hidden) ²
8	1250-2317	1	HV BNC Connector ²³
9	1250-2317	1	HV BNC Connector ²³
	0360-1190	1	Lug Terminal (Hidden) ²
10	1250-2228	1	Triaxial Connector ²³
11	1252-1419	1	Connector 6 pin ²⁴⁵
	04339-01204	1	Lug Terminal (Hidden) ²
	04339-24009	1	Nut (Hidden) ²
12	04339-87122	1	Panel Label ²

1 The assembly consists of the parts designated by 5 through 12 and cables connected to the all connectors on the front panel.

2 This part is included in the Front Panel Assembly, 3.

3 Includes washer and nut

4 Includes washer

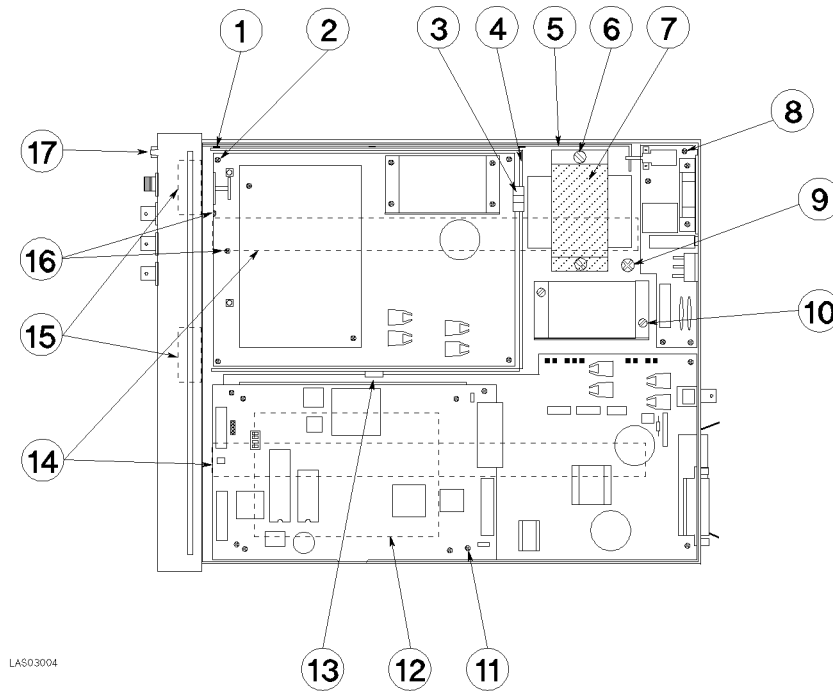
5 Furnished nut cannot be used

Table 3-5. Replaceable Mechanical Parts List 2

CAUTION: For continued protection against fire hazard, replace only with the same type and rating of fuse as specified for the line voltage being utilized. WARNING: No operator serviceable parts inside. Refer servicing to qualified personnel. Handler Interface Ext Trigger Voltage Selector Fuse LINE 50/60Hz 45A Max 115V~ T 0.5A 250V 230V~ T 0.25A 250V L5S03003			
Reference Designation	Agilent Part Number	Qty.	Description
1	04339-61697	1	GPIB Connector with flatcable ¹
2	0515-1551	2	Screw M3
3	2110-0565	1	Fuse Holder
	2110-0202	1	Fuse 0.25 A, Slow Blow (230V)
	2110-0201		Fuse 0.5 A, Slow Blow (115V)
4	04339-00103	1	Chassis
5	2190-0054	1	Washer
	2950-0054	1	Nut

¹ Includes two sets of screw, washer, and nut.

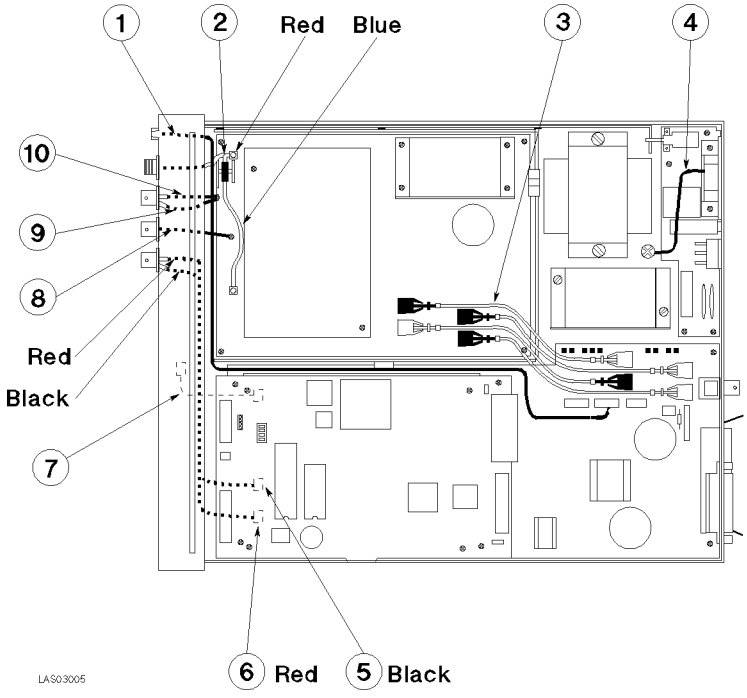
Table 3-6. Replaceable Mechanical Parts List 3



LA503004

Reference Designation	Agilent Part Number	Qty.	Description
1	04339-25002	3	Support, Line Switch Plate
	0515-0914	3	Screw M3L4 Flat Head
2	0515-1550	4	Screw M3 (for A3)
	04339-25003	5	Standoff (Hidden, for A3)
3	1400-1048	1	Edge Saddle
4	04339-00601	1	Case Shield
	0361-1360	2	Rivet Nyron (for Shield)
5	04339-01202	1	Plate, Line Switch
6	04263-24001	2	Nut Rod (for Transformer)
	2190-0586	2	Washer Spring M4
7	04263-00607	1	Plate Shield
8	0515-01550	4	Screw M3 (for A5)
9	0515-2079	1	Screw M4 (on the Chassis)
10	04263-24002	2	Nut Rod (for DC-DC Conv.)
	2190-0584	2	Washer Spring M3
11	0515-1550	7	Screw M3 (for A1 and A2)
	04339-24006	4	Standoff (Hidden, for A1)
12	04339-00612	1	Insulator (Hidden)
	0460-0616	120 mm x 2	Adhesive Tape (for Insulator)
13	1400-0866	1	Cable Clamp
14	5040-3347	2	Plate (Hidden, Chassis Reverse side)
	0460-0616	200 mm x 2	Adhesive Tape (for Plate)
15	04263-07001	2	Gasket
	0515-1550	4	Screw M3
16	0515-1550	2	Screw M3
17	0370-2862	1	Button, Line Switch
	04339-23001	1	Shaft, Line Switch
	0535-0031	1	Nut (for Shaft)

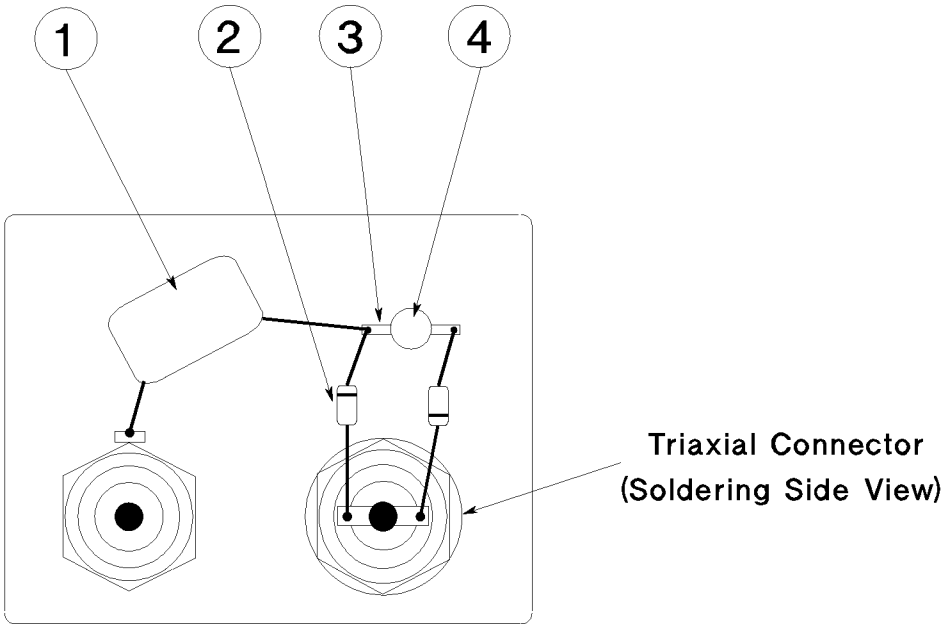
Table 3-7. Replaceable Mechanical Parts List 4

			
Reference Designation	Agilent Part Number	Qty.	Description
1	04339-61608	1	Wire Assy
2	04339-61607	1	Cable Assy
	04339-24010	1	Sleeve
	0890-0312	25 mm	Tube, Heat Shrink
	04339-25004	1	Core Holder
	0515-1550	1	Screw M3
3	04339-61605	4	Cable Assy, Optical
4	04339-61614	1	Wire Assy (Binding Post)
5	04339-61606	1	Wire Assy, Black ¹
	0890-1806	20 mm	Tube, Heat Shrink
6	04339-61612	1	Wire Assy, Red ¹
	0890-1480	15 mm	Tube, Heat Shrink
	0890-1806	20 mm	Tube, Heat Shrink
7	04339-61613	1	Wire Assy
8	04339-61616	1	Wire Assy
	0890-0311	15 mm	Tube, Heat Shrink
	0890-1806	20 mm	Tube, Heat Shrink
9	04263-61611	1	Wire Assy
10	04339-61615	1	Wire Assy
	0890-0311	15 mm	Tube, Heat Shrink

¹ Must be twisted

3-8 Assembly Replacement

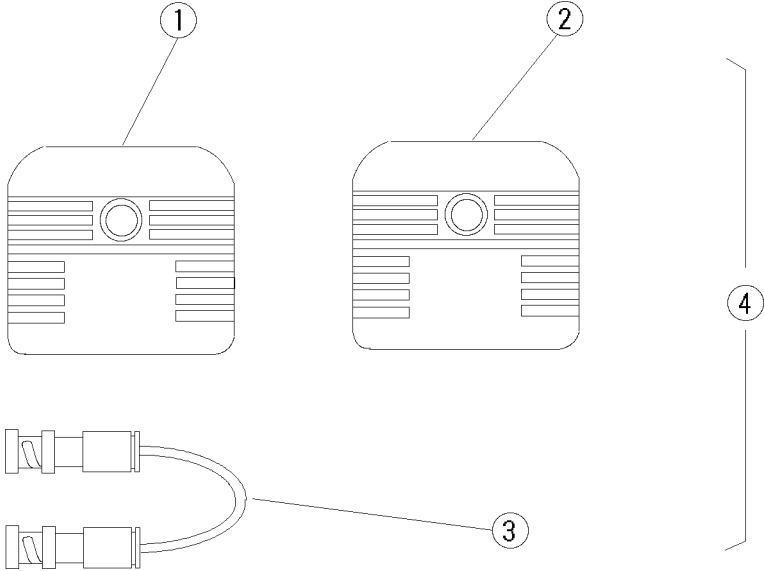
Table 3-8. Replaceable Mechanical Parts List 5



L5S03007

Reference Designation	Agilent Part Number	Qty.	Description
1	0160-7457	1	Capacitor 2200 pF 1.6 kV
2	1901-1250	2	Diode
3	04339-24013	1	Stick
4	04339-25008	1	Stud
	0515-0914	1	Screw M3

Table 3-9. Replaceable Mechanical Parts List 6

			
Reference Designation	Agilent Part Number	Qty.	Description
1	04339-40003	1	Housing ¹
2	04339-40004	1	Housing with Nut ¹
	0515-1550	1	Screw M3 ¹
	3050-0891	1	Washer ¹
3	04339-61651	1	Cable Assembly ¹
4	04339-60003	1	Shunt Connector ²

1 This part is included in the Shunt Connector Assembly, 4

2 This assembly consists of the part designated by 1 through 3.

Disassembly Procedures

Caution SUSCEPTIBLE TO DAMAGE FROM ESD.



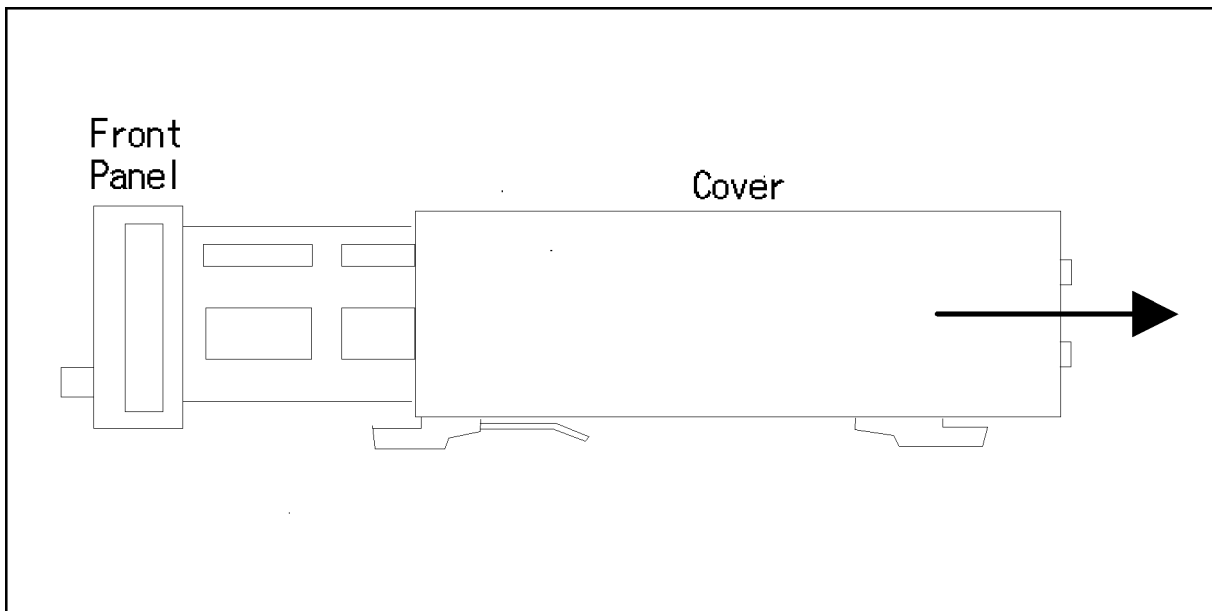
Perform the following procedures only at a static-safety workstation and wear a grounding strap.

Tools and Fasteners

The 4339B mechanical components are secured using metric threaded fasteners. Many fasteners in the 4339B may appear to be Phillips type, but they are in fact, Pozidrive type. To avoid damaging them, use only pozidrive screwdrivers to remove or tighten pozidrive type fasteners.

Cover Removal

The following procedure is common for gaining access to any of the assemblies.



LCS03103

Figure 3-1. Cover Removal

1. Remove the two screws which fasten the cover to the chassis's rear panel.
2. Slide the cover toward rear while holding the front panel bezel as shown in Figure 3-1.

A1 Main Board Removal

Removal Procedure

1. Remove the A2 CPU Board Assembly while referring to “A2 CPU Board Assembly Removal”.
2. Disconnect the following cable assemblies from the A1 assembly.
 - a. Four cable assemblies from the front panel
 - b. The cable assembly from the transformer
 - c. Two cable assemblies from the DC-DC Converter
3. Disconnect the four optical fiber cables which are connected to the A3 Ammeter Board Assembly
4. Disconnect the four optical fiber cables from the A3 Ammeter Board Assembly

Caution



To avoid damaging on the optical fiber cable caused by bending or other mechanical stress, remove all the fiber cables from the 4339B when replacing either the A1 board or the A3 board.

5. Remove the cable clamp on the shield case which surrounds the A3 board.
6. Remove the nut which fastens the Ext Trigger connector on the rear panel.
7. Remove the screw which secures the A1 board to the chassis side.
8. Remove the four studs, that secure the A1 assembly to the chassis, by rotating the studs with a flat bladed screwdriver.
9. Remove the three screws that secure the A1 assembly to the chassis.
10. Remove the A1 assembly from the chassis.

A2 CPU Board Assembly Removal

Removal Procedure

1. Remove the cover while referring to “Cover Removal”.
2. Disconnect the four flatcable assemblies and the wire assembly from the A2 board.
3. Remove the four screws that secure the A2 board to the stud.
4. Remove the A2 board from the chassis.

Note



The ROM and EEPROM on the A2 assembly may be transferred to the new assembly to minimize the repair time and parts cost. Refer to “Replacing the A2 CPU Board Assembly” for more information.

A3 Ammeter Board Assembly Removal

Removal Procedure

1. Remove the cover while referring to “Cover Removal”.
2. Disconnect the cable assembly connected to the transformer assembly, from the A3 board.
3. Disconnect the four optical fiber cables from the A3 board.
4. Disconnect the four optical fiber cables from the A1 Main Board Assembly

Caution



To avoid damaging on the optical fiber cable caused by bending or other mechanical stress, remove all the fiber cables from the 4339B when replacing either the A1 board or the A3 board.

5. Disconnect the cable assembly, which includes a core, from the front of the A3 board.
6. Remove the screw which fasten the cable assembly on the front of the A3 board.
7. Remove four screws that secure the A3 board to the chassis.
8. Remove the A3 board from the chassis.

A5 AC Inlet Board Assembly Removal

Removal Procedure

1. Remove the cover while referring to “Cover Removal”.
2. Disconnect the 4 pin connector cable assembly from the A5 board.
3. Remove the screw which fixes the green and yellow wire connected to the neutral terminal of the power cable connector to the bottom of the chassis.
4. Remove the four screws that secure the A5 board to the chassis.
5. Remove the A5 board from the chassis.

Keyboard Assembly Removal

Removal Procedure

1. Remove the cover while referring to “Cover Removal”.
2. Disconnect the two flatcable assemblies and the wire assembly from the front side of the A2 board.
3. Remove the screw which fastens the cable assembly on the front side of the A3 Ammeter Board Assembly.
4. Remove the screws which fastens the cable assembly on the left front side of the chassis.
5. Remove the side trim label from both sides of the front bezel.
6. Remove the four screws that secure the front panel bezel to the chassis from both sides.
7. Place the front panel assembly, so that the front panel faces down.
8. Remove the wire assembly from the keyboard.
9. Remove the screw that secures the keyboard to the front panel bezel.
10. Remove the keyboard assembly from the front panel bezel.

LCD Assembly Removal

Removal Procedure

1. Remove the cover while referring to “Cover Removal”.
2. Disconnect the two flatcable assemblies and the wire assembly from the front side of the A2 board.
3. Remove the screw which fastens the cable assembly on the front side of the A3 Ammeter Board Assembly.
4. Remove the screws which fastens the cable assembly on the left front side of the chassis.
5. Remove the side trim label from both sides of the front bezel.
6. Remove the four screws that secure the front panel bezel to the chassis from both sides.
7. Place the front panel assembly, so that the front panel faces down.
8. Remove the two screws that secure the LCD to the front panel bezel.
9. Remove the LCD assembly from the front panel bezel.

Interlock Connector Removal

Removal Procedure

1. Remove the cover while referring to “Cover Removal”.
2. Disconnect the two flatcable assemblies and the wire assembly from the front side of the A2 board.
3. Remove the screw which fastens the cable assembly on the front side of the A3 Ammeter Board Assembly.
4. Remove the screws which fastens the cable assembly on the left front side of the chassis.
5. Remove the side trim label from both sides of the front bezel.
6. Remove four screws that secure the front panel bezel to the chassis from both sides.
7. Place the front panel assembly, so that the front panel faces down.
8. Unsolder the white cable from the lug terminal for the interlock connector.
9. Unscrew the nut which fasten the Interlock connector to the front panel assembly using a spanner from the back of the front panel bezel.
10. Unsolder the cables from the the interlock connector.
11. Remove the Interlock connector.

Note



When soldering the cable assemblies to the Interlock connector, refer to Figure 3-2 for connection assignment between the connector pins and wire color.

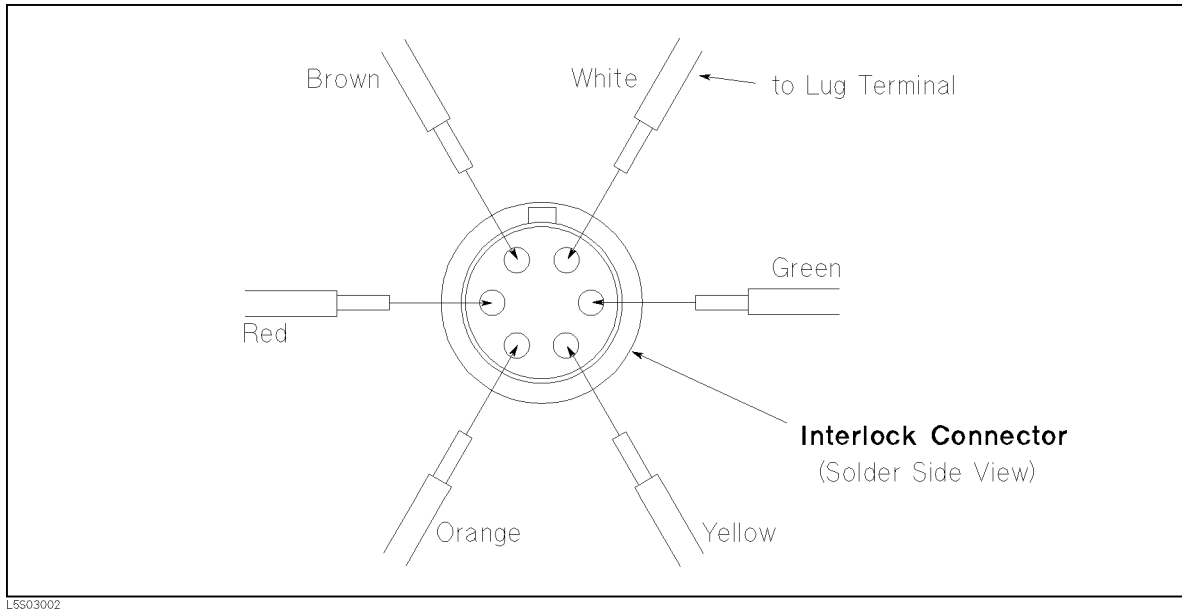


Figure 3-2. Cable Assembly Connection for Interlock Connector

Triaxial Connector Removal

Caution



When accessing the triaxial connector, use lint free gloves to avoid contaminating the connector. Agilent Technologies supplies lint free gloves (Agilent PN 9300-0163).

Removal Procedure

1. Remove the cover while referring to "Cover Removal".
2. Disconnect the two flatcable assemblies and the wire assembly from the front side of the A2 board.
3. Remove the screw which fastens the cable assembly on the front side of the A3 Ammeter Board Assembly.
4. Remove the screws which fastens the cable assembly on the left front side of the chassis.
5. Remove the side trim label from both sides of the front bezel.
6. Remove the four screws that secure the front panel bezel to the chassis from both sides.
7. Place the front panel assembly, so that the front panel faces down.
8. Disconnect the cable assembly which includes a core from the front side of the A3 Ammeter board assembly.
9. Remove the core holder which holds the cable assembly disconnected in the last procedure, by unscrewing the screw which secures the holder from the front side. Unsolder the diodes from the sleeve of the triaxial connector.
10. Remove the heat shrink tube from the triaxial connector.
11. Unsolder the sleeve from the triaxial connector.
12. Unsolder the coaxial cable from the triaxial connector.
13. Unscrew the nut which fastens the triaxial connector to the sub panel.

14. Remove the triaxial connector.

Note



When soldering the cable assembly to the triaxial connector, refer to Figure 3-3 and carefully solder the cable to the connector so that the center conductor and the outer shield are not shorted to each other.

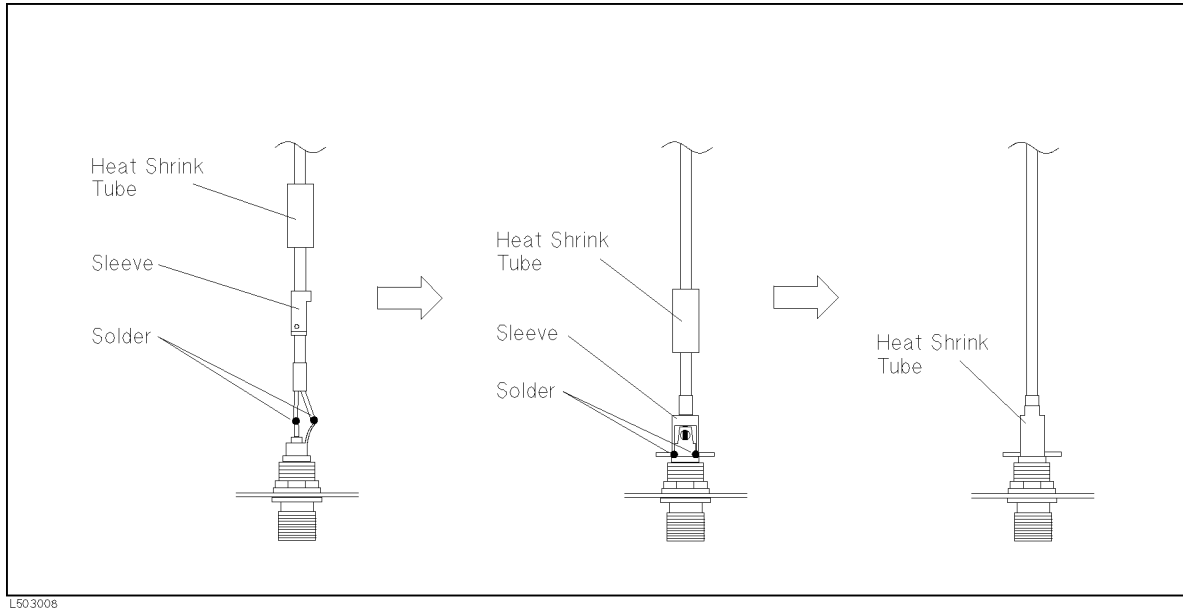


Figure 3-3. Cable Assembly Connection for Triaxial Connector

BNC Connector Removal

Removal Procedure

Caution



When accessing the BNC connector, use lint free gloves to avoid contaminating the connector. Agilent Technologies supplies lint free gloves (Agilent PN 9300-0163).

1. Remove the cover while referring to “Cover Removal”.
2. Disconnect the two flatcable assemblies and the wire assembly from the front side of the A2 board.
3. Remove the screw which fastens the cable assembly on the front side of the A3 Ammeter Board Assembly.
4. Remove the screws which fastens the cable assembly on the left front side of the chassis.
5. Remove the side trim label from both sides of the front bezel.
6. Remove the four screws that secure the front panel bezel to the chassis from both sides.
7. Place the front panel assembly, so that the front panel faces down.
8. Remove the heat shrink tube from the BNC connector being replaced.
9. Unsolder the cable from the BNC connector being replaced.
10. Unscrew the nut which connects the BNC connector to the sub panel.
11. Remove the BNC connector.

Troubleshooting

Introduction

This chapter provides assembly level troubleshooting information for the 4339B. The information includes theory of operation, and troubleshooting.

Safety Considerations

This chapter contains *WARNINGS* and *CAUTIONS* that must be followed for your protection and to avoid damaging the equipment.

Warning



The servicing procedures described herein are performed when power is supplied to the instrument and its protective covers are removed. This type of servicing must be performed only by service trained personnel who are aware of the hazards involved (for example, fire, and electrical shock). When servicing can be performed without power applied to the instrument, remove power from the instrument. Before any repair is completed, ensure that all safety features are intact and functioning, and that all necessary parts are properly connected to the protective grounding system.

Required Equipment

Table 1-1 lists the equipment required for troubleshooting.

After Service Product Safety Checks

Warning



Whenever it appears likely that protective safety provisions have been impaired, the apparatus shall be marked as inoperative and should be secured against any unintended operation. The protection provisions will have likely been compromised if, for example:

- The instrument shows visible signs of damage.
- The instrument fails to perform the intended measurement.
- The unit has undergone prolonged storage under unfavorable conditions.
- The instrument was severely stressed in transport.

Perform the following five safety checks to verify the safety condition of the 4339B (these checks may also be used for safety checks after troubleshooting and repair).

1. Visually inspect the interior of the instrument for any signs of abnormal internally generated heat, such as discolored printed circuit boards and components, damaged insulation, or evidence of arcing. Determine the cause, and repair.
2. Use an ohmmeter which can accurately measure $0.1\ \Omega$ to check the resistance from the instrument enclosure to the power cord's ground pin. The resistance must be less than $0.1\ \Omega$. Flex the power cord while making this measurement to determine if any intermittent discontinuities exist.
3. Unplug the 4339B's power plug from the power source. Set the line switch to ON. Tie the line and neutral pins of the power connector together and check the resistance between them and enclosure. The minimum acceptable resistance is $5\ M\Omega$. Find and replace any component which causes the instrument to fail this test.
4. Verify that the correct fuse is installed.
5. Make sure that the grounding wire (green/yellow) is secured to the chassis by a screw and washer.

Theory of Operation

This section describes the overall operation of the 4339B and the operation of each assembly.

Overall Measurement Theory

The 4339B measures the resistance of the Device Under Test (DUT) in the following manner.

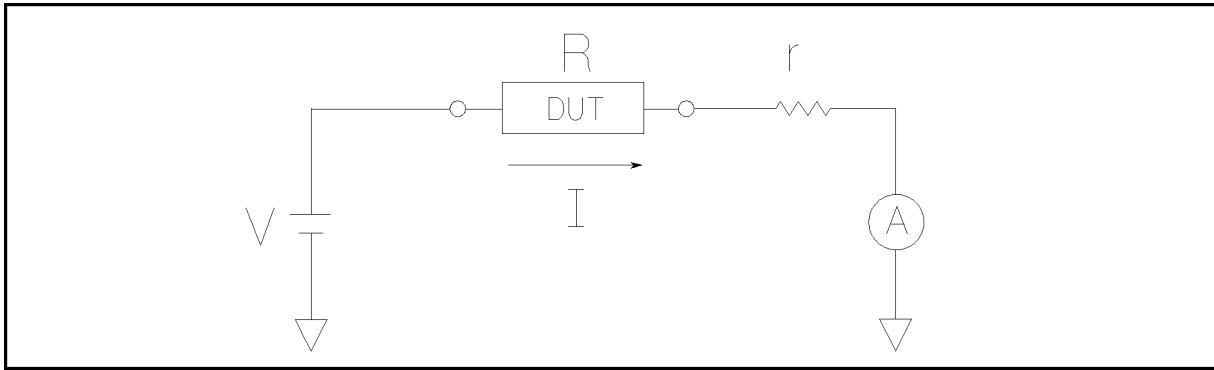


Figure 4-1. Ohm's Law

In Figure 4-1, a DUT is connected in series with test voltage source V, and ammeter A. If the ammeter measures I amperes when the source voltage is V, the DUT's resistance R is expressed by (when ignoring r):

$$R = \frac{V}{I}$$

This equation shows that if the DUT resistance R is extremely high, the current flowing the circuit is extremely low. For example, if $R = 1 \text{ G}\Omega$, and $V = 1 \text{ V}$, the current flowing is 1 nA (10^{-9} A). The 4339B High Resistance Meter is essentially a set of a voltage source and a very sensitive current meter.

Note



In practice, ammeter input resistance r, which is approximately $1 \text{ k}\Omega$, decreases the current flowing through the DUT. The actual current, I, flowing through the DUT, R, is expressed by:

$$I = \frac{V}{R + r}$$

In the current measurement mode, the 4339B displays the actual current I for the measurement result. For example, if $R = 100 \text{ k}\Omega$, and $V = 1 \text{ V}$, the measurement result will be $9.9 \text{ }\mu\text{A}$ ($\frac{1}{100\text{k}+1\text{k}}$) rather than $10 \text{ }\mu\text{A}$ ($\frac{1}{100\text{k}}$).

In the resistance measurement mode, on the other hand, the 4339B displays the "derived" DUT resistance which coincides with the DUT resistance. In other words, the 4339B shows the resistance calculated by:

$$R = \frac{V}{I} - r$$

For example, if $R = 100 \text{ k}\Omega$, and $V = 1 \text{ V}$, the measurement result will be $100 \text{ k}\Omega$, even the actual current flowing through the DUT, thus through the ammeter with r is $9.9 \text{ }\mu\text{A}$.

Overall Block Diagram

Figure 4-2 shows the overall block diagram of the 4339B.

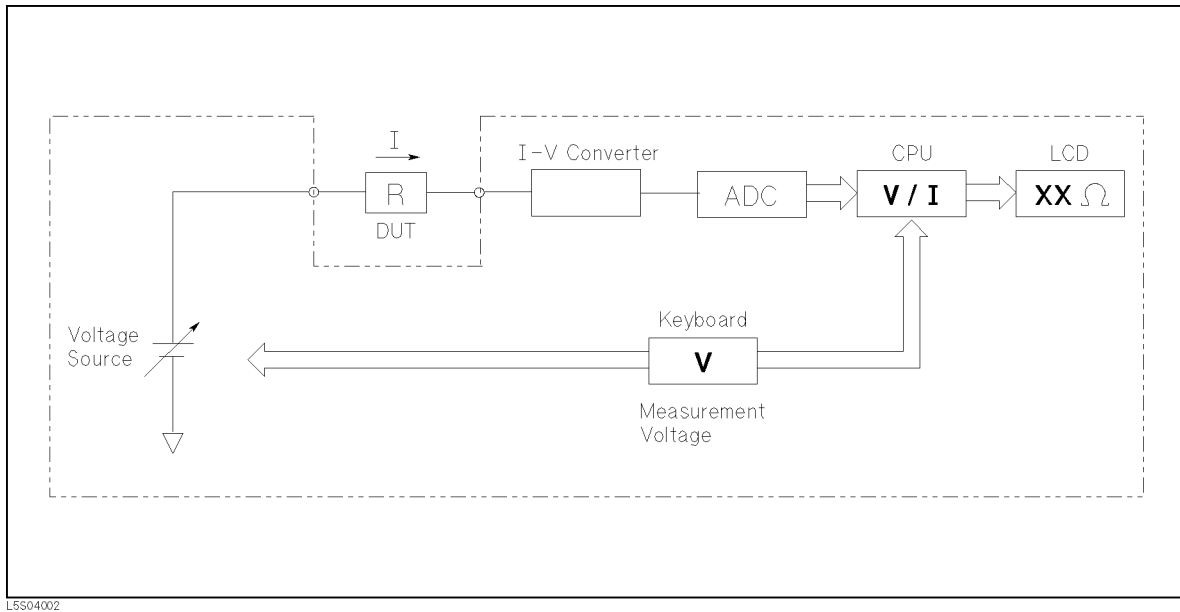


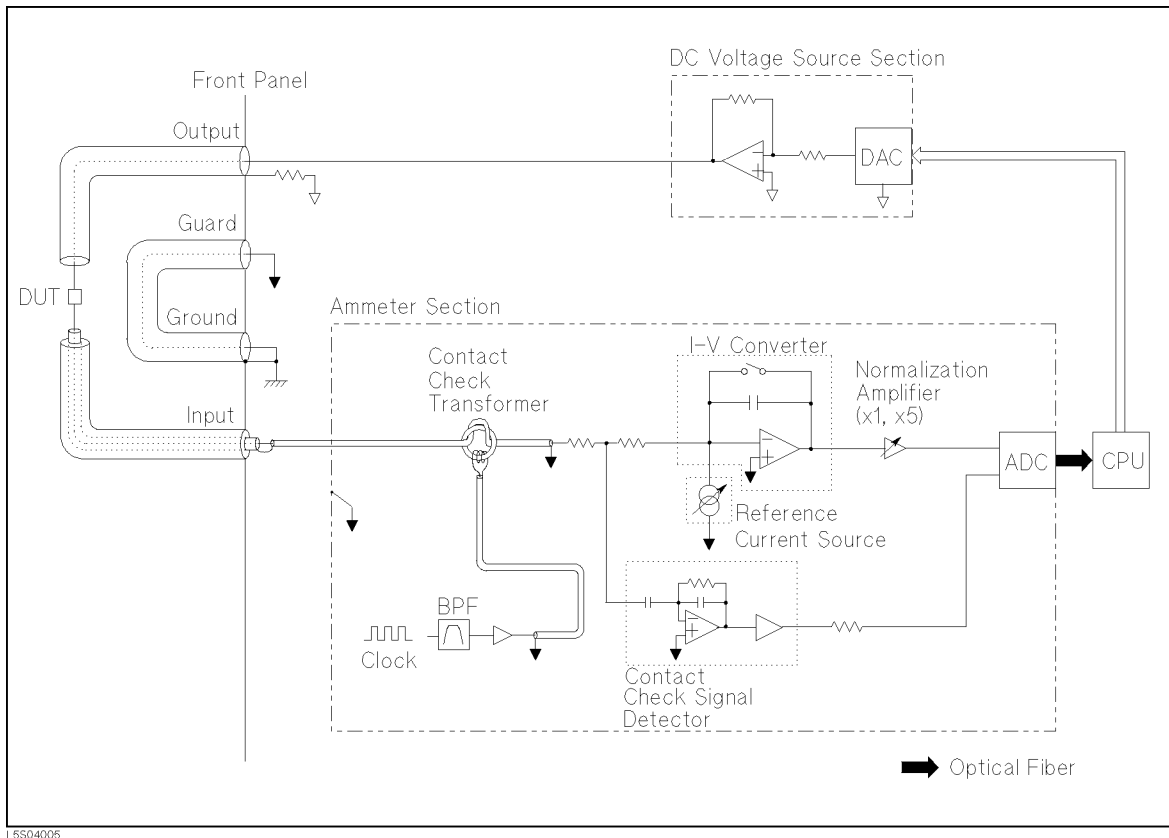
Figure 4-2. 4339B Overall Block Diagram

The voltage source applies dc voltage which is set from the keyboard or by an GPIB command. The I-V converter which is directly connected to the input converts the current flowing into to a voltage ramp of which slope is proportional to the input current. The CPU calculates the current from the voltage ramp slope, then calculates the DUT resistance by dividing the source voltage by the current.

Analog Section

Figure 4-3 shows the analog section block diagram. The 4339B analog section can be divided in two sections, the dc voltage source section and the ammeter section.

The dc voltage source section applies measurement voltage to the series circuit consisting of the DUT and I-V Converter. The DUT is connected to the 4339B “Input” connector by a triaxial cable which is a three layered coaxial cable. This triaxial cable shields external noise and improves the contact check function accuracy. The current flows into the I-V Converter in the ammeter section via the contact check transformer. As discussed in “I-V Converter”, the I-V Converter converts current flowing into to voltage ramp. The normalization amplifier enhances the number of measurement range and of measurement speed selection with fewer range capacitors. The I-V converter output voltage slope, which is proportional to the converter input current, is determined by the difference between two voltage measurement results in a certain time interval. The result (current) is converted to digital data by the ADC, and transferred to the CPU section by optical fiber links.



L6504005

Figure 4-3. Analog Section Block Diagram

DC Voltage Source Section

The voltage source generates a dc voltage ranging from 0 V to 1,000 V. The voltage setting resolution is 0.1 V when the output is less than and equal to 200 V, and 1 V when the output is greater than 200 V. The current limit function controls the source output voltage so that the current flowing through the DUT is within the user specified range.

Figure 4-4 shows the DC Voltage Source Section block diagram.

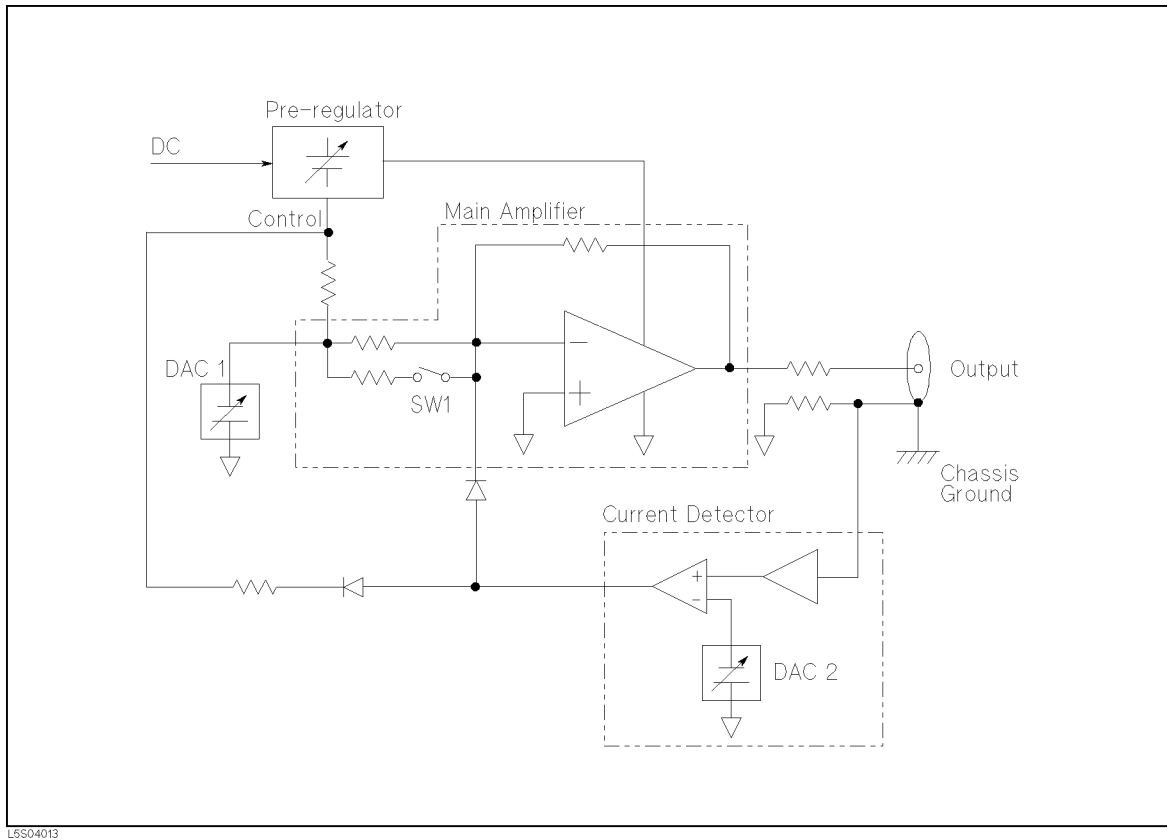


Figure 4-4. DC Voltage Source Section Block Diagram

The Main Amplifier amplifies the reference voltage generated by DAC 1 so that the output voltage is between 0 V and 1,000 V. The Pre-regulator supplies a voltage to the Main Amplifier. The Pre-regulator voltage varies according to the output voltage in order to minimize energy consumption of the Main Amplifier. The Current Detector detects the over current to reduce the output voltage so that the current is within the specified range.

Ammeter Section

The ammeter section converts current flowing into to corresponding digital data. The section includes an I-V converter, reference current source, and the Analog-to-Digital Converter.

I-V Converter. Figure 4-5 shows the I-V converter block diagram.

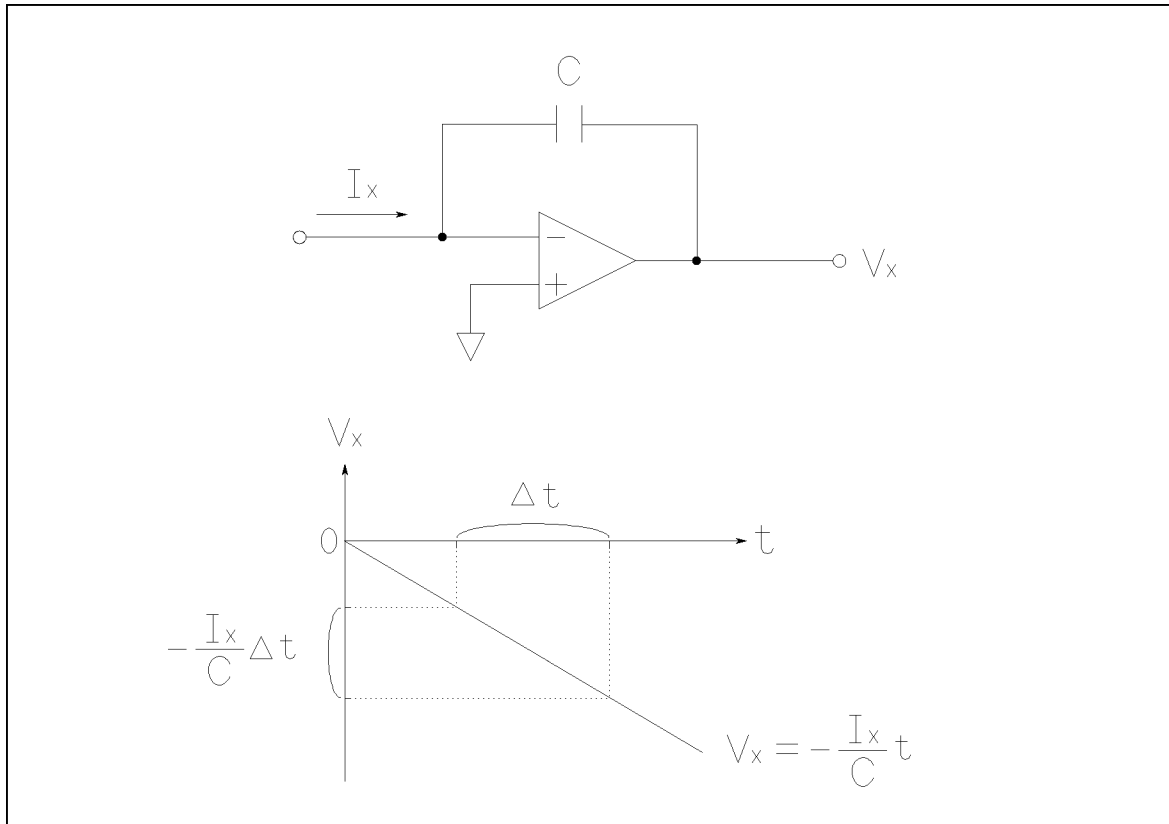


Figure 4-5. I-V Converter Block Diagram

The I-V Converter is essentially an integrator composed of an operational amplifier and a capacitor. When current I_x flows into the integrator, the current charges capacitor C . As a result, the integrator outputs a negative going ramp of which slope is $-\frac{I_x}{C}$. The current I_x can be obtained by $-C \frac{\Delta v}{\Delta t}$, where Δt is a certain time interval, and Δv is the output voltage drop for this interval. Capacitor C , which is called range capacitor, determines the applicable measurement range in a practical integrator.

Reference Current Source. The Reference Current Source is an internal current reference, which provides the I-V converter with some sets of pre-defined dc currents. The source is used for the power-on self test sequence and for the calibration function.

Digital Section

Figure 4-6 shows the Digital Section block diagram.

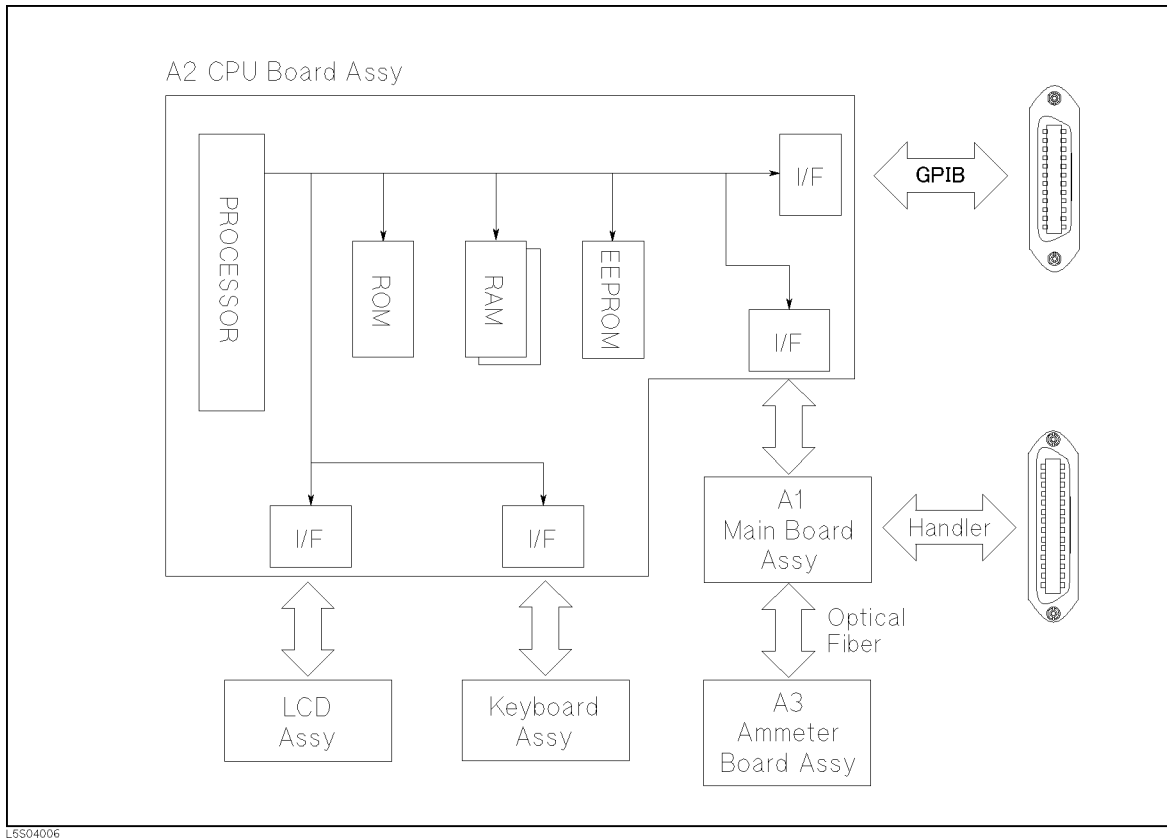


Figure 4-6. Digital Section Block Diagram

The digital section consists of the A2 CPU Board Assembly and other peripheral assemblies such as the keyboard and LCD. The section communicates with the A1 Main Board Assembly in order to control the latches, switches, and other components on the A1 Assembly and receive the measurement data. For the same purpose, the A2 Assembly also communicates with the A3 Ammeter Assembly via the A1 Assembly and four optical fibers. The GPIB interface on the A2 Assembly allows the 4339B communicate with a controller. The handler interface on the A1 Assembly allows the 4339B communicate with an external handler.

Note



Because of required high dc isolation between the A3 Assembly and other assemblies, the A3 Assembly communicates with other assemblies via optical fibers.

The A2 CPU Board Assembly includes a processor, ROM, EEPROM, jumpers, switches, and LEDs.

ROM (A2U11) stores the firmware which controls all the 4339B operation and functions. The ROM is mounted in a socket for easy replacement.

EEPROM (A2U1) stores the unit unique data, such as the adjustment data and the operator unique data, such as the operator saved measurement setup condition. The EEPROM will

not lose its data when power is turned off. The EEPROM is mounted in a socket for easy replacement.

Jumpers and switches set the 4339B conditions. Refer to Appendix B for more information.

Power Supply Section

Figure 4-7 shows the Power Supply Section block diagram.

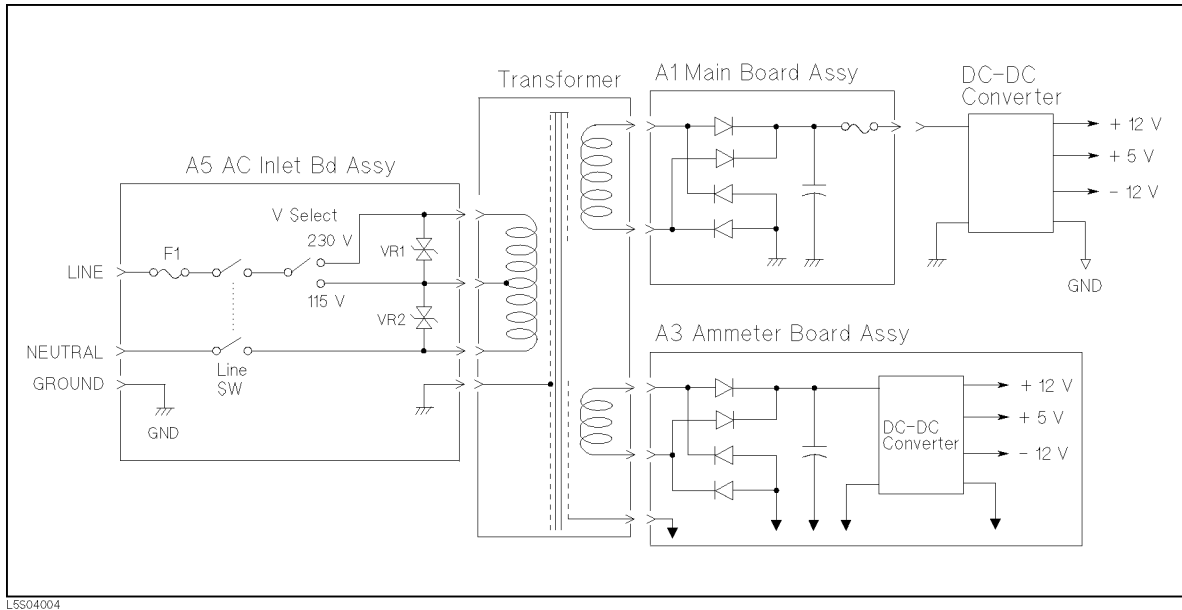


Figure 4-7. Power Supply Section Block Diagram

The ac line power is connected to the A5 AC Inlet Board Assembly, which consists of a fuse, line switch, voltage selection switch, and the varistors. The voltage selection switch selects the ac line voltage either 230 V or 115 V. According to the selection, the ac line power is connected to the corresponding primary tap of the transformer. Varistor, VR1 protects the circuit from surge voltage on the line power. VR2 blows the fuse F1, if the 4339B is turned on with wrong line voltage setting selection, for example, 115V selection when using 230 V line voltage.

Note



Because very high dc isolation is required between A3 Ammeter assembly and the other assemblies, the 4339B has two independent dc voltage supply systems.

Both of the transformer secondary voltages are approximately 14 V. One of the ac voltages is rectified and filtered by circuitry on the A1 Main Board Assembly, and produces approximately 14 Vdc. The dc voltage is applied to the DC-DC Converter to produce regulated +5 V, +12 V, and -12 Vdc. The dc voltages are supplied to all the assemblies except A3, either directly or indirectly via the A1 assembly. The other ac voltage is rectified and filtered on the A3 Assembly. A dc-dc converter on the A3 assembly provides regulated +5 V, +12 V, and -12 Vdc for the A3 assembly operation.

Troubleshooting

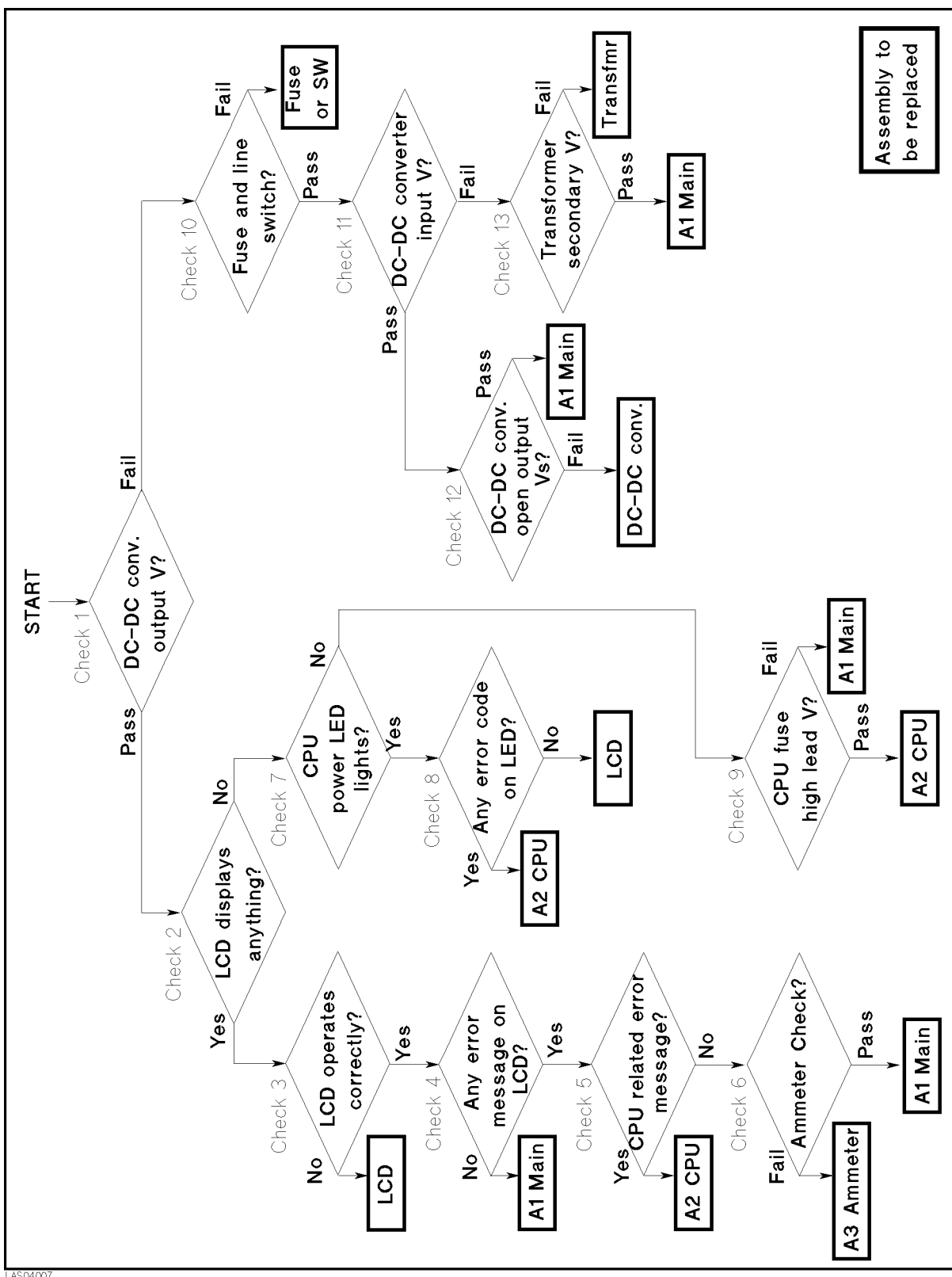
Figure 4-8 shows the overall troubleshooting flowchart to find the defective assembly. Follow the flowchart when troubleshooting. Refer to the “Check Procedure References” for detailed procedure to check each item.

Refer to Chapter 3 for assembly replacement.

Note



Because of each assembly's high SMD (surface mount device) ratio, the repair should be done by assembly replacement. The troubleshooting procedure, therefore, only isolates the defective assembly.



Check Procedure References

Refer to the corresponding check procedure. Each check procedure is numbered the same as in Figure 4-8 for quick reference.

Check 1, DC-DC Converter Output Voltage

1. Remove the cover referring to “Cover Removal” in Chapter 3.
2. Turn on the 4339B.
3. Using a multimeter, check to see if the voltages between the test pads (TPs), shown in Figure 4-9, on A1 Main Board Assembly are in the ranges listed in Table 4-1.
4. If passed, proceed to “Check 2, LCD Displays Anything?”, otherwise proceed to “Check 10, Fuse and Line Switch”.

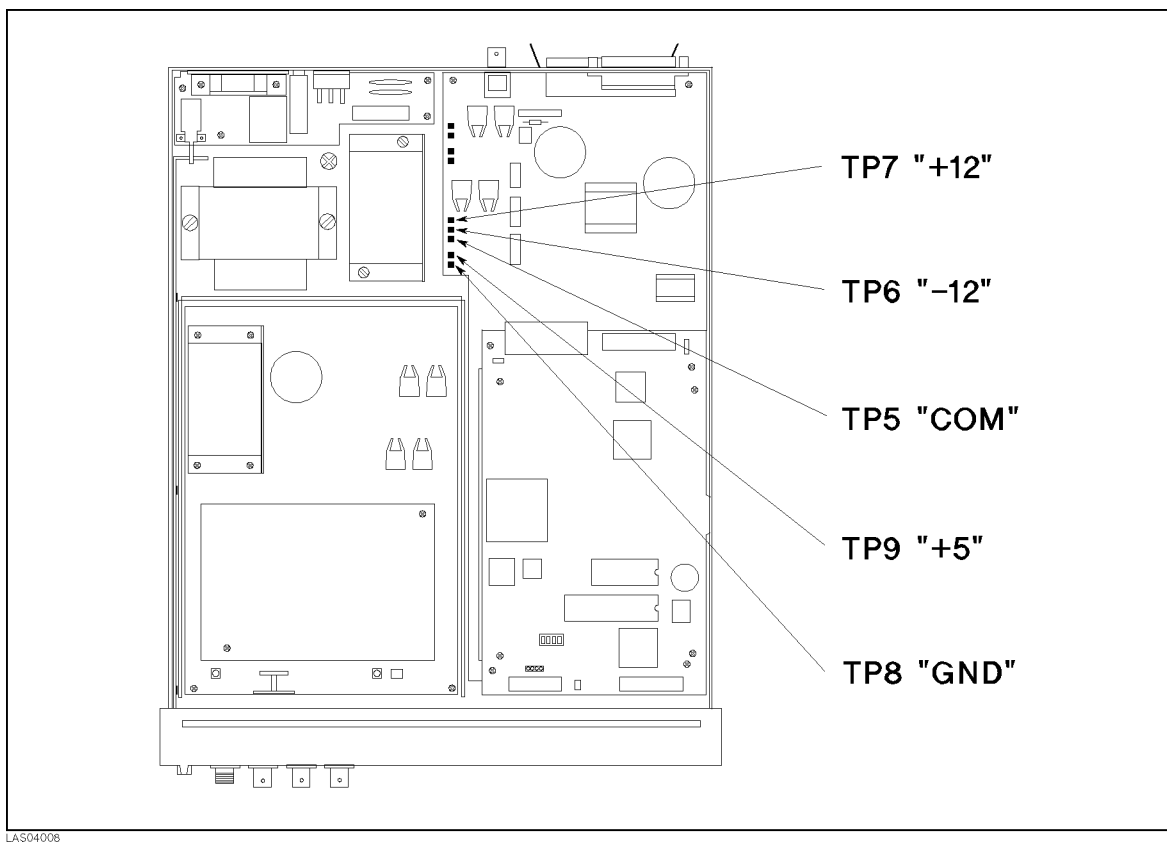


Figure 4-9. DC-DC Converter Output Voltage Check

Table 4-1. DC-DC Converter Output Voltages (Connected)

Test Pad (+)	Test Pad (-)	Range
9 (" +5")	8 ("GND")	$5.1 \pm 0.2 \text{ V}$
7 (" +12")	5 ("COM")	$12 \pm 0.6 \text{ V}$
6 (" -12")	5 ("COM")	$-12 \pm 0.6 \text{ V}$

Check 2, LCD Displays Anything?

1. Turn off the 4339B.
2. Turn on the 4339B while watching the LCD.
3. Check for a beep sound for a moment and if you see anything is displayed on the LCD.
4. If beep sounds and LCD displays something, proceed to “Check 3, LCD Operates Correctly?”, otherwise proceed to “Check 7, CPU Power LED Lights?”.

Check 3, LCD Operates Correctly?

1. Turn on the 4339B.
2. Reset the 4339B.
3. Check if the LCD’s back light is lit.
4. Press some front panel keys such as Meas Prmtr and check if the characters are correctly displayed in the whole area of the LCD.
5. If the LCD operates correctly, proceed to “Check 4, Any Error Message on LCD?”, otherwise replace the LCD Assembly.

Check 4, Any Error Message on LCD?

1. Turn off the 4339B.
2. Turn on the 4339B while watching the LCD.
3. Check if the LCD displays any error message.
4. If an error has NOT occurred, replace the A1 Main Board Assembly, otherwise proceed to “Check 5, CPU Related Error Message?”.

Check 5, CPU Related Error Message?

1. If the error message is one of the following replace the A2 CPU Board Assembly, otherwise proceed to “Check 6, Ammeter Functionality Check”.
 - a. ROM TEST FAILED
 - b. RAM TEST FAILED
 - c. EEPROM R/W FAILED

Note



When replacing the A2 CPU Board Assembly, refer to “Replacing the A2 CPU Board Assembly” in Chapter 3 for handling the ROM and EEPROM on the A2 Assembly.

Check 6, Ammeter Functionality Check

1. If the error message is one of the following, replace the A3 Ammeter Board Assembly, otherwise, replace the A1 Main Board Assembly.
 - a. A3 BD TEST FAIL
 - b. ADC FAILURE

Check 7, CPU Power LED Lights?

1. Turn on the 4339B.
2. Check if the LED “+5V” of DS1 on the A2 CPU Board Assembly lights. Refer to Figure 4-10 for DS1 location.
3. If the LED lights, proceed to “Check 8, Any Error Code on LED?”, otherwise proceed to “Check 9, CPU Fuse High Lead Voltage”.

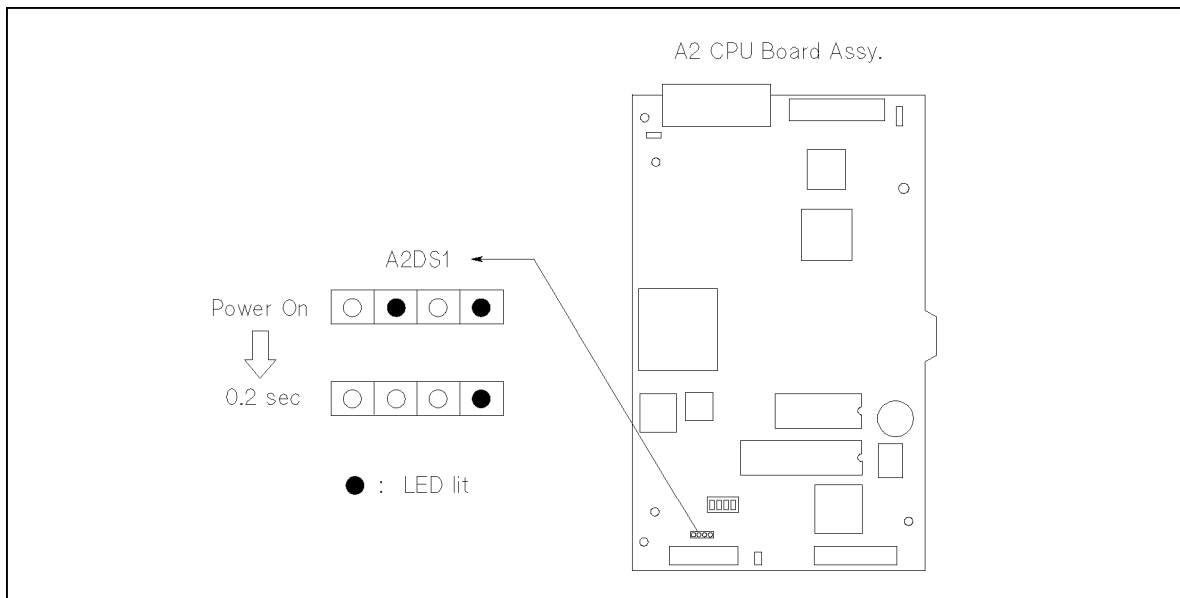
Check 8, Any Error Code on LED?

1. Turn off the 4339B.
2. Turn on the 4339B while watching the LEDs on the A2 CPU Board Assembly.
3. Check if the LEDs light as the sequence shown in Figure 4-10.
4. If LEDs light as the sequence, replace the LCD Assembly, otherwise (possibly “HALT” doesn’t light or “BERR” lights) replace the A2 CPU Board Assembly.

Note



When replacing the A2 CPU Board Assembly, refer to “Replacing the A2 CPU Board Assembly” in Chapter 3 for handling the ROM and EEPROM on the A2 Assembly.



LCS04009

Figure 4-10. CPU Board Assembly LED Light Sequence

Check 9, CPU Fuse High Lead Voltage

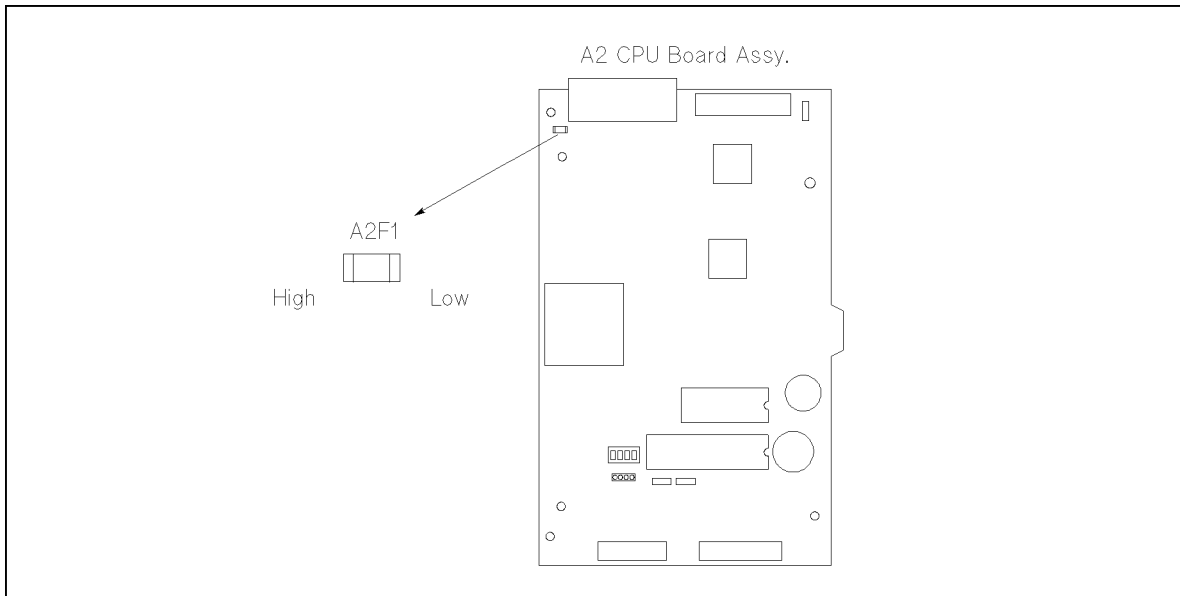
1. Turn on the 4339B.
2. Using a multimeter, check if the dc voltage at the high lead of the fuse F1 on the CPU Board shown in Figure 4-11 is $+5\pm0.2$ V.
3. If the voltage is in the range, replace the A2 CPU Board Assembly, otherwise replace the A1 Main Board Assembly.

Note

If the multimeter reading is correct, the F1 fuse on the A2 CPU Board Assembly is most suspicious. Replacing only the fuse may fix the problem.

Note

When replacing the A2 CPU Board Assembly, refer to “Replacing the A2 CPU Board Assembly” in Chapter 3 for handling the ROM and EEPROM on the A2 Assembly.



LCS04010

Figure 4-11. Location of High Lead of A2F1 Fuse

Check 10, Fuse and Line Switch

1. Check that the fuse on the 4339B rear panel is not blown.
2. Check that the line switch on the A5 AC Inlet Board Assembly is not defective.
3. If passed, proceed to “Check 11, DC-DC Converter Input Voltage”, otherwise replace the defective line switch or blown fuse.

Check 11, DC-DC Converter Input Voltage

1. Turn on the 4339B.
2. Using a multimeter, check if the voltage between TP4 and TP3 (DC-DC Converter input voltage) on A1 Assembly is between +12 V and +15 Vdc. Refer to Figure 4-12 for the test pad locations.
3. If the voltage is in the range, proceed to the "Check 12, DC-DC Converter Open Output Voltages", otherwise proceed to the "Check 13, Transformer Secondary Voltage".

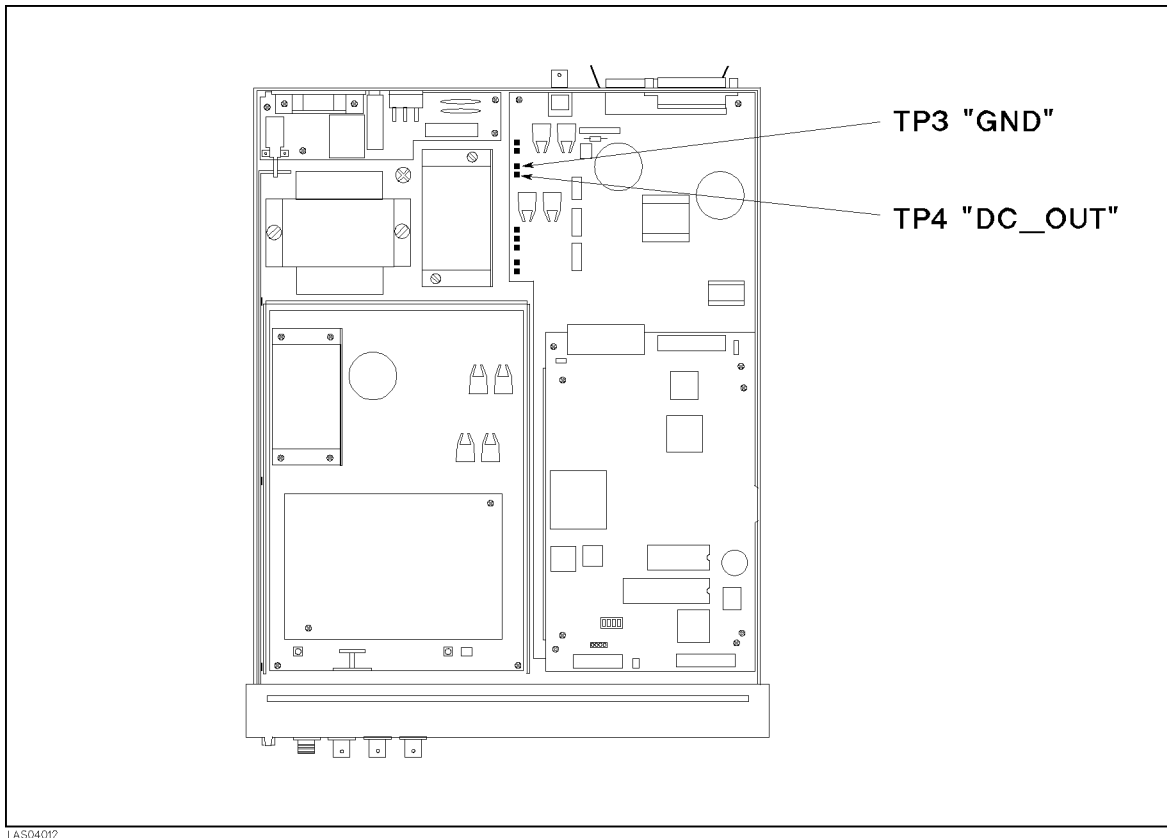
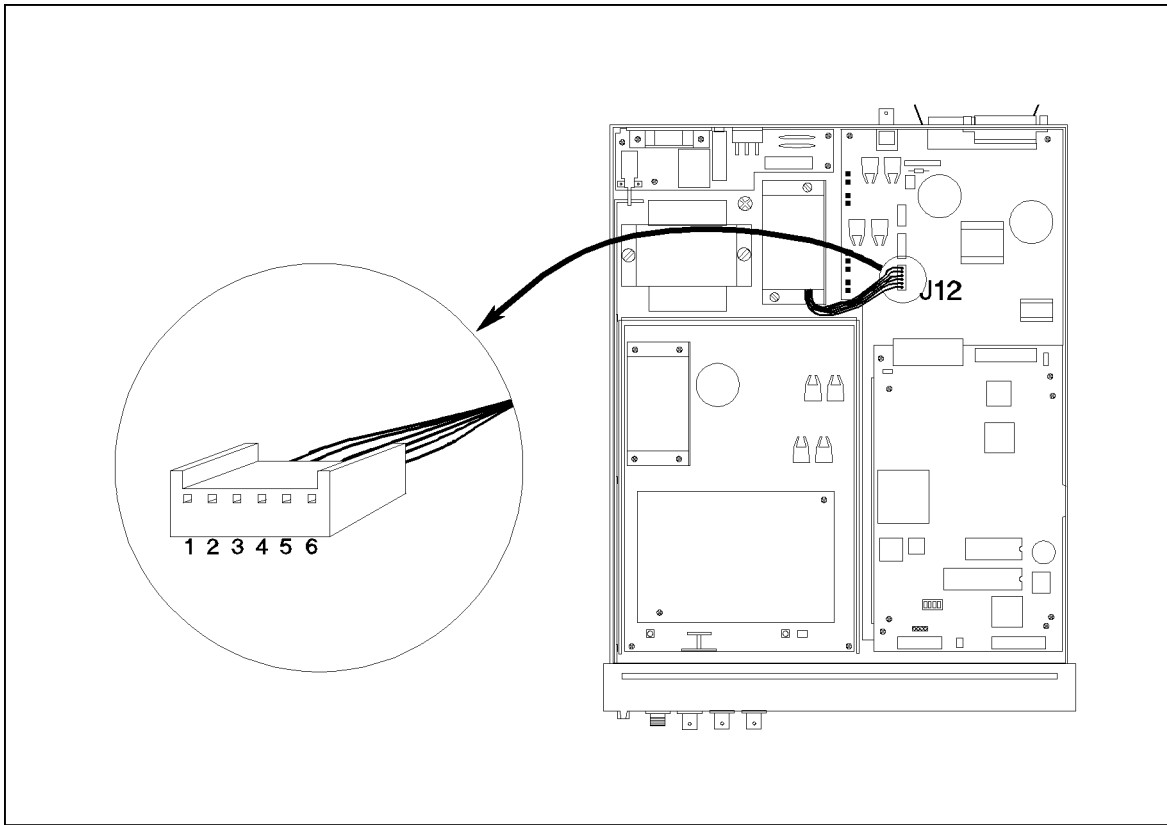


Figure 4-12. Test Pad Locations

Check 12, DC-DC Converter Open Output Voltages

1. Turn off the 4339B.
2. Disconnect the DC-DC Converter Output Cable shown in Figure 4-13 from connector “J12” on the A1 Main Board Assembly.
3. Turn the 4339B on.
4. Using a multimeter, check if the DC-DC Converter open output voltages on the output connector pins shown in Figure 4-13 are in the ranges shown in Table 4-2.
5. If passed, replace the A1 Main Board Assembly, otherwise replace the DC-DC Converter Assembly.



LAS04011

Figure 4-13. DC-DC Converter Output Connector

Table 4-2. DC-DC Converter Open Output Voltages

Pin (+)	Pin (–)	Voltage Range
1	2	5.1 $\pm$ 0.2 V
4	3	12 $\pm$ 0.6 V
5	3	–12 $\pm$ 0.6 V

Check 13, Transformer Secondary Voltage

1. Turn off the 4339B.
2. Disconnect the transformer secondary connector from connector “J13” on the A1 Main Board Assembly. Refer to Figure 4-14 for the connector location.
3. Turn the 4339B on.
4. Using a multimeter, check if the transformer secondary voltage is between 13 V and 17 Vac.
5. If passed, replace the A1 Main Board Assembly, otherwise replace the transformer assembly.

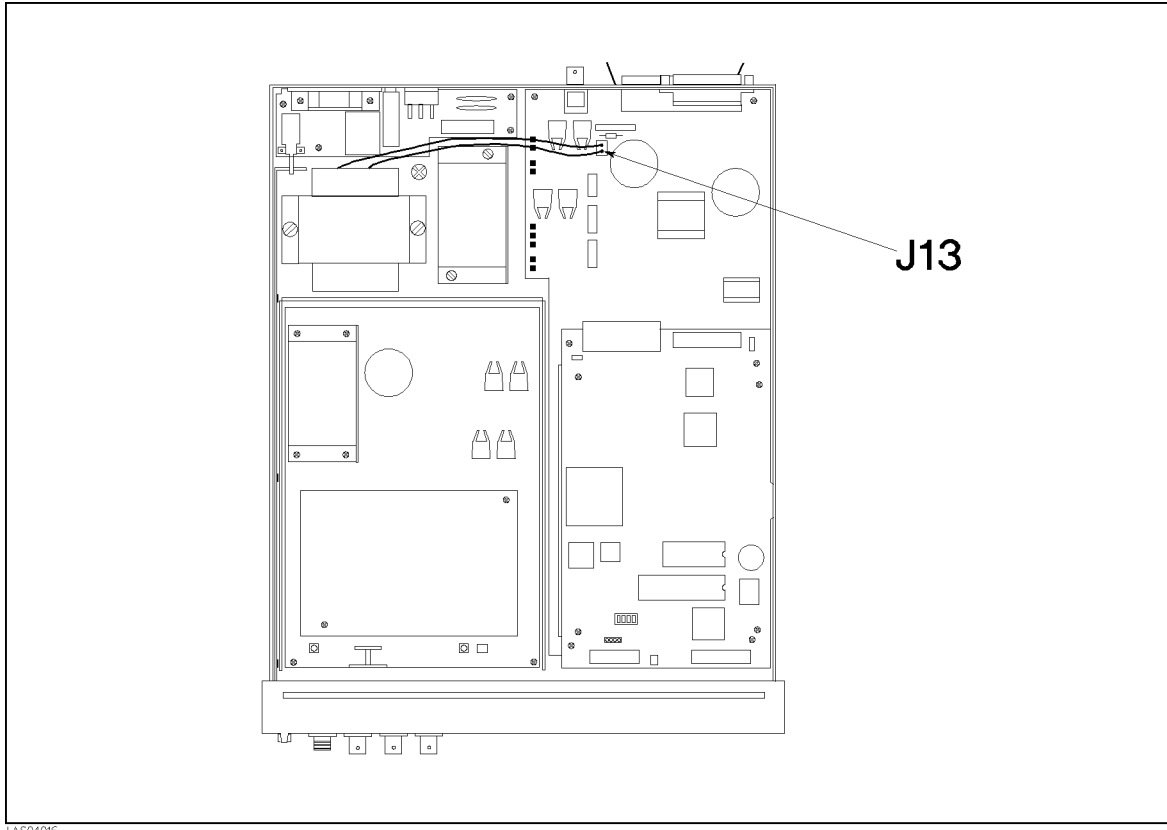


Figure 4-14. Transformer Secondary Voltage Check

Manual Changes

Introduction

This appendix contains the information required to adapt this manual to earlier versions or configurations of the 4339B than the current printing date of this manual. The information in this manual applies directly to 4339B High Resistance Meter whose serial number prefix is listed on the title page of this manual.

Manual Changes

To adapt this manual to your 4339B, refer to Table A-1, and make all of the manual changes listed opposite your instrument's serial number.

Instruments manufactured after the printing of this manual may be different from those documented in this manual. Later instrument versions will be documented in a manual changes supplement that will accompany the manual shipped with that instrument. If your instrument serial number is not listed on the title page of this manual or in Table A-1, it may be documented in a *yellow MANUAL CHANGES* supplement.

For additional information on serial number coverage, refer to 4339B Operation manual.

Table A-1. Manual Changes by Serial Number

Serial Prefix or Number	Make Manual Changes
	There are no earlier configurations than the printing date of this manual.

Default Jumper and Switch Settings

Introduction

This appendix describes the setting of the jumpers and switches on the A2 CPU Board Assembly. Use this information when replacing the A2 Assembly.

Jumper and Switch Settings

Figure B-1 shows the default Jumper and Switch Settings. When the A2 CPU Board Assembly is replaced, set the jumpers and switches to the default side as shown in the figure.

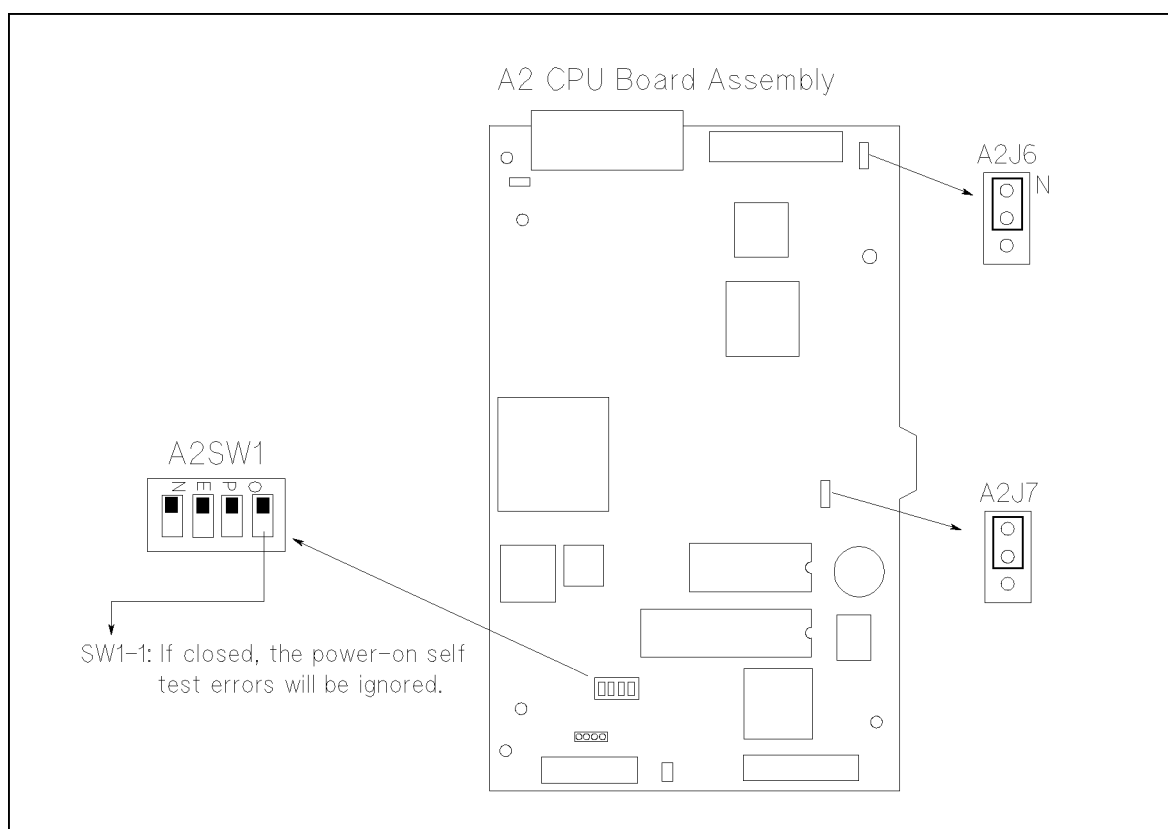


Figure B-1. Jumper and Switch Settings

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